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INFLUENCE OF ARTIFICIAL INTELLIGENCE ON TEACHING EFFECTIVENESS

Ajasa, F.A. & Okemakinde, T.

Faculty of Specialised and Professional Education

Emmanuel Alayande University of Education, Oyo

Email: okemakindetimothy@gmail.com

Abstract

The potentials of artificial intelligence (AI) literacy and application to enhance teaching effectiveness is increasingly recognised, as it has become necessary to leverage technology effectively to support teaching and learning in the ever-evolving landscape of education. The continuous development of AI and its application are significantly supporting educational reforms and profoundly influencing learning methodologies. This paper thus delves into the potentials of AI in tailoring learning experiences to individual students' needs and abilities, providing feedback, identifying areas for improvement, tracking progress, helping teachers identify knowledge gaps, and providing targeted interventions. It discusses ethical issues in its application, including bias, privacy, accountability and transparency, job displacement, manipulation, disinformation, human-AI interaction, value alignment, regulate governance. Identified obstacles to AI implementation include reluctance to change, inadequate funding, and insufficient training. It concludes that in order to fully utilise AI technologies and enhance learning outcomes for students, educators, policymakers, and researchers must understand the intricate relationships between AI adoption, ease of use, teaching effectiveness and student interest.

Keywords: Artificial intelligence, Prospects, Teaching effectiveness, Challenges, Learners

Introduction

Teaching is the process of imparting knowledge, values and skills to students. The facilitator or the teacher must thus be an effective communicator to take the content to the students based on their ability

to comprehend. Therefore, when scrutinizing the concept of teaching, which implies that the main objective of teaching is to impart knowledge, it can be concluded that everyone is a teacher in one way or the other.

Recently, artificial intelligence (AI) has increasingly influenced all spheres of life, especially education, and thus offers significant opportunities to enhance teaching-learning process. According to Chiu et al. (2023), Artificial Intelligence in Education (AIED) is an evolving interdisciplinary concept incorporating AI technologies to renovate and enhance teaching and learning process. Mohammed, Mohd and Ewan (2024) assert that AI technologies are increasingly being integrated into educational environments, from adaptive learning platforms to automated grading systems. Therefore, AI literacy for educators encompasses understanding AI principles, applications, as well as the ability to critically evaluate, effectively utilise and ethically implement AI tools in educational contexts.

Optimising AIED has the potentials to better promote the improvement of teaching quality, facilitate optimization of learning styles and encourage teachers to adopt and utilise AI technology. Besides, AI technology helps teachers to understand teaching tasks more clearly, teach content accurately, choose teaching methods, and makes a scientific assessment of learners' study processes. Hence, AI technology plays an important role in promoting the development of learners. Teachers are more likely to adopt different teaching methods and make some teaching decisions according to the needs and learners' situations. It would also assist teachers to strengthen communication and interaction with colleagues, promote their professional development, and improve classroom teaching quality.

Luckin and Cukurova (2019) asserted that in spite of the significance of AI, the rapid pace of technological advancements often outstrips the speed at which educational systems can adapt, leading to a constant need for up-skilling and professional development. More so, the diverse needs of different educational settings, from urban to rural and primary to tertiary education further complicate the implementation of AI literacy programmes. Financial constraints pose another significant hurdle, as many educational institutions struggle to allocate resources for AI-related training and infrastructure. Additionally, there is the challenge of addressing teachers'

apprehensions about AI, including fears of job displacement and concerns about the ethical implications of AI in education.

Despite opinions and empirical evidences on how artificial intelligence has flourished in numerous domains within the education system, an analysis of its roles, prospects, and challenges in teaching effectiveness needs to be explored to fill the knowledge gap which might prompt teachers, policymakers, and educational administrators to pay attention and base decisions on challenges limiting its roles in effectively enhancing teaching-learning process.

Theoretical Framework

Theory of Connectivism is a learning theory that emphasises the importance of connections and networks in the process of acquiring knowledge. Its practical implications in education include the need for educators to adopt new pedagogical strategies that support the development of networked learning environments, facilitate learner centred instruction and promote lifelong learning (Afroz, 2023). This approach is based on the idea that knowledge is distributed and that learning occurs through the connections that individuals make with others and with information.

Connectivism, according to Siemens (2017), entails that knowledge is not only acquired through traditional means such as textbooks or lectures but also through online communities, social media, and other technological platforms. According to the theory, learning is an on-going process of exploration and discovery, and it occurs both within and outside formal educational institutions. It suggests that learners must be able to critically evaluate the information they encounter in order to discern what is reliable and relevant. The ability to make connections between different sources of information and knowledge is also critical, as it enables learners to construct new knowledge and adapt to new situations. The implications of Connectivism for the future of education are that as technology continues to evolve, learners will have access to even more information and resources, and thus will be able to connect with others around the world in new and innovative ways.

Key principles of Connectivism, as opined by Afroz (2023), are that learning is a process of connecting specialized or information sources; learning may reside in non-human appliances; capacity to

know more is more critical than what is currently known; nurturing and maintaining connections is needed to facilitate continual learning; ability to see connections between fields, ideas, and concepts is a core skill; and currency is the intent of all connectivist learning activities. Conclusively, the pedagogy of connectivism is an approach to teaching and learning that emphasises the importance of networks, connections, and the integration of new information and ideas into existing knowledge structures.

Prospects of Incorporating AI in the Teaching-Learning Process

The integration of AI in the teaching learning process has numerous prospects, transforming the education landscape in various ways. It has the potentials of tailoring learning experiences to individual students' needs, abilities and learning styles. It can provide instant feedback to students, helping them to identify arrears for improvement and track their progress. It can help teachers in developing lesson plans, identifying knowledge gaps, and providing targeted interventions.

In the words of Zhao, et al. (2022), the development of AI literacy among teachers is demonstrating significant strengths, with many educators now able to integrate AI tools into their teaching methods to enhance student learning outcomes. One of the primary strengths, according to them is the ability to personalize learning using AI-powered technologies to tailor educational content to the unique needs of each student, improving engagement and overall learning outcomes. This enables students to learn at their own pace, which is particularly beneficial in a diverse classroom environment.

Rützi-Joy, et al. (2023) assert that AI-literate teachers also benefit from increased efficiency, as AI tools can automate time-consuming administrative tasks such as grading, attendance tracking, and generating reports. This allows teachers to focus more on personalised instruction and student support. The integration of AI in administrative functions reduces teacher's workload and also enhances the accuracy of data collection and reporting, leading to better-informed decisions on students' activities. Olari and Romeike (2021) opine that professional development programmes specifically designed to enhance AI literacy are becoming prominent and helping teachers to develop the skills necessary to responsibly integrate AI into their teaching, ensuring that AI is used effectively and ethically.

One of the robust applications of AI in education is its ability to simulate scientific experiments and provide virtual laboratory experiences to learners. Wahyono, et al. (2019) assert that AI has the capability to transform the way education is taught and learned. This ensures that students can practice and develop their skills in a safe environment, offering new opportunities for exploring concepts that may not be feasible in traditional teaching-learning process. By leveraging AI, educators can also move away from traditional methods to personalised and interactive learning experiences for students. Its applications provide students with a variety of cutting-edge learning opportunities, from automation tools to teaching assistance systems. Teachers can create ways to improve teaching effectiveness and foster student success in courses by recognizing the factors that influence students' interest and engagement in AI-enhanced learning.

Mavroudi, Giannakos and Krogstie (2018) opine that AI can help educators to track and monitor students' progress more effectively, allowing for needed interventions and support where and when necessary. Besides, its usage can enable the development of interactive learning environments, making education more engaging and accessible to students with diverse learning methods and needs. As AI continues to advance, the tendency for its integration into teaching-learning process is likely to grow, presenting exciting opportunities to transform and elevate education experiences for students at all levels. Zawacki-Richter, Marín and Bond (2019) assert that AI has numerous benefits in education, as its programmes can study how students learn to fit each their needs, skills, and learning process. This helps them to learn better and faster, move at their own pace and capacities.

Another potential, according to Ibáñez and Delgado-Kloos (2018), is the improvement of exploratory learning through virtual laboratories. AI-powered instruments have the potential to recreate complex tests, which may be hazardous to conduct in a conventional classroom setting. These virtual situations offer hands-on learning encounters and permit students to try distinctive approaches that can improve their understanding of certain concepts. Fernandez, et al. (2024) asserted that AI reduces the amount of time spent on teaching by organizing course materials, grading assignments, and producing reports. This effectiveness can help teachers to concentrate on developing relationships with students, and creating a supportive

learning environment. In addition, automating repetitive chores and administrative duties, user-friendly AI programmes save instructors time and effort. The ease of use of AI tools encourages teachers to collaborate and share knowledge, opening doors for professional development and interactions. Teachers are more inclined to work together on educational initiatives, exchange best practices, and take advantage of continuing professional development opportunities when AI platforms are available and user-friendly.

Ethical considerations in the Integration of Artificial Intelligence in Education

The increasing usage of AI in education has raised some ethical issues, despite its prospects and positive influence on teaching effectiveness. Thus, ethical issues need to be identified and resolved when integrating AI in the teaching-learning process. Some of the key ethical issues in its application include bias and discrimination, privacy, accountability, job displacement, manipulation and disinformation, regulation and governance.

Bozkurt, Karadeniz, Baneres, Rodríguez and Rodríguez (2021) are of the opinion that poor critical reflection on ethical implications and the risks of implementing AI applications in education underscore the need for a comprehensive ethical framework. Thus, the integration of AI into educational settings presents ethical obligations for teachers, necessitating a re-evaluation of ethical frameworks and responsibilities as the application of AI in education goes beyond technical considerations to encompass broader societal impacts, such as privacy, protection and social justice. This implies that educators and students understand, evaluate, and familiarise themselves with generative AI tools, considering their potential impacts on academic integrity. This involves recognising when and how AI is used, assessing the reliability and validity of AI-generated outputs, and understanding the ethical and social implications of its applications.

Influence of AI Integration on Teaching Effectiveness

With the gradual development and increasing application of AI technology, many scholars now view it as the core means that influences reforms in the teaching-learning process. It has revolutionized the way teachers give instructions and promote

students' learning, its teaching experience with AI has shown a clear and favourable association with teaching effectiveness. Kaswan, et al. (2024) asserted that with the development of AI technology, human-like teaching behaviours are rapidly being replicated, providing students with more engaging, adaptable and interactive learning experiences. The ability to offer individualized learning routes suitable to each student's requirements and preferences is a key benefit of AI driven educational experiences. Essel, et al. (2022) found a positive correlation between the use of AI and the effectiveness of teaching through highlighting the potentials of AI technologies to improve the quality of learning experiences and personalizing instructions.

A study by Bowden, et al. (2021) emphasised how teaching experience with AI shaped teaching effectiveness and how crucial it is for teachers to be proficient and confident in using AI technology to maximize learning and teaching outcomes. They aver that teachers who incorporate AI into their lessons are better able to use AI tools to modify lessons, examine student data, and offer focused assistance. Thus, to fully utilise AI in education, funding training courses and provision of adequate and relevant materials that can improve teachers' use of AI in the classroom is crucial. The study also emphasises how student interest moderates the relationship between AI adoption, ease of use, efficacy, and teaching experience. They further opine that an important mediator that affects how other elements affect the effectiveness of teaching is student interest. Students are more likely to participate in learning activities, and produce higher learning results when they are actively engaged and enthusiastic in employing AI technologies.

Allal-Chérif, et al. (2021) found that students are more inclined to work with peers, look for more resources, and participate in conversations when they are actively using friendly AI technologies. Effective teaching requires critical thinking, communication skills, and teamwork, all of which are fostered by this cooperative learning environment. This encourages students to actively engage in the learning process. AI-powered learning environments can also adjust to students' innate passions and interests, fostering intrinsic motivation, creativity, and curiosity. It encourages deeper learning and long-term memory retention by engaging students in meaningful ways, whether through immersive simulations, interactive lessons, or personalised

learning pathways. This cooperative learning style encourages critical thinking, good communication, and teamwork, all of which enhance the effectiveness of instruction. Learning has become conducive with the active aid of artificial intelligence (Okunade, 2024).

Lee, et al. (2022) argued that AI-based tools such as chat-bots can help students become cognitively more active in the learning process. Likewise, personalised learning facilitated by AI can help to reduce the gap between lower- and higher-performing students. Moreover, AI-powered education can empower students to predict their learning outcomes and strategically regulate their learning behaviour. In essence, these findings underscore the potential of AI to augment teaching learning process by enhancing student understanding, motivation and engagement.

Azcona, et al. (2019) found that students' interest increased when AI was integrated into the learning environments. Students particularly admired the AI's power to provide prediction and personalised feedback. Their analysis suggests that science teachers hold a high level of acceptance and positive attitudes toward AI's utilisation in the classroom. Almasri (2024) found that science teachers exhibited favourable attitudes toward AI's integration, possibly due to the perceived reduced effort in its utilisation and their confidence in their essential skills to incorporate it effectively. Rütty-joy et al. (2023), highlight the long-term impact of AI literacy on teachers' professional development. AI-literate teachers, according to them, are better equipped to engage with technological advancements, making them more adaptable to changes in educational tools and methods. AI literacy helps to integrate ethical considerations into technology use, fostering accomplishment of educational goals and inculcating societal values.

Lin (2022) found that teachers with a strong understanding of AI were better able to implement AI-driven tools such as intelligent tutoring systems and adaptive learning platforms. These technologies allow for real-time feedback and adjustments to learning systems, leading to more individualized instruction and improved student outcomes. Teachers with higher AI literacy were also more confident in their ability to use AI to identify weak students and provide timely interventions and recommendations. Chou, et al. (2023) found that teachers who were trained in AI supported applications felt more

confident in integrating AI into their teaching methods. This enhances their teaching capabilities and also encourages them to explore new AI-driven innovations that can further benefit their students.

Challenges of AI Application in the Teaching-Learning Process

Despite the promising potentials of AI in enhancing teaching effectiveness, its application encounter numerous challenges. According to Rützi-Joy et al.(2023), one of the obstacles is the rapid pace of technological change because AI technologies evolve at of many educational system to adapt Zhao et al. (2022) also reported that some teachers lacked adequate professional development opportunities to build the necessary skills for applying AI effectively in the teaching learning process. Besides, the diverse needs of different educational settings from urban to rural and primary to tertiary education further complicate the implementation of AI programmes.

Fernandez et al. (2024) study identified obstacles to AI implementation to include reluctance to change, inadequate funding, and insufficient training, among others, and found the ease of use of AI as a crucial element determining teaching effectiveness. The study emphasised the necessity of continuous professional development initiatives and systems of support to improve teachers' digital literacy and self-assurance in applying AI to teaching. Another major challenge is limited assessment tools specifically designed to evaluate teachers' understanding and AI application. Ng et al. (2024) assert that existing instruments often focus on general digital literacy or basic computer skills, failing to capture the competencies required for AI proficiency, such as ethical AI usage or the integration of AI into pedagogical practices. The lack of validated, standardized instruments makes it difficult for schools and policymakers to effectively assess progress in AI literacy development.

Teachers' apprehension about AI's role in the classroom is another issue concerning its application. Some educators, in the words of Andersdotter (2023), express concerns about AI potentially displacing their roles or fundamentally changing the nature of teaching, leading to fear and resistance to adopting AI technologies. Teachers may fear that AI will automate certain teaching tasks, reducing their authority or interaction with students. These concerns may contribute to a general reluctance to embrace AI fully, despite its potential

benefits. Educators also need to understand AI's functionality and navigate complex ethical issues such as data privacy, bias, and the potential for student surveillance. These concerns are particularly challenging for educators, as they may lack the expertise or support necessary to address these issues effectively in classroom environment.

Conclusion

Artificial intelligence has emerged as a transformative force in the 21st-century education, reshaping teaching methodologies, administrative processes, and learning experiences. The use of new technologies in the classroom is crucial for improving the quality of education. Utilising AI to enhance learning outcomes and teaching effectiveness has become a prominent trend in education industry. The importance of AI literacy and application in enhancing teaching effectiveness cannot be overemphasised, as it is becoming important to leverage technology effectively to support teaching and learning in the ever-evolving landscape of education.

However, sustaining these benefits requires continuous support, access to resources, and equitable opportunities for all educators to build and maintain their AI competencies. It is crucial to support student efforts to develop digital literacy in order to guarantee their active involvement and participation in AI-enhanced learning settings. To fully leverage AI technologies, educators and policy makers must understand the relationships between AI adoption, ease of use, teaching effectiveness and student engagement. Only then can they develop evidence-based strategies.

While AI holds the promise of transforming education, access to AI tools and resources is yet to be evenly distributed. Schools in low-income or rural areas often lack the technology infrastructure necessary to support based- learning. This disparity creates a risk of deepening inequalities between students who have access to AI and those who do not. Addressing this challenge requires both educational policy reform and concerted efforts to bridge the technological gap in communities that lack AI technology infrastructure. Without continuous professional development and access to updated AI tools, teachers' AI literacy may stagnate, limiting its long-term effectiveness in teaching-learning process. There is therefore the need to develop suitable tools

to measure AI literacy for identifying gaps in teachers' knowledge and providing targeted support.

References

- Afroz, A. (2023) Connectivism learning theory and connectivist approach in teaching and learning: A review of literature. *International Journal of Education and Research*, 12(2), 1-16.
- Al Darayseh, A. (2023). Acceptance of artificial intelligence in teaching science: Science teachers' perspective. *Artificial Intelligence*, 4, 80-92.
- Allal-Chérif, O., Aránega, A. Y., & Sánchez, R. C. (2021). Intelligent recruitment: How to identify, select, and retain talents from around the world using artificial intelligence. *Technological Forecasting and Social Change*, 169, 120-822.
- Almasri, F. (2024) Exploring the impact of artificial intelligence in teaching and learning of science: A systematic review of empirical research. *Research in Science Education*, 54, 977-997.
- Andersdotter, K. (2023). Artificial intelligence skills and knowledge in libraries: Experiences and critical impressions from a learning circle. *Journal of Information Literacy*, 17 (3), 108-130.
- Azcona, D., Hsiao, I. H., & Smeaton, A. F. (2019). Detecting students-at-risk in computer programming classes with learning analytics from students' digital footprints. *User Modeling and User-Adapted Interaction*, 29, 759-788.
- Bowden, J. L.-H., Tickle, L., & Naumann, K. (2021). The four pillars of tertiary student engagement and success: A holistic measurement approach. *Studies in Higher Education*, 46(6), 1207-1224.
- Bozkurt, A., Karadeniz, A., Baneres, D., Rodriguez, M.E (2021). Artificial intelligence and reflections from educational landscape: A review of AI studies in half a century. *Sustainability*, 13(2), 104-116
- Chiu, T. K., Xia, Q., Zhou, X., Chai, C. S., & Cheng, M. (2023). Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education. *Computers and Education: Artificial Intelligence*, 4, 62-76.

- Chou, C.-M., Shen, T.-C., Shen, T.-C., Shen, C.-H., & Liu, T.-L. (2023). Promoting Pre-service Teachers' AI-Supported Application of Self-Efficacy. 2023 IEEE 3rd International Conference on Software Engineering and Artificial Intelligence, 261–265.
- Essel, H. B., Vlachopoulos, D., Tachie-Menson, A., Johnson, E. E., & Baah, P. K. (2022). The impact of a virtual teaching assistant (chatbot) on students' learning in Ghanaian higher education. *International Journal of Educational Technology in Higher Education*, (19)1, 45-57.
- Fernandez, D., Dastane, O., Omar Zaki, H., & Aman, A. (2024). Robotic process automation: Bibliometric reflection and future opportunities. *European Journal of Innovation Management*, (26)2, 692-712.
- Ibáñez, M. B., & Delgado-Kloos, C. (2018). Augmented reality for STEM learning: A systematic review. *Computers & Education*, 123, 109–123.
- Kaswan, K. S., Dhattewal, J. S., & Ojha, R. P. (2024). AI in personalized learning. In A. Garg, B. V. Babu, & V. E. Balas (Eds.), *Advances in Technological Innovations in Higher Education* (pp. 103-117). CRC Press.
- Kerr, K. (2024). Using a theory of change approach to support teachers' action research inquiries. *Educational Action Research*, 4, 1–17.
- Lin, H. (2022). Influences of artificial intelligence in education on teaching effectiveness: The mediating effect of teachers' perceptions of educational technology. *International Journal of Emerging Technologies in Learning*, (17)24, 144-160.
- Luckin, R., & Cukurova, M. (2019). Designing educational technologies in the age of AI: A learning sciences-driven approach. *British Journal of Educational Technology*, 50(6), 129-143
- Mavroudi, A., Giannakos, M., & Krogstie, J. (2018). Supporting adaptive learning pathways through the use of learning analytics: Developments, challenges and future opportunities. *Interactive Learning Environments*, 26(2), 206–220.
- Mohammed, A. Z., Mohd, E. & Ewan, M. M. (2024) Artificial Intelligence (AI) Literacy among teachers positive outlook: The huge potential talent has landed. *International Journal of Academic Research*, 13(4),88-103

- Ng, D. T. K., Wu, W., Leung, J. K. L., Chiu, T. K. F., & Chu, S. K. W. (2024). Design and validation of the AI literacy questionnaire: The affective, behavioural, cognitive and ethical approach. *British Journal of Educational Technology*, (55)3, 80-94.
- Okunade, A. I. (2024). The role of artificial intelligence in teaching of science education in secondary schools in Nigeria. *European Journal of Computer Science and Information Technology*, (12)1, 57–67.
- Olari, V. & Romeike, R. (2021). Addressing AI and data literacy in teacher education: A review of existing educational frameworks. In *ACM International Conference Proceeding Series* (Vol. 1, Issue 1). Association for Computing Machinery.
- Wahyono, I. D., Fadlika, I., Asfani, K., Putranto, H., Hammad, J., & Sunarti, O. (2019). New adaptive intelligence method for personalized adaptive laboratories. In *2019 International conference on electrical, electronics and information engineering (ICEEIE)* (pp. 196–200).
- Rütti-joy, O., Winder, G. & Biedermann, H. (2023). Building AI literacy for sustainable teacher education. *ZFHE* 18(4), 175–189.
- Siemens, G. (2017). Connectivism: A knowledge learning theory for the digital age? *Educational Technology*,(57)1, 3-10.
- Zawacki-richter, O., Marín, V. I., & Bond, M. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education*, 16(1), 1–27.
- Zhao, L., Wu, X., & Luo, H. (2022). Developing AI Literacy for Primary and Middle School Teachers in China: Based on a structural equation modeling analysis. *Sustainability*, (14)21,12-26.