Journal of Blended and Technical Education

e-ISSN: 3090-3203

Vol 01 (2) 2025 p. 128-144

Corresponding author:
Cahyani
Email: iacahya02@gmail.com

Received 17 June 2025;
Accepted 16 July 2025;
Published 17 July 2025.

Conflict of interest statement:
The author (s) reported no conflict of interest

DOI: http://doi.org/10.70764/gdpu-jbte.2025.1(2)-11

CHATGPT AND EDUCATION TRANSFORMATION: A SWOT ANALYSIS TOWARDS AN INNOVATIVE AND ETHICS-BASED CURRICULUM IN THE DIGITAL ERA

Cahyani[1]

[1] *Universitas Muhammadiyah Purworejo, Indonesia*

ABSTRACT

Objective: This study aims to provide a systematic and evidence-based understanding of the strengths, weaknesses, opportunities, and threats (SWOT) of integrating ChatGPT, an artificial intelligence (AI)-based chatbot, in an educational context.

Research Design & Methods This study used a descriptive qualitative approach with a SWOT analysis framework to evaluate the strategic aspects of using ChatGPT in the teaching and learning process. Data were collected through a literature review and observation of the practice of using AI in education.

Findings: The analysis shows that ChatGPT has strengths in generating logical and relevant responses, providing real-time feedback, and supporting personalized learning. However, there are weaknesses such as limited depth of understanding, potential bias, and inability to accurately assess cultural context and academic relevance. Opportunities include facilitating access to information and simplifying teaching activities, while threats include the risk of plagiarism, academic ethical challenges, and perpetuating discrimination in the learning process.

Implications & Recommendations: This study recommends developing a holistic approach that integrates AI into instructional design while emphasizing the importance of strengthening critical thinking skills and digital literacy. In addition, clear ethical guidelines are needed to ensure fair and responsible use of ChatGPT.

Contribution & Value Added: This study contributes by offering a SWOT-based evaluative framework to understand the impact of ChatGPT in education and provides direction for further research related to optimizing AI-based learning and developing ethical policies in academic writing.

Keywords: ChatGPT, Educational Technology, Academic Ethics

JEL codes: I21, O33, A29
Article type: research paper

INTRODUCTION

Recent years have seen a significant increase in scholarly attention towards the integration of artificial intelligence (AI)-based chatbots in education. Chatbots such as ChatGPT are now seen as key representations of disruptive technologies that have the potential to revolutionize the way teaching and learning are conducted (Eke, 2023; Gökçearslan et al., 2024). The technology's presence has not only sparked academic discussions on its effectiveness and relevance in modern learning contexts but also prompted explorations on how AI can be used to enrich learning experiences, enhance personalization, and respond to learners' needs in real-time. This trend indicates a paradigm shift in education towards utilizing advanced technologies to create a more adaptive, collaborative, and innovative learning ecosystem.

Released to the public on November 30, 2022, ChatGPT immediately attracted global attention by registering over one million users within just one week of its launch (Yatoo & Habib, 2023). This achievement reflects a remarkable and unprecedented growth rate, making ChatGPT one of the fastest-adopting consumer platforms in history. The increase in the number of users in a short period of time not only demonstrates the high public interest in artificial intelligence but also marks a major shift in the pattern of human interaction with digital technology. The platform was developed by OpenAI and is built on advanced language models trained using large datasets of human conversations, making it capable of performing a variety of complex tasks and generating responses that resemble natural human language (Korkmaz et al., 2023; Randell & Coghlan, 2023). Utilizing deep learning techniques, ChatGPT is designed to understand, process, and generate natural language text with a high degree of sophistication, while maintaining sufficient accuracy and relevance for various user needs (Abdullah et al., 2022; Hashana et al., 2023).

The use of ChatGPT certainly brings various benefits, especially in the world of education (Castro, 2023), such as increasing the efficiency of the learning process and facilitating access to information. The use of ChatGPT can strengthen the role of educators in various aspects of the learning process, from designing a more adaptive curriculum, compiling relevant and contextual teaching materials, to tailoring learning experiences according to students' individual needs. This technology allows teachers to be more efficient in designing innovative teaching strategies, providing personalized learning support, as well as creating a more responsive learning environment that is focused on developing learners' competencies holistically (Zhang & Tur, 2024).

However, experts also emphasize a number of concerns regarding its potential as well as ethical challenges and potential negative impacts that need to be considered in its application (Rudolph et al., 2023). One of the main concerns relates to academic integrity, where the use of AI could potentially lead to plagiarism or misuse in academic assignments. In addition, the protection of student data privacy is a crucial issue as interactions with ChatGPT often involve the collection and processing of sensitive personal data. The absence of clear regulations can increase the risk of privacy violations and misuse of such information. Last but not least, the accuracy of the information provided by AI is also a serious concern as ChatGPT may produce inaccurate or biased answers, which, if not properly controlled by educators, may lead to misunderstandings among learners (Law et al., 2024).

The development of comprehensive ethical guidelines to address the ethical challenges posed by the use of ChatGPT, as well as clear policies on the utilization of artificial intelligence in academic settings, is needed (Ghandour et al., 2024). These efforts are important to ensure that the integration of AI technology remains within the corridors of noble educational values and does not erode long-held academic principles (Hsu, 2023). In addition, the process of validating the accuracy and authenticity of content generated by AI systems such as ChatGPT should be a top priority in order to maintain scientific quality, prevent the spread of misinformation, and maintain ethical standards in teaching and research activities (Kim, 2024). The synergy between strict regulations, technological literacy, and the moral responsibility of users is an important foundation in ensuring the responsible and sustainable use of AI in the education sector. Therefore, the implementation of ChatGPT in education must be accompanied by the development of strict ethical guidelines, transparency in the algorithm mechanism used, and clear and firm legal rules. These steps are essential for the technology to be optimally utilized while minimizing the negative risks that may arise.

Academics have explored the benefits and challenges of integrating ChatGPT into education, but there is still a lack of comprehensive studies that can serve as a theoretical foundation for empirical research in optimally utilizing the potential of this AI technology. An in-depth literature review is needed to identify and evaluate the strengths and weaknesses of ChatGPT, as well as uncover opportunities and threats that may arise in the educational context. Using a SWOT analysis framework, this review aims to provide educators and researchers with a more systematic and evidence-based understanding of how to effectively, ethically, and sustainably design strategies for utilizing AI to improve the quality of learning and teaching in the digital age.

LITERATURE REVIEW

Innovative Education Curriculum

The curriculum is a fundamental tool in the education system that not only serves as a guide but also as a strategic tool to realize overall educational goals. The curriculum is designed as an integrated system that includes various main elements such as educational objectives, content or learning materials, teaching strategies and methods, and evaluation systems used to measure learning achievements (Huda, 2017). Each component in the curriculum interacts systemically, so changes or adjustments to one aspect, for example, in teaching methods or material content, will directly affect the effectiveness and relevance of the entire curriculum.

Innovative educational curricula are the result of systematic reforms and the application of new approaches designed to improve the effectiveness of the teaching and learning process, while responding to the dynamic needs of modern society and the rapid development of technology. Such curricula not only promote updates in learning methods and content, but also emphasize the importance of integrating cutting-edge technology into the overall educational activities. The ultimate goal is to equip learners with 21st-century skills, including the ability to think critically, creatively, collaboratively, and communicatively, so that they are able to face complex global challenges. In addition, innovative curricula also promote more contextualized and relevant learning, accommodating students' various learning styles and individual needs, and fostering a culture of active, reflective, and problem-solving-oriented learning (Luo, 2023; Shimizu et al., 2023).

An innovative curriculum is generally designed by integrating various important elements that can enrich the learning process and prepare students for future challenges. The elements of an innovative curriculum include the following: 1) Utilization of the latest technology such as artificial intelligence to support the effectiveness of the teaching process and expand access to relevant information (Huang, 2021; Shimizu et al., 2023); 2) Prioritization of experiential learning methods and the development of skills in solving real problems encountered in daily life (Wilson et al., 2018); 3) Emphasis on the development of higher-order thinking skills and essential communication skills in the learning process (Shimizu et al., 2023); 4) Integration of global perspectives and sustainability principles into specific subject matter to shape students' insights and social responsibility (Yu et al., 2024); 5) Implementation of an interdisciplinary approach accompanied by alignment between learning objectives, content, and evaluation methods to create unity and coherence in the curriculum (Sullanmaa et al., 2019).

Implementing an innovative curriculum requires careful planning and consideration of various contextual factors, such as teachers' beliefs and values, local socio-cultural conditions, and potential challenges that may arise during the implementation process. Success in implementing such a curriculum depends on the ability to strike a balance between a top-down approach, which involves directives and policies from education authorities, and a bottom-up approach, which involves the active participation of educators at the grassroots level. In addition, strategies are needed to promote shared understanding and collective commitment among teachers, so that they take ownership of the changes and are able to translate them effectively into classroom practice (Handal & Herrington, 2003; Soini et al., 2018; Tikkanen et al., 2020; Zhang & Liu, 2014). The main objective of an innovative curriculum is to shape individual learners who are resilient, flexible, and able to adapt effectively in the face of the dynamics and complexity of the rapidly changing modern world.

The key principle in designing an innovative curriculum is to promote active participation and orientation to user needs. This process emphasizes the importance of collaboration between teachers, students, and various stakeholders in developing the curriculum (Cruz-Martínez et al., 2020). This collaboration not only strengthens the relevance of the curriculum content but also ensures that the educational design reflects the real needs, aspirations of learners, and socio-cultural dynamics in the environment where the curriculum is implemented. In addition, the direct involvement of curriculum users provides contextual insights that are not always captured by centralized approaches, making the end result more adaptive and applicable. Through this

collaborative model, the curriculum is not just a formal instrument of learning, but also a means of empowerment that encourages involvement and shared ownership of the educational process.

The integration of technology, particularly artificial intelligence (AI), is now an important pillar in the development of innovative curricula relevant to the needs of the 21st century. The use of mobile devices and the implementation of the BYOD (Bring Your Own Device) concept have opened up great opportunities for a more creative, flexible, and student-centered pedagogy, where learning is no longer limited to traditional time and space (Cochrane et al., 2014). This technology allows for personalization of learning, wider access to information, and high interactivity between students and teaching materials. Furthermore, the integration of AI in education contributes significantly to creating an adaptive and predictive curriculum, as it is able to analyze individual learning needs and provide appropriate learning recommendations. This is particularly relevant for vocational high schools, which demand a competency-based curriculum and are ready to face the development of the digital industry (Halomoan et al., 2024).

ChatGPT as an Educational Tool

ChatGPT has emerged and was developed by OpenAI in November 2022 (Pahtoni & Jati, 2024), as a tool as an educational tool due to its ability to provide fast, accurate, and data-driven responses. In an educational context, ChatGPT acts as a virtual tutor that helps students understand concepts, answer questions, and encourage independent exploration of knowledge. A study revealed that the application of ChatGPT in linguistics learning, especially on morphosyntactic material, significantly increased students' learning motivation. This is evidenced by the increase in scores between the pre-test and post-test, as well as the emergence of positive perceptions of the learning experience (Rosiana et al., 2024).

Artificial intelligence (AI) models are capable of generating quick and detailed responses to questions, which can be utilized for various purposes in education. Some of its key benefits include the development of assessment instruments, improvement of pedagogical strategies, provision of personalized virtual tutoring, drafting of essay or scientific article outlines, and idea generation (Sok & Heng, 2023). ChatGPT, as an AI-based language model, also has the potential to change the interaction between teachers and students in teaching and learning activities, and encourage active learning and more innovative pedagogical approaches (Baskara, 2023).

This technological innovation is seen as a transformative force capable of redirecting the future of generative technologies, especially in the education sector. Its use has expanded to various fields, including education, programming, and content production. In education, ChatGPT plays an important role in enhancing learning effectiveness through the design of relevant assignments, provision of personalized feedback, as well as support in the research process, such as outlining a study or exploring initial ideas. Its adaptive and interactive capabilities make it a potential learning partner in encouraging students' active participation and reinforcing independent understanding of concepts. Therefore, the utilization of ChatGPT opens up great opportunities for educational institutions to adopt more flexible, innovative, and individualized learning approaches (Kim, 2023).

Scientific literature has consistently highlighted the great potential of ChatGPT as a virtual instructor in the context of education and learning. ChatGPT is considered capable of providing comprehensive explanations of various learning topics, thus supporting in-depth understanding of concepts for learners. Its ability to answer questions in real-time provides a more interactive and responsive learning experience, resembling the role of a personal tutor. In addition, ChatGPT also serves as an effective tool in summarizing learning materials in a concise and compact manner, which is very useful for reviewing materials or preparing presentation materials. Not only that, its ability to help create content, whether in the form of writing, creative ideas, or teaching materials, makes ChatGPT a digital partner that supports the productivity of educators and learners. Studies from Montenegro-Rueda et al., (2023) and Wollny et al., (2021) emphasize that the existence of this technology further expands the scope of innovation in the teaching and learning process, especially in technology-based education and self-directed learning.

Conceptually, the implementation of ChatGPT is based on the theory of constructivism, which emphasizes that learning takes place actively through direct interaction between learners

and information sources. In this case, ChatGPT acts as a facilitator that provides instant feedback, answers questions, and helps students understand concepts, thus encouraging independent and inquiry-based learning. In addition, this approach is in line with the theory of technology-enhanced learning, which emphasizes the importance of utilizing digital technology to increase student engagement and the overall effectiveness of the learning process (Yandola, 2023).

METHODS

SWOT analysis is a qualitative research method often used in strategic planning and situational evaluation because of its ability to provide a comprehensive overview of the condition of an organization, project, or phenomenon. This method focuses on four main elements, namely Strengths, Weaknesses, Opportunities, and Threats, which are systematically analyzed to understand the internal and external factors that influence the success or failure of an initiative (Gürel, 2017). In the context of research, SWOT analysis allows researchers to identify potential opportunities and challenges more comprehensively, which can be used as a basis for formulating relevant and adaptive strategies. With this approach, researchers not only describe existing conditions but are also able to provide strategic recommendations based on contextual analysis, making SWOT an effective tool to examine the dynamics and development direction of a research subject in depth. Research with the SWOT approach is generally conducted through methods such as literature studies, interviews, observations, or document analysis, the results of which are then described descriptively and grouped into the four main components of SWOT. Strengths and weaknesses represent internal factors, while opportunities and threats represent external factors that affect the outcome or impact of the object of study. This approach is very useful in formulating development or improvement strategies because it is able to display the overall strategic position and provide a contextual and realistic understanding of the situation being encountered.

RESULT

SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats, which was first developed in the early 1950s as an analytical tool to evaluate organizational strategies (Benzaghta et al., 2021). Over time, this framework has not only been used in the business world but has also been widely adopted in the education sector. In the context of education, SWOT analysis has become an important instrument to assist institutions in formulating strategic planning and supporting the decision-making process, especially in situations involving multiple parties with different perspectives, roles, and resources (Zhu & Mugenyi, 2015). By considering internal strengths, weaknesses that need to be overcome, opportunities that can be utilized, and potential threats faced, this analysis allows education stakeholders to formulate policies and development strategies that are more targeted, adaptive, and sustainable.

SWOT analysis as a strategic approach is very useful in supporting the implementation of new technologies in the education sector. It emphasizes the need to optimize available opportunities by strengthening internal potentials, and to face challenges by improving or overcoming existing weaknesses. The SWOT framework provides a structured method for gathering and analyzing information from a variety of sources, enabling a thorough understanding of the internal factors of strengths and weaknesses, as well as the external factors of opportunities and threats that influence the success of technology implementation. In this context, strengths are understood as resources or capacities that contribute directly to the achievement of technology utilization goals. Opportunities refer to internal or external aspects that can increase the relevance and demand for the technology in the educational environment. In contrast, weaknesses describe technical or functional limitations that can impede progress and need to be identified immediately to be minimized. Meanwhile, threats refer to external aspects or negative sides of the technology that can create obstacles or risks in the implementation of the strategy, thus requiring anticipatory steps so as not to disrupt the sustainability and effectiveness of the program.

Table 1. SWOT Analysis of the Education Sector

Advantageous for reaching goals	Detrimental to reaching goals
Strenghts	Weaknesses

Internal Factors	- Presents logical and relevant responses - Potential to learn and develop independently - Gives responses tailored to individual needs - Provides real-time responses	- Lack of comprehensive understanding - Difficulty in assessing the relevance of responses - Possibility of unobjective preferences - Lack of critical and analytical thinking skills
External Factors	**Opportunities** - Ease access to information - Encourages an individualized approach to learning - Supports complex learning processes - Facilitates teaching activities	**Threats** - Lack of understanding - Disregard for academic ethics - Supporting the existence of discrimination in the learning process - Widespread practice of plagiarism in the academic environment

Based on the SWOT framework and drawing on relevant literature, this analysis presents a comprehensive understanding of ChatGPT's role in the educational context. ChatGPT's strengths are identified as a basis for exploring potential opportunities to support curriculum and learning innovation. On the other hand, the review also examines weaknesses to uncover possible future threats to educators, institutions, and other stakeholders. By thoroughly understanding these factors, appropriate and adaptive strategies can be developed to maximize the benefits of this technology while minimizing the risks.

Strengths Associated with ChatGPT

Presents logical and relevant responses

ChatGPT is an artificial intelligence-based language model designed with transformer architecture technology, which enables it to accomplish various tasks in the field of Natural Language Processing (NLP), such as understanding and generating text (Xue et al., 2023). This architectural structure allows ChatGPT to understand the semantic relationships between words in a sentence and maintain context consistency in a conversation, so that it is able to provide responses that are relevant and integrated into the flow of the dialogue (Li et al., 2019). ChatGPT's superior performance is greatly supported by the vast scale of training data, covering a wide variety of languages and writing styles, allowing the model to recognize linguistic patterns thoroughly (Kasneci et al., 2023). In the realm of learning, ChatGPT has shown a positive contribution to the improvement of students' logical thinking skills, especially in argumentative essay writing. Through the application of strategies such as gathering, which is the process of collecting relevant and in-depth information, and exercising, which is the practice of composing logical and structured arguments, students are helped to develop their analytical power and argumentation skills more systematically (Zhang et al., 2025). This provides ChatGPT with a distinct advantage in deeply understanding context and generating natural-sounding and convincing responses, especially when compared to similar AI platforms (Lecler et al., 2023; Wang et al., 2023). The synergy between cutting-edge architecture and massive data training makes ChatGPT highly reliable in linguistically interacting with users from different cultural and knowledge backgrounds.

Potential to learn and develop independently

One of the key advantages of ChatGPT's features lies in its ability to evolve and improve the quality of its answers through the Reinforcement Learning from Human Feedback (RLHF) method. Unlike traditional chatbots that rely on fixed rules, ChatGPT utilizes human input in the training process to adjust its output to better align with human preferences and values. Through the RLHF approach, the model obtains human evaluations of various response options, then uses that information to generate increasingly relevant and appropriate answers over time (Patil & Shrikhande, 2024). Through this learning process, ChatGPT is able to improve the accuracy, cohesiveness, and relevance of its responses by absorbing feedback in the form of criticism and suggestions on the responses it has given. Studies have shown that this approach not only strengthens the technical aspects of the model but also helps the AI become more ethical and in line with real user expectations (Pulari et al., 2025). In addition, with continuous updates based on

fresher and more diverse training data, ChatGPT evolves into an adaptive and responsive system rather than a static system that is able to keep up with the ever-changing language and information needs (Rudolph & Manogar, 2024).

Gives responses tailored to individual needs

ChatGPT's ability to learn from human interactions makes it a conversational agent that is highly adaptive and contextual to the dynamics of user communication. One of its key advantages is its ability to remember elements from previous conversations and use them to form more contextual and coherent responses. This feature allows ChatGPT to maintain a natural conversational flow, even in dialogs that take place over multiple rounds, making it feel more like talking to a real human than a machine (Shen et al., 2023). This capability is achieved through training using large-scale data and the application of advanced deep learning techniques (Hadi et al., 2023). In addition, ChatGPT is able to generate responses with varying styles and formats according to the user's wants and needs (Aljanabi, 2023). More than just responding, recent developments have also shown that ChatGPT has the potential to become a proactive agent- it can initiate conversation topics, provide recommendations based on previous interactions, and create a more contextualized and purposeful dialog experience (Liao et al., 2023).

Provides real-time responses

ChatGPT's processing speed is one aspect that makes it excel as a tool in various contexts, especially in the context of academic writing. In a study by Kumar (2023) that evaluated ChatGPT's performance in completing scientific writing tasks in the biomedical field, it was found that the chatbot could produce 300-500 words of text in just under two minutes. However, although the process is very fast, the academic quality of the writing still needs improvement to meet the criteria for scientific publication. Not only is it quick to respond, but it is also able to simplify the process of brainstorming, summarizing literature, and editing text, thus speeding up the entire academic writing process (Alqadi et al., 2023). These advantages drastically simplify the information search process, as users no longer have to perform manual searches across multiple platforms or references. In the fast-paced modern world, where information is needed immediately, both to meet deadlines and support quick decision-making. ChatGPT's capabilities provide significant advantages, making it an efficient and responsive solution in a digitally driven work and education ecosystem.

Weaknesses Found in ChatGPT's Use

Lack of comprehensive understanding

Even though ChatGPT is capable of producing logical and seemingly convincing responses, it is still limited when faced with tasks that require an in-depth understanding of theoretical or abstract concepts. This is particularly evident in fields such as medical education and physiology, where complex conceptual understanding is crucial (Banerjee et al., 2023). Furthermore, in language learning, ChatGPT also shows limitations in capturing implicit meanings, emotional nuances, as well as context complexity in natural language, which are often important aspects in authentic and communicative language acquisition. The use of ChatGPT tends to produce narrative and surface-level outputs, which while seemingly informative, are often not accompanied by sufficient analytical depth, thus falling short of the standards of critical and evaluative thinking required in complex and responsible professional decision-making (Vaishya et al., 2023).

Difficulty in assessing the relevance of responses

As a language model developed with artificial intelligence technology, ChatGPT has fundamental limitations in evaluating the credibility of the information on which it is trained. Unlike humans, who are able to judge whether information is trustworthy or not, ChatGPT relies solely on statistical patterns in text datasets without the ability to judge the accuracy or validity of the information source (Sallam, 2023). This limitation is further exacerbated by the fact that ChatGPT does not have direct access to the internet and is only trained on data up to 2021. As a result, the model is prone to producing information that is outdated and less in line with the latest developments (Adetayo, 2023; Sallam, 2023).

Possibility of unobjective preferences

The possibility of unobjective preferences in ChatGPT's responses to students, teachers, or learning content is an important concern. This is due to its training process that relies on large data sets from the internet, which inherently contain various social, political, and cultural biases. The results revealed that ChatGPT has the potential to exhibit biases related to race, gender, and socioeconomic status due to hidden biases in both its training data and algorithm design. As an illustration, ChatGPT may provide different responses or judgments based on the demographic attributes implied in the prompt, even though the content provided is actually the same (Warr et al., 2023). It has also shown a tendency towards systemic bias towards certain groups in higher education and professional contexts (Ferrara, 2023; Li et al., 2025).

Lack of critical and analytical thinking skills

While ChatGPT is able to support the development of complex learning skills, its limitations are still very apparent when faced with tasks that demand higher-order thinking skills, such as critical analysis and deep reflection (Rudolph et al., 2023)s. This is because such AI models operate based on learned data patterns without truly understanding the underlying context or meaning. In addition, ChatGPT also lacks common sense, as well as in capturing the emotional dimension that is often an important component of critical thinking (Bakpayev et al., 2022). For example, when asked to generate questions that stimulate critical thinking, the output tends to be superficial and unable to explore the complexity or nuances of the topic at hand. This suggests that a comprehensive understanding of the core issues is still a major obstacle for this technology (Cotton et al., 2024).

Opportunities Presented by ChatGPT

Ease access to information.

ChatGPT is increasingly recognized as a tool that plays an important role in education, supporting the needs of students and teachers. Unlike conventional search engines that only display a list of links, ChatGPT is able to provide direct and concise answers. Its advantage in simplifying complex information into easy-to-understand explanations greatly assists students in understanding the material quickly and efficiently (Cascella et al., 2023; Yandola, 2023). Pedagogically, the integration of ChatGPT in learning can shift students' focus from simply seeking information to higher-order cognitive activities such as analyzing and evaluating the information (Zhai, 2022). ChatGPT has been shown to increase students' learning motivation by providing immediate feedback, aiding essay writing, and strengthening language skills (Achour et al., 2024). For teachers, ChatGPT supports the development of materials, question design, and lesson plans that are tailored to students' needs and learning styles, thereby increasing learning efficiency (Mbwambo & Kaaya, 2024; Murad et al., 2023).

Encourages an individualized approach to learning

ChatGPT has a significant ability to provide individually tailored feedback, particularly in argumentative essay writing, which requires critical thinking skills, organization of ideas, and language proficiency (Noroozi et al., 2012). Asadi et al., (2025) study revealed that combined feedback from ChatGPT and teachers effectively improved EFL students' writing skills, especially in terms of task completion, coherence, vocabulary use, and grammar, compared to relying solely on teachers. This shows that ChatGPT is able to provide quick and varied responses that can be customized to each student's level of need. The quality of feedback from ChatGPT is greatly influenced by the form of the question or request given. For example, when asked to give praise, ChatGPT tends to provide a more positive and affective response, but can also produce more critical feedback if so requested (Dong, 2024). Therefore, teachers need to design prompts in a balanced way so that students receive constructive feedback while providing positive emotional encouragement.

Supports complex learning processes

ChatGPT has great potential in supporting complex learning such as language learning, programming, academic writing, and critical thinking (Hapsari & Wu, 2022; Jia et al., 2022). In language learning, ChatGPT acts as a learning partner that allows students to reflect and improve

their writing independently (Kurt & Kurt, 2024), while in critical thinking practice, this AI helps improve the clarity, logic, and relevance of arguments (Xue, 2024). In the field of programming, ChatGPT is utilized as a self-learning companion that provides immediate instructions, solutions, and clarifications, thus encouraging deeper exploration of concepts through a project-based approach (Biswas, 2023). With its ability as an intelligent conversational agent, ChatGPT provides an important opportunity to hone their argumentation skills through safe and non-pressurized interactive exercises, thus supporting deep and complex learning effectively.

Facilitates teaching activities

ChatGPT has great potential to assist teachers by reducing administrative workload, especially in providing feedback and grading student assignments. The study by Nguyen & Tran (2023) showed that ChatGPT-provided essay grading and feedback can be consistent and comparable to teacher grading. In addition, ChatGPT-based automated assessment systems, such as AI Assess, are able to create practice questions, identify students' comprehension deficiencies, and provide quick feedback, thus significantly saving teachers' time (Diyab et al., 2025). ChatGPT also helps increase teacher productivity by automating tasks such as lesson plan creation and essay grading, allowing teachers to focus more on teaching and direct interaction with students (Rasheed et al., 2024). However, to achieve optimal results, the use of ChatGPT should be done with caution and remain supervised by teachers, as this model sometimes provides less specific or less accurate feedback. In summary, ChatGPT can be an effective tool provided it is accompanied by proper supervision from educators.

Threats Faced by the Development and Use of ChatGPT

Lack of understanding

The use of ChatGPT in education presents the threat of not understanding the context, meaning, and cultural background of students, which may result in inappropriate learning materials or recommendations. In essay grading, AI's limitations in understanding nuance, social context, and implicit arguments could potentially lead to inaccurate grading (Alibrahim, 2024). ChatGPT also shows a tendency to be biased, provide misinformation, and lack the ability to perform critical reasoning and moral reflection, which are essential in meaningful education (Mesiono et al., 2024). This threat is even more complex in multicultural or remote contexts, where a lack of sensitivity to local diversity can widen educational disparities (LaFrance et al., 2024). The implementation of ChatGPT in education must be accompanied by a critical understanding of its limitations and human oversight to ensure relevance and equity in learning.

Disregard for academic ethics

The emergence of ChatGPT has sparked serious concerns regarding academic integrity, including in the conduct of examinations. With its ability to produce text that resembles human writing and answer questions with high accuracy, ChatGPT has the potential to be used for academic fraud. Study of Susnjak (2022) showed that ChatGPT can complete high-level cognitive tasks with results that are difficult to distinguish from human answers. This finding is reinforced by recent research showing that ChatGPT is able to answer multimodal exam questions across multiple disciplines, including in the context of critical thinking across text and visuals (Susnjak & McIntosh, 2024). An empirical study by Fijačko et al., (2023) suggests that ChatGPT answers in a college life support exam were generally relevant, accurate, and more in line with resuscitation guidelines than previous AI tools. This high performance confirms that ChatGPT can be a real threat to academic integrity, particularly in higher education environments (Cotton et al., 2024). To reduce the potential for AI-assisted cheating, Evangelista (2025) argues for the need to redesign exam forms to reduce the potential for AI-assisted cheating. Strategies such as oral assessment, analysis-based questions, and the use of AI detection tools can be complementary solutions to maintain academic integrity.

Supporting the existence of discrimination in the learning process

Discussions about the potential for bias and discrimination in the use of ChatGPT in education are increasingly relevant as AI technologies are increasingly integrated into education.

Studies show that ChatGPT can reproduce ethnic bias and gender discrimination, as seen in job application screening simulations (Evangelista, 2025). In the context of academic assessment, the model also shows implicit bias against students based on implied demographic descriptions, reflecting serious challenges in maintaining fairness and objectivity (Warr et al., 2023). ChatGPT reinforces linguistic discrimination against non-standard dialect users, potentially disadvantaging learners from diverse language backgrounds (Fleisig et al., 2024). Based on the existing findings, ChatGPT still displays various forms of bias in educational settings, including bias related to ethnicity, gender, disability, and dialectal variation. Thus, developers and educators need to be vigilant and critically evaluate the application of this technology in the learning system.

Widespread practice of plagiarism in the academic environment

ChatGPT has raised various ethical issues in academia, particularly regarding plagiarism, cheating, and spreading misinformation or hoaxes (Gašević et al., 2023; Tlili et al., 2023). Although OpenAI emphasizes that ChatGPT does not directly transcribe text, but rather generates responses through synthesis of training data, studies show that the degree of similarity between ChatGPT output and existing sources can be very high. This makes its use in academic contexts highly controversial. A number of studies have shown that ChatGPT facilitates plagiarism and academic fraud, due to its ability to quickly produce essay-like writing that resembles human work (Cotton et al., 2024; Spirgi et al., 2024). This risk is heightened because models like ChatGPT are prone to "hallucination", which is the generation of information that appears valid when it is false or misleading (Ferdousi, 2024; Qasem, 2023). The ethical issues become even more complex when considering ChatGPT's tendency to generate false or illogical answers, potentially increasing the risk of spreading misleading information in academic publications (Liebrenz et al., 2023). Therefore, the use of this technology in scientific contexts should be accompanied by strict supervision and verification.

DISCUSSION

The existence of ChatGPT and similar AI chatbots has raised concerns regarding academic integrity; many academics suggest alternative approaches that aim not only to reduce the risk of cheating but also to improve the quality of learning. One proposed approach is a shift from conventional theory-based assessment towards case-based analysis methods, which encourages the application of knowledge in real contexts and reduces the possibility of unethical use of ChatGPT (Mbwambo & Kaaya, 2024; Rane et al., 2024). One alternative strategy in maintaining academic integrity is to implement oral evaluations, which allow lecturers to directly assess students' understanding and originality of thought and are difficult to manipulate by AI (Sullivan et al., 2023). In addition, directing assessment to creative writing rather than rote memorization is considered more effective, as although ChatGPTs are able to compose narrative texts, they still struggle to authentically replicate the author's personal style and experiences (Fiialka et al., 2024). Thus, this approach can strengthen the authenticity and quality of the learning process.

With the increasing reliance of education on artificial intelligence (AI), special attention needs to be paid to the development of higher-order learning outcomes, such as creativity and critical thinking skills (González-Pérez & Ramírez-Montoya, 2022). His change in focus demands adjustments in the design of learning tasks to stimulate students' deep thinking skills (Farrokhnia et al., 2022). In this context, the utilization of ChatGPT can be an innovative solution. Instead of assigning essays with uniform topics, educators can utilize ChatGPT to produce a variety of essays that are then evaluated by students. Through the process of reflection and argumentation on the quality of AI-generated essays, students are encouraged to hone their analytical and critical skills. Furthermore, the advantages of ChatGPT in creating personalized learning experiences (Shen et al., 2023), as well as the critical role of adaptive learning in supporting the achievement of high-level learning outcomes (Gašević et al., 2023), make it a strategic tool in designing learning activities that are not only effective but also relevant to students' individual needs.

To realize an innovative curriculum that remains ethical, a holistic approach is needed that equally accommodates the potential and risks of using ChatGPT in education. This includes careful and purposeful integration of ChatGPT into instructional design, so that its use not only

supports the achievement of learning objectives but also strengthens students' critical and creative thinking skills (Choi et al., 2024). Additionally, the development of critical digital literacy is an important component to enable students and educators to understand, evaluate, and utilize these technologies responsibly (Tran & Tran, 2023). Ethical considerations should also be a key cornerstone, including transparency in the use of AI, data protection, and prevention of bias in content (Vaccino-Salvadore, 2023). With this framework, ChatGPT can function as an effective tool to support educational innovation, without compromising academic integrity or human values in the learning process.

The use of ChatGPT in education is still at an early stage, so further empirical research is needed to optimize its use. The results of the SWOT analysis suggest several potential directions for future studies, including further exploration of the effectiveness of ChatGPT in facilitating personalized learning across different contexts, comparison of the impact of feedback from ChatGPT with teachers and peers on learning outcomes, and identification of the best instructional design to support complex learning in higher education. In addition, it is important to examine how the type of user prompts and constraints affect the quality of academic essays produced, as well as provide appropriate guidance on the use of AI for writing reflective, argumentative, and descriptive essays. Given the ethical issues that accompany the use of ChatGPT, future research should also focus on developing ethical principles and guidelines to ensure its fair and responsible application in higher education settings.

CONCLUSION

The integration of artificial intelligence (AI) chatbots, such as ChatGPT, in education has attracted significant attention in recent years. ChatGPT, released by OpenAI in November 2022, has the potential to revolutionize teaching and learning. This study aims to provide a systematic and evidence-based understanding of ChatGPT's strengths, weaknesses, opportunities, and threats (SWOT) in the context of education. The strengths of ChatGPT include its ability to provide logical and relevant responses, learn and evolve independently, generate personalized responses, and provide real-time feedback. However, weaknesses such as limited comprehensive understanding, difficulty in assessing the relevance of responses, potential bias, and lack of critical and analytical thinking skills were also identified. Opportunities presented by ChatGPT include facilitating access to information, promoting individualized learning approaches, supporting complex learning processes, and simplifying teaching activities. Conversely, threats include a lack of understanding of cultural contexts and backgrounds, challenges to academic ethics, perpetuation of discrimination in the learning process, and rampant plagiarism in the academic environment. This discussion highlights the need for a holistic approach that carefully integrates ChatGPT into instructional design while developing critical thinking skills and digital literacy. Furthermore, the importance of establishing ethical principles and guidelines to ensure fair and responsible use of AI in higher education is emphasized. Future research directions are suggested, focusing on optimizing the utilization of ChatGPT in personalized learning, comparing the impact of feedback from ChatGPT with teachers and peers, and developing ethical guidelines for the use of AI in academic writing.

REFERENCES

Abdullah, M., Madain, A., & Jararweh, Y. (2022). ChatGPT: Fundamentals, Applications and Social Impacts. *2022 Ninth International Conference on Social Networks Analysis, Management and Security (SNAMS)*, 1– 8. https://doi.org/10.1109/SNAMS58071.2022.10062688

Achour, K., Laanoui, M. D., & Ourahay, M. (2024). The Impact of ChatGPT in Education: A Comprehensive Overview. *2024 International Conference on Global Aeronautical Engineering and Satellite Technology (GAST)*, 1-10. https://doi.org/10.1109/GAST60528.2024.10520810

Adetayo, A. J. (2023). ChatGPT and Librarians for Reference Consultations. *Internet Reference Services Quarterly*, *27*(3), 131– 147. https://doi.org/10.1080/10875301.2023.2203681

Alibrahim, A. A. (2024). Is ChatGPT Reliable in Education? *South African Journal of Education*, *44*(4), 1– 9. https://doi.org/10.15700/saje.v44n4a2557

Aljanabi, M. (2023). ChatGPT: Future Directions and Open possibilities. *Mesopotamian Journal of*

CyberSecurity, *2023*, 16-17. https://doi.org/10.58496/MJCS/2023/003

Alqadi, R., Alrbaiyan, A., Alrumayyan, N., Alqahtani, N., & Najjar, A. B. (2023). Exploring the User Experience and the Role of ChatGPT in the Academic Writing Process. *2023 Congress in Computer Science, Computer Engineering, & Applied Computing (CSCE)*, 1082– 1089. https://doi.org/10.1109/CSCE60160.2023.00180

Asadi, M., Ebadi, S., & Mohammadi, L. (2025). The Impact of Integrating ChatGPT with Teachers' Feedback on EFL Writing Skills. *Thinking Skills and Creativity*, *56*, 101766. https://doi.org/10.1016/j.tsc.2025.101766

Bakpayev, M., Baek, T. H., van Esch, P., & Yoon, S. (2022). Programmatic Creative: AI Can Think but it Cannot Feel. *Australasian Marketing Journal*, *30*(1), 90–95. https://doi.org/10.1016/j.ausmj.2020.04.002

Banerjee, A., Ahmad, A., Bhalla, P., & Goyal, K. (2023). Assessing the Efficacy of ChatGPT in Solving Questions Based on the Core Concepts in Physiology. *Cureus*. https://doi.org/10.7759/cureus.43314

Baskara, F. R. (2023). AI-Driven Dynamics: ChatGPT Transforming ELT Teacher-Student Interactions. *Lensa: Kajian Kebahasaan, Kesusastraan, dan Budaya*, *13*(2), 261–275. https://doi.org/10.26714/lensa.13.2.2023.261-275

Benzaghta, M. A., Elwalda, A., Mousa, M., Erkan, I., & Rahman, M. (2021). SWOT Analysis Applications: An Integrative Literature Review. *Journal of Global Business Insights*, *6*(1), 55–73. https://doi.org/10.5038/2640-6489.6.1.1148

Biswas, S. (2023). Role of ChatGPT in Computer Programming. *Mesopotamian Journal of Computer Science*, *2023*, 9–15. https://doi.org/10.58496/MJCSC/2023/002

Cascella, M., Montomoli, J., Bellini, V., & Bignami, E. (2023). Evaluating the Feasibility of ChatGPT in Healthcare: An Analysis of Multiple Clinical and Research Scenarios. *Journal of Medical Systems*, *47*(1), 33. https://doi.org/10.1007/s10916-023-01925-4

Castro, C. A. de. (2023). A Discussion about the Impact of ChatGPT in Education: Benefits and Concerns. *Journal of Business Theory and Practice*, *11*(2), 28–34. https://doi.org/10.22158/jbtp.v11n2p28

Choi, G. W., Kim, S. H., Lee, D., & Moon, J. (2024). Utilizing Generative AI for Instructional Design: Exploring Strengths, Weaknesses, Opportunities, and Threats. *TechTrends*, *68*(4), 832–844. https://doi.org/10.1007/s11528-024-00967-w

Cochrane, T., Antonczak, L., Keegan, H., & Narayan, V. (2014). Riding the Wave of BYOD: Developing a Framework for Creative Pedagogies. *Research in Learning Technology*, *22*, 1–14. https://doi.org/10.3402/rlt.v22.24637

Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2024). Chatting and Cheating: Ensuring Academic Integrity in the Era of ChatGPT. *Innovations in Education and Teaching International*, *61*(2), 228–239. https://doi.org/10.1080/14703297.2023.2190148

Cruz-Martínez, R. R., Wentzel, J., Asbjørnsen, R. A., Noort, P. D., van Niekerk, J. M., Sanderman, R., & van Gemert-Pijnen, J. E. (2020). Supporting Self-Management of Cardiovascular Diseases Through Remote Monitoring Technologies: Metaethnography Review of Frameworks, Models, and Theories Used in Research and Development. *Journal of Medical Internet Research*, *22*(5), 1–21. https://doi.org/10.2196/16157

Diyab, A., Frost, R. M., Fedoruk, B. D., & Diyab, A. (2025). Engineered Prompts in ChatGPT for Educational Assessment in Software Engineering and Computer Science. *Education Sciences*, *15*(2), 156. https://doi.org/10.3390/educsci15020156

Dong, L. (2024). ChatGPT in Language Writing Education: Reflections and a Research Agenda for a ChatGPT Feedback Engagement Framework. *Language Teaching Research Quarterly*, *43*, 121–131. https://doi.org/10.32038/ltrq.2024.43.07

Eke, D. O. (2023). ChatGPT and the Rise of Generative AI: Threat to Academic Integrity? *Journal of*

Responsible Technology, *13*, 100060. https://doi.org/10.1016/j.jrt.2023.100060

Evangelista, E. D. L. (2025). Ensuring Academic Integrity in the Age of ChatGPT: Rethinking Exam Design, Assessment Strategies, and Ethical AI Policies in Higher Education. *Contemporary Educational Technology*, *17*(1), 1–19. https://doi.org/10.30935/cedtech/15775

Farrokhnia, M., Baggen, Y., Biemans, H., & Noroozi, O. (2022). Bridging the Fields of Entrepreneurship and Education: The Role of Philosophical Perspectives in Fostering Opportunity Identification. *The International Journal of Management Education*, *20*(2), 100632. https://doi.org/10.1016/j.ijme.2022.100632

Ferdousi, B. (2024). Generative Artificial Intelligence ChatGPT in Education: Challenges and Opportunities. *Journal of Systemics, Cybernetics and Informatics*, *22*(6), 48–64. https://doi.org/10.54808/JSCI.22.06.48

Ferrara, E. (2023). Should ChatGPT Be Biased? Challenges and Risks of Bias in Large Language Models. *First Monday*, *28*(11). https://doi.org/10.5210/fm.v28i11.13346

Fiialka, S., Kornieva, Z., & Honcharuk, T. (2024). The Use of ChatGPT in Creative Writing Assistance. *XLinguae*, *17*(1), 3–19. https://doi.org/10.18355/XL.2024.17.01.01

Fijačko, N., Gosak, L., Štiglic, G., Picard, C. T., & John Douma, M. (2023). Can ChatGPT Pass the Life Support Exams without Entering the American Heart Association Course? *Resuscitation*, *185*, 109732. https://doi.org/10.1016/j.resuscitation.2023.109732

Fleisig, E., Smith, G., Bossi, M., Rustagi, I., Yin, X., & Klein, D. (2024). Linguistic Bias in ChatGPT: Language Models Reinforce Dialect Discrimination. *ArXiv*. https://doi.org/https://doi.org/10.48550/arXiv.2406.08818

Gašević, D., Siemens, G., & Sadiq, S. (2023). Empowering Learners for the Age of Artificial Intelligence. *Computers and Education: Artificial Intelligence*, *4*, 100130. https://doi.org/10.1016/j.caeai.2023.100130

Ghandour, A., Woodford, B. J., & Abusaimeh, H. (2024). Ethical Considerations in the Use of ChatGPT: An Exploration Through the Lens of Five Moral Dimensions. *IEEE Access*, *12*, 60682–60693. https://doi.org/10.1109/ACCESS.2024.3394243

Gökçearslan, Ş., Tosun, C., & Erdemir, Z. G. (2024). Benefits, Challenges, and Methods of Artificial Intelligence (AI) Chatbots in Education: A Systematic Literature Review. *International Journal of Technology in Education*, *7*(1), 19–39. https://doi.org/10.46328/ijte.600

González-Pérez, L. I., & Ramírez-Montoya, M. S. (2022). Components of Education 4.0 in 21st Century Skills Frameworks: Systematic Review. *Sustainability*, *14*(3), 1493. https://doi.org/10.3390/su14031493

Gürel, E. (2017). SWOT Aalysis: A Theoritical Review. *Journal of International Social Research*, *10*(51), 994–1006. https://doi.org/10.17719/jisr.2017.1832

Hadi, M. A., Abdulredha, M. N., & E. Hasan. (2023). Introduction to ChatGPT: A New Revolution of Artificial Intelligence with Machine Learning Algorithms and Cybersecurity. *Science Archives*, *04*(04), 276–285. https://doi.org/10.47587/SA.2023.4406

Halomoan, H., Hakiki, M., Ramadhan, M. A., Hidayah, Y., Fakhri, J., Aljamaliah, S. N. M., & Abi Hamid, M. (2024). Integrating Principal Leadership and Teacher Roles with AI-Based "Merdeka" Curriculum Innovation: The Quantitative Research. *TEM Journal*, *13*(4), 3397–3404. https://doi.org/10.18421/TEM134-73

Handal, B., & Herrington, A. (2003). Mathematics Teachers' Beliefs and Curriculum Reform. *Mathematics Education Research Journal*, *15*(1), 59–69. https://doi.org/10.1007/BF03217369

Hapsari, I. P., & Wu, T.-T. (2022). *AI Chatbots Learning Model in English Speaking Skill: Alleviating Speaking Anxiety, Boosting Enjoyment, and Fostering Critical Thinking* (pp. 444–453). https://doi.org/10.1007/978-3-031-15273-3_49

Hashana, A. M. J., Brundha, P., Ahamed Ayoobkhan, M. U., & S, F. (2023). Deep Learning in ChatGPT - A Survey. *2023 7th International Conference on Trends in Electronics and Informatics (ICOEI)*,

1001–1005. https://doi.org/10.1109/ICOEI56765.2023.10125852

Hsu, H.-P. (2023). Can Generative Artificial Intelligence Write an Academic Journal Article? Opportunities, Challenges, and Implications. *Irish Journal of Technology Enhanced Learning*, *7*(2), 158–171. https://doi.org/10.22554/ijtel.v7i2.152

Huang, S. (2021). Design and Development of Educational Robot Teaching Resources Using Artificial Intelligence Technology. *International Journal of Emerging Technologies in Learning (IJET)*, *16*(05), 116–129. https://doi.org/10.3991/ijet.v16i05.20311

Huda, N. (2017). Manajemen Pengembangan Kurikulum. *Al-Tanzim : Jurnal Manajemen Pendidikan Islam*, *1*(2), 52–75. https://doi.org/10.33650/al-tanzim.v1i2.113

Jia, F., Sun, D., Ma, Q., & Looi, C.-K. (2022). Developing an AI-Based Learning System for L2 Learners' Authentic and Ubiquitous Learning in English Language. *Sustainability*, *14*(23), 15527. https://doi.org/10.3390/su142315527

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., … Kasneci, G. (2023). ChatGPT for Good? On Opportunities and Challenges of Large Language Models for Education. *Learning and Individual Differences*, *103*, 102274. https://doi.org/10.1016/j.lindif.2023.102274

Kim, S.-J. (2024). Research Ethics and Issues Regarding the Use of ChatGPT-Like Artificial Intelligence Platforms by Authors and Reviewers: A Narrative Review. *Science Editing*, *11*(2), 96–106. https://doi.org/10.6087/kcse.343

Kim, T. W. (2023). Application of Artificial Intelligence Chatbots, Including ChatGPT, in Education, Scholarly Work, Programming, and Content Generation and its Prospects: a Narrative Review. *Journal of Educational Evaluation for Health Professions*, *20*, 38. https://doi.org/10.3352/jeehp.2023.20.38

Korkmaz, A., Aktürk, C., & Talan, T. (2023). Analyzing the User's Sentiments of ChatGPT Using Twitter Data. *Iraqi Journal for Computer Science and Mathematics*, *4*(2), 202–214. https://doi.org/10.52866/ijcsm.2023.02.02.018

Kumar, A. H. (2023). Analysis of ChatGPT Tool to Assess the Potential of its Utility for Academic Writing in Biomedical Domain. *Biology, Engineering, Medicine and Science Reports*, *9*(1), 24–30. https://doi.org/10.5530/bems.9.1.5

Kurt, G., & Kurt, Y. (2024). Enhancing L2 Writing Skills: ChatGPT as an Automated Feedback Tool. *Journal of Information Technology Education: Research*, *23*, 24. https://doi.org/10.28945/5370

LaFrance, J., Johnson, J., & Harmon, H. (2024). Harnessing Artificial Intelligence's Potential in Rural Education Research: An Application of ChatGPT-4. *Futurity Education*, *4*(2), 86–105. https://doi.org/10.57125/FED.2024.06.25.05

Law, S., Oldfield, B., & Yang, W. (2024). ChatGPT/GPT-4 (large language models): Opportunities and challenges of perspective in bariatric healthcare professionals. *Obesity Reviews*, *25*(7). https://doi.org/10.1111/obr.13746

Lecler, A., Duron, L., & Soyer, P. (2023). Revolutionizing Radiology with GPT-based Models: Current Applications, Future Possibilities and Limitations of ChatGPT. *Diagnostic and Interventional Imaging*, *104*(6), 269–274. https://doi.org/10.1016/j.diii.2023.02.003

Li, M., Enkhtur, A., Yamamoto, B. A., Cheng, F., & Chen, L. (2025). Potential Societal Biases of ChatGPT in Higher Education: A Scoping Review. *Open Praxis*, *17*(1), 79–94. https://doi.org/10.55982/openpraxis.17.1.750

Li, Z., Niu, C., Meng, F., Feng, Y., Li, Q., & Zhou, J. (2019). Incremental Transformer with Deliberation Decoder for Document Grounded Conversations. *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics*, 12–21. https://doi.org/10.18653/v1/P19-1002

Liao, L., Yang, G. H., & Shah, C. (2023). Proactive Conversational Agents in the Post-ChatGPT World. *Proceedings of the 46th International ACM SIGIR Conference on Research and Development in*

Information Retrieval, 3452–3455. https://doi.org/10.1145/3539618.3594250

Liebrenz, M., Schleifer, R., Buadze, A., Bhugra, D., & Smith, A. (2023). Generating Scholarly Content with ChatGPT: Ethical Challenges for Medical Publishing. *The Lancet Digital Health*, *5*(3), 105–106. https://doi.org/10.1016/S2589-7500(23)00019-5

Luo, S. (2023). The Current Landscape and Future Direction of Curriculum Reform in China. *Future in Educational Research*, *1*(1), 5–16. https://doi.org/10.1002/fer3.8

Mbwambo, N. M., & Kaaya, P. B. (2024). ChatGPT in Education: Applications, Concerns and Recommendations. *Journal of ICT Systems*, *2*(1), 107–124. https://doi.org/10.56279/jicts.v2i1.87

Mesiono, M., Fahada, N., Irwansyah, I., Diana, D., & Siregar, A. S. (2024). SWOT Analysis of ChatGPT: Implications for Educational Practice and Research. *JMKSP (Jurnal Manajemen, Kepemimpinan, Dan Supervisi Pendidikan)*, *9*(1), 181–196. https://doi.org/10.31851/jmksp.v9i1.14137

Montenegro-Rueda, M., Fernández-Cerero, J., Fernández-Batanero, J. M., & López-Meneses, E. (2023). Impact of the Implementation of ChatGPT in Education: A Systematic Review. *Computers*, *12*(8), 153. https://doi.org/10.3390/computers12080153

Murad, I. A., Surameery, N. M. S., & Shakor, M. Y. (2023). Adopting ChatGPT to Enhance Educational Experiences. *International Journal of Information Technology and Computer Engineering*, *3*(05), 20–25. https://doi.org/10.55529/ijitc.35.20.25

Nguyen, T. H. B., & Tran, T. D. H. (2023). Exploring the Efficacy of ChatGPT in Language Teaching. *AsiaCALL Online Journal*, *14*(2), 156–167. https://doi.org/10.54855/acoj.2314210

Noroozi, O., Weinberger, A., Biemans, H. J. A., Mulder, M., & Chizari, M. (2012). Argumentation-Based Computer Supported Collaborative Learning (ABCSCL): A synthesis of 15 years of research. *Educational Research Review*, *7*(2), 79–106. https://doi.org/10.1016/j.edurev.2011.11.006

Pahtoni, T. Y., & Jati, H. (2024). Analisis Sentimen Data Twitter terkait ChatGPT menggunakan Orange Data Mining. *Jurnal Teknologi Informasi Dan Ilmu Komputer*, *11*(2), 329–336. https://doi.org/10.25126/jtiik.20241127276

Patil, S. Y., & Shrikhande, P. R. (2024). Improving Conversational AI using Transformer and Reinforcement Learning from Human Feedback (RLHF). *International Journal for Research in Applied Science and Engineering Technology*, *12*(11), 1366–1375. https://doi.org/10.22214/ijraset.2024.65383

Pulari, S. R., Umadevi, M., & Vasudevan, S. K. (2025). Improved Fine-Tuned Reinforcement Learning From Human Feedback Using Prompting Methods for News Summarization. *International Journal of Interactive Multimedia and Artificial Intelligence*, *9*(2), 59–67. https://doi.org/10.9781/ijimai.2025.02.001

Qasem, F. (2023). ChatGPT in Scientific and Academic Research: Future Fears and Reassurances. *Library Hi Tech News*, *40*(3), 30–32. https://doi.org/10.1108/LHTN-03-2023-0043

Randell, B., & Coghlan, B. (2023). ChatGPT's Astonishing Fabrications About Percy Ludgate. *IEEE Annals of the History of Computing*, *45*(2), 71–72. https://doi.org/10.1109/MAHC.2023.3272989

Rane, N., Shirke, S., Choudhary, S. P., & Rane, J. (2024). Artificial Intelligence in Education: A SWOT Analysis of ChatGPT and Its Impact on Academic Integrity and Research. *Journal of ELT Studies*, *1*(1), 16–35. https://doi.org/10.48185/jes.v1i1.1315

Rasheed, K., Aqsa, & Ain, S. Q. ul. (2024). ChatGPT and Improvement in Productivity: An analytical Study. *Bulletin of Business and Economics (BBE)*, *13*(3), 396–402. https://doi.org/10.61506/01.00512

Rosiana, C., Cahyanti, T. W., & Rahayu, L. E. (2024). Artificial Intelligence (AI) ChatGPT Meningkatkan Motivasi Mahasiswa pada Pembelajaran Morphosyntax. *Jurnal Kiprah*, *11*(2), 98–105. https://doi.org/10.31629/kiprah.v11i2.6563

Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit Spewer or the End ofTtraditional Assessments in Higher Education? *Journal of Applied Learning & Teaching*, *6*(1), 342–363. https://doi.org/10.37074/jalt.2023.6.1.9

Rudolph, K., & Manogar. (2024). Clone of ChatGPT. *International Journal of Engineering Applied Sciences and Technology*, *09*(02), 159–163. https://doi.org/10.33564/IJEAST.2024.v09i02.019

Sallam, M. (2023). *The Utility of ChatGPT as an Example of Large Language Models in Healthcare Education, Research and Practice: Systematic Review on the Future Perspectives and Potential Limitations*. https://doi.org/10.1101/2023.02.19.23286155

Shen, Y., Heacock, L., Elias, J., Hentel, K. D., Reig, B., Shih, G., & Moy, L. (2023). ChatGPT and Other Large Language Models Are Double-edged Swords. *Radiology*, *307*(2), 1–4. https://doi.org/10.1148/radiol.230163

Shimizu, I., Kasai, H., Shikino, K., Araki, N., Takahashi, Z., Onodera, M., Kimura, Y., Tsukamoto, T., Yamauchi, K., Asahina, M., Ito, S., & Kawakami, E. (2023). Developing Medical Education Curriculum Reform Strategies to Address the Impact of Generative AI: Qualitative Study. *JMIR Medical Education*, *9*, 1-9. https://doi.org/10.2196/53466

Soini, T., Pietarinen, J., & Pyhältö, K. (2018). Shared Sense-Making Strategies in Curriculum Reform: District-Level Perspective. *Improving Schools*, *21*(2), 111–126. https://doi.org/10.1177/1365480217744290

Sok, S., & Heng, K. (2023). ChatGPT for Education and Research: A Review of Benefits and Risks. *Cambodian Journal of Educational Research*, *3*(1), 110–121. https://doi.org/10.62037/cjer.2023.03.01.06

Spirgi, L., Seufert, S., Delcker, J., & Heil, J. (2024). Student Perspectives on Ethical Academic Writing with ChatGPT: An Empirical Study in Higher Education. *Proceedings of the 16th International Conference on Computer Supported Education*, *2*, 179–186. https://doi.org/10.5220/0012555700003693

Sullanmaa, J., Pyhältö, K., Pietarinen, J., & Soini, T. (2019). Curriculum Coherence as Perceived by District-Level Stakeholders in Large-Scale National Curriculum Reform in Finland. *The Curriculum Journal*, *30*(3), 244–263. https://doi.org/10.1080/09585176.2019.1607512

Sullivan, M., Kelly, A., & McLaughlan, P. (2023). ChatGPT in higher education: Considerations for academic integrity and student learning. *Journal of Applied Learning & Teaching*, *6*(1), 31–40. https://doi.org/10.37074/jalt.2023.6.1.17

Susnjak, T. (2022). ChatGPT: The End of Online Exam Integrity? *ArXiv*, 1–21. https://doi.org/http://dx.doi.org/10.48550/arXiv.2212.09292

Susnjak, T., & McIntosh, T. (2024). ChatGPT: The End of Online Exam Integrity? *Education Sciences*, *14*(6), 656. https://doi.org/10.3390/educsci14060656

Tikkanen, L., Pyhältö, K., Pietarinen, J., & Soini, T. (2020). Lessons Learnt from a Large-Scale Curriculum Reform: The Strategies to Enhance Development Work and Reduce Reform-Related Stress. *Journal of Educational Change*, *21*(4), 543–567. https://doi.org/10.1007/s10833-019-09363-1

Tlili, A., Shehata, B., Adarkwah, M. A., Bozkurt, A., Hickey, D. T., Huang, R., & Agyemang, B. (2023). What if the Devil is my Guardian Angel: ChatGPT as a Case Study of Using Chatbots in Education. *Smart Learning Environments*, *10*(1), 15. https://doi.org/10.1186/s40561-023-00237-x

Tran, T. N., & Tran, H. P. (2023). Exploring the Role of ChatGPT in Developing Critical Digital Literacies in Language Learning: A Qualitative Study. *Proceedings of the AsiaCALL International Conference*, *4*, 1–17. https://doi.org/10.54855/paic.2341

Vaccino-Salvadore, S. (2023). Exploring the Ethical Dimensions of Using ChatGPT in Language Learning and Beyond. *Languages*, *8*(3), 191. https://doi.org/10.3390/languages8030191

Vaishya, R., Misra, A., & Vaish, A. (2023). ChatGPT: Is this Version Good for Healthcare and Research?

Diabetes & Metabolic Syndrome: Clinical Research & Reviews, *17*(4), 102744. https://doi.org/10.1016/j.dsx.2023.102744

Wang, F.-Y., Miao, Q., Li, X., Wang, X., & Lin, Y. (2023). What Does ChatGPT Say: The DAO from Algorithmic Intelligence to Linguistic Intelligence. *IEEE/CAA Journal of Automatica Sinica*, *10*(3), 575–579. https://doi.org/10.1109/JAS.2023.123486

Warr, M., Oster, N. J., & Isaac, R. (2023). Implicit Bias in Large Language Models: Experimental Proof and Implications for Education. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4625078

Wilson, E. J., McCabe, C., & Smith, R. S. (2018). Curriculum Innovation for Marketing Analytics. *Marketing Education Review*, *28*(1), 52–66. https://doi.org/10.1080/10528008.2017.1419431

Wollny, S., Schneider, J., Di Mitri, D., Weidlich, J., Rittberger, M., & Drachsler, H. (2021). Are We There Yet? - A Systematic Literature Review on Chatbots in Education. *Frontiers in Artificial Intelligence*, *4*, 1-18. https://doi.org/10.3389/frai.2021.654924

Xue, V. W., Lei, P., & Cho, W. C. (2023). The Potential Impact of ChatGPT in Clinical and Translational Medicine. *Clinical and Translational Medicine*, *13*(3), 1–3. https://doi.org/10.1002/ctm2.1216

Xue, Y. (2024). A Critical Thinking-Oriented Approach in English as a Foreign Language (EFL) Writing: Using ChatGPT as an Ideal Peer. *Proceedings of the International CALL Research Conference, 2024*, 327–332. https://doi.org/10.29140/9780648184485-49

Yandola, K. O. (2023). Using the ChatGPT in the Educational Process. *Innovate Pedagogy*, *2*(57), 261–265. https://doi.org/10.32782/2663-6085/2023/57.2.53

Yatoo, M. A., & Habib, F. (2023). ChatGPT, a Friend or a Foe? *MRS Bulletin*, *48*(4), 310–313. https://doi.org/10.1557/s43577-023-00520-9

Yu, B., Guo, W. Y., & Fu, H. (2024). Sustainability in English Language Teaching: Strategies for Empowering Students to Achieve the Sustainable Development Goals. *Sustainability*, *16*(8), 3325. https://doi.org/10.3390/su16083325

Zhai, X. (2022). ChatGPT User Experience: Implications for Education. *SSRN Electronic Journal*, 1–18. https://doi.org/10.2139/ssrn.4312418

Zhang, F., & Liu, Y. (2014). A Study of Secondary School English Teachers' Beliefs in the Context of Curriculum Reform in China. *Language Teaching Research*, *18*(2), 187–204. https://doi.org/10.1177/1362168813505940

Zhang, P., & Tur, G. (2024). A Systematic Review of ChatGPT use in K-12 Education. *European Journal of Education*, *59*(2), 1–22. https://doi.org/10.1111/ejed.12599

Zhang, R., Zou, D., & Cheng, G. (2025). ChatGPT Affordance for Logic Learning strategies and its Usefulness for Developing Knowledge and Quality of Logic in English Argumentative Writing. *System*, *128*, 103561. https://doi.org/10.1016/j.system.2024.103561

Zhu, C., & Mugenyi, K. J. (2015). A SWOT Analysis of the Integration of E-learning at a University in Uganda and a University in Tanzania. *Technology, Pedagogy and Education*, *24*(5), 1–19. https://doi.org/10.1080/1475939X.2015.1093537