Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/51/20242449

Study on the Positive and Negative Impacts of ChatGPT on the Education System

Juntao Li[1,a,*]

[1]*College of Letters & Science, University of Wisconsin–Madison, Madison, 53703, United States*
a. jli2549@wisc.edu
**corresponding author*

Abstract: The integration of artificial intelligence (AI) particularly language models into education has catalyzed an ongoing debate regarding its prospective advantages and perils. Critics continue to stress the perils arguing against continued utilization in educational settings, while those advocating for this technology continue to underscore the need to mitigate the emerging challenges while leveraging the immense opportunities it characterizes. This critical literature review contains an analysis of the impact of ChatGPT, a widely-discussed AI language model, on global education ecosystems. Through an exhaustive literature review, this study evaluates whether ChatGPT acts as a constructive instrument for enhancing personalized learning, supporting educators, and improving access, or if it poses significant challenges like undercutting conventional teaching roles, propagating inequality, and raising ethical issues. The findings reveal that although ChatGPT presents transformative educational opportunities, realizing its full potential necessitates careful and ethical implementation. Ultimately, ChatGPT can be an invaluable educational resource, provided its assimilation is thoughtfully supervised to alleviate associated risks.

Keywords: ChatGPT, Global Education, AI in Education, Personalized Learning, Ethical Challenges.

1. Introduction

Artificial intelligence (AI) in education has attracted attention from educators and policymakers. Of the various AI instruments available, ChatGPT stands out as the first to market, producing human-like intelligence. Deploying ChatGPT in educational settings offers promise in delivering real-time student feedback, assisting teachers in lesson preparation, and enhancing the overall accessibility of pedagogical materials [1-3]. However, ChatGPT's rapid adoption has also raised concerns. Critics argue using AI erodes teacher roles, impairs student thinking, and introduces bias in educational content [4]. Data privacy, academic integrity, and potential technology overreliance have been highlighted as critical challenges to address [5]. These concerns raise questions regarding the degree to which ChatGPT should be in education.

This literature review analyzes the dual impact of ChatGPT on global education systems, examining whether the benefits outweigh the detriments. The study's methodological approach is a review of current literature to provide a balanced viewpoint on ChatGPT in educational contexts. The goal is to offer discernments into ChatGPT's accountable usage. Considering AI technology's rapid permeation into educational frameworks, assessing its instant gains and long-term ramifications on

DOI: 10.54254/2753-7064/51/20242449

teaching methods is imperative [4, 6]. According to Opara et al. [7] understanding the prospective hazards linked to overdependence on AI is vital for safeguarding educational quality. With a measured investigation accounting for ChatGPT's ability, this study informs future policy and practice in educational technology.

2. Analysis of positive effects

2.1. Personalized Learning

One of ChatGPT's most acclaimed attributes in education is its capacity to enable personalized learning. By adapting curricular content to students' distinct requirements, ChatGPT has demonstrated substantial improvement in student engagement and academic performance. For example, Rahman and Watanobe [3] highlight that ChatGPT's flexible learning functionalities permit customizing difficulty levels and pace grounded on real-time student progress evaluations, thereby engineering a more bespoke educational journey. Such adaptability is instrumental in accommodating varied learning styles and needs - a persistent challenge for conventional pedagogical approaches.

However, despite these compelling advantages, leveraging ChatGPT to enable personalized learning is not without certain limitations. Critics contend that the efficacy of personalized education through ChatGPT is heavily reliant on input data quality and processing algorithms. For instance, Montenegro-Rueda et al. [8] warn that although ChatGPT can accommodate student requirements, interrogating its scalability across heterogeneous academic settings remains imperative. In regions with constrained access to high-grade data or technological framework, the model's capacity to furnish genuinely customized pedagogy is markedly hampered. Moreover, the prospect of bias embedded in the algorithms steering personalization can propagate unequal learning effects, especially for students from underprivileged backgrounds. Therefore, while ChatGPT shows the potential to progress personalized education, an analytical appraisal of its scalability and flexibility is vital, particularly given varying global contexts.

2.2. Improving Accessibility

ChatGPT's capacity to enhance accessibility to education constitutes another salient advantage, especially in democratizing learning for marginalized or geographically secluded groups. Through the instant availability of academic resources, ChatGPT holds promise to mitigate education gaps, rendering pedagogy more inclusive and attainable. Investigations by Montenegro-Rueda et al. [8] spotlight how ChatGPT can serve as an invaluable instrument in localities where conventional educational provisions are scarce, furnishing students access to knowledge and academic support they might otherwise lack.

However, realizing enhanced access through ChatGPT is hampered by salient obstacles. The digital divide persists as a formidable barrier, given that those devoid of the requisite technological framework are inevitably denied such benefits. As Rahman and Watanobe [3] explain, despite improving access for some, ChatGPT risks inadvertently exacerbating inequities for others, especially in developing nations with constrained internet availability and digital literacy. Moreover, dependence on English content and present constraints in multilingual skills further constrain ChatGPT's accessibility for non-English speakers, thus muddling its purpose in global education. Consequently, while ChatGPT furthers access enhancement, such attempts must align with broader efforts to tackle digital inequalities and ensure its advantages are equitably disseminated.

DOI: 10.54254/2753-7064/51/20242449

2.3. Support for Educators

ChatGPT's capacity to assist educators by systematizing mundane responsibilities like lesson preparation, evaluation, and instant feedback has been extolled as a momentous benefit. As Lo [5] elucidates, by alleviating educators' administrative load, ChatGPT empowers them to prioritize student engagement and tailored pedagogy, thereby nurturing enhanced academic performance. Such reinforcement is especially invaluable in resource-deprived contexts, where instructors frequently tackle vast class strengths and restricted occasions for personalized student interaction. Nevertheless, the degree to which such advantages transform into substantive academic betterment is contentious. Despite bolstering efficiency, ChatGPT risks deskilling educators by demoting them to mere coordinators of AI-powered content. As Montenegro-Rueda et al. [8] advise, overdependence on AI technologies like ChatGPT threatens instructors' professional advancement, as critical thinking and pedagogical aptitudes cultivated through direct tutelage are increasingly relegated to technology. Furthermore, the impersonal essence of AI-generated feedback may prove inadequate in addressing students' nuanced requirements, which only human educators can fully discern. Hence, notwithstanding its invaluable reinforcement, ChatGPT integration must be judiciously counterpoised to guarantee it complements rather than displaces teaching's fundamental human constituents.

3. Analysis of negative effects

3.1. Erosion of Traditional Teaching Roles

One of the most pressing issues surrounding ChatGPT integration in education is its potential to erode conventional teaching functions by systemizing responsibilities that customarily necessitate human discernment, innovation, and pedagogical proficiency. As Hasanein and Sobaih [6] contend, as AI instruments like ChatGPT subsume functions such as lesson planning, grading, and even tailored feedback, educators' role risks significant diminution, engendering devaluation of their professional aptitude. This transformation not only jeopardizes relegating teachers to mere coordinators of AI-generated content, but also threatens the seminal teacher-student dynamic, an axis fundamental to efficacious education. Moreover, the profound astuteness and emotional intellect human instructors contribute cannot be replicated by AI. As Montenegro-Rueda et al. [8] accentuate, interpersonal facets of teaching like mentoring, motivation, and capacity to adapt pedagogical tactics to students' emotional and cognitive needs, are integral to erudition but remain lacking in AI. Hence, notwithstanding prospective efficiency enhancements, ChatGPT might also undermine students' holistic progress by supplanting the inimitable contributions human educators make to the educational process.

3.2. Prejudice and Inequality

ChatGPT's propensity to entrench and even aggravate extant biases and disparities in education is a salient concern. As Rahman and Watanobe [3] underscore, notwithstanding its capacity to furnish customized pedagogy, ChatGPT might inadvertently perpetuate stereotypes and compound prevailing academic inequities, disproportionately impacting marginalized demographics. Moreover, embedding societal prejudices within AI-generated content bears far-reaching ramifications for educational equity. As Lo [5] expounds, the lack of diversity in datasets leveraged to train AI models risks begetting biased academic outcomes, unfairly disadvantaging students from underrepresented milieus. Further exacerbating matters, most AI systems are bereft of the transparency imperative to identify and redress such biases, thereby propagating inequality within education. While ChatGPT proffers innovative edification solutions, its potential for prejudice and inequity entrenchment necessitates meticulous governance and continuous refinement of its underlying algorithms.

DOI: 10.54254/2753-7064/51/20242449

3.3. Ethical and Privacy Issues

The ethical and privacy repercussions of harnessing ChatGPT in academic settings are elaborate and multifarious, arousing salient concerns amongst educators and policymakers. A principal ethical quandary involves managing sensitive student data. As Montenegro-Rueda et al. [8] advise, ChatGPT may require accessing critical personal information to perform its educational capacity, raising questions about data security and potential misuse. Moreover, the escalating dependence on digital platforms in education, which do not invariably adhere to stringent data protection protocols, heightens privacy breach concerns. Additionally, the ethical implications of AI decision-making in pedagogy warrant critical analysis. As Hasanein and Sobaih [6] argue, choices made by AI technology regarding personalized curricula or assessments may lack the moral and ethical deliberations innate to human educators, casting doubts on the equity and fairness of AI-driven academic decisions, especially in high-stakes environments where student ramifications could be weighty. Hence, while ChatGPT presents substantial advantages, these must be judiciously weighed against attendant ethical and privacy hazards accompanying its educational employment.

3.4. Over-reliance on Technology

The burgeoning dependence on ChatGPT and analogous AI technologies in academia poses salient hazards, chiefly regarding abetting reliance and compromising critical thinking competencies. As Lo [5] admonishes, with educational systems becoming increasingly AI-reliant, students risk lapsing into passive information recipients, resorting to technology for solutions rather than engaging in indispensable critical analysis and problem-solving. This overdependence on AI threatens to undermine students' capacity for autonomous and discerning cognition, competencies integral to modern success. Moreover, Rahman and Watanobe [3] caution that deploying AI in pedagogy may prioritize technological remedies over traditional, human-centered modalities. This transformation might spawn an educational ecosystem valorizing efficiency and automation, rather than nurturing profound comprehension and innovation. Effectively integrating AI like ChatGPT, therefore, remains contingent on its ability to buttress, instead of supplanting, the seminal critical thinking processes fundamental to impactful tutelage.

4. Suggestions

4.1. Responsible Integration

Embedding ChatGPT into an academic framework requires a judicious approach to balancing the benefits of AI with preserving the essential human component of teaching. As Hasanein and Sobaih accentuate, effective integration entails not solely adopting AI instruments, but guaranteeing educators' sustained centrality in learning. Tactics like deploying ChatGPT to supplement teacher-led instruction, rather than supplant it, remain critical. This approach allows faculty to harness AI’s efficiency and customization while preserving the human touch imperative for nurturing critical analysis, creativity, and emotional astuteness. However, Rahman and Watanobe argue, sans unambiguous guidelines, the hazards of overdependence on AI could undermine these vital human elements, engendering the devaluation of conventional educational practices. Ultimately, stakeholders must endeavor to institute responsible integration practices to realize the desired outcomes.

DOI: 10.54254/2753-7064/51/20242449

4.2. Man-Machine Collaboration

Realizing optimal academic outcomes necessitates efficacious cooperation between educators and AI technologies like ChatGPT. As Rahman and Watanobe [3] illuminate, human-AI collaboration harbors rich potential to refine customized learning and alleviate educators' administrative encumbrances, enabling greater dedication to meaningful student interactions. However, as Lo [5] argues, such symbiosis mandates educators cultivate emergent competencies in AI literacy, empowering them to critically evaluate and seamlessly embed AI instruments into pedagogical practices. Ultimately, suitably empowering faculty with apt training and assistance can transmute AI into a formidable partner in realizing academic goals, rather than supplanting indispensable human expertise.

4.3. Code of Ethics and Oversight

Instituting a rigorous ethical framework and supervisory entities remains indispensable for regulating ChatGPT's educational employment. As Hasanein and Sobaih [6] expostulate, devoid of such scaffolding, the prospects of misuse, partiality, and privacy contraventions escalate conspicuously. A clearly delineated code of ethics must tackle issues like data confidentiality, illuminating AI decision-making processes, and ensuring equitable AI resource allocation. Additionally, as Rahman and Watanobe [3] accentuate, meticulous oversight is imperative for guaranteeing alignment of AI tools with academic tenets that champion fairness, inclusivity, and students' holistic growth. With such vigilant governance absent, the risks of AI exploitation countervailing educational values heighten exponentially.

5. Conclusion

In appraising ChatGPT's impacts on global education, this review elucidates a complex picture; while substantial advantages exist, like enriched personalization, accessibility, and instructor support, significant perils also loom, including corroding traditional pedagogy, entrenching partialities, ethical quandaries, and over-dependency on technology. The analysis intimates ChatGPT's advantages may outweigh its detriments, but only if its application is accorded conscientious integration mindful of safeguarding indispensable human educational components and guaranteeing rigorous ethical governance. Without such judicious implementation, the hazards likely outweigh the gains. Ultimately, realizing ChatGPT's potential necessitates nuance, foresight and deliberation to ensure the preservation of academic values and outcomes for it to be considered an "Angel" in educational settings. Otherwise, its disadvantages will outweigh its benefits eventually turning the technology into a "devil" within educational settings.

These may include the focus on the educational application of ChatGPT, possibly at the expense of the broader role that AI technology plays. In this regard, other AI tools related to education have an impact on varied aspects associated with teaching and learning, and with hitherto underexplored AI features, it will be well done if the roles played by AI within education are fully scoped.

References

[1] *Adeshola, I., & Adepoju, A. P. (2023). The opportunities and challenges of ChatGPT in education. Interactive Learning Environments, 6(9), 1–14. https://doi.org/10.1080/10494820.2023.2253858*

[2] *Aktay, S., Gök, S., & Uzunoğlu, D. (2023). ChatGPT in education. Türk Akademik Yayınlar Dergisi (TAY Journal), 2023(2), 378–406. https://doi.org/10.29329/tayjournal.2023.543.03*

[3] *Rahman, Md. M., & Watanobe, Y. (2023). ChatGPT for Education and Research: Opportunities, Threats, and Strategies. Applied Sciences, 13(9), 5783. https://doi.org/10.3390/app13095783*

DOI: 10.54254/2753-7064/51/20242449

[4] *Memarian, B., & Doleck, T. (2023). ChatGPT in education: Methods, potentials and limitations. Computers in Human Behavior: Artificial Humans, 1(2), 100022. https://doi.org/10.1016/j.chbah.2023.100022*

[5] *Lo, C. K. (2023). What Is the Impact of ChatGPT on Education? A Rapid Review of the Literature. Education Sciences, 13(4), 410. https://doi.org/10.3390/educsci13040410*

[6] *Hasanein, A. M., & Sobaih, A. E. E. (2023). Drivers and Consequences of ChatGPT Use in Higher Education: Key Stakeholder Perspectives. European Journal of Investigation in Health, Psychology and Education, 13(11), 2599–2614. https://doi.org/10.3390/ejihpe13110181*

[7] *Opara, E., Mfon-Ette Theresa, A., & Aduke, T. C. (2023, March 1). ChatGPT for Teaching, Learning and Research: Prospects and Challenges. Social Science Research Network. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4375470*

[8] *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*