A Systematic Review of the Potential Influencing Factors for ChatGPT-Assisted Education

Chuhan Xu, Beijing Language and Culture University, China*

https://orcid.org/0009-0007-1678-5438

ABSTRACT

Due to the swift advancement of artificial intelligence, the emergence of ChatGPT has garnered considerable attention within the educational sphere. The aim of the study is to conduct a systematic literature review concerning the potential factors of ChatGPT-assisted education, specifically focusing on learners' acceptance, the accessibility of communication, digital literacy, and motivation. Therefore, pertinent peer-reviewed articles (n=41) were identified using the preferred reporting items for systematic review and meta-analysis protocol (PRISMA-P) for subsequent exploration. The findings indicated that the potential influencing factors in four dimensions have positive contribution to the educational achievements facilitated by ChatGPT. The four primary influencing factors further include 14 sub-influencing factors. Future research may delve into the mode of feedback and the mode of interaction within the context of ChatGPT-facilitated learning and teaching.

KEYWORDS

Artificial Intelligence, ChatGPT, Education, Influencing Factors, PRISMA-P

INTRODUCTION

The swift advancement of intelligent chatbot technology has garnered considerable interest in the enhanced availability of ChatGPT for educational applications. The implementation of ChatGPT for instructional purposes is presently prevalent and widely adopted across diverse domains, such as medical education, language education and so on. Many educators and learners have recognized the immense potential that ChatGPT brings to the process of learning and instruction. By participating in dialogues, rectifying grammatical errors, and providing vocabulary recommendations, chatbots can assist language learners in improving their linguistic proficiency. In addition, chatbots could aid lecturers in the management of virtual classrooms by facilitating tasks such as attendance tracking, lecture recording, fostering group discussions, and supporting collaborative project endeavors. Obviously, abundant educational factors that impact the ChatGPT-assisted environment merit thorough examination and consideration.

The utilization of mobile learning technologies demonstrated a noteworthy enhancement in behavioral, social, cognitive, and emotional engagements, as well as English learning outcomes,

*Corresponding Author

surpassing the impact observed with traditional teaching tools (Yu et al., 2022). In the context of English as a Foreign Language (EFL) instruction, individuals utilizing the mobile learning platform exhibited higher satisfaction levels, experienced a notable enhancement in learning outcomes, and demonstrated a significantly reduced cognitive load compared to their counterparts without access to the platform (Yu et al., 2019). Satisfaction in a clickers-aided English as a Foreign Language (EFL) class exhibited a positive correlation with interaction, self-efficacy, and self-regulation, revealing no statistically significant gender differences (Yu, 2015). Furthermore, the persistence intention of students to utilize mobile tools is notably influenced by both peer and superior factors (Yu & Yu, 2019). In the realm of education, virtual reality (VR) technologies predominantly yield a robust and favorable impact on educational outcomes, notwithstanding certain adverse findings regarding their effects on anxiety, cognition, creativity, gender disparities, learning attitudes, learner satisfaction, and engagement (Yu, 2023). Hence, the integration of ChatGPT technology into pedagogical practices is imperative for prospective research endeavors.

Several studies endeavored to investigate the prospective influence of ChatGPT on students in education (Montenegro-Rueda et al., 2023). In classroom teaching, Chatbots could help instructors to create and administer quizzes or tests to assess students' knowledge. They can provide instant feedback on performance and offer suggestions for improvement. In language learning, ChatGPT could provide personalized learning experiences by adapting content and interactions to the individual needs and preferences of students (Kohnke et al., 2023). It can offer explanations, resources, and recommendations tailored to each student's learning pace and style. In the realm of health education, chatbots could assist students and educators in finding relevant research materials, academic papers, and reference information (Sallam, 2023). However, the preponderance of review articles primarily scrutinizes the pros and cons of ChatGPT, with a limited number of studies dedicated to the factors exerting influence.

LITERATURE REVIEW

Artificial Intelligence (AI) was evolving in a way that obfuscates the demarcations between specialized domains of application and enhances its potential for diverse and extensive utility (Jeon & Lee, 2023). Artificial intelligence (AI) and AI-driven conversational agents, exemplified by ChatGPT, were revolutionizing the educational paradigm (Romero-Rodriguez et al., 2023). ChatGPT, an artificial intelligence content generation model crafted by OpenAI, had garnered global recognition due to its prowess in addressing intricate language comprehension and production tasks within conversational contexts (T. Wu et al., 2023). The fundamental technologies underpinning ChatGPT exerted a notable influence on the educational domain, encompassing primarily extensive language models, context-based learning, and reinforcement learning through human feedback (Romero-Rodriguez et al., 2023). Diverse chatbot technologies facilitate educators in the enhanced execution of various administrative tasks, such as the more efficient assessment and grading of student assignments, leading to an elevated standard of instructional activities. Simultaneously, curricular materials and content were tailored and personalized to cater to students' specific needs, thereby fostering improved retention, learning, and the overall quality of the educational experience for learners (Chen et al., 2020).

ChatGPT's performance exhibited disparities within diverse educational domains, thereby presenting numerous prospects for a wide range of disciplines (Lo, 2023). As illustrated in Figure 1, it becomes evident that ChatGPT has made notable contributions to a range of pedagogical domains, including but not limited to computer technology, science, environment, medicine, and linguistics. Educators utilized ChatGPT to decode language inquiries and generate code, as they seek to adapt pedagogical methods and assessment techniques (Piccolo et al., 2023). Within the realm of science education, ChatGPT served as a research instrument for editing assistance and experimentation in enhancing research clarity (Cooper, 2023). From the perspectives of biology and environmental science, ChatGPT had the potential to streamline and accelerate intricate and demanding tasks

17 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/article/a-systematic-review-of-the-potential-influencing-factors-for-chatgpt-assisted-education/339189

Related Content

Pre-Service Teachers' Perceived Relevance of Educational Technology Course, Digital Performance: Teacher Perceived of Educational Technology
Ogunlade Bamidele Olusolaand Bello Lukuman Kolapo (2019). *International Journal of Technology-Enabled Student Support Services (pp. 41-54).*
www.irma-international.org/article/pre-service-teachers-perceived-relevance-of-educational-technology-course-digital-performance/236073

Professional Skill Enrichment in Higher Education Institutions: A Challenge for Educational Leadership
Siran Mukerji, Purnendu Tripathiand Anjana (2019). *International Journal of Technology-Enabled Student Support Services (pp. 14-27).*
www.irma-international.org/article/professional-skill-enrichment-in-higher-education-institutions/244208

Immersive Technology: Past, Present, and Future in Education
Robert Z. Zhengand Kevin Greenberg (2020). *Cognitive and Affective Perspectives on Immersive Technology in Education (pp. 107-126).*
www.irma-international.org/chapter/immersive-technology/253691

An Exploratory Mixed Method Study on H5P Videos and Video-Related Activities in a MOOC Environment
Stefan Thurner, Sandra Schön, Lisa Schirmbrand, Marco Tatschl, Theresa Teschl, Philipp Leitnerand Martin Ebner (2022). *International Journal of Technology-Enhanced Education (pp. 1-18).*
www.irma-international.org/article/an-exploratory-mixed-method-study-on-h5p-videos-and-video-related-activities-in-a-mooc-environment/304388

Edu-ACoCM: Automatic Co-existing Concept Mining from Educational Content
Maitri Maulik Jhaveriand Jyoti Pareek (2019). *International Journal of Technology-Enabled Student Support Services (pp. 16-40).*
www.irma-international.org/article/edu-acocm/236072