



ETHICAL CONSIDERATION AND VALUES EDUCATION IN THE APPLICATION OF ARTIFICIAL INTELLIGENCE



Dr (Mrs.) Patience Ukwuori Mark
Educational Administration and Planning,
Abia State University, Uturu
patiencemark859@gmail.com

Abstract

As technology advances, the education industry is embracing the potential of AI to create smarter classrooms that enhance the learning experience for students and educators alike. From personalized learning to adaptive assessments, AI redefines how we approach education. It improves student learning outcomes, enhances teaching practices, and optimizes educational processes. The rapid advancement of AI and its integration into education and research presents a paradoxical landscape of opportunities and challenges. Existing scholarship has recently reflected on AI's technical capabilities but less so on its philosophical and pedagogical ethical consideration and values within education system. The advancement of Artificial Intelligence in Education (AIED) has the potential to transform the educational landscape and influence the role of all involved stakeholders. In recent years, the applications of AIED have been gradually adopted to progress our understanding of students' learning and enhance learning performance and experience. However, the adoption of AIED has led to increasing ethical risks and concerns regarding several aspects such as personal data and learner autonomy. This paper revolves around the key principles underpinning Ethical consideration and values education in the application of Artificial Intelligence. This paper also aims to explore the importance of Ethics and Values Education, the principles of ethical considerations and values education, finally highlight the challenges and opportunities offered by AI in education and potential ethical issues.

Keynotes: Artificial Intelligence, principles of Ethical consideration, values

Introduction

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are designed to perform tasks that typically require human intelligence. Applied AI refers to tools that have been designed and developed to assist in or replace decision making processes through the analysis of big data, and the prediction of the best value for a designated outcome variable, which is conveyed through a user interface (Du, X. & Wang, X. 2023).

Ethical considerations involve applying moral principles and values to decisions and actions, ensuring they align with societal norms and beliefs. Values, on the other hand, are deeply held beliefs that guide individuals' behavior and judgments, reflecting their sense of right and wrong. Ethical considerations and values education in the classroom focus on developing good character in students by incorporating ethical discussions and promoting values like responsibility, empathy, and compassion. This involves fostering critical thinking, ethical reflection, and the ability to make responsible moral judgments. Ethics and values education is crucial for developing well-rounded individuals who can contribute positively to society. It involves fostering critical thinking, promoting key values, and addressing ethical issues that arise in the classroom and beyond. In essence, ethical considerations are the practical application of values in specific situations, ensuring that our actions are both morally justifiable and aligned with our core beliefs. Ethical considerations and values education are crucial when applying AI, especially in education. As AI systems become more autonomous, it is essential to ensure they are used responsibly, ethically, and equitably. This involves addressing concerns like data privacy, algorithmic bias, and maintaining student agency. Educating students and educators about



these issues is paramount to fostering a responsible and informed approach to AI in education. (Du, X. & Wang, X. 2023)

Importance Of Ethics And Values Education

The importance of Ethics and Values Education include:

- Developing well-rounded individuals;
- Preparing students for future success;
- Creating a positive and inclusive learning environment;
- Contributing to a more just and equitable society.

Ethics and values education is crucial for developing well-rounded individuals who can contribute positively to society. (Bogina, V., Hartman, A., Kuflik, T., & Shulner-Tal, A. 2021).

Ethical principles / Guidelines for Artificial Intelligence in Education (AIED)

There are continued calls for substantial ethical guidelines and open communications with beneficiaries: educators, students, parents, AI developers, and policymakers. Berendt, B., Littlejohn, A., & Blakemore, M. (2020), stated that more emphasis is necessary to enforce ethical guidelines or principles for AI systems to better align with societal values. Safeguard measures and human oversight are required to oversee how AI systems are designed, how they function and evolve. The knowledge of behavioral science, equipped with self-awareness and empathy at the fore, is argued to intrinsically motivate AI developers to develop more trustworthy and responsible AI.

Ethical Principles for Artificial Intelligence in Education (AIED)

There are continued calls for substantial ethical guidelines and open communications with beneficiaries: educators, students, parents, AI developers, and policymakers which stated that more emphasis is necessary to enforce ethical guidelines for AI systems to better align with societal values (Berendt et al., 2020). Safeguard measures and human oversight are required to oversee how these AI systems are designed, how they function and evolve. These principles include:

Principle of Accountability: The regulation of AIED should explicitly address acknowledgment and responsibility for each stakeholder's actions involved in the design and use of AIED, including auditability, minimization, and reporting of negative side effects, trade-offs, and compensation. The accountability of AIED relates to the concept of "responsible AI" that features the ethical practice of designing, developing, and implementing AI with good intentions to empower relevant stakeholders and society fairly. Though 'responsible AI' has become increasingly popular, the terms accountability and responsibility are rarely defined. Nevertheless, it is commonly referred to as acting with integrity and clearly determining the attribution of responsibility and legal liability with careful consideration of potentially harmful factors. AI has been questioned over whether it should be held accountable in a human-like manner, or whether humans should always be the sole actors responsible for AI as technological artifacts. (Jobin, A., Ienca, M., & Vayena, E. 2019).

Principle of Sustainability and Proportionality: AIED must be designed, developed, and used in a justifiable way that they would not disrupt the environment, world economy, and society, such as the labor market, culture, and politics. For instance, regulation of AIED should consider ensuring policies supporting accountability of potential job losses and to leverage challenges as an opportunity for innovation (UNESCO, 2019). Careful deliberations of sustainability and proportionality will make AIED more approachable and beneficial to all.

Principle of Privacy: AIED must ensure well-informed consent from the user and maintain the confidentiality of the users' information, both when they pro-



vide information and when the system collects information about them. In most cases, when AIED tools are used to engage users in a particular learning activity, users are assumed to give consent, by which they would agree on terms of use of technology and how their personal data is collected, managed, and processed. Aligned with the principle of transparency and accountability, consent must be well informed as a pragmatic approach to building trust among students since the consent demonstrates their ease with the use of data by teachers to enhance their own learning performance also highlighted the significance of this consent to show respect towards students and reinforce their autonomy and freedom of choice. Once data is garnered, questions arise about how data management works, where and how long their personal information should be stored and to whom the rights of accessibility should be granted, (Li, W., Sun, K., Schaub, F., & Brooks, C. 2021).

Principle of Security and Safety

One of the main functions of educational learning systems is to collect data of users, from which predictions about the learning behaviors and performance of users will be made. However, it is inevitable to envisage a scenario when the data is probably manipulated or corrupted by another party, or even worse, by cybercriminals. AIED should be designed and implemented in a manner that ensures the solution is robust enough to safeguard and protect data effectively from cybercrimes, data breaches and corruption threats, ensuring the privacy and security of sensitive information. The concept of incorruptibility in AIED traces its root from incorruptibility in AI, or robustness against malicious manipulation by external factors. Bostrom & Yudkowsky (2014) pointed out that AI systems must be “robust against human adversaries deliberately searching for exploitable flaws in the algorithm”. Therefore, it can be stated that the incorruptible nature and integrity of the data go hand in hand with data security. It is essential to protect the personal data of stakeholders, including students, teachers, and schools, to prevent any misuse or violation. The protection of data privacy and security is even more essential in the current context of normalizing virtual learning, and it requires concerted effort and the self-awareness of all the stakeholders. Whereas learning analytics are governed by data ethics, many AIs are forms of intelligence expressed by some artifact that interacts with humans at various levels, such as robots and self-driving cars (Manoharan, S. 2019). AIED systems should be designed, developed, and deployed in a risk-management approach so that users are protected from unintended and unexpected harm, and fatalities are mitigated. As a result, it is pivotal that AIED developers take great care to design, train, pilot test, and validate the safety of AI systems (Leslie, D. 2019). Multi-stakeholder groups, including product developers, educators, and public authorities, should establish appropriate oversight, assessment, and due diligence mechanisms to ensure accountability and robustness throughout the AI lifecycle. This group should produce detailed guidelines and ensure that AI users (educators and learners) receive adequate training to operate the system safely within the defined environment.

Principle of Inclusiveness in Accessibility

AIED design, development, and deployment must take into account the infrastructure, equipment, skills, and societal acceptance that will accommodate a wide range of individuals in the intended region, allowing equitable access and use of AIED. The current digital gap evidently widens after COVID-19, where countries with poor infrastructure hamper their aspirations of thriving in digitalization (Palomares, I., Martínez-Cámara, E., Montes, R., García-Moral, P., Chiachio, M., Chiachio, J., & Herrera, F. 2021).

Principle of Human-Centered AIED

In recognition of autonomy as a modern moral and political value the development and regulation of AIED need to adopt a human-centric approach that safeguards and empowers human



autonomy This principle emphasizes the important of learners' interaction with others and their ability to cultivate individual resourcefulness, metacognition, self-regulation, and independent

Thought. One of AIED's main ethical concerns is the possibility of undermining learner agency pertaining to breaching autonomy of action. To ensure a human-centric AIED that emphasizes the learner agency, researchers, developers, and practitioners must adopt an interdisciplinary approach to developing negotiation-based adaptive learning systems that emphasize but are not limited to transversal competencies (European Parliament, 2021). AIED should allow learners the power to negotiate the type and frequency of received support, scaffolding of not only knowledge but also metacognition and self-regulation skills. Governments and educators should be aware of the AI literacy skills crucial for effective human-machine collaboration to develop and integrate the appropriate curriculum into education practices. As a result, not only will students and teachers remain in control and at the center of AI implementation but humans and machines will also collaborate for improved educational outcomes rather than using AI to usurp humans (Daradoumis, T., & Arguedas, M. 2020).

Challenges And Opportunity In Ethical Consideration And Values Education In The Application Of Artificial Intelligence

There are many challenges when addressing ethical consideration and values education in the application of Artificial Intelligence such challenges among others are:

Data Privacy Concerns: The collection and use of student data by AI systems raise concerns about privacy and security.

Algorithmic Bias: AI systems can perpetuate biases present in their training data, leading to unfair or discriminatory outcomes.

Loss of Human Agency: Excessive reliance on AI can undermine human autonomy and agency, particularly in education.

Opportunities for Personalized Learning: AI can provide personalized learning experiences, catering to individual student needs and learning styles.

Enhanced Feedback and Assessment: AI can provide timely and personalized feedback to students, supporting their learning and development.

Facilitating Collaborative Learning: AI can facilitate collaboration between students, teachers, and experts, fostering a more dynamic and engaging learning environment.

Addressing the challenges:

Develop Ethical Frameworks: Create clear ethical guidelines for the development and use of AI in education.

Promote Transparency and Explainability: Ensure that AI systems are transparent and explainable, allowing users to understand how they work.

Address Algorithmic Bias: Implement measures to identify and mitigate bias in AI systems.

Prioritize Data Privacy: Protect student data and ensure that it is used responsibly.

Maintain Human Agency: Balance AI with human involvement in education, ensuring that students and educators retain control over their learning experiences.

Provide Training and Education: Equip educators and students with the knowledge and skills to navigate the ethical implications of AI.

Final Remarks And Future Directions

The complexity and “intelligence” of this technology have led to potentially extensive ethical threats that trigger a pressing need for risk-intensive procedures to ensure the quality of delivery. Indeed, a sense of flexibility that acknowledges human values within the developing momentum of AI is vital to fostering sustainable innovations. The education system faces a paradox of artificial intelligence. Though regarded as vital for AI generation of high-quality educational outcomes. This paper contributes to the discussions of the ethical consideration and values education of application of AI in education, and at the same time, raises concerns for the adverse impacts on fundamental issues surrounding human rights. The intricacy of AI necessitates a holistic and applicable set of ethical principles for AI in the educational context. By systematically analyzing some general AI principles, proposed of a set of ethical tenets for AIED was made as a starting point to engage and spark further debates on the robustness of these principles. The proposed set of ethical principles should be considered when developing and implementing ethical and trustworthy AI systems for education. Nevertheless, while educational practitioners and AI developers have the best intentions of developing and implementing AI to improve education, the guiding ethical principles for AIED are yet to be workable. Furthermore, the education system has been confronting a paradox of applications of artificial intelligence

Technology across teaching and learning contexts. Despite existing theoretical frameworks investigating ethics of AI in general, no universal consensus has been reached on the best ethical theory in general, with moderate attention given to a practical set of ethical standards in the field of education in particular.

References

- Abulibdeh, A., Zaidan, E., & Abulibdeh, R. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry 4.0: Challenges, opportunities, and ethical dimensions. *Journal of Cleaner Production*, 140527.
- Agarwal, R., Bjarnadottir, M., Rhue, L., Dugas, M., Crowley, K., Clark, J., & Gao, G. (2023). Addressing algorithmic bias and the perpetuation of health inequities: An AI bias aware framework. *Health Policy and Technology*, 12(1), 100702.
- Ahmad, K., Qadir, J., Al-Fuqaha, A., Iqbal, W., El-Hassan, A., Benhaddou, D., & Ayyash, M. (2020). Data-driven artificial intelligence in education: A comprehensive review.
- Akgun, S. & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics*, 2(3), 431-440.
- Alam, A. (2021), November. Possibilities and apprehensions in the landscape of artificial intelligence in education. In *2021 International Conference on Computational Intelligence and Computing Applications (ICCICA) (pp. 1-8). IEEE*.
- AlGerafi, M.A., Zhou, Y., Oubibi, M., & Wijaya, T.T. (2023). Unlocking the potential: A comprehensive evaluation of augmented reality and virtual reality in education. *Electronics*, 12(18), 3953.
- Bogina, V., Hartman, A., Kuflik, T., & Shulner-Tal, A. (2021). Educating software and AI stakeholders about algorithmic fairness, accountability, transparency and ethics. *International Journal of Artificial Intelligence in Education*, 1-26.
- Borenstein, J. & Howard, A. (2021). Emerging challenges in AI and the need for AI ethics education. *AI and Ethics*, 1, 61-65.
- Božić, V. (2023). Artificial intelligence as the reason and the solution of digital divide. *Language Education and Technology*, 3(2).
- Berendt, B., Littlejohn, A., & Blakemore, M. (2020). AI in education: learner choice and fundamental rights. *Learning Media and Technology*, 45(3), 312–324. <https://doi.org/10.1080/17439884.2020.1786399>



- Bostrom, N., & Yudkowsky, E. (2014). The ethics of artificial intelligence. In K. Frankish, & W. Ramsey (Eds.), *The Cambridge Handbook of Artificial Intelligence* (pp. 316–334). Cambridge University Press. <https://doi.org/10.1017/CBO9781139046855.020>
- Chan, C.K.Y. (2023). A comprehensive AI policy education framework for university teaching and learning. *International Journal of Educational Technology in Higher Education*, 20(1), 38.
- Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in education: A review. *Ieee Access*, 8, 75264-75278.
- Chen, X., Zou, D., Xie, H., Cheng, G., & Liu, C. (2022). Two decades of Artificial Intelligence in education: Contributors, collaborations, research Topics, challenges, and future directions. *Educational Technology and Society*, 25(1), 28-47.
- Chen, Y., Jensen, S., Albert, L.J., Gupta, S., & Lee, T. (2023). Artificial Intelligence (AI) student assistants in the classroom: Designing chatbots to support student success. *Information Systems Frontiers*, 25(1), 161-182.
- 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, 100118.
- Corrin, L., Kennedy, G., French, S., Buckingham Shum, S., Kitto, K., Pardo, A., West, D., Mirriahi, N., & Colvin, C. (2019). *The Ethics of Learning Analytics in Australian Higher Education: A Discussion Paper*. <https://melbournecshe.unimelb.edu.au/research/research-projects/edutech/the-ethical-use-of-learning-analytics>
- Daradoumis, T., & Arguedas, M. (2020). Cultivating students' reflective learning in metacognitive activities through an affective pedagogical agent. *Educational Technology and Society*, 23(2), 19–31. <https://www.jstor.org/stable/26921131>
- Dartmouth Summer Research Project on Artificial Intelligence (2023). IEEE Spectrum <https://spectrum.ieee.org/dartmouth-ai-workshop>
- Dhayanidhi, G. (2022). Research on IoT Threats & Implementation of AI/ML to Address Emerging Cybersecurity Issues in IoT with Cloud Computing.
- Dhanrajani, S. (2018). 3 Ways To Human Centric AI. <https://www.forbes.com/sites/cognitiveworld/2018/12/12/3-ways-to-human-centric-ai/?sh=495e42804a38>
- Du, X. & Wang, X. (2023). Play by Design: Developing Artificial Intelligence Literacy through Game-based Learning. *Journal of Computer Science Research*, 5(4), 1-12.
- Ehimuan, B., Anyanwu, A., Olorunsogo, T., Akindote, O.J., Abrahams, T.O., & Reis, O. (2024). Digital inclusion initiatives: Bridging the connectivity gap in Africa and the USA–A review. *International Journal of Science and Research Archive*, 11(1), 488-501.
- Engstrom, D.F. & Ho, D.E. (2020). Algorithmic accountability in the administrative state. *Yale J. on Reg.*, 37, 800.
- European Commission (2018). *Statement on artificial intelligence, robotics and 'autonomous' systems*. European Union Publications Office. <https://op.europa.eu/en/publication-detail/-/publication/dfebe62e-4ce9-11e8-be1d-01aa75ed71a1/language-en/format-PDF/source-78120382>
- European Commission (2019). *The European Commission's high-level expert group on artificial intelligence: Ethics guidelines for trustworthy AI*. European Union Publications Office. <https://digital-strategy.ec.europa.eu/en/policies/expert-group-ai>
- European Parliament (2021). *Report on artificial intelligence in education, culture and the audiovisual sector (2020/2017(INI))*. Committee on Culture and Education. https://www.europarl.europa.eu/doceo/document/A-9-2021-0127_EN.html
- Hagendorff, T. (2020). The ethics of AI ethics: An evaluation of guidelines. *Minds and Machines*, 30(1), 99–120. <https://doi.org/10.1007/s11023-020-09517-8>
- Holmes, W., Porayska-Pomsta, K., Holstein, K., Sutherland, E., Baker, T., Shum, S. B., Santos, O. C., Rodrigo, M. T., Cukurova, M., Bittencourt, I. I., & Koedinger, K. R. (2021). Ethics of AI in



- education: Towards a community-wide framework. *International Journal of Artificial Intelligence in Education*. <https://doi.org/10.1007/s40593-021-00239-1>
- Hwang, G. J., & Tu, Y. F. (2021). Roles and Research Trends of Artificial Intelligence in Mathematics Education: A Bibliometric Mapping Analysis and Systematic Review. *Mathematics*, 9(6), 584. <https://doi.org/10.3390/math9060584>
- Hogenhout, L. (2021). *Unite Paper | A Framework for Ethical AI at the United Nations*. <https://unite.un.org/news/unite-paper-framework-ethical-ai-united-nations>
- Jobin, A., Ienca, M., & Vayena, E. (2019). Artificial Intelligence: The global landscape of ethics guidelines. *Nature Machine Intelligence*, 1(9), 389–399. <https://doi.org/10.1038/s42256-019-0088-2>
- Kay, J., & Kummerfeld, B. (2019). From data to personal user models for life-long, life-wide learners. *British Journal of Educational Technology*, 50(6), 2871–2884. <https://doi.org/10.1111/bjet.12878>
- Kazim, E., & Koshiyama, A. S. (2021). A high-level overview of AI ethics. *Patterns*, 2(9), 100314. <https://doi.org/10.1016/j.patter.2021.100314>
- Leslie, D. (2019). Understanding artificial intelligence ethics and safety: A guide for the responsible design and implementation of AI systems in the public sector. <https://doi.org/10.5281/zenodo.3240529>
- Li, W., Sun, K., Schaub, F., & Brooks, C. (2021). Disparities in students' propensity to consent to learning analytics. *International Journal of Artificial Intelligence in Education*. <https://doi.org/10.1007/s40593-021-00254-2>
- Manoharan, S. (2019). An improved safety algorithm for artificial intelligence enabled processors in self driving cars. *Journal of Artificial Intelligence*, 1(02), 95–104. <https://doi.org/10.36548/jaicn.2019.2.005>
- Office of the High Commissioner for Human Rights (2019). *Transforming our world: the 2030 Agenda for Sustainable Development*. <https://sdgs.un.org/2030agenda>
- Organization for Economic Co-operation and Development (2021). *OECD Recommendation of the Council on Artificial Intelligence*. OECD/LEGAL/0449. <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449>
- O'Sullivan, S., Nevejans, N., Allen, C., Blyth, A., Leonard, S., Pagallo, U., Holzinger, K., Holzinger, A., Sajid, M. I., & Ashrafian, H. (2019). Legal, regulatory, and ethical frameworks for development of standards in artificial intelligence (AI) and autonomous robotic surgery. *The International Journal of Medical Robotics and Computer Assisted Surgery*, 15(1), e1968. <https://doi.org/10.1002/rcs.1968>
- Palomares, I., Martínez-Cámara, E., Montes, R., García-Moral, P., Chiachio, M., Chiachio, J., & Herrera, F. (2021). A panoramic view and swot analysis of artificial intelligence for achieving the sustainable development goals by 2030: progress and prospects. *Applied Intelligence*, 1–31. <https://doi.org/10.1007/s10489-021-02264-y>
- United Nations Educational, Scientific and Cultural Organization, & Organization, C. (2021). *Recommendation on the Ethics of Artificial Intelligence*. United Nations Educational. <https://unesdoc.unesco.org/ark:/48223/pf0000379920.page=14>
- Wang, T., & Cheng, E. C. K. (2021). An investigation of barriers to Hong Kong K-12 schools incorporating Artificial Intelligence in education. *Computers and Education: Artificial Intelligence*, 2, 100031. <https://doi.org/10.1016/j.caeai.2021.100031>