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Balancing Ethics and Privacy in the Use of Artificial Intelligence in Institutions of Higher Learning: A Framework for Responsive AI Systems

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Abstract:

Artificial Intelligence (AI) is swiftly revolutionising higher education, presenting substantial prospects for innovation while concurrently evoking ethical and privacy concerns. These concerns include issues such as intrusive data collection, algorithmic bias, threats to student autonomy, and unequal access to AI-enhanced learning. Without clear guidelines or institutional safeguards, there is a risk that AI systems may reinforce existing social inequalities, compromise student privacy, and erode the human-centred nature of teaching and learning. This research presents an AI framework that is responsive and ethical within the area of higher education. The process involved sixteen in-depth interviews from university students, administrators, lecturers, and IT professionals belonging to three separate universities, with the Technology Organisation Environment model and the sociocultural learning theory being employed. Thematic analysis identified ten critical themes centred around benefits, challenges, applications, responsible use, privacy and data security, ethical considerations, institutional policies and frameworks, training, equity, and sustainable AI use. The results indicate that institutions should take a proactive stance in dealing with these issues and harnessing AI's full potential. The study thus advances the formulation of policies that provide for the equitable distribution of AI technologies, with the accompanying strong emphasis on ethical principles and data security. In preserving academic integrity and enhancing educational processes, this research stresses the need to create collaborative environments among the major stakeholders. Thus, higher education, taking into consideration AI implementations aligned with learner, educator, and administrator interests, thereby offers the promise of navigating the complex terrain of AI integration.

Keywords: *artificial intelligence, ethics, privacy, responsive ai systems, responsible use.*

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Introduction

Artificial Intelligence (AI) is transfiguring the shifting course of higher education, thereby changing pedagogical strategies, administrative processes, and research techniques (Mnguni et al., 2024; Ndlovu et al., 2024). It ranges from intelligent tutor systems to adaptive-learning systems AI technologies transform how higher learning institutes operate: providing personalised learning experiences, automating administrative tasks, and engaging in data-based decision-making (Dube et al., 2024; Smith et al., 2024). There are, however, some concerns about the application of AI in education. Ethical issues, such as algorithmic bias, non-transparency, and accountability, to name a few, are considered, with privacy issues in respect of the collection and use of personal data also being discussed (Adewale, 2024; Nguyen et al., 2023). Hence, some interventions must be put forward by higher education institutions to address these concerns in order to set up ethical standards that protect individual privacy before AI systems are implemented.

The use of AI for learning is more than just a technical alteration; it is a transformation with a solid ethical foundation (Cumming et al., 2024). While AI, i.e., AI-based tools such as adaptive learning platforms, intelligent tutoring systems, and automated evaluating mechanisms, do largely enhance the learning experience, exposure is laid upon students and faculty to data breaches, algorithmic bias, and threats to academic integrity (Dube et al., 2024).

With these concerns in mind, a necessity arises to establish a responsive AI framework that would provision higher education in reconciling ethicalities with privacy protection, for this is fast becoming a real-world issue. In the absence of any guidelines and institutional measures, AI applications will likely serve to enhance present social inequities, further infringe on student privacy, and dilute teaching and learning of human-centred values. If institutions were to implement AI without such a framework, there is an impending risk of losing public confidence, deepening the chasm of digital divides, and attracting legal challenges or dubious acts of data misuse or discrimination. More importantly, they stand to lose the opportunity of fully harnessing the benefits a sustainable education framework would bring for using AI in forming equally inclusive, transparent, and fair education. Thus, development of this responsive framework is not only an urgency but a necessity. It will serve as the intervention to protect students' personal data, ensure AI technologies are applied ethically, and promote equity and accountability within the educational ecosystem. Leaving out these ethical guardrails in this Data-Age decision-making would be very reckless and have lasting consequences such as biased educational outcomes or the marginalisation of vulnerable learners. The study's contribution lies in establishing a guided pathway towards the resolution of such matters, thereby ensuring that AI remains a means of empowerment rather than exclusion.

Review of Literature

Artificial Intelligence Ethics

Many ethical topics are discussed concerning AI, such as bias, equality, accountability, transparency, interference with personal privacy, and more across the whole gamut of AI-related topics (Abulibdeh et al., 2024; Jobin et al., 2019). The transparency and accountability concerns are raised with the ever-existing opaque design that some AI models have (Adelakun et al., 2024; Xulu et al., 2024). The use of AI-driven technologies and systems within the scope of higher education must be in conformity with ethical guidelines promoting the interests of students, teachers, and administrators (Massaty et al., 2024). Ndlovu et al. (2025) discussed different ethical dilemmas associated with the use of AI chatbots, including bias in AI responses, risk of plagiarism, and jeopardising students' development of critical thinking skills. It thus becomes an ethical question to consider in the integration of these technologies into education, as an improper use of AI could be detrimental to education.

Privacy Concerns

In university systems, the overly personal data of students ought to be guarded with security concerning its collection,use, transmission, distribution, and storage. The increase in the use of AI technologies further threatens the matter byoffering added risks and complications of data privacy and ethical governance. In higher education, the utilisation of AI massively raises privacy interventions, as these technologies generally involve collecting and processing vast quantities of personal information (Kumar et al., 2024). Universities must protect the privacy rights of their students by effectively navigating the tortuous places of data protection legislation (Mutunhu et al., 2022). In doing so, strict data management policies must be put in place, and the sharing on how data would be collected and used should be made transparent to all stakeholders, hence enabling them to keep some control on their personal information (Akgun et al., 2022) as concerns on data breaches, unauthorised access to information, and the possible misuse of personal information have been brought into the limelight (Moyo et al., 2024). Ndlovu et al. (2025) elucidate the concerns regarding data privacy thereof in relation to AI chatbot application in education. Since these chatbots commonly handle a significant portion of student data, concerns arise about the management and security of such information, which could result in breaches of confidentiality or misuse.

Applications of AI in Higher Education

Artificial intelligence in higher learning automates some of the academic and administrative functions (Moyo et al., 2024; Ndlovu et al., 2025). AI systems adapt learning experiences, give students instant feedback, provide feedback on assignments, assess student work, predict and streamline administrative functions, establish intelligent tutoring systems, and predict and grade students (Xulu et al., 2024; Zawacki-Richter et al., 2019). In Ndlovu et al.'s (2025) words, AI helps to improve personalised instruction and engagement through instant assistance and handling of more time-consuming tasks, thereby providing academics with more time to actually assist students. The software provides for immersive learning, targeted feedback, and access to various learning styles. To ensure successful implementation of this technology, one shall need to go beyond a surface understanding and seek to comprehend the uniqueness of the socio-cultural academic setting and the needs and concerns of students, lecturers, and administrative staff. While promising for these applications, however, their deployment must consider ethical and privacy issues critically.

Existing AI systems in education

Higher education institutions are increasingly employing AI-driven tools and systems, such as learning management systems, adaptive learning platforms, and intelligent tutoring systems (de Almeida et al., 2021). Numerous studies offer frameworks for the ethical implementation of AI, rendering principles of fairness, accountability, transparency, and human-centric values (Tirado et al., 2024; Villegas-Ch & Garcia-Ortiz, 2023). These mitigate biases and allow for personalised teaching and student support services (Wynand & Patrick, 2024). However, we face challenges in implementing these principles while adapting to the changing face of technology (Ayling & Chapman, 2021). Such problems arise not only from possible AI displacement of teaching personnel and lack of transparency in the decision-making process (Zouhaier et al., 2023), but also from weak data security laws, possible worsening of socioeconomic disparities, and the necessity of upgrading AI literacy for lecturers and students (Yang & Beil, 2024). Ethical AI frameworks within learning analytics have been proposed to address these challenges (Tirado et al., 2024). Solutions exist, both conceptual and implementation-based, to address the problem of ethical AI (Kapuya et al., 2024). The multidimensional frameworks aim at confronting these challenges from educational, governance, and operational perspectives (Chan, 2023; Drach et al., 2023). Contextual AI ethics, incorporation of ethics training into the AI curricula, and strengthening of data privacy protection measures are all further called for by researchers (Adewale, 2024; Gartner & Krasna, 2023). Literature in the past has shown that strong governance frameworks alongside the continued engagement of all stakeholders are required for the continuous assessment and improvements of AI systems so that their implementations remain faithful to institutional values while adapting to the changing needs of the academic community (Chan, 2023; Kapuya et al., 2024; Nguyen et al., 2023). However, few specific frameworks exist to trace the implications of these technologies on ethics and privacy (Nguyen et al., 2023; Maguraushe et al., 2022).

Theoretical Underpinning

Having adopted the TOE theoretical framework, this paper sets out to comprehend the technology-organisational factors and external environment influencing AI adoption (Hoti, 2015). The theory offers a wide spectrum of aspects considered to affect the adoption and implementation of technical inventions in an organisation (Tornatzky et al., 1990). The study also considered the Socio-Cultural Learning Theory (SCLT) which holds that social and cultural factors affect the learning trajectories and development of people (Vygotsky, 1978). The framework accentuates the need to develop AI systems catering to the distinct socio-cultural contexts of the academic world and the varied needs and perspectives of students, lecturers, and administrators (Akgun et al., 2022).

Research Method

Findings from this study were influenced by the adopted research methodology in the recruitment, gathering of data from participants, method(s) of data analysis, and credibility of the findings. The case study was on three universities. Case studies are apt for providing qualitative data that allows for assessing, analysing, comprehensively understanding, and explaining contextual factors relating to a phenomenon within a specific context and place (Saunders et al., 2019).

Study Setting

Three universities, convenient for the researchers, were selected. One was situated in South Africa, and the other two were situated in Zimbabwe. The institutions were chosen based on their levels of AI implementation and technological agility. As an exploratory qualitative study that aimed to develop a responsive AI system framework for higher education, it was vital for the researchers to engage institutions that were geographically accessible and familiar; thus, this streamlined the recruitment process and allowed for quick data collection with thorough technical dialogues with students, administrators, lecturers, and IT professionals. With this, the research obtained vital qualitative data with minimal logistical hassle. Although this sampling technique cannot propose generalised findings, it opens the channels toward discussing rich contextual knowledge, which enhances the broad applicability of the findings to similar educational settings (Pruchno et al., 2008) and offers essential preliminary insights into the complicated relationship between ethics and privacy in AI applications in higher education institutions.

Participant Recruitment

Purposive sampling and snowball sampling were used to select heterogeneous respondents comprising university students, administrators, lecturers, and IT professionals for a well-balanced and comprehensive array of voices capable of shedding light on the ethical and privacy issues of AI in higher education (Dhipayasa, 2023). Purposive sampling allowed for the deliberate choosing of specific individuals believed to have pertinent knowledge and experience regarding AI adoption, ethics, and privacy in higher education. In tandem with this, snowball sampling enabled the identification of additional participants as recommendations were made by those initially interviewed who had relevant

expertise (Golzar & Noor, 2022). This method provided a way for engaging more individuals that might have been hard to reach using conventional recruitment techniques, thereby enhancing the richness of the data (Naderifar et al., 2017). The employment of this array of sampling techniques ensured a broad spectrum of perspectives, thus enriching the analysis and encouraging a more intricate understanding of the issues associated with the deployment of AI in educational institutions.

Recruitment was conducted through a combination of university mailing lists and direct personal contacts. Included in the research were 16 participants representing the stakeholder types interested in the application of AI in higher education: five university students (undergraduate and postgraduate), five lecturers, two administrators, and four IT professionals. Particulars of the study were given to participants, including the study objectives, their voluntary participation, informed consent procedures, and their right to withdraw at any time. Participants' anonymity was protected by assigning pseudonyms, and all data were stored securely under data protection laws.

The Semi-Structured Interview Guide

The interview outline was formulated based on the theoretical frameworks guiding the study: the TOE framework and Socio-Cultural Learning Theory. The TOE framework helped analyse technological, organisational, and environmental factors influencing the acceptability and implementation of AI. The Socio-Cultural Learning Theory helped analyse the social and cultural factors affecting user perceptions and experiences of AI. The guide was semi-structured to elicit an in-depth understanding of participants' views, concerns, and suggestions concerning AI use in higher education, with an emphasis on ethics and privacy. The interview guide contained some open-ended questions about AI in education; the benefits; implementation challenges; current applications of AI technology; privacy and data security concerns; ethical implications of AI; existing institutional policies and frameworks; training and awareness programs; equity in access to and utilisation of AI; and green and sustainable AI practices.

Data Collection

Participants provided qualitative insight from interviews held between October and December 2024. The research used semi-structured interviews, as these are more focused on gathering data and yet remain flexible to allow extensive exploration (Jowarder, 2023). This style of data-collection method permitted the use of a pre-established set of interview questions that ensured all candidates answered the key research questions uniformly. Simultaneously, it allowed further questioning for the exploration of on-the-spot themes, or if need be, adjustment to the answers of particular participants (Pin et al., 2023). This flexibility ensured that differentiated inputs from students, academics, administrators, and IT personnel on their diverse privacy and ethical issues in AI within higher education were procured, which was crucial to the development of a deeper data set imbibed with meaning. With permission, interviews were audio recorded and took approximately 30-45 minutes; to ensure validity and reliability of the data, the recordings were transcribed verbatim immediately after each session.

Data Analysis

The data was systematically organised and managed in Atlas.ti version 25.0, a computer program for qualitative data analysis, thereby facilitating the coding and theme derivation process. Thematic analysis is intended to identify patterns in qualitative data and, as such, allows for the induction of complete themes arising from the research findings (Braun & Clarke, 2012). This technique enables a researcher to unite various segments of data under one theme, usually attained through the coding process. Thematic Analysis offers a systematic yet creative means of bringing together a range of themes in qualitative research (Braun & Clarke, 2012). Using thematic analysis, researchers are able to recognise prominent themes and create visual outputs which demonstrate the connections between those themes. Thematic analysis can be guided by either data, existing theoretical knowledge, or a combination of the two, thereby allowing it to be well-suited in varied contexts of qualitative research.

Hence, this study was informed by Braun and Clarke's (2012) approach of conducting thematic analysis as follows: Familiarisation: the researchers engaged deeply with the data by thoroughly reading, followed by re-reading the transcripts to garner an in-depth and thorough understanding of the perspectives of the participants. Generating Initial Codes: 50 initial codes were generated from the data; they stressed essential characteristics relating to the study topics, whereby they were collated and some dropped, thus leaving a sample of 35 codes. Theme Development: the 35 codes were categorised into comprehensive themes. The themes that emerged were ten, focusing on benefits, challenges, current applications, responsible use, privacy, data security, ethical concerns, institutional policies and frameworks, training and awareness, equity and access, and green and sustainable AI practices. Theme Review: The themes were reviewed and refined to ensure that they fit both the data and the aims of the study. Report Writing: The findings were documented with illustrative quotations and are reported in the results section.

Trustworthiness

In enhancing the trustworthiness of the qualitative data, several strategies were undertaken, based on Lincoln & Guba's (1985) criteria of research rigour, namely credibility, generalizability, transferability, and confirmability. Credibility was attained through the establishment of rapport through prolonged engagement with research participants, member checking, and triangulation. Member checking consisted of the presentation of preliminary results to a selected group of participants so that feedback could be elicited regarding the extent to which their views were represented accurately. To identify convergent and divergent views, data from several groups of participants: students, lecturers, administrators, and IT professionals, were analysed in triangulation. Transferability was obtained through in-depth, thick descriptions of the experiences and contexts of participants, which became crucial in developing a more enhanced understanding of their perspectives. There was meticulous documentation of all research activities concerned with the interview guide, audio recordings, documents transcribed, participant interactions, and analytical decisions, which ascertained dependability. Such an audit trail can be followed by others. The notion of confirmability was established by using well-regarded frameworks such as the TOE framework and SLCT, which offered a theoretical foundation to understand how the findings may apply to other institutions or environments. To improve transparency throughout the research process, the researchers kept a reflective journal for the study, which documented their thoughts, biases, and decisions.

Results

This study aims to formulate a framework for the responsive and accountable implementation of AI systems in higher education. Ten themes emerged from the data analysis, while thirty-five subthemes were used to support the emerging themes.

Theme 1: Benefits of AI in educational institutions

This theme focuses on the ways AI improves educational experiences, such as personalised learning and accessibility through gamification and AR and VR experiences. The lecturers explained how it would enrich their learning experience for them to have a positive attitude toward school work. Lecturer 1: *"AI promotes student engagement through gamification, VR, and AR, and it plays a pivotal role in preparing students for the future job market".* The findings also showed that AI automates administrative tasks so that academics and other staff may concentrate on strategic issues, thereby optimising operational efficiency and utilising data analytics for decision-making, thus further enhancing research capabilities and the recruitment of elite students. Administrators 1, 2, and 4 further emphasised the importance of AI development for institutional innovation and competitiveness by stressing the importance of AI in advancing research, accessibility, and preparing students for future employment opportunities. In addition, having time-series analyses makes it more feasible for universities to forecast enrollment and revenue patterns and thus engage in informed, proactive planning for revenue forecasting. Moreover, the ability to perform time-series analysis helps colleges to more precisely understand enrollment trends and income trends, thereby improving proactive revenue forecasting. Furthermore, the use of AI in libraries for data mining of student theses shows its usefulness in improving scholarly resources. This was expressed as follows: Administrator 1: *"AI can offer universities insightful analysis from data, so guiding their decisions". It can help with research and attract outstanding academics and students. AI can even improve accessibility. Furthermore, with AI we can be able to understand each student (KnowYourCustomer), thus universities can prepare students for the future job market."*

These findings assert that a strong AI framework is crucial for improving student engagement and equipping institutions to address future labour market challenges.

Theme 2: Current applications of AI in education

This theme explores the practical implementation of AI technologies in educational contexts, including AI-enabled chatbots, personalised learning platforms, document peer review and virtual tutors. The findings demonstrate a diverse application of AI in education, encompassing both academic and administrative functions. Lecturers emphasise the application of AI in digital libraries and resource access and the integration of VR and AR for immersive learning and its efficacy in optimising peer review processes, identifying reviewers, selecting journals, and evaluating academic work, while warning of its propensity for "hallucinations" and its limits in acknowledging innovative student concepts. The findings highlight AI's function in automating administrative duties and customising learning experiences, as well as its use in credit risk modelling to improve financial decision-making. The reference to particular tools, such as Whisper and Knime, LexaAI highlights the actual application of AI for optimising processes and enhancing results.

Lecturer 2: *"AI has found its way into various aspects of education, making it more accessible and engaging, specifically in peer review processes. However, AI fails to recognise the novelty of student ideas."*

Administrator 2: *"AI will help our university since it will automate administrative chores, personalise the learning experiences of students and help in credit risk modelling, thus improving education. By using AI applications such as Whisper and Knime, some procedures can be simplified and results enhanced."*

These points of view collectively show AI as a powerful tool for increasing accessibility and efficiency in education; yet, it requires careful assessment of its limitations and possible negative effects to properly exploit its promise.

Theme 3: Challenges of AI in education

What is relevant in the development of an ethically sensitive AI system in education is negotiating the negative aspects of including AI into the learning environment. Dependency on technology is very likely; thus, critical thinking becomes a secondary concern in the classroom. Furthermore, there is a possibility for AI tools to be misused, upsetting the justification for their acceptance. Adoption of AI tools in the education sector raises questions regarding academic integrity, a vital issue that has to be given top attention. Notwithstanding the difficulties, AI has limits, including a lack of creativity in AI-generated content. Teachers note that students often use ChatGPT without applying critical thinking, possibly hindering their intellectual development and understanding of topics. This dependence syndrome not only undermines their analytical abilities but also increases the likelihood of accepting erroneous information produced by AI. This is exacerbated by the dependency on training data and potential bias, which underscores the need for cautious and informed AI usage. Lecturer 3 indicated: *"Students have been abusing ChatGPT and the like. You find that they have been using those tools to an extent where sometimes they don't think, they just go there and ask simple things that you should be thinking. There is a need to stop students from over-relying on AI tools, as most of these AI tools, especially LLMs, can suggest the wrong things. Furthermore, research needs plenty of intuition and deep knowledge to evaluate any research idea."*

It was also emphasised by the participants that lecturers will never be replaceable within the learning process as there is always a need for human interaction and guidance. Student 2: *"It can never replace the role of a physical lecturer, who understands the ethical and socio-cultural dynamics of students".*

These revelations highlight the necessity for a balanced strategy in AI integration within education, which alleviates the dangers of over-reliance and disinformation while preserving human oversight and addressing ethical issues and maximising its advantages in the learning process.

Theme 4: Responsible use of AI in education

Establishment of some explicit regulations on AI use, guarantee of fairness, and human supervision to disallow abuses are, without a doubt, primary concerns. For greater emphasis on accountability and the necessity of constant monitoring and evaluation, responsible use of Artificial Intelligence should also be practiced in education. Putting responsibility in the foreground means making it clear that students should be held accountable for the outputs generated by AI tools and, therefore, may not shift blame to the technology. This accountability will ensure that students become expert users rather than passive recipients of technology, thus enriching their experience in education and equipping them with skills that will enable them to navigate the complexities of AI in their academic and professional engagements. Lecturer 1: *"Students need to be held accountable when using AI so that they use it responsibly. They should realize that they cannot hold AI responsible for any wrong answers or citations it generates. When things go wrong, you would be amazed at how often people like to blame software, as if it hadn't been programmed by human beings as well."* The equity-use dimension here entails the establishment of an environment that engages students critically in understanding the AI tool's limitations and using it to complement their thought processes rather than replace them.

Theme 5: Privacy and data security

The processing of data must be accompanied by due diligence throughout its collection, storage, and dissemination when AI systems come into play in the educational context. The fundamental principles are privacy, data security and transparency. These principles seek to nurture trust between institutions and their students. The importance of privacy and data security speaks to a demand for fair access to AI tools and informed consent, ensuring that data processing is both inclusive and ethical. Student Representative: *"I want autonomy on the use of my data. I am concerned that my personal data may be used for some form of AI profiling. There needs to be transparency on how our data is stored and secured. There are instances where I ask something from AI that has nothing concerning the university. If there is a breach, I have a right to know about it. There have been several cases where data breaches at universities literally put someone's career to a halt. We do not even know who is watching our online activities and where they are storing them. In case of a data breach or misuse, I have to know what protections there are for me as a student-whoever is watching my privacy is very important".*

Lack of transparency in data storage, security, and even algorithmic decision-making is a recurring problem, and hence, there is a persistent call from the administrators for responsible and transparent AI systems. This shared understanding

alludes to the confidence in AI in educational settings is the guarantee of strong privacy safeguards that are tied to informed consent and explicit procedures that themselves are transparent. Administrator 4 stated: *"We need to have AI systems that are transparent and accountable. It is necessary to understand the process by which AI algorithms arrive at their judgments so that we also know how to protect the students and how we can fully trust them when integrating them with our pre-existing systems."*

Such findings confirm that giving priority to privacy and security-related issues is an absolute must for the ethical deployment of AI in educational contexts; only then can students feel safe and respected within their learning spaces.

Theme 6: Ethical considerations

Ethical considerations lie at the very centre of the responsible implementation of AI in education. This includes matters such as issues of ownership and copyright, academic integrity and dishonesty, institutional culture and values, and bias mitigation. The theme stressed that the standardisation of AI use was essential if regulations and human rights were to be guaranteed. Originality could be masked by AI, and there has to be a system of clear ethical principles and preventive policies against plagiarism to preserve academic integrity. The findings showed that algorithmic bias would, through AI systems, reinforce existing biases to the detriment of students from marginalised groups, either through poor-quality data or the unpredictable, unexplained, and inconsistent outcomes of some AI interventions. Student Representative 2: *"I am seriously concerned that these AI-powered tools could unfairly discriminate against students from underrepresented groups or countries, like Zimbabwe."* This raises very important questions about inclusivity and equity when it comes to AI. The lecturers supported that view, stating that AI systems have to be human-centred, meaning that they should uphold human rights and are intended to assist rather than substitute student skills.

Lecturer 3 expressed concerns that AI might blur the lines between originality and plagiarism, necessitating rigid regulations and frameworks in the protection of academic integrity. Lecturer 3: *"Students may cheat as a result of AI's ability to conflate creativity and originality. Instead of using AI to provide them with an idea or abstract understanding, students usually copy and paste, then either verify the information or write it in their own words."*

The administrators further supported those comments, agreeing that explicit rationale and clear ethical underpinnings would engender confidence and buy-in within the university community, thus highlighting the need to harmonise AI systems with institutional values and socio-cultural contexts. Administrator 5: *"AI and institutional values must be consistent." To foster confidence and support from the university community, AI systems must be implemented with a clear purpose that is guided by the institution's unique sociocultural characteristics and guiding principles. They will fail if they are unaware of the legal framework of the institutions in which they are placed."*

These results highlight the complex ethical issues surrounding AI in education and emphasise the need for careful assessment of its effects on integrity, equity, and institutional coherence.

Theme 7: Equity and access to AI

Equity and access imply disparities in AI availability and use by various socioeconomic strata in society. The findings reinforce the importance of equitable access to AI resources and suggest ways in which AI can be deployed to increase accessibility. Lecturers stressed the point of ethics in applying AI: the inequitable access to devices such as laptops and smartphones yields disparities among students. These existing inequalities are further compounded if students with such privileges avail themselves of 'benefits' more than those who are less privileged, for example, features and premium tools from ScieSpace and Ellicit. The findings also posit the need for policy and framework establishment to guide organised innovation in ensuring that, regardless of students' background, all students are able to enjoy the fruits of AI technology.

Lecturer 5: *"Ensuring that every student has equal access to AI resources is essential to the responsible use of AI in education. Some students have smartphones and laptops, while others do not. Because they can afford the associated costs, some people can utilise advanced features, while others cannot. For instance, neither students nor even lecturers can afford the premium version of ScieSpace. However, some students from wealthy households have easy access to the version."*

The findings highlight the necessity to proactively confront the digital divide by investing in technology and resources that guarantee equitable access to resources and benefits from AI for all students instead of intensifying current disparities. This dedication to equity is crucial for cultivating an inclusive learning atmosphere and for optimising the potential of AI as a transformational educational instrument.

Theme 8: Institutional Policies and Frameworks

Institutional policies and frameworks are prerequisites for good and ethical AI use in education. The findings mapped an AI use policy, an ethical AI framework, and structured guidelines as the fundamental pillars for regulating AI

integration. Exploring the plights of institutions exposed a lack of exposure and knowledge, given that most participants conveyed that their universities do not expose them to AI technologies. Furthermore, a consensus was reached by the participants on the dire need for institutional policies on fundamental topics such as ethical standards, data governance, bias minimisation, and accountability, thus bringing to light ongoing efforts to formalise and regulate AI adoption within educational institutions.

Administrator 4: *"The absence of explicit standards and regulations for the development and utilisation of AI is a substantial obstacle. A comprehensive AI use policy should address several key areas. It should outline ethical principles, data management practices, bias mitigation strategies, transparency, explainability requirements, accountability measures, risk assessment procedures, training, and a review and update processes".*

Some challenges encountered in implementing AI are resistance to change and ignorance of AI amongst the workforce. There thus emerged an appeal from administrators for continued AI policy formulation despite resistance from "old-guard" mindsets that believe AI will conflict with most university traditional operations and policies, including the determination of degree classes. Such a resistance stems from a wider apprehension of how AI can fit with the existing legacy systems and the need for institutions to reconcile the new with the old academic framework. Administrator 2: *"We are in the process of crafting an AI policy. I also hear from the national level there is a call to come up with such a policy. However, there is resistance to change from "old horses" who think the use of AI will conflict with most university traditional operations and policies".*

The university administrator suggested that it was necessary to have comprehensive training modules that would equip university stakeholders with the necessary skills in AI, understanding of AI tools, and awareness of policies related to AI. This identification of a lack of knowledge and exposure to AI tools and the policies about them points to a gap in professional development and training amongst university staff. Such a lack of understanding may well impede the informed implementation of AI projects. The lack of knowledge creates a systemic problem wherein policy-making goes on despite the fact that persons consulted in the process are simply lacking in expertise. A university administrator remarked: *"There is a deficiency of knowledge and exposure regarding AI tools and the associated policies. Even if you research to inform the development of an AI tool, you will not obtain the requisite data because the people you consult do not know".*

The results further established the importance of clearly defined governance frameworks and standards to direct the ethical and responsible use of AI. Such results expose the need for proactive policy development coupled with comprehensive training and education in order to meet the logistical, technological, and ethical challenges posed by AI Applications. This will ensure that the AI procedures conform to relevant data protection laws and institutional values.

Theme 9: Training and Awareness

Training and awareness are essential so that students, lecturers, and other stakeholders are sufficiently informed about AI tools and their possible implications. The findings show that there is a need for an area-wide approach that includes public lectures, workshops, and seminars and incorporation into the curriculum to increase awareness and develop proficiency in working with AI. Put differently, everlasting learning, peer learning and continuous feedback approaches must be emphasised. A student representative stated, *"The university can cultivate a conscientious culture concerning AI through workshops and seminars, curriculum integration, and peer learning."*

Lecturers stressed the importance of introducing ethical issues into students' academic work from an early stage. It is important to teach students about the ethical considerations of AI in developing their critical thinking skills and taking into account the societal implications of technology at large. Educator 3*: "The goal is to introduce students to the ethical implications of AI at a young age."* Incorporating technology into the curriculum requires a large investment of time and resources. It is therefore more important to ensure that teachers are correctly trained and the technology is smoothly integrated into the teaching and learning process.

According to the findings, comprehensive training and awareness-raising campaigns should instead be organised for students and educators to prepare them to deal with the challenges and opportunities presented by AI; however, it takes a significant investment in both time and resources to achieve that integration of technology into the curriculum and also to train educators able to properly instruct students in this field. A continuous epistemic and ethical reflection atmosphere will definitely assist institutions in better preparing their community to interact with AI ethically and responsibly.

Theme 10: Green and sustainable AI practices

Participants encouraged the need for energy-efficient AI models that use less energy to perform the same or better. In addition, deployment with low resources is necessary to guarantee that there will be minimal computation when

resources are limited. The participant further discussed giving priority to balancing cloud and edge processing. The IT Technicians 2*: "We must create and train AI models that are energy-efficient and scalable to places with limited infrastructure. Priority must be given to maintaining a balance between cloud and edge processing. Ultimately, we must ensure that we do not jeopardise these models' accuracy and performance."*

It is also important to acknowledge issues surrounding carbon footprinting. Encouraging ecological computing practices and applying carbon consciousness within their AI development pipelines would then be a crucial step to lead technological development onto the path of environmental conservation. This is consistent with the increasing awareness of the environmental implications of AI technology life cycles, including data storage, model training, data centre cooling, and hardware production. IT Experts 2: *"I think that the world is finally realising that artificial intelligence is more than just code, it is also carbon ambience. We need to be more intentional about their design and training if we can see the environmental cost."* This emphasises the need for environmentally friendly AI solutions. To attain this, we need increased awareness of carbon footprints and technological advancement in energy-efficient solutions.

Discussion

AI in education promotes ten themes that include benefits, challenges, applications, responsible use, privacy and data security, ethical considerations, institutional policies and frameworks, training, equity, and sustainable AI use. These findings highlight that AI integration into higher education is complicated. The themes identified coincide with the theory underlying the TOE framework, which stresses the relative importance of technological, organisational, and environmental factors for the adoption of a new technology. From the highlighted importance of privacy and data-security concerns, the study infers a solemn need for scrutiny into the ethical and organisational issues surrounding AI adoption. The focus on privacy and data security, coupled with ethical considerations and institutional norms, resonates with previous research (Cumming et al., 2024; Nguyen et al., 2023; Maguraushe et al., 2024) emphasising the need for frameworks to protect student privacy. Some AI systems are rather opaque and mysterious, adding to the predicament of reduced transparency in many AI models. This ethical stance queries accountability and consent amongst others, especially when the rules that govern AI are still unclear (Ifenthaler et al., 2024).

Several participants felt that inequity and access to AI technology are major impediments to the adoption of AI technology, in that some students may be denied access to essential technology resources, which reduces their ability to efficiently utilise AI-enhanced solutions. This observation concurs with those of Dube et al. (2023) and Maguraushe et al. (2022), who point out that inequity in access to resources impedes technology adoption. Moreover, this study highlights bias and equity issues as areas where AI could perpetuate existing stereotypes and social injustices, thus hindering the responsible and fair use of the technology, similar to what Tella et al. (2024) have found. In this study, we go a step further in contributing to the discourse on the role and place of AI in educational contexts by underscoring the importance of social interaction and cultural context in learning. The additionally pinpointed issues, such as the requirement of human interaction and the inability of AI to adequately program subtle human actions, show that a balance must be negotiated among AI applications and the preservation of humanistic aspects of educational systems (Dube et al., 2024).

Similar to our findings, Massaty et al. (2024) reveal that students mostly have positive views about the integration of technology into their educational activities. From the perspective of at least one student, technology in educational settings fosters engagement and interactivity along the entire learning spectrum. Furthermore, research shows that AR and VR experiences, integrating AI tools, are especially beneficial as a possible solution to under-resourced institutions while also reducing the digital divide (Ndlovu et al., 2023; Revesai et al., 2024). AI's potential advantages are recognised widely. Yet, ethical, privacy and organisational challenges persist (Nguyen et al., 2023). The importance of strong governance frameworks becomes apparent. Data management regulations prove essential. Stakeholder engagement can't be overlooked. The alignment of AI with institutional values highlights one essential need. A thorough and proactive strategy guarantees proper technology use, as Jobin et al. (2019) argued, is a necessity.

Zawacki-Richter et al. (2019) further validate this study's results. They underscore the necessity for creating AI-driven tools and systems. These must be designed for academia's distinctive socio-cultural context. Although these authors see the opportunity for AI, many ethical, privacy, and administrative concerns continue to persist (Nguyen et al., 2023). According to Jobin et al. (2019), a unified and active approach is required to ensure that these technologies are employed appropriately, with the design of robust governance structures, data management rules, stakeholder engagement, and aligning AI to institutional values fitting under this umbrella. The study by Zawacki-Richter et al. (2019) expounds on the results of this research by emphasising the need for AI development and deployment to pay particular attention to the unique socio-cultural context of academic institutions. The emergence of algorithmic bias as the greatest concern only intensifies the need for serious consideration of how AI systems must be developed and

evaluated. Our findings place the burden upon the necessity of carrying out his development and implementation with fairness and equity as a central concern. Further, being transparent and accountable means that there must be an explicit disclosure of the decision processes that substantiate and underpin the functioning of these AI systems.

On the other hand, what empirical studies have shown is that to achieve technology integration into educational practices successfully, one needs a holistic approach that embraces technological infrastructure, pedagogical approaches, teacher training, and the general educational environment (Celik, 2023; Masimba & Maguraushe, 2022; Dube et al., 2023; Mutunhu et al.,2022). The institutional recommendation system will constitute an improvement of the AI framework to ensure the best matching of students with academic programmes and thus take full advantage of the *KnowYourCustomer* capacity offered by AI (Ndlovu et al., 2023). The lecturers' views are crucial for evaluating the effect of technology on the teaching/learning environment. Ali et al.(2023) research indicates something telling about lecturer preparedness. Lecturers provided with sufficient training and resources exhibit a higher likelihood of success. They integrate technology into teaching methods more effectively. The findings reveal that appropriate tools and materials enable educators considerably. They utilise technology to enhance curricula. They offer more customised learning experiences for pupils. This study illuminated sustainable environmental practices in AI use within academic settings. This suggests the need to conscientise stakeholders within higher education institutions. Carbon footprinting implications require attention. Low-energy consumption AI models become essential. These findings align with Tabbakh et al. (2024) advocacy. They emphasised balancing performance and resource efficiency in AI technologies. Complementarily, Bolón-Canedo et al. (2024) suggested eco-friendly AI solution practices. Green AI models that accurately measure and optimise energy consumption represent futuristic sustainable solutions.

Implications

Practical Implications

In practice, there is a need to include setting up clear governance structures and regulations to supervise the ethical and responsible implementation of AI within the institutions of higher learning by way of setting down explicit ethical principles and standards for the use of AI. Further, rigorous data management standards must be implemented and measures taken to encourage transparency against privacy concerns to safeguard the student, teacher, and administrative personnel data. Providing further training and support for the university stakeholders will continue to increase their competence in using AI-driven tools and systems while addressing current ethical challenges. Moreover, engaging students as active contributors during the design and implementation of AI systems will also ensure their acceptance of AI demands and concerns.

Alignment with academic institutions along the values and socio-cultural dynamics of each institution will foster trust and support from the university community; this calls for continuous assessment of the performance and impact of AI systems, with a constant reiteration to fulfil changing demands and newly emerging ethical or private concerns.

Theoretical Implications

The study enhances the theoretical comprehension of the factors for the cautious application of AI within higher education institutions. The study merges the TOE framework with the SLT to provide a more robust theoretical lens for the analytical treatment of the interrelation of technological, organisational, environmental factors, and the sociocultural forces at work that govern the adoption of AI systems within educational settings. By concentrating on the importance of human values and agency in AI development, this study contributes to the broader discourse around AI that addresses human welfare. Furthermore, the study also advances the importance of participatory approaches to AI governance by incorporating perspectives of divergent stakeholders within a university setting to present a responsive and ethical AI framework.

Proposed Responsive and Ethical AI Framework

The proposed Responsive and Ethical AI Framework represents a comprehensive approach to AI integration within educational institutions, with a strong emphasis on ethical issues and responsible application. The framework is shown in Figure 1.

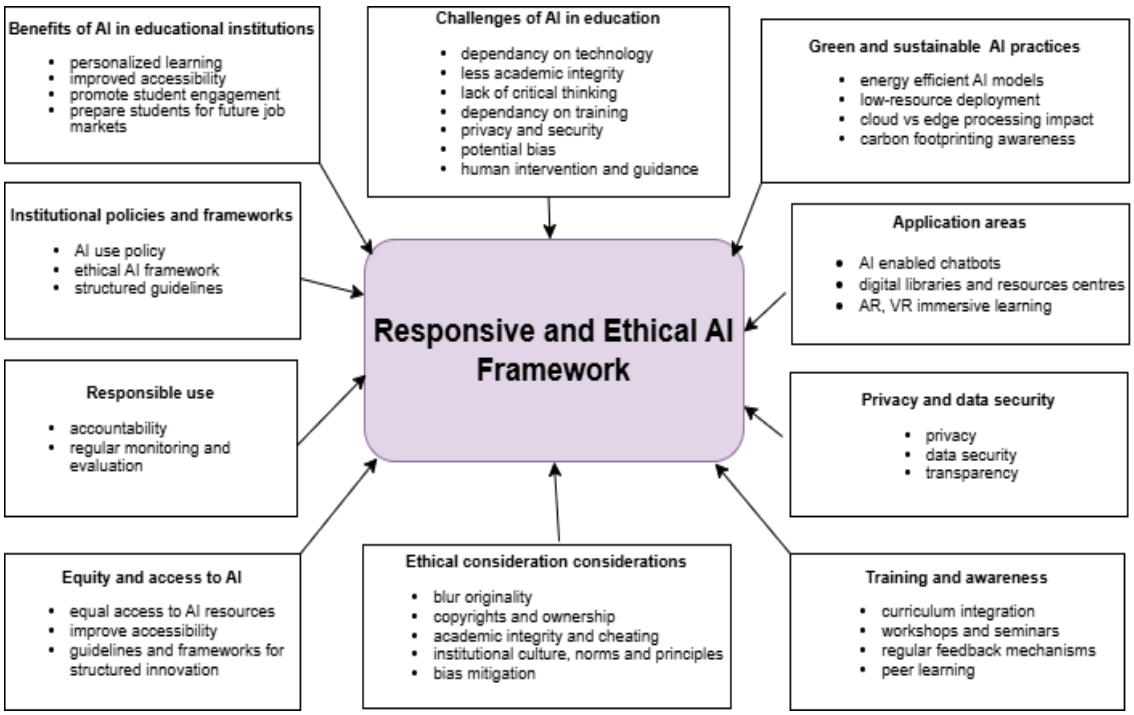

Figure 1. A Framework for Ethical and Responsible AI in Higher Education

The framework addresses urgent problems in the field of education presented by AI, including dependency on technology and privacy issues, through a system of formalised regulations and policies that promote individual accountability and systemic evaluation. Other contributions to the literature relate to ensuring equity in access to AI-provided benefits for learners in developing personalised learning experiences. In so doing, this framework inculcates an ecosystem of continuous professional development, imparted through training, as well as awareness creation initiatives; in essence, it supports lecturers in managing ethical issues pertaining to AI. Also, the framework acts as a strategic innovation injection in institutional policymaking, wherein it fosters innovation and whilst de-risking against bias and academic integrity-related interferences. Therefore, the framework adds to the ongoing debates in the educational arena, marking out the importance of ethical considerations keeping pace with the rapid and green evolution of AI in institutions of higher learning.

Conclusion, Recommendation and Future Work

This study has presented a holistic framework for the ethical and responsible use of AI in higher education institutions. The results of this study hold key insights for university administrators, policymakers, and AI developers seeking to use the technology properly while accounting for the needs and concerns of the academic community.

In setting up comprehensive AI ethics frameworks, higher education institutions can dedicate appropriate resources for data privacy and security, carry out propaganda for AI awareness among the members of the local communities, and push for interdisciplinary collaboration in AI governance and enforcement. Through vigorous management of data, these instructive institutions can then provide broad-based training and support to their staff, thus creating a learning environment where students are engaged in perpetually assessing and improving AI systems to align with the existing institutional values and practices for green environmental sustainability.

This study should be complemented by a practical application of this framework in educational settings, along with accounts of the challenges and successes of such implementations in different institutional settings. Furthermore, longitudinal investigations should also consider the lasting implications that the implementation of AI systems may

have on the teaching, learning, and research of higher education institutions in their attempt to shed light on emerging ethics and implications of privacy associated with these technologies.

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