Ethics and Policies for the Use of Artificial Intelligence (AI) in TVET Tertiary Institutions

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Abstract
The integration of Artificial Intelligence (AI) in Technical and Vocational Education and Training (TVET) tertiary institutions offers transformative potential for enhancing learning outcomes, operational efficiency, and innovative pedagogies. However, the deployment of AI technologies necessitates comprehensive ethical frameworks and policy guidelines to address challenges related to privacy, bias, accountability, and inclusivity. This paper explores the critical ethical considerations and policy imperatives for implementing AI in TVET tertiary institutions. It emphasizes the importance of establishing transparent, fair, and responsible AI usage protocols that align with educational values and societal norms. Additionally, the study advocates for stakeholder engagement, continuous oversight, and adaptive policies to ensure that AI applications support equitable access, safeguard data integrity, and promote ethical decision-making. By fostering a balanced approach to AI integration, TVET institutions can harness technological advancements while upholding ethical standards that protect learners, educators, and the broader community. Ultimately, this work aims to inform policymakers and educational leaders on best practices for the responsible adoption of AI in the tertiary TVET sector.

Keywords: Artificial, Ethics, Intelligence, Policies, TVET

Introduction

Artificial Intelligence (AI) refers to the simulation of human intelligence by machines that are programmed to think, learn, and solve problems autonomously (Bulus, 2024). This technological advancement allow systems to process data, recognise patterns, and make decisions with minimal human intervention, thus increasing efficiency and accuracy in a variety of applications. AI encompasses various subfields, including machine learning, natural language processing (NLP), robotics, and computer vision (Okunade, 2024). Machine learning involves the creation of algorithms that allow systems to learn and make decisions from data without explicit programming, while NLP focuses on enabling computers to understand and process human language (Udeagha, 2024). Robotics involves designing systems that can interact with the physical world, and computer vision equip machines with the ability to interpret and understand visual information (Ajani et al., 2023).

The rapid advancement of Artificial Intelligence (AI) technologies has profoundly transformed various sectors, including education, by offering innovative solutions for personalized learning, administrative efficiency, and

data-driven decision-making (Oluyemisi, 2023). In particular, Technical and Vocational Education and Training (TVET) tertiary institutions are increasingly integrating AI tools to enhance skill development, improve pedagogical approaches, and address the evolving needs of the workforce.

Ethical concerns surrounding AI in education encompass issues of privacy, data security, bias, transparency, and accountability (Cios and Zapala, 2020). For instance, the collection and analysis of student data pose risks to learners' privacy rights, while biases embedded within AI algorithms can perpetuate inequalities and discrimination (Onyanabo, 2024). Furthermore, the opacity of some AI systems can hinder understanding and trust among stakeholders, raising questions about accountability when errors or adverse outcomes occur (Corrigan and Ikonnikova, 2024). As AI becomes more embedded in educational decision-making processes, establishing clear ethical guidelines is paramount to safeguard the rights of learners and educators.

Simultaneously, effective policies are essential to govern AI use in TVET institutions, ensuring alignment with educational goals and societal values. Policymakers must develop frameworks that promote fairness, inclusivity, and transparency, while also addressing issues of digital divide and access (Oluyemisi, 2023). These policies should delineate standards for data management, algorithmic fairness, and stakeholder engagement, fostering an environment where AI supports equitable and quality education. Moreover, ongoing oversight and adaptive governance are necessary to respond to technological developments and emerging ethical challenges.

Balta (2023) explored the ethical challenges associated with integrating artificial intelligence into educational settings and highlighted the key ethical principles to guide the various applications of AI in educational research, including transparency, accountability, fairness, and authenticity. This paper explores the key developments in AI, the ethical considerations in AI and academic integrity as well as the various applications of AI across various domains, and the ethical considerations that accompany its advancement to ensure an effective balancing of technology and human values (Lancaster, 2024). This paper explores the ethics and policies for use of AI in TVET tertiary institution.

As AI continues to reshape the landscape of tertiary TVET education, it is imperative to establish robust ethical principles and comprehensive policies. Such measures will ensure that AI integration benefits all learners and educators while upholding fundamental human rights and societal values. This paper explores the key ethical considerations and policy imperatives for the responsible use of AI in TVET tertiary institutions, emphasizing the importance of a balanced approach that harnesses technological potential without compromising ethical standards.

Meaning of Artificial Intelligence (AI)

Artificial Intelligence (AI) is a tangible real-world capability of non-human machines or artificial entities to

perform, task solve, communicate, interact, and act logically as it occurs with biological humans (Chen and Wen, 2021). In the context of this paper, artificial intelligence (AI) refers to computer systems capable of performing complex tasks that naturally only a human could do, such as reasoning, making decisions, or solving problems. Owoyemi (2023)state that Artificial Intelligence (AI) is a broad term used to describe a collection of technologies able to solve problems and perform tasks without explicit human guidance. Some of these include: machine learning, computer vision, natural language processing, robotics and deep learning. A general-purpose technology, AI uses data-driven algorithms to autonomously solve problems and perform tasks without human guidance.

The American Heritage Science Dictionary (2020) defines AI as the ability of a computer or other machine to perform actions thought to require intelligence. The actions include logical deduction and inference, creativity, the ability to make deductions based on past experience or insufficient or conflicting information, and the ability to understand language. Today, AI Researchers are drawing parallels with how humans think. A recent definition from Stanford University's 100 Year Study on AI describes AI as "a science and a set of computational technologies that are inspired by, but typically operate quite differently from, the ways people use their nervous systems and bodies to sense, learn, reason, and take action (Peter, 2016). In layman's terms, AI is the development of computer systems that are able to perform tasks that would require human intelligence. Examples of such tasks are visual perception, speech recognition, decision-making, and translation of languages. The emerging field of AI is a multidisciplinary concept combining Philosophy,
Logic/Mathematics, Computation,
Psychology, Neuroscience and Evolution.

Popular AI Tools and Benefits in TVET Tertiary Institution

The following are popular AI tools being used in Nigeria universities. They include but are not limited to the following:

1. **Open AI Playground:** A dynamic platform called Open AI Playground uses artificial intelligence to help with content creation. Whether it's a creative write-up for your literature class, a research paper for your history class or a line of code for your computer science assignment, it's like having a personal assistant that can create content from scratch. Because of the tool's adaptability to different content types, students in a variety of disciplines can benefit greatly from its versatility (Kajiwara and Kawabata, 2024). However, Open AI Playground offers advantages that go beyond content production. Writer's block, that annoying state in which you're staring at a blank screen and unable to put your thoughts into words, is one of the most frequent problems that students encounter. In these kinds of situations, Open AI Playground comes to the rescue. It can assist you in organising and structuring your ideas and give you a place to start when writing. Open AI Playground is

essentially a companion for students on their academic journey rather than just a tool. It facilitates the process of creating content and gives students the tools they need to communicate their ideas clearly and succinctly (Ghallab, 2019).

2. **Chat GPT-3/GPT-4**: Chat GPT-3 and GPT-4, are particularly complex and have the potential to completely transform the way students study and work. OpenAI's Chat GPT-3 and GPT-4 are two of the most sophisticated chatbots on the market right now. They are extremely flexible learning tools because they are made to comprehend and react to different prompts. These chatbots provide an additional degree of support for students who are interested in coding. They are an invaluable resource for both novice and expert programmers since they can assist with writing code in several different programming languages (Ray, 2023).
3. **Quillbot:** In academic writing, uniqueness and lucidity are essential. Finding the right words, however, can occasionally be difficult. This is the role of Quillbot. Quillbot, a tool for paraphrasing, is like having a personal writing assistant that assists students in creating interesting and original content.Quillbot's capacity to comprehend text in context is one of its most notable qualities. In contrast to basic thesaurus tools that merely change words, Quillbot makes use of sophisticated artificial intelligence to understand the content. This enables it to produce paraphrases that preserve the original meaning while utilising new words. For students who want to avoid plagiarism or convey an idea in a novel and original way, this feature is immensely helpful.However, Quillbot's powers go beyond simple sentences (Owoyemi, 2023).
4. **Grammarly:** Regardless of the tone or style they're going for, Grammarly is meant to assist students in producing content that is free of errors. Grammarly can help you with both informal email writing and formal research paper writing. It carefully examines your writing for any grammatical errors, punctuation errors, or awkward wording and offers immediate suggestions for corrections.That's not all, though. Additionally, Grammarly has an integrated plagiarism detector. To make sure your original work is free of inadvertent plagiarism, it compares it to billions of published works and web pages (Chincholkar and Sarkar, 2021).
5. **Otter.ai:** Otter.ai is a cutting-edge tool that can act as your personal scribe by transcribing voice notes and lectures. It records spoken words and turns them into written text so that you don't miss any crucial information from your study sessions or lectures. This means that instead of dividing your attention between listening and taking notes, you can give your whole attention to taking in the material, participating in discussions, and developingyour understanding.
   Otter.ai offers advantages over transcription alone (Michalik, Stofa, and Zolotova, 2024).
6. **Stepwise Math**: This AI tool is a boon for students struggling with mathematics. It provides personalized

courses, assignments, and worksheets, targeting students' weaknesses and making learning interactive and fun (Owoyemi, 2023).

7. **Google Bard:** Google Bard is not just any chatbot; it's an AI-powered tool designed to understand and respond to complex queries. Whether trying to understand a complicated scientific concept or looking for historical facts, Google Bard can provide accurate and detailed answers. This feature particularly benefits students who need quick answers while studying or working on assignments.
8. **Slidesgo:** An AI-powered tool called Slidesgo is revolutionising the way students make presentations. With its extensive collection of Google Slides and PowerPoint templates, it offers students an abundance of design options. Students can concentrate more on the content of their presentations and save time by doing this.The tool's goal is to improve the visual appeal and decrease monotony of presentations. With the range of layouts, colour schemes, and design options available, students can tailor their presentations to their preferences. This diversity guarantees that every presentation is distinct and captivating, drawing in the audience and facilitating a more palatable assimilation of the material. To further streamline the design process, Slidesgo's AI capabilities can recommend templates based on the content of the presentation. Students who wish to create visually stunning presentations but may not have a background in design will find this feature especially helpful (Michalik, Stofa, and Zolotova, 2024).

Ethics for the Use of AI in TVET Tertiary Institutions

The ethics that surround the use of AI in TVET tertiary institutions include:

1. **Data Privacy and Security:** One of the foremost ethical issues surrounding AI in education is the management of student data. AI systems often require extensive data collection to function effectively, which raises concerns about privacy and data security (Gomez and Hwang, 2021). Educational institutions must implement robust data protection measures and ensure that students are informed about how their data is used. Transparency in data collection and usage is essential for fostering trust between students and institutions.
2. **Bias and Fairness:** AI systems can inadvertently perpetuate biases present in the data they are trained on, leading to unfair treatment of certain student groups. For example, if an AI algorithm is developed using data that reflects historical inequalities, it may disadvantage marginalised students. Educators and developers must prioritise fairness and equity in AI design, ensuring that algorithms are regularly audited for bias and that diverse datasets are used (Luckin, 2016).
3. **Academic Integrity:** The ease of access to AI tools raises questions about academic integrity. Students may use AI to complete assignments or take exams, leading to concerns about plagiarism and the devaluation of authentic learning. Educational

institutions must establish clear guidelines on the acceptable use of AI in academic work, emphasising the importance of original thought and effort in the learning process (Lopez-Pernas, 2022).

4. **Responsibilities of Students:** Students also bear a significant responsibility in the ethical use of AI in education. They must develop digital literacy skills to critically evaluate AI-generated content and recognise its limitations. This includes understanding the potential for misinformation and the importance of corroborating AI outputs with reliable sources. Additionally, students should engage in open discussions about the ethical implications of AI, fostering a culture of responsibility and awareness.
5. **Accountability:** Clear mechanisms must be established to determine responsibility for AI-driven outcomes. When AI systems malfunction or produce unintended consequences, institutions need to have procedures for addressing grievances, rectifying errors, and assigning accountability—be it to developers, administrators, or policymakers (Owoyemi, 2023).
6. **Stakeholder Engagement:** Policy frameworks should encourage participatory development processes involving students, educators, industry partners, and policymakers. Engaging stakeholders ensures AI deployment aligns with societal values and addresses community concerns (Cios and Zapala, 2020).
7. **Capacity Building and Ethical Training:** Training programs should be implemented to develop AI literacy among educators and administrators regarding ethical considerations, bias recognition, and responsible AI management. Continuous professional development can foster a culture of ethical awareness.
8. **Oversight and Monitoring:** Establishing dedicated oversight bodies or committees to monitor AI systems' ethical compliance, performance, and impact is vital. These bodies should facilitate ongoing evaluation, feedback collection, and adjustments as needed.
9. **Legal and Regulatory Compliance:** Institutional policies must align with national and international regulations governing AI, data protection, and digital rights to ensure legal accountability and safeguard learners' interests (Cios and Zapala, 2020).

Policies for Use of AI in TVET Tertiary Institution

As artificial intelligence (AI) technologies continue to advance, the need for robust policies and institutional frameworks has become increasingly urgent. Policymakers and institutions must not only address the technical aspects of AI deployment but also consider ethical implications and integrity in its usage (Ojo, 2023). Key Policy Areas for AI Use in TVET tertiary institutions:

1. Strategic Framework and Governance: Policy Development and Oversight: Establish a dedicated committee or body responsible for overseeing AI integration, setting strategic priorities, and ensuring

alignment with institutional goals.Alignment with National and International Standards: Policies should reflect national laws, data protection regulations (e.g., GDPR), and international ethical guidelines to ensure compliance and promote best practices (Lopez-Pernas, 2022).

2. Data Management and Privacy Policies**:** Data Collection and Usage: Define protocols for ethically collecting, storing, and processing student and staff data. Emphasize data minimization, relevance, and purpose limitation.
3. Quality Assurance and Evaluation: Establish benchmarks and key performance indicators (KPIs) to evaluate the effectiveness of AI tools. Promote ongoing review and refinement of AI systems based on feedback and emerging best practices. Require validation processes before deploying AI applications broadly within the institution (Okunade, 2024).
4. Capacity Building and Ethical Training: Develop training programs for educators and administrators to understand AI technologies and ethical considerations. Educate students about AI's role, benefits, and risks to foster responsible usage.
5. Legal and Regulatory Compliance: Ensure AI deployment complies with existing legal frameworks related to data protection, intellectual property, and digital rights.Clearly define accountability in case of AI system failures or errors affecting learners or staff.
6. Stakeholder Engagement and Participation**:** Involve students, educators, industry partners, and policymakers in developing and reviewing AI policies. Establish channels for stakeholders to report concerns, suggest improvements, and participate actively in AI governance.
7. Innovation and Research Support: Encourage experimentation with AI applications while adhering to ethical standards. Support research initiatives that evaluate AI's impact on education quality, equity, and outcomes (Lopez-Pernas, 2022).

Importance of Policies of Use of AI

1. Transparency and Accountability: Policies should mandate transparency in AI algorithms, ensuring that stakeholders understand how decisions are made. This includes documenting data sources, model training processes, and providing users with access to information about AI functionalities. Additionally, accountability measures must be in place to hold developers and organisations responsible for AI outcomes (Lee and Chang, 2024).
2. Bias Mitigation: As highlighted by Obermeyer et al. (2019), biases in training data can lead to unequal outcomes. Policies must enforce rigorous testing and validation of AI systems to identify and address biases before deployment. This involves diverse data sets and interdisciplinary teams in the development process.
3. Privacy Protection: AI applications often involve the processing of sensitive personal data. Policies should emphasise the importance of

data privacy and security, adhering to regulations such as the General Data Protection Regulation (GDPR) in Europe. Organisations must implement data minimisation principles, ensuring that only necessary information is collected and processed (Udeagha, 2024).

4. Promoting a Culture of Integrity: In parallel with policy development, fostering a culture of integrity within institutions is crucial. This culture not only supports ethical AI use but also builds trust among stakeholders.
5. Ethical Training and Awareness: Institutions should invest in training programmes that educate employees about ethical AI use and the potential impacts of their work. This includes understanding the ethical implications of AI decisions and recognising the importance of integrity in their actions (Okunade, 2024).
6. Leadership Commitment: Strong leadership is vital in promoting a culture of integrity. Leaders must model ethical behaviour and establish clear expectations regarding AI use. When leaders prioritise ethical considerations, it encourages employees to follow suit (Ojo, 2023).
7. Whistleblower Protections: Institutions should implement mechanisms that allow employees to report unethical practices without fear of retaliation. This can be achieved through anonymous reporting systems and clear policies that protect whistleblowers.
8. Stakeholder Engagement: Engaging diverse stakeholders, including community members, policymakers, and industry experts, can help institutions develop comprehensive AI policies that reflect a broad range of perspectives. This collaborative approach fosters a sense of shared responsibility and integrity (Holmes et al., 2019).

Role of Tertiary Institution in Promoting Ethical AI Use among Students

The adoption of Artificial Intelligence (AI) technologies has revolutionised multiple facets of contemporary existence, encompassing education. Nigerian universities, which are major players in forming the future workforce, are essential in encouraging students to use AI ethically. Universities can guarantee that AI technologies are used responsibly and for the good of society by integrating AI ethics into their curricula, creating governance frameworks, and encouraging cooperation with business and government.

1. **Incorporating AI Ethics into the Curriculum:** Integrating AI ethics into their curricula is one of the best ways Nigerian universities can encourage the use of ethical AI. It is ensured that students not only acquire technical skills but also comprehend the wider societal consequences of AI by including courses that address the legal, social, and ethical implications of AI. Binns (2018) has pointed out

that ethical AI education is crucial to producing graduates capable of navigating morally challenging issues like algorithmic bias, privacy, and accountability.Prioritising the development of an extensive curriculum that addresses the effects of AI on society is imperative for Nigerian universities. This includes talking about how AI systems, especially in areas like facial recognition and hiring algorithms, may unintentionally reinforce prejudices (Raji & Buolamwini, 2019). Universities contribute to providing the next generation of AI professionals with the knowledge and abilities necessary to create systems that put inclusivity and fairness first by teaching students about these concerns.

2. **Developing AI Governance Policies and Codes of Conduct:** Integrating AI ethics into their curricula is one of the best ways Nigerian universities can encourage the use of ethical AI. It is ensured that students not only acquire technical skills but also comprehend the wider societal consequences of AI by including courses that address the legal, social, and ethical implications of AI. Binns (2018) has pointed out that ethical AI education is crucial to producing graduates capable of navigating morally challenging issues like algorithmic bias, privacy, and accountability.Prioritising the development of an extensive curriculum that addresses the effects of AI on society is imperative for Nigerian universities. This includes talking about how AI systems, especially in areas like facial recognition and hiring algorithms, may unintentionally reinforce prejudices (Raji & Buolamwini, 2019). Universities contribute to providing the next generation of AI professionals with the knowledge and abilities necessary to create systems that put inclusivity and fairness first by teaching students about these concerns.
3. **Collaboration with Industry and Government on Ethical AI Standards:** Effective cooperation among Nigerian academia, industry, and government is imperative in advancing the moral application of artificial intelligence at the national level. In order to guarantee that students are exposed to ethically compliant real-world applications of AI, universities should collaborate with industry stakeholders. Universities can benefit from this collaboration by being informed about the most recent advancements in AI governance and regulation.Taddeo and Floridi (2018) contend that cooperation in academia, business, and government is essential to guaranteeing that artificial intelligence (AI) technologies are created and applied in a manner consistent with society values. Universities in Nigeria have the potential to significantly influence national AI policies through

research that helps set ethical standards for the application of AI in various industries and influences government decision-making.

4. **Raising Awareness through Seminars and Workshops:** Through conferences, workshops, and seminars, Nigerian universities can increase public awareness of the ethical implications of artificial intelligence (AI) outside of the classroom. These gatherings give students the chance to talk with authorities on AI ethics and investigate the advantages and disadvantages of AI technologies. Students can evaluate their work's effect on privacy and security by critically analysing topics such as the ethical concerns of AI in surveillance and autonomous systems (Crawford, 2021). Universities can promote a culture of ethical AI use outside of the classroom by organising multidisciplinary events. These programs also give students the chance to participate in ongoing discussions about AI governance, giving them the tools they need to contribute to national and international dialogues about the field's future.
5. **Building a Culture of Responsible AI Use:** Nigerian universities must set an ethical AI usage example for their students. Universities need to make sure that they employ AI ethically in all aspects of their own operations, including student monitoring, grading, and admissions. Organisations that use AI ethically, according to Fjeld et al. (2020), set an example for responsible technology deployment and emphasise the significance of accountability and transparency. Universities can show students the practical applications of AI governance and the value of ethical decision-making by implementing ethical AI practices into their administrative procedures. Students that receive this kind of instruction will carry these lessons into their future careers and will be more responsible as a result (Udeagha, 2024).

Conclusion

The integration of AI into academic environments presents both opportunities and challenges for academic integrity. While AI can enhance learning, streamline research, and promote inclusivity, it creates new avenues for academic dishonesty. As institutions, educators, and policymakers grapple with these challenges, a proactive approach that includes revising policies, adopting detection tools, redesigning assessments, and promoting ethical AI use is critical. By fostering an academic culture that values integrity and transparency, the benefits of AI can be harnessed without compromising the ethical foundations of teaching and research. Also, by addressing the challenges and implementing best practices, students, educators, researchers, and academic institutions can harness the benefits of AI while preserving the core values of academic integrity. Ethical challenges posed by AI advancements in education demands a multifaceted approach, including the development of fair and

transparent AI systems, the reinforcement of academic integrity through innovative assessment methods, and the safeguarding of student privacy and data. Educators and institutions must collaborate to create ethical frameworks and strategies that allow AI to enhance learning while maintaining the core values of integrity, fairness, and human-centered education.

Recommendations

The following recommendations are made:

1. Nigerian universities should incorporate courses on AI ethics that emphasise the responsible use of technology in academic pursuits. These courses must highlight the legal, ethical, and societal implications of AI to prepare students for ethical decision-making in their future careers.
2. Educational institutions should adopt AI-based plagiarism detection tools like Turnitin and Grammarly to monitor academic submissions. These tools can aid in identifying unethical practices and deter students from engaging in academic dishonesty.
3. Nigerian universities must cultivate an environment that promotes integrity through explicit policies, stringent enforcement of academic standards, and continuous education on the importance of honesty and fairness in academic and professional settings.
4. Educational institutions should collaborate with AI technology developers to ensure the creation of tools that support academic integrity. These collaborations can lead to AI systems designed with built-in safeguards against unethical use and tools that assist educators in detecting academic dishonesty, while also promoting ethical AI engagement in educational contexts.
5. Educational institutions should establish thorough training programs to enhance AI literacy among both students and faculty. These programmes should focus on understanding AI's capabilities, limitations, and ethical challenges.
6. With AI becoming more integrated into educational practices, courses or modules covering AI ethics, privacy, and societal impact should be embedded into the curriculum. Teaching students the ethical use of AI will not only help them in academic settings but will also prepare them for professional responsibilities related to AI in the future.

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