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Artificial Intelligence in education: Excavating the Pros and Cons

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Abstract

The 21st century presents unprecedented technological stride with the (r) evolution of artificial intelligence (AI). AI can shape learning outcomes and foster self-paced and collaborative learning. The role of artificial intelligence in teaching and learning processes has enhanced educational universalization, making distance between the teacher and learners not to be a challenge anymore. AI technologies such as ChatGPT, Google, and Writing AI hold transforming trends and predictable impacts on creative learning and problem-solving skills in the years to come. Thus, AI seems to be forward-looking towards creating learning transitions that can bring more interconnectivity that can promote global benefits. However, with all these promises AI holds for creative learning and critical thinking, there seems to be a handful of perils that are also looming as AI continues to have stronger presence in teaching and learning contexts. Issues related to algorithmic bias and data security continue to pose threats to the outstanding popularity AI enjoys today. AI disruptive tendencies should be carefully excavated and examined to enhance innovations that can address its perceived shortcomings. Considering the above points, this presentation aims to explore the pros and cons of AI of the educational landscape. The presentation is hoped to be done online.

Keywords: AI, Artificial Intelligence, AI pros, AI cons, education

Introduction

The 21st century presents unprecedented technological stride with the (r) evolution of artificial intelligence (AI) which refers to computer systems and machines that can perform tasks that usually require human intelligence, meaning it can make autonomous decisions like human beings (Kong, 2020). Artificial intelligence (AI) has substantially transformed teaching and learning activities (Talan, 2021; Pavlik, & Pavlik, 2024; Alkan, 2024; Asio & Gadia, 2024; Dong, Tang, & Wang, 2025), with an amazing growing population utilizing it to enhance learning. ChatGPT alone accounts for about 1.8 billion monthly users (Black, 2023). AI can enhance self-paced and collaborative learning, thereby making learning easy and fun for learners. It opens doors of new opportunities of approaches to teaching and

learning environments (Dong, Tang, & Wang, 2025). Debby, Peter and Shipway (2024) posited that AI tools like ChatGPT hold potentials benefits which can foster increased student engagement, collaboration, and accessibility. Chaushi, Ismaili, and Chaushi (2024) also argued that integrating AI into the educational ecosystem offers significant benefits as it is transforming traditional pedagogy and creating tailored content suitable to individual learner's needs. In addition, AI applications, like adaptive learning systems, machine learning, intelligent tutoring systems, Chatbot, among others have been adjudged as transforming tools with potentials of improving traditional teaching approaches, fostering students' academic success (García-Martínez et al., 2023; Sari, Tumanggor & Efron, 2024; Rahiman, & Kodikal, 2024).

With the growing influence of AI applications, their objective integration into educational systems is likely to improve teaching and learning processes (Jie & Kamrozzaman, 2024). AI has also been known to have enhanced educational universalization, conquering the challenges of distance between the teacher and learners. Thus, AI technological applications like ChatGPT, Google, and Writing AI hold transforming trends and predictable impacts on creative learning and problem-solving skills in the years to come. Hence, AI seems to be forward-looking towards creating learning transitions that can bring more interconnectivity that can promote global benefits. Studies have confirmed that learners are positively disposed to using AI in their learning processes (Alzahrani, 2023; Katsantonis & Katsantonis, 2024; Mallillin, 2024). Adding to this view, Abubakar, Onasanya, and Ibrahim (2024) opined that AI has potential benefits in education that can improve learning experiences. Similarly, Sasikala and Ravichandran (2024) are of the opinion that advancement in AI could be instrumental to reshaping educational processes.

Innovative AI pedagogical approaches like virtual simulations, adaptive learning, and intelligent tutoring systems could make an interactive class (Chen, Lahcen & Paradiso, 2020), which is the cornerstone for teaching and learning environments. AI has also been found to be reshaping music education, enabling learning of musical instruments and making composition of music easy, leading to recorded academic progress in the field (Li & Wang, 2024). The growing need of AI educational facilitation has also been extended to medical education to position medical educators for the evolving challenges and opportunities of AI in the days to come (Masters, 2019).

However, with all the potentials AI holds in the education sector for creative learning and critical thinking, there seems to be a handful of perils that are also looming as AI continues to have strong presence in teaching and learning contexts. Issues related to algorithmic bias and data security continue to pose threats to the outstanding popularity AI enjoys today. AI disruptive tendencies should be carefully excavated and examined to enhance innovations that can address its perceived shortcomings. In spite of the positive effects of AI, students have expressed concerns about technical challenges, privacy and adequacy of training that can support AI

technologies (Abubakar et al.,2024). Challenges of gender disparities which undermines the principle of inclusivity and equality resulting in lack of equity for women in opportunities offered by AI innovations have also sparked concerns in some quarters (Daraz, Chang & Bouseh, 2022). Inadequacies of ChatGPT to exhaustively handle mathematical issues have also emerged (Wardat et al., 2023), putting to question the acclaimed intelligence of AI.

AI has also been criticized for aiding academic dishonesty and plagiarism (Debby et al.,2024; Ivanov, 2023; Gulson & Sellar,2024), which is seriously affecting originality in the academic world- a situation that seems to be breeding mediocrity. As a result of some of the challenges associated with AI, establishment of laws to guide its usage is now an inevitable burden and great demand upon our society (Black, 2023), so that the disruptive potentials of AI could be curtailed before it destroys pedagogical sanctity. According to Chazan (2022) “education is an activity which takes place in many diverse venues and is intended to develop knowledge, understanding, valuing, growing, caring, and behaving.” Hence, in line with this definition, education through its social function should provide the necessary tools that are needed for societal cohesion or lose its social value. Thus, it is important to maintain surveillance on its contents and contexts to ensure it does not lose its value with the integration of AI into the sector.

Considering the points raised so far, it may be safe to say that AI holds great benefits for learners, but at this same time there are looming dangers that could be challenges to teaching and learning processes if the infusion of AI in our educational approach is not properly guarded. Thus, this paper aims to explore the pros and cons of AI in the educational landscape to examine the potentials and the possible problems AI can create in teaching and learning contexts in order to provide possible solutions to make it more beneficial in the field and to humanity.

Pros of Artificial Intelligence in Education

AI is a technological breakthrough that is being celebrated all over the world. It is one of the greatest technological evolvments in recent times with amazing benefits for humanity, taking the lead in enhancing quality education (Choi, 2020). This technological advancement is a product of the continuous efforts of humankind to explore potential means of making life easier than what it used to be in the past. The pros of AI in education are evident based on reports of users in different parts of the world.

Talking about the pros of AI, Asio et al (2024) perceived AI as a tool that can make educational experiences more exciting and memorable. This means that students can easily access learning experiences through AI tools, as they have the opportunity to learn at their own pace; and such experiences could be quite engaging, and uniquely exciting and memorable as they learn or discover things by themselves. Furthermore, Hwang and Tu (2021) also posited that AI could maximize learning processes through personalized support for students and reduction of workload on teachers,

by assisting them to create instructional materials and presenting learning experiences that are student-tailored. This position brings to bare the importance of AI as a facilitator both for teachers and students in teaching and learning processes. For Klimova and Pikhart (2025), the increasing use of AI in tertiary education is reshaping the way students relate with their academic endeavors and personal lives, and it notably, enhanced personalized learning, mental health support, and improved communication efficiency among students. These observations further strengthen the pros of AI as a student-support tool and even as an enhancer of mental health.

In addition, Mallillin (2024) in a study noted that AI effectively met students' learning needs and facilitated comprehensive and improved learning experiences. The study also noted that AI enhanced students' study habits and learning behavior; and specifically observed that AI's adaptive learning tools helped learning processes with valuable feedbacks. The observation from the study proves that AI can boost and motivate students to study and improve on their learning behavior, the key to academic excellence. Aligning with other scholars on the pros of AI, Kamalov et al (2023) also observed that students engaged AI tools for quick solutions to their learning needs and to personalize their learning experiences. This view gives credence to the fact that AI is a readily available tool which can provide solutions to learning needs in a personalized manner, making the learner to have access to self-paced learning anytime and anywhere. Quick access to solutions to learning needs means opportunity to cover a lot of learning contents within a short period of time.

Still on the pros of AI in education, Mallillin, Enriquez and Yee (2025) reported in a study a significant agreement on the transformative potency of AI in teaching and learning processes in higher education institutions among participants. This is another evidence that AI is a transformative agent in the educational space for both learners and teachers. It means teachers and learners can engage with AI and enrich themselves with relevant learning experiences as AI like chatbots are ready consultants at their reach- right there in their smartphones and tablets! In addition, Alkan (2024) observed some unique benefits of AI by pointing out the potentials of AI applications in enriching the learning experiences of special need students. The benefits highlighted can reduce inequalities in education. Equality in education has ever been a global concern as learners with disabilities could be left out in traditional pedagogy. However, there are evidences now that AI can reduce the margin of out-of-school individuals as special need learners can now turn to AI for learning support. When special needs students can access a system that could make learning accessible, learner-tailored and interesting, it may go a long way to reduce the population of illiterates in the society and increase the number of functional and competent people in the world at large.

Also, Vieriu and Petrea (2025) in their findings aligned with previous scholars by confirming that AI provided significant benefits- personalized learning, improved academic outcomes, and enhanced

students' engagement. One of the major areas of concern in education is the academic outcome of students as this can determine their future since employment offers are largely based on academic qualifications. Thus, with the integration of AI into education, there are indications that academic outcomes can improve tremendously, creating room for the possibility of raising more educationally rounded individuals and potentially sound manpower for work places.

In another development, Ngonso et al. (2025) in a study reported that AI positively impacted educational performance of Nigerian students, stressing it enhanced knowledge of courses, learning and speaking skills. This observation provides another evidence that AI benefits are multifaceted as they can also enhance speaking skills of users. Speaking skill is an expressive act which has denied many people of opportunities at their doorsteps because they lacked effective skills during job interviews or public speeches. However, based on the findings of the study, AI welcomes individuals with speaking skills deficiency to transform their speaking competences.

Dong, Tang and Wang, (2025) also noted that AI has revolutionized the field of education through innovative teaching and learning approaches. The study validated the efficacy of AI in education. This means that the integration of AI into the field of education has created a paradigm shift from traditional teaching and learning methods to digitalized pedagogy. Similarly, Pavlik and Pavlik (2024) perceived that a teacher can engage students in critical analysis of art work. This means that AI tools are supportive in teaching and learning of art, making AI a key driver of educational innovations. Gökçearslan, Tosun and Erdemir (2024) also aligned with other scholars by observing that chatbots motivate students to learn and enhance language skills, while reducing cost and workload on teachers. Reduced workload is likely to give teachers more time to look at other important areas of learners to provide wholistic supports to learners under them.

With this array of findings of scholars in support of AI, it is clear that the integration of AI into educational processes has helped in the sector. AI has added values to education because of its enormous capacities to handle educational tasks autonomously. Commenting on the multitasking potentials of AI, Lang (2024) summarized the functions of Gen-AI as follows- a voracious learner (having the ability to learn autonomously from vast databases of texts, images, or audio); an exceptional transformer (having potentials to transform various digital domains); a creative generator (being able to refine ideas to foster divergent reasoning); an amazing worker (ability to generate paragraphs and pages of sophisticated writing in just seconds); an inquisitive assistant (ability to improve how questions are asked); and a personalized communicator (ability to generate personalized messages in line with target audience). These characteristics of AI make it indeed an education transformer.

Cons of Artificial Intelligence in Education

AI has enormously impacted education and there seems to be an endless celebration of its achievements in the field. However, scholars have also berated the continued integration of AI into the educational system due to some perceived shortcomings AI has injected into the system. Thus, as we bask in the euphoria of AI as a technological boost to education, we also need to carefully examine the disruptive impacts of it on the sector. Thus, unpacking the cons of AI as an integral part of a modern pedagogical ecosystem is a task worth undertaking.

Katsantonis et al. (2024) expressed concerns about academic integrity, plagiarism, and the decreasing level of critical thinking in higher education. AI through its human-like and autonomous function seems to have given the license to learners to consult it and get solutions to tasks without the personal input that is expected of them. This means a learner can get answers to questions without learning taking place. This undermines the whole essence of education which should be a fundamental process of acquiring knowledge that is transformational in nature. This development also poses challenges to academic integrity which could possibly lead to half-baked academic products that cannot stand the test of time.

Vieriu et al. (2025) in their position, noted challenges related to accuracy, cognitive disengagement, and ethical implications. Ethical issues relate to keeping to the professional ethics of education and respecting fundamental rights of AI users. There seems to be a continuous flouting of certain forms of ethicality as AI may abuse some cardinal rules related to privacy. This is even more worrisome as developers of AI may infuse their ideological inclinations in the operation of this technology, thereby undermining the multicultural nature of human existence and the necessity of upholding technological inclusivity and equity. Also, Nakshine et al. (2022) observed isolation, anxiety, mental health challenge, screen time excessiveness as some of the drawbacks of AI. The view of these scholars relates with the fact that excess screen time could pose challenges to the effectiveness of AI in the education sector because it can lead to technostress and hinder emotional wellness of users. Mental health challenges can be a stumbling block to educational progress, meaning that excessive screen time being associated with AI users should certainly be a concern to educators and education enthusiasts.

Chausi et al. (2023) have also queried the increasing reliance on technology which can lead to students' unpreparedness to meet the demands of a blend of digitalization and social skills. AI as digital technology is limiting human interdependence in education, as almost everything can be provided by it. This raises the concerns of limitation of human interactions. Human beings need social interactions to build social bonds that are needed for fruitful co-existence. Ngonso et al. (2025) on their part raised the concerns of students using AI to aid examination malpractice. Examination malpractice is a form of academic dishonesty. From the report of these scholars, it could be observed that examination malpractice thrives

among learners with the help of AI. Academic integrity is central to teaching learning process and should not be compromised.

Jie et al. (2024) also stressed privacy and security, ethical considerations, over-reliance on AI as some of the cons of AI in education. Adewale et al. (2024) also noted in their study the challenges of inclusive educational technologies which could lead to gender and cultural disparities in AI applications. This drawback of AI is critical because inclusivity in education is necessary to integrate all categories of learners, irrespective of gender to foster seamless globalization. Debby et al. (2024) also noted the difficulties of detecting and preventing academic dishonesty associated with AI. Assessors or teachers may not be able to detect tasks done purely through AI by students and award unearned marks to such learners. This could affect objectivity in assessments, giving undue advantage to undeserving students who take advantage of AI to cheat.

Kaplan, Sari and Danik (2025) in their study found that ChatGPT was limited in solving mathematical problems involving representing rational numbers on the number line and converting them to decimal forms. This shows that as intelligent as the ChatGPT is, it is still limited in certain mathematical operations. Thus, overdependence on AI learning tools may lead to limited knowledge as AI apps cannot go beyond how their developers configured them.

Future Direction for Artificial Intelligence in Education

Artificial Intelligence seems to have come to stay considering its impacts in education and other spheres of life. Since it is difficult to throw away this technological breakthrough, it is important to look at the future directions that could make it to continue its transformative trends in education. It is of necessity to see how to keep AI vibrant in the field of education, but there should be modalities to curtail its disruptive tendencies. It is important to note that education is the heart of human development and should be guarded with care.

Both teachers and learners need to be given more orientations about the use of AI to improve their attitudes toward it (Katsantonis et al., 2024; Ngonso, et al., 2025; Sanasintani, 2023; Rahiman, et al., 2024). Proper orientation is hoped to help them to know that AI is meant to assist them in their teaching and learning processes in order to help them to adjust to appropriate and profitable use of the technology. Proper orientation should also emphasize the fact that AI is a learning facility and not a substitute for human cognitive activities to acquire knowledge.

Challenges of technological infrastructure and support services need to be addressed to enhance effective integration of AI into the field of education (Abubakar, 2024). In some regions of the world, infrastructures like digital tools and internet connectivity are still a challenge for the effective infusion of AI in education. The problem of steady power supply, especially in some developing countries could stand on the way of effective use of AI.

Furthermore, considering the importance of both AI and humans in

teaching and learning process, it is important that seamless collaboration of both humans and AI should be maintained (Lang, 2024). This means that AI and humans have critical interdependence roles to play in order to sustain the educational needs of the 21st century learners. To maintain this balance, boundaries have to be set through appropriate policy guidelines to regulate AI operations in the educational sector.

Ethical issues have to be addressed for AI to retain its relevance in educational settings. By implications, AI technologies have to be designed to suit the diversity in educational needs of users to foster equality and inclusivity in AI-powered educational contexts (Vieriu, et al., 2025; Adewale, et al., 2024; Debby, et al., 2024). With the increased integration of AI into education, teachers or instructors should device ways of redesigning curriculum in ways they can foster effective content delivery to stimulate students' participation and engagement in learning processes (Lang, 2024; Knox, 2020). This calls for teachers' dedication to duty to ensure that academic dishonesty is reduced significantly.

AI sustainability is a clarion call to all stakeholders of education to work assiduously on ways to mitigate disruptive influences of AI for the benefits of learners (Chan and Hu, 2023; Klimova & Pikhart, 2025). There should be in place laws regulating AI to guide teachers and learners at all levels of education to curtail abuse of the technology (Black, 2023). AI is a technology that could be used for good or evil (Floridi, 2023), requiring precaution to make its integration into education productive.

AI developers should consistently assess the output of their AI technologies. For instance, Kaplan et al. (2025) reported that ChatGPT was limited in solving mathematical problems involving representing rational numbers on the number line and converting them to decimal forms. This means the developers of ChatGPT have the task of reviewing this perceived deficiency with the aim of improving the efficiency of this digital application that has gained so much popularity among users.

In a nutshell, AI could play a supportive role in pedagogical processes, but its integration into education should be handled with care (Kaplan, 2025) as unguarded AI educational environment could be harmful to the overall objective of education as social tool for human development and saner society.

Conclusions

AI technology has been dominating academic discourse for a while among scholars because of its dynamic nature and the unending surprises it keeps churning out. Its integration into the educational landscape has been received with mixed feelings- seen as both as a transformer and disrupter in the sector- depending on the angle it is being perceived. This paper has so far excavated both sides in order to provide a blended perspective about AI role in education. The advantages of AI in education are many and quite appealing because it has transformed pedagogical approaches. However, in spite of the great opportunities that come with AI in the field of education there are many drawbacks associated with its integration. Thus, efforts

should be made to ensure that as AI is transforming the educational sector, it is not destroying the unique features of education. Education as a human centric venture may still need the presence of teachers in its system since AI though innovative, lacks some of the human attributes that could make education play its social functions to the fullest. Thus, a blended approach where both AI and teachers complement each other seems to be favored in this contribution.

Recommendations

- Both teachers and learners should be given more orientations from time to time about the use of AI to improve their attitudes toward the technology.
- Government should address challenges of technological infrastructure and support services to enhance effective integration of AI into the field of education.
- Appropriate policy guidelines should be formulated and implemented to regulate AI operations in the educational sector.
- Instructors should redesign curriculum in line with trends in AI to deliver contents that can enhance students' engagement in teaching and learning processes.
- Developers of AI tools should consistently review the efficiency of their tools with the aim of improving on them.
- Institutions of higher learning should device means to check plagiarism or copy and paste materials presented by students to earn undeserved grades.
- There should be international collaborations to sanction abuse of AI technology in order to strengthen its ethical integration into the field of education.
- School counsellors should include AI counselling as part of their routine orientation and information counselling services to help learners to be in tune with happenings in the AI-powered educational world.

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* Editor's Note

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