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ARTIFICIAL INTELLIGENCE IN TANZANIA'S HIGHER EDUCATIONAL INSTITUTIONS: A PHILOSOPHICAL REFLECTION ON ETHICS AND HUMAN INTELLIGENCE: ST. AUGUSTINE UNIVERSITY OF TANZANIA AND THE MWALIMU NYERERE MEMORIAL ACADEMY AS CASE STUDIES

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Abstract
This Paper delves into the ethical implications of integrating artificial intelligence [AI] technologies in Tanzanian higher education institutions, focusing on St. Augustine University of Tanzania [SAUT] and The Mwalimu Nyerere Memorial Academy [MNMA]. This study examines the influence of sex, age, and education on AI integration; the impact of AI on learning processes and assessment outcomes, the significance of AI in preparing graduates for the workforce, and the effectiveness of AI in personalizing learning experiences for students. Through descriptive and cross-sectional designs, data were obtained from academic staff and students from SAUT and MNMA, with findings highlighting gender disparity, diverse age distribution, and positive perceptions toward AI in education. Interviewed Participants highlighted the benefits of AI while expressing concerns about potential challenges such as teacher substitution, student behavior, creativity limitations, and data privacy issues. This Paper underscores the importance of engaging with diverse perspectives in addressing ethical considerations for the responsible integration of AI in Tanzanian universities.

1. INTRODUCTION

Artificial Intelligence [AI] has become a prominent force in shaping contemporary societies, with implications across various sectors, including education. In the context of developing countries such as Tanzania, the integration of AI in higher education institutions presents a unique set of opportunities and challenges. As AI

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technologies continue to evolve, there is a growing global discourse on the ethical considerations and philosophical reflections surrounding the use of AI in shaping human intelligence and learning experiences.

Global educational systems are increasingly embracing AI technologies in enhancing teaching and learning processes. According to Wellmon and Piper [2018], the integration of AI in education holds the potential to personalize learning experiences, improve student engagement, and prepare learners for the demands of the digital age. In Tanzania, a country facing economic and educational challenges, the incorporation of AI in higher education institutions such as St. Augustine University of Tanzania [SAUT] in Mwanza and The Mwalimu Nyerere Memorial Academy [MNMA] in Arusha can significantly affect the quality and accessibility of education.

With a focus on the ethical implications of AI integration, this Paper explores the intersections of technology, ethics, and human intelligence in Tanzanian higher education. As highlighted by Floridi [2019], ethical considerations are paramount in the development and deployment of AI systems, particularly in educational settings where issues of privacy, accountability, and transparency are paramount. By examining the perceptions of academic staff and students at SAUT and MNMA, the research seeks to shed light on the ethical dilemmas and philosophical reflections inherent in AI implementation, with a view toward promoting responsible AI use and human-centered education.

The study of intelligence has a rich history that dates back to ancient times, with foundations in ancient Greek philosophy [Gencten, 2018]. Although ancient philosophers did not use the term ‘intelligence’specifically, they referred to similar concepts using terms such as ‘mind, intellect, reason, or consciousnes’ [Gencten, 2018]. The views of philosophers like Plato and Avicenna on intelligence reflect notions that resonate with modern Psychology, highlighting the fundamental role of the mind in processing various cognitive functions [Srivastava, 2019; Gutas, 2012].

Aristotle emphasized the significance of perception in guiding both theoretical and practical aspects of cognition, suggesting that perception involves rational modes of thought that enable individuals to make informed decisions based on their understanding of the situation [Wingate, 2022]. Thorndike and Garret further classified intelligence into concrete, abstract, and social intelligence, highlighting the diverse aspects that contribute to human cognitive abilities [Thorndike, 1920].

The work of Alfred Binet in developing intelligence tests, known as the Binet-Simon Scale, has significantly influenced the field of Psychology by defining intelligence as a combination of mental abilities such as reasoning, judgment, memory, and abstraction [Binet, 1965]. Additionally, AI, a dynamic field of computer science, has emerged as a powerful tool capable of mimicking human intelligence in tasks such as problem-solving and decision-making [Russell & Norvig, 2020].

Machine learning, a subset of AI, uses algorithms in enabling machines learn from data and improve performance over time, with deep learning harnessing neural networks to simulate human brain functions [Goodfellow et al., 2016]. Despite AI's potential benefits in automating tasks and enhancing efficiency across various industries, ethical considerations are essential in guiding its development and implementation [Bostrom, 2014].

In the educational sector, AI presents opportunities to individualize learning experiences and improve access to education in Tanzania [UNESCO, 2023]. Through AI-powered systems, students can receive personalized feedback and access advanced educational resources, enhancing their engagement, motivation, and academic performance (Schiller University, 2023). Education initiatives in Tanzania bridge the digital divide and equip students with essential digital literacy skills to thrive in an AI-driven world [Lyimo, 2023].

Government initiatives in Tanzania are continuously addressing the ethical implications of emerging technologies, including the integration of AI in education; to ensure responsible and transparent use of these tools [Mirondo, 2024]. AI-guided feedback mechanisms and virtual assistants are transforming the way students access educational resources and receive support in their learning journey [Sclater, 2018].

As AI continues to shape in Tanzania's landscape it is crucial to establish policies and guidelines that manage research practices, prevent bias and discrimination, and promote digital literacy and critical thinking skills amongst students [Khlaif et al., 2023; Vega & Bojourquez, 2023]. Inclusion and diversity in AI education are essential in combating digital bias and providing equal opportunities for students from all backgrounds [Bojorquez & Vega, 2023].

This Paper's main objective is to explore the ethical implications of integrating artificial intelligence (AI) technologies in higher education institutions in Tanzania, with a specific focus on St. Augustine University of Tanzania [SAUT] and The Mwalimu Nyerere Memorial Academy [MNMA]. Specifically, the Paper addressed the following objectives;

i]. To examine the influence of sex, age, and education on AI integration in higher educationAL institutions

ii]. To analyze the integration of AI in Tanzania's education sector.

iii]. To assess the extent to which AI has influenced the learning process and assessment outcomes in academic studies.

iv]. To investigate the importance of embracing AI technology in equiping graduates for the future workforce.

v]. To evaluate the effectiveness of AI in personalizing learning experiences for students in Tanzania,

2. METHODOLOGY

This section of the Paper highlights the research design, target population, sample size, sampling technique, research instrument, and method of analysis employed by the researchers in a bid to drive their ideas across to the readership.

2.1. Research Design

The Paper employed a combination of descriptive and cross-sectional designs, utilizing both quantitative and qualitative techniques in evaluating AI in Tanzanian higher education, focusing on ethics and human intelligence at SAUT and MNMA. The descriptive design is utilized to systematically describe the socio-economic factors influencing employee performance. A correlational approach was adopted to examine the relationship between the factors and employee performance. The choice of a cross-sectional research design was based on the collection of data from a specific sample of local government employees at a particular point in time, as outlined by Amin [2005].

2.2. Target Population

A Population is defined as a complete set of individuals, cases, or objects with common observable characteristics [Cooper & Schindler, 2013]. On the other hand, the specific population is the collection of subjects from whom the sample is drawn [Kothari, 2014]. The principal specific population encompasses the academic staff and students of SAUT and MNMA.

2.3. Sample Size and Sampling Technique

According to Kothari [2009], sample size refers to the number of items selected from a sample for research purposes, or the number of observations or individuals chosen for a study or experiment [Babbie, 2016]. Similarly, a sampling technique is the method used to select a subset of a population for research purposes [Saunders, Lewis, & Thornhill, 2019]. The sample size for this study was determined using: n = [Z^2 * p * [1-p]] / E^2 formula which is deemed appropriate for this survey because a definite target population number was unknown. To

calculate the sample size of academic staff and students at SAUT and MNMA, the values for the formula were determined as follows:

- Z = 1.96 [for a 95% confidence level]
- p = 0.5 [assuming maximum variability as the proportion is unknown]
- E = 0.05 [desired margin of error]

n = [1.96^2 * 0.5 * [1-0.5]] / 0.05^2
n = [3.8416 * 0.25] / 0.0025
n = 0.9604/0.0025
n = 384.16

According to the above formula, the sample size for the academic staff and students of SAUT and MNMA was 385 participants who were selected using the convenience sampling technique.

2.4. Research Instruments

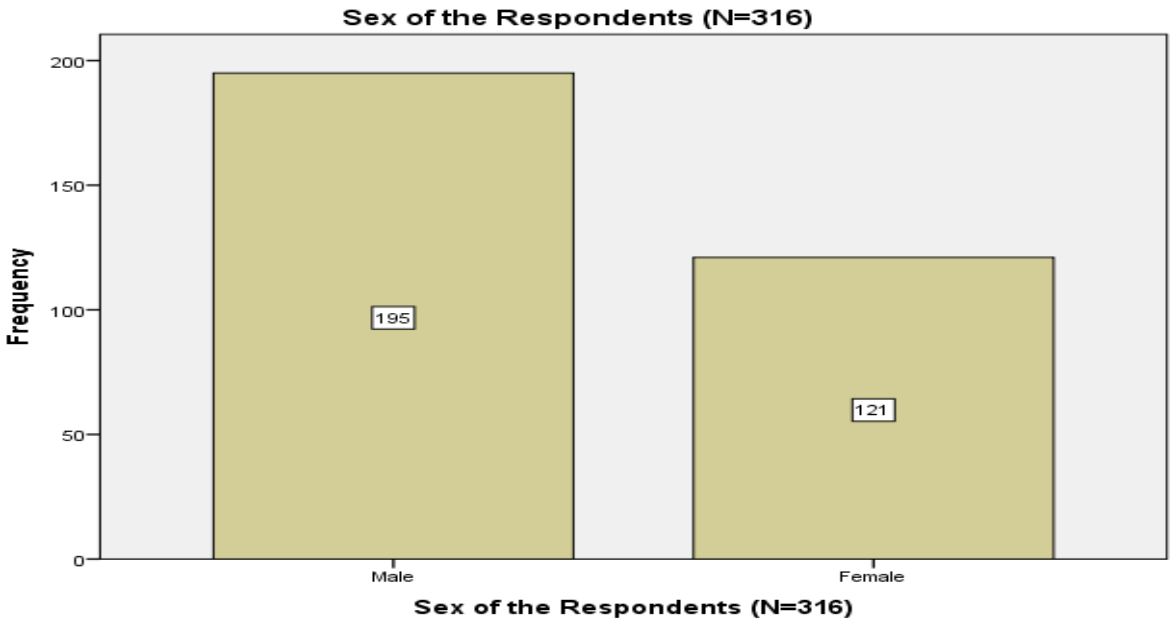
To ensure accuracy in the gathered information, a combination of open- and closed-ended questions was incorporated into the questionnaires used in the study. Questionnaires serve as a data collection tool by presenting a structured set of questions for individuals to respond to in written form or via researcher-administered processes [Gupta & Gupta, 2022]. In addition to questionnaires, an interview guide was utilized by the researchers to gather vital information for the study's conclusions. As highlighted by Kothari [2019], interviews offer a platform for researchers to delve deeper into individuals' perspectives through dialogs.

2.5. Method of Analysis

In analyzing the ethical implications of integrating artificial intelligence [AI] technologies in higher educational institutions, descriptive analysis was used. Additionally, narrative analysis was employed in interpreting findings from interviews to cross-validate the results obtained from the Likert scale data collected through questionnaires and gains a deeper understanding of the quantitative data.

3. GENERAL RESULTS AND DISCUSSIONS ON THE ETHICS AND INTELLIGENCE IN TANZANIA'S HIGHER EDUCATIONAL INSTITUTIONS

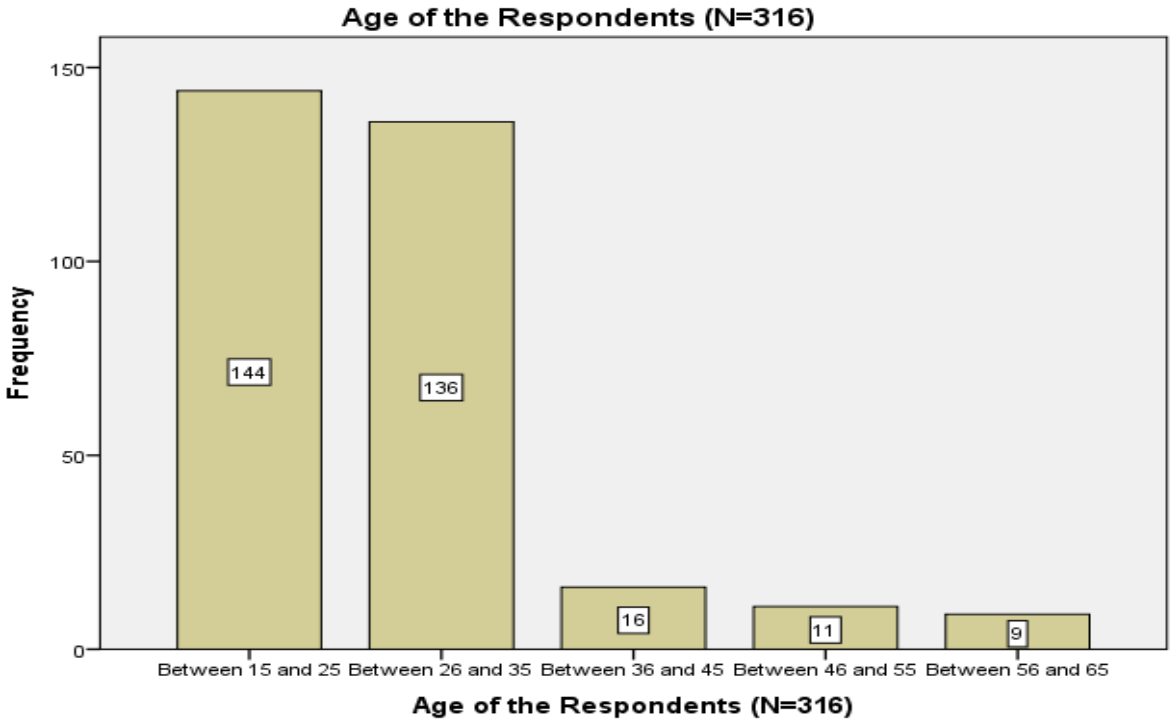
3.1. Influence of Sex, Age, and Education on AI Integration in Higher Education Institutions



AI in higher learning educational institutions provides numerous opportunities and challenges, particularly in the context of ethics and human intelligence. The data on the sex of respondents in Tanzania's universities reveals a gender disparity, with most male respondents compared to female respondents. This gender distribution has implications for how AI is implemented and utilized in higher educational settings.

Gender diversity is crucial in the development and implementation of AI technologies. Research has shown that gender diversity in AI development teams can lead to more inclusive and ethical AI systems [Bosley et al., 2019]. With a larger number of male respondents in Tanzania's universities, there is a risk that the perspectives and needs of female students and faculty may not be adequately considered in the integration of AI in higher education. Additionally, gender bias in AI algorithms is a significant concern. Studies have shown that AI systems perpetuate and amplify gender biases present in the data used to train them [Buolamwini & Gebru, 2018]. With a higher representation of male respondents, there is a potential for gender biases to be inadvertently embedded in AI systems used in Tanzania's universities, leading to discriminatory outcomes for female stakeholders.

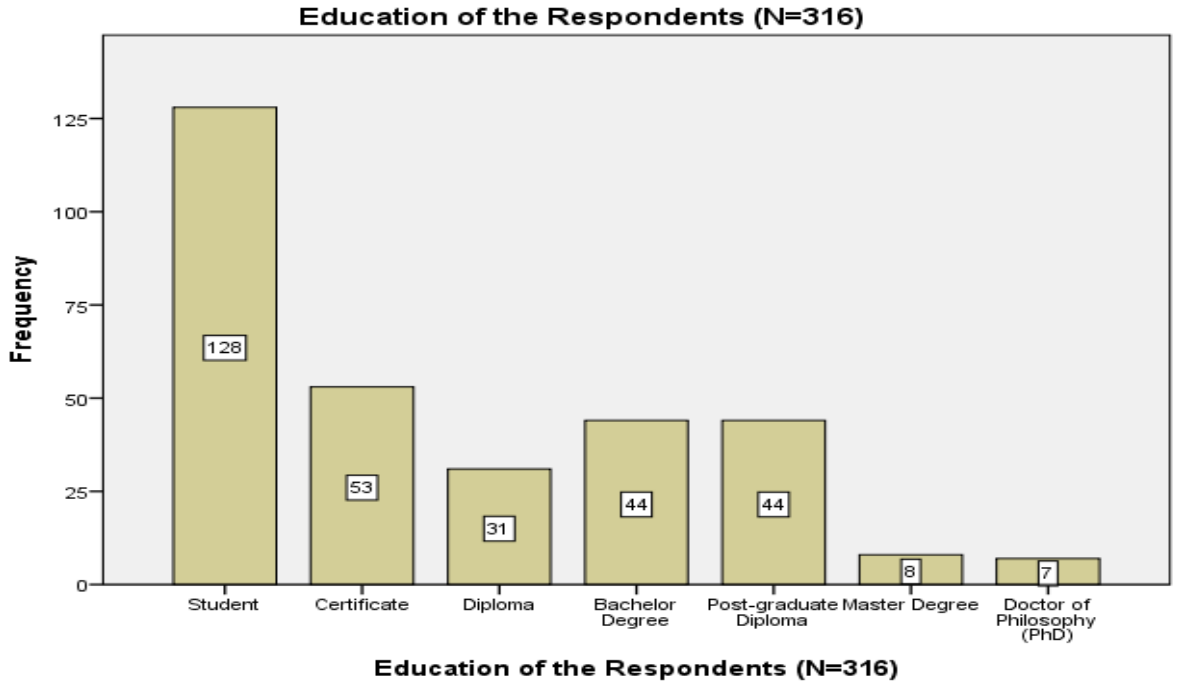
In addressing all these challenges, it is essential to promote gender diversity and inclusivity in the development, deployment, and oversight of AI technologies in higher education. Initiatives that prioritize diverse perspectives and incorporate ethical considerations can be helpful in ensuring that AI systems are fair, transparent, and aligned with the values of the university community.



The Data on the age of respondents in Tanzania's universities provides insights into the demographics of individuals involved in higher learning education. The majority of respondents fall within the age range of 15 to 35 years, with a significant portion between 15 and 25 years old. This distribution of age groups can have implications for the integration of AI in higher learning education and philosophical reflections on ethics and human intelligence.

Younger individuals in the 15 to 25 age bracket are more likely to be digital natives who are comfortable with technology and open to incorporating AI tools into their learning experiences. This age bracket embraces AI technologies in education more readily, leading to an increased adoption and use of AI in Tanzania's universities.

However, it is essential to consider how age diversity impacts the ethical considerations surrounding AI in higher learning education. Older individuals in the 36 to 65 age bracket have different perspectives on the ethical implications of AI and human intelligence in education. Engaging with a diverse range of age brackets in philosophical reflections on AI ethics can help ensure that a variety of perspectives are considered in decision-making processes. Additionally, age influences attitudes toward technology and concerns about AI in education. Research shows that older individuals have reservations about the impact of AI on learning outcomes and traditional teaching methods [Feldstein, 2020]. Understanding these age-related perspectives informs the development of ethical guidelines and policies for the responsible use of AI in higher education.



The Data on the education levels of respondents in Tanzania's universities provides valuable insights into the qualifications and backgrounds of individuals involved in higher learning education. The distribution of education levels amongst respondents varies, with a significant portion being students, followed by individuals with Certificate, Diploma, Bachelor's degree, post-graduate diploma, Master's degree, and a smaller proportion with a Doctor of Philosophy [PhD] qualification. This diversity in educational backgrounds influences the philosophical reflections on ethics and human intelligence in the context of AI in higher learning education.

Students, who make up a substantial portion of the respondents, are directly impacted by the integration of AI technologies in their learning experiences. As key stakeholders, it is essential to consider their perspectives and concerns regarding the ethical implications of AI in education. Engaging students in philosophical reflections provides valuable insights into their expectations, fears, and aspirations regarding the use of AI in higher learning. Furthermore, individuals with higher education qualifications, such as post-graduate diplomas, Master's degrees, and PhDs, bring expertise and knowledge to the discussion on AI ethics and human intelligence. These individuals have a deep understanding of the complexities of AI technologies and the ethical considerations that accompany their integration in educational settings. Involving individuals with advanced degrees in philosophical reflections enriches the dialogue and contributes to the development of ethical guidelines for the responsible use of AI in higher education. However, it is important to recognize that individuals with lower educational qualifications, such as Certificates and Diplomas, also have a stake in the ethical debates surrounding AI in education. These

individuals offer unique perspectives based on their experiences and backgrounds, highlighting the importance of inclusivity and diversity in philosophical reflections on AI ethics.

1.2. Integrating Artificial Intelligence [AI] Technologies in Tanzania's Higher Education Institutions

Table 1: How strongly do you agree or disagree with the integration of artificial intelligence [AI] in the education sector of Tanzania

Items	Frequency	Percentage
Strongly Disagree	14	4.4
Disagree	16	5.1
Agree	206	65.2
Strongly Agree	80	25.3
Total	316	100.0

Individuals may offer unique perspectives based on their experiences and backgrounds, highlighting the importance of inclusivity and diversity in philosophical reflections on AI ethics.

1.3. Influence of AI on Learning Process and Assessment Outcomes in Tanzania's Educational Institutions

Table 2: Please rate the extent to which you believe AI has influenced the learning process and assessment outcomes in academic studies.

Items	Frequency	Percentage
Disagree	5	1.6
Agree	84	26.6
Strongly Agree	227	71.8
Total	316	100.0

The Data on the perceived influence of AI on the learning process and assessment outcomes in academic studies amongst respondents in Tanzania universities reveals a significant positive perception toward the impact of AI in education. The majority of respondents either agree or strongly agree that AI has influenced the learning process and assessment outcomes, with 71.8% strongly agreeing and 26.6% agreeing. This high percentage indicates a wide-spread belief in the transformative potential of AI technologies in higher learning education.

The strong agreement amongst respondents regarding the influence of AI on the learning process and assessment outcomes suggests that AI technologies are perceived to play a significant role in enhancing educational experiences and improving academic performance in educational institutions. AI-driven tools, such as personalized learning platforms, automated grading systems, and predictive analytics, have the potential to optimizee learning environments; provide tailored support to students, and facilitate more efficient assessment processes[Siemens & Gasevic, 2012]. The positive attitudes toward the impact of AI on education reflect a recognition of the benefits that AI technologies bring to teaching and learning practices. However, while the data indicates a high level of agreement on the influence of AI in education, it is essential to critically examine the ethical implications and potential drawbacks of relying heavily on AI technologies in academic settings. Concerns related to data privacy, algorithmic bias, and the limitations of AI in replicating human intelligence and creativity

need to be carefully considered in philosophical reflections on the ethical dimensions of AI in higher learning education [Floridi et al., 2018]. Engaging in discussions on these ethical considerations helps ensure that the integration of AI technologies in education is done responsibly and with a focus on human well-being.

Incorporating diverse perspectives and engaging in philosophical reflections on the ethical implications of AI in Tanzania universities is crucial for fostering a holistic understanding of the impact of AI on the learning process and assessment outcomes. By critically examining the role of AI technologies in higher education and considering the ethical implications from various viewpoints, universities can develop ethical guidelines and frameworks that promote the responsible and equitable use of AI in educational settings.

3.4 Importance of Embracing AI Technology to Equip Tanzania's Graduates for the Future Workforce

Table 3: How important do you think it is for Tanzania's universities to embrace AI technology to better equip the country's graduates for the future workforce?

Items	Frequency	Percentage
Strongly Disagree	20	6.3
Disagree	13	4.1
Agree	67	21.2
Strongly Agree	216	68.4
Total	316	100.0

The Data on the importance of embracing AI technology in Tanzanian universities to better equip graduates for the future workforce suggests a strong consensus amongst respondents regarding the significance of AI integration in higher learning education. Most respondents either agree or strongly agree with the importance of universities in Tanzania embracing AI technology, with 68.4% strongly agreeing and 21.2% strongly agreeing. This indicates a high degree of recognition amongst respondents about the crucial role that AI plays in preparing graduates for the evolving demands of the future workforce.

The overwhelming agreement amongst respondents regarding the importance of embracing AI technology to better equip graduates for the future highlights the recognition of the transformative potential of AI in shaping the skills and competencies need in the contemporary job market. AI technologies offer opportunities for enhancing educational experiences, developing critical thinking skills, and fostering innovation and adaptability amongst students, which are essential for success in the rapidly changing workforce [Brynjolfsson & McAfee, 2011]. The positive attitudes toward AI integration in higher education reflects a forward-looking perspective on the role of technology in preparing graduates for future career opportunities.

While the data reflects a strong agreement on the importance of AI technology in universities for workforce readiness, it is crucial to consider the ethical implications and human intelligence aspects of AI integration in educational settings. Philosophical reflections on ethics in the use of AI technologies in higher learning education are important for addressing concerns related to fairness, transparency, and accountability in the deployment of AI systems [Anderson & Anderson, 2011]. Engaging in discussions on ethical considerations help ensure that the adoption of AI technology in universities is guided by principles that prioritize the interests and well-being of students and society at large.

Incorporating philosophical reflections on ethics and human intelligence in the context of AI in Tanzania's universities is essential for guiding the responsible and ethical implementation of AI technologies in higher education. By considering the ethical implications of AI integration and promoting discussions on the societal impact of AI in education, universities can develop strategies that align with ethical principles and respect human autonomy and dignity.

3.5. Effectiveness of AI in Personalizing Learning Experiences for Tanzanian Students

Table 4: How effective do you think AI can be in personalizing learning experiences for Tanzanian students?

Items	Frequency	Percentage
Strongly Disagree	12	3.8
Disagree	13	4.1
Agree	9	2.8
Strongly Agree	282	89.2
Total	316	100.0

The Data on the perceived effectiveness of AI in personalizing learning experiences for Tanzania's students reveals a high level of agreement amongst respondents regarding the potential of AI in enhancing personalized learning. A vast majority of respondents strongly agree [89.2%] that AI can be effective in personalizing learning experiences, while a small percentage either agree [2.8%] or disagree [4.1%] with this statement. This strong agreement indicates a widespread belief in the ability of AI technologies in tailoring educational experiences to the individual needs and preferences of students.

The overwhelming agreement on the effectiveness of AI in personalizing learning experiences suggests a recognition of the benefits that AI-driven personalized learning platforms can bring to education. AI technologies can analyze student data, provide real-time feedback, and adapt instructional materials to match students' learning styles and pace, thereby enhancing engagement and improving academic outcomes [Baker, 2010]. These positive attitudes toward AI in personalizing learning experiences reflect an understanding of the potential of AI in catering diverse learning needs and promote personalized learning pathways for students.

While the data highlights a high level of agreement on the effectiveness of AI in personalizing learning experiences, it is essential to consider the ethical implications and human intelligence aspects of AI-driven personalized learning. Philosophical reflections on ethics in personalized learning with AI technology are crucial for addressing concerns related to data privacy, algorithmic bias, and the ethical use of personal data in education [Selwyn, 2011]. Engaging in discussions on ethical considerations help ensure that the implementation of AI for personalized learning is guided by principles that respect student autonomy, agency, and well-being.

Incorporating philosophical reflections on ethics and human intelligence in the context of AI-driven personalized learning in Tanzania's universities contributes to the responsible and ethical use of AI technologies in education. By considering the ethical implications of personalized learning with AI and promoting discussions on the ethical dimensions of AI integration, universities can develop guidelines and policies that prioritize the ethical use of AI in personalized learning environments.

3.6. Rating the Potential of AI for Improving Access to Tanzania's Education

Table 5: How would you rate the potential of AI in improving access to Tanzania's education?

Items	Frequency	Percentage
Strongly Disagree	23	7.3
Disagree	6	1.9
Agree	103	32.6
Strongly Agree	184	58.2
Total	316	100.0

The Data on the potential of AI to improve access to education in Tanzania demonstrates a significant level of optimism and agreement amongst respondents regarding the transformative impact of AI on expanding educational opportunities. Most respondents strongly agree [58.2%] that AI has the potential to improve access

to education, while a substantial portion agrees [32.6%] with this statement. A small percentage either disagrees [1.9%] or strongly disagrees [7.3%] with the notion that AI can enhances access to education in Tanzania.

The strong agreement on the potential of AI to improve access to education suggests a recognition of the role that AI technologies play in overcoming barriers to educational access, particularly in regions with limited resources and infrastructure. AI-driven educational platforms provide scalable and personalized learning experiences, remote and underserved populations, and facilitate self-paced learning, thereby increasing access to quality education [Bazalgette, 2023]. This positive attitudes toward AI in enhancing educational access reflects a forward-looking perspective on leveraging technology in bridging educational divides and promote inclusivity in learning opportunities.

While the data highlights a high level of agreement on the potential of AI in improving access to education; it is essential to consider the ethical implications and human intelligence dimensions of AI in educational access. Philosophical reflections on ethics in AI-driven educational access are crucial for addressing concerns related to digital divide, socio-economic disparities, and the ethical use of AI in educational equity [Banks, 2003]. Engaging in discussions on ethical considerations help ensure that the integration of AI in educational access is guided by principles that promote equity, inclusion, and social justice.

Incorporating philosophical reflections on ethics and human intelligence in the context of AI-driven educational access in Tanzania universities can contribute to the responsible and ethical expansion of educational opportunities through AI technologies. By considering the ethical implications of AI in promoting educational access and fostering discussions on the ethical dimensions of AI integration, universities can develop strategies that prioritize equitable access to education and uphold ethical values and principles.

3.7. Teaching Tanzanian Students AI is Essential for Developing Digital Literacy and Critical Thinking Skills

Table 6: To what extent do you believe that teaching Tanzanian students about AI is essential for developing digital literacy and critical thinking skills?

Items	Frequency	Percentage
Strongly Disagree	18	5.7
Disagree	10	3.2
Agree	149	47.2
Strongly Agree	139	44.0
Total	316	100.0

Data on the perceived importance of teaching students about AI for developing digital literacy and critical thinking skills in Tanzania universities reveals a high level of agreement amongst respondents regarding the significance of AI education. Most respondents strongly agree [44.0%] that teaching students about AI is essential for developing digital literacy and critical thinking skills, while a substantial portion agrees [47.2%] with this statement. A small percentage either disagree [3.2%] or strongly disagree [5.7%] with the notion that AI education is crucial for enhancing digital literacy and critical thinking skills.

The strong agreement on the importance of teaching students about AI for developing digital literacy and critical thinking skills suggests a recognition of the role that AI knowledge plays in preparing students for the digital age and equipping them with the skills need to navigate and critically engage with emerging technologies. AI education empowers students in understanding AI applications, evaluate AI-driven information, and makee informed decisions about technology use, thereby enhancing their digital literacy and critical thinking abilities

[Livingstone, 2012]. The positive attitudes toward AI education reflects a proactive stance on incorporating AI knowledge into the curriculum to cultivate students' digital skills and analytical capacities.

While the data highlights a high level of agreement on the importance of AI education for developing digital literacy and critical thinking skills, it is essential to consider the ethical implications and human intelligence dimensions of AI education. Philosophical reflections on ethics in AI education are crucial for addressing concerns related to data ethics, algorithmic bias, and the ethical use of AI in learning environments [Floridi, 2019]. Engaging in discussions on ethical considerations help ensure that the integration of AI education is guided by principles that promote ethical awareness, responsible decision-making, and ethical AI practices.

Incorporating philosophical reflections on ethics and human intelligence in the context of AI education in Tanzania's universities enhances the ethical and humanistic dimensions of AI literacy and critical thinking skills development. By considering the ethical implications of AI education and fostering discussions on the ethical dimensions of AI knowledge, universities equip students with not only technical skills but also ethical values and critical perspectives necessary for engaging with AI technologies in a thoughtful and responsible manner.

2. SAUT AND MNMA'S FIELD RESPONSES/VIEWS ON AI IN TANZANIA'S HIGHER EDUCATIONAL INSTITUTIONS

With regard to the topic at hand, the researchers went to the field to specifically attain first-hand information on the aspect of AI in Tanzania's Higher Educational Institutions. The researchers chose St. Augustine University of Tanzania [SAUT] and The Mwalimu Nyerere Memorial Academy [MNMA] as case studies as a representation of Tanzania's other institutions of higher learning. The researchers interviewed a selected number of participants from the above-listed institutions, and their responses are reflected below:

4.1. AI Potential in Revolutioning Tanzania's Educational Sector

Three Participants from SAUT and MNMA shared their views regarding AI potential in revolutionizing Tanzania's education sector.

The First Participant from SAUT said:

'I believe that AI has the potential to greatly impact education in Tanzania by providing students with access to a wealth of information and resources. It can help bridge the digital divide and empower students in thinking critically and creatively…. However, my main concern is that excessive reliance on AI could potentially hinder students' creativities and critical thinking skills. Therefore, it is important to find balance in using AI technologies in ensuring that students still are actively engaged in the learning processes.

The Second Participant from MNMA had this to say:

'I believe that AI can enhance efficiency, productivity, and access to educational resources in Tanzanian universities. It can provide students with new ways to learn, collaborate, and problem solving. …. It is crucial to engage in discussions on the ethical implications of AI in education and to ensure that students are equipped with the necessary digital literacy skills to navigate the changing landscape of technology…'

The Third Participant from MNMA said:

'AI can revolutionize the education sector in Tanzania by fostering creative thinking, generating new ideas, and enhancing information access for students. It can provide a platform for innovation and discovery in a way that was not possible before… It is essential for students to be aware of both the benefits and potential drawbacks of AI in order to make informed decisions and to develop a responsible approach to using these technologies in their education.

The Perceptions of participants regarding the potential of AI to revolutionize the education sector in Tanzania vary, with some expressing optimism about its transformative impact while others highlight concerns about its limitations. AI has the potential of empowering students, bridge the digital divide, and enhance access to information in Tanzania's universities. It is viewed as a catalyst for discoveries, providing resources for further exploration, and acting as a laboratory for human self-improvement. However, it is crucial for students to receive education on both the positive and negative effects of AI to ensure responsible and effective integration of these technologies in education [Smith, 2020].

While some participants believe that AI can revolutionize education by fostering creative thinking, generating new ideas, and enhancing information access, others caution against excessive reliance on AI that could potentially undermine students' creativity and critical thinking skills. In this case, finding a balance in the moderate use of AI technologies is essential for promoting critical thinking, creativity, and reducing dependency on AI for all tasks amongst students. Despite differing opinions, many participants acknowled the potential of AI in enhancing efficiency, productivity, and access to educational resources in Tanzania. Furthermore, ethical considerations and philosophical reflections on AI in education are underscored as vital aspects for the responsible implementation of AI technologies. Engaging in discussions on the impact of AI on human intelligence, creativity, and ethical decision-making is crucial in shaping the future of AI integration in Tanzani's universities. By fostering inclusivity, encouraging ethical dialogue, and emphasizing digital literacy, universities can leverage the transformative potential of AI while upholding ethical values and preparing students for success in an increasingly digital world.

2.2. Tanzania's Government Support for the Intergration of AI in the Country's Universities

Six Participants from SAUT and MNMA shared their views regarding how the Tanzanian Government can best support the integration of AI in the country's universities.

The First Participant from SAUT said:

'I believe that the Government can provide financial support for universities to develop AI programs, collaborate with industry experts, and conduct training initiatives for both students and faculty members…'

Another Participant from SAUT said:

'The Government should establish clear ethical guidelines for the use of AI in universities, conduct regular evaluations, and engage the public in discussions about the responsible implementation of AI technologies.'

A Participant from MNMA said:

'The Government can promote local AI creation, provide research funding, adjust policies to facilitate AI advancements, and collaborate with technical experts in ensuring the successful integration of AI in Tanzania's universities.'

Another from MNMA said:

'It is crucial for universities to prioritize ethical considerations when using AI technologies in ensuring the responsible and ethical integration of all these technologies in education.'

A Participant from SAUT added:

'The Government can best support the ethical use of AI technologies by engaging with Philosophers and information scientists, providing education on AI ethics, and establishing ethics review boards to oversee the implementation of AI in Tanzanian universities.'

Another Participant from MNMA had this to say:

‘Universities can ensure limited AI dependency amongst students by emphasizing the importance of critical thinking and creativity, providing education on the limitations of AI, and encouraging a balanced approach to using technology in education.’

Participants’ perceptions on how Tanzania’s Government can best support the integration of AI in universities and ensure the ethical use of AI technologies encompasses various strategies and considerations. To effectively support the integration of AI, the Government must provide ample resources and develop academic programs focused on information and technology across all education levels. It is crucial to ensure the availability of experts and quality materials, such as computer laboratories, to foster advancements in AI within the nation. Seminars play such a vital role in preparing students to understand the limitations of AI and discourage overdependence on technology.

Formulating and enforcing rules and laws, promoting local AI creation, conducting campaigns, offering financial support, adjusting policies, and engaging technical experts are key strategies identified by participants as ways the Government can support AI integration. Additionally, collaboration with philosophers and information scientists, providing education on AI, emphasizing ethical norms in AI use, and ensuring limited AI dependency are essential steps highlighted by participants in supporting the ethical implementation of AI technologies. Furthermore, participants underscore the importance of curriculum development, research funding, ethical guidelines, partnerships with industry players, and training initiatives to promote the responsible integration of AI technologies in universities. Emphasizing continuous evaluation and public engagement, and establishing ethics review boards are also suggested approaches for ensuring ethical AI use in Tanzania’s higher educational institutions.

2.3. The Benefits of Using AI in Tanzania’s Higher Educational Institutions

Seven Participants from SAUT and MNMA shared their views regarding benefits of using AI in Tanzania’s higher educational institutions.

The First Participant from SAUT said:

‘…. Well, one significant advantage is the enhanced engagement it brings to the classroom. AI-powered tools make learning more interactive and tailored to individual student needs. For instance, adaptive learning platforms can adjust the pace and content of lesson baseds on students' progresses, ensuring that no one is left behind.”

Another Participant from MNMA said:

‘AI algorithms can analyze students'learning patterns and preferences, allowing instructors to customize lesson plans accordingly. This personalization not only improves learning outcomes but also boosts students’ confidence and expertise in various subjects.

The Third Participant from MNMA added that

‘…AI-driven simulations, problem-solving exercises encourage students to think critically, and creatively. By presenting real-world scenarios and challenges, AI fosters a deeper understanding of complex concepts and enhances students' analytical skills...”

Another from MNMA said:

‘...AI streamlines various administrative processes, from admissions and enrollment to grading and resource management. For example, AI-powered chatbots can handle student inquiries and provide assistance round the clock, feeing up staff time for more complex tasks.’

A Fifth Participant from SAUT said:

'.... By automating routine tasks like grading and scheduling, AI helps reduce human errors and optimizes resource allocation. This efficiency not only saves time but also ensures smoother operations, ultimately benefiting both students and staff."

Another from SAUT said:

'AI offers innovative solutions for constructing exams, grading assignments, and analyzing educational tasks. For instance, AI algorithms can quickly assess and provide feedback on student submissions, allowing educators to focus on providing personalized guidance and support.

The last Participant from MNAM added:

'Byminimizing errors and standardizing assessment processes, AI ensures fairness and consistency in evaluating students' performances. This ultimately leads to better learning outcomes and a more enriching educational experience for students.

Participants'perception of the benefits of using AI in Tanzania's higher educational institutions highlights various advantages that AI technology can offer in the educational setting. One significant benefit is AI's ability to make learning engagement for students while providing teachers with tools to personalize lesson plans for individual student needs. Additionally, AI serves as a catalyst for critical thinking and a vast source of unified knowledge, boosting students' confidence and expertise in multiple areas. Moreover, AI simplifies work processes, enhances understanding of complex concepts, and contributes to efficient time management. It also supports research endeavors; improves accessibility to educational materials, and promotes personalized learning through analyzing students' learning patterns to tailor curriculum accordingly. The implementation of AI tools facilitates educational processes, improves enrollment and retention rates, and enhance resource management in higher educational institutions. Furthermore, AI aids in constructing exams, grading scores, and evaluating educational tasks for better enhancements. It minimizes errors made by educators and optimizes operational efficiency by automating administrative processes. AI enables universal access to high-quality education, facilitates lifelong learning opportunities, and adapts to the evolving educational landscape in the digital age.

2.4. The Emerging Challenges of Using AI in Tanzania's Higher Educational Institutions

Three Participants from SAUT and MNMA shared their views regarding challenges of using AI in Tanzania's higher educational institutions. This is what they had to say:

A Participant from MNMA said:

'…One major concern I have is the potential substitution of teachers by AI tools, which can lead to ethical dilemmas and issues related to plagiarism. I also worry about the risk of students becoming lazy and overdependent on technology for learning, which can hinder their critical thinking abilities."

Another from MNMA said:

'…The limitations of AI in fostering creativity and innovation amongst learners and researchers are disturbing. Without the ability to think critically and independently, students struggle to develop essential skills needed in today's rapidly changing world.

A Participant from SAUT said the following:

'...Data privacy and security are significant concerns when using AI technology in education. Handling sensitive information can be risky, especially if proper measures are not in place to protect student data. It is crucial to address these issues in ensuring the safe implementation of AI in educational settings.

Participants' responses on the challenges of using AI in Tanzania's higher educational institutions in Tanzania reveals a range of concerns regarding the impact of AI technology on the educational landscape. One major challenge identified is the potential substitution of teachers by AI tools, leading to ethical dilemmas and issues related to plagiarism. Participants also highlight the risk of fostering laziness amongst students who may rely excessively on AI for learning, thereby diminishing their critical thinking abilities and resulting in an overdependence on technology. Moreover, concerns are raised about the limitations of AI in promoting creativity and innovation amongst learners and researchers. Participants noted the challenges associated with the lack of technical knowledge on operating AI systems in schools, emphasizing the need for training and resources to overcome this hurdle. In addition, the participants express apprehensions about the negative effects of excessive reliance on technology, which may impedes students' critical thinking skills and hinder their ability to reason independently. Furthermore, challenges related to data privacy and security are noted, particularly regarding the handling of sensitive information. Other concerns include infrastructure and resource limitations, such as insufficient computing power and unreliable internet connectivity, as well as human resource constraints, including a shortage of faculty expertise in AI-related fields. Financial constraints and ethical considerations, such as bias in AI algorithms and transparency issues, are also highlighted as key challenges in the integration of AI in Tanzania's higher educational institutions.

The analysis of various aspects related to AI integration in Tanzania's universities underscores the significance of ethical considerations, diversity, and philosophical reflections in higher education. The data reflects a positive outlook toward AI in education, recognizing its potential benefits in terms of access, personalized learning experiences, digital literacy, and critical thinking skills. However, the data also highlights the importance of addressing ethical dilemmas, promoting inclusivity, and ensuring responsible and ethical implementation of AI technologies.

6. CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the discussions surrounding the integration of AI in Tanzania's higher educational institution highlights immense potential of AI in revolutionizing education and drive positive change. To fully harness these benefits, a thoughtful and strategic approach is necessary, considering both the advantages of AI and the ethical consideration inherent in its use. Balancing these aspects, fostering critical thinking skills, and encouraging creative problem-solving are key to maximizing the positive impact of AI technologies in Tanzania's educational sector.

Effective Government support and collaboration with educational institutions are pivotal in successfully integrating AI technologies within Tanzanian universities. By adopting recommended strategies such as providing resources, formulating ethical guidelines, and fostering partnerships, the Government, can facilitate the responsible adoption of AI in the education sector, leading to improved learning outcomes and technological advancements for all students in the country. Moreover, the significant benefits of incorporating AI into Tanzania's higher education sector include transforming educational experiences, driving academic achievements, and advancing technological solutions for societal challenges. Leveraging AI tools enhance teaching efficiency, promote student engagement, address educational inequalities, and pave the way for groundbreaking discoveries in the academic realm. Key considerations for Tanzania's universities based on the data include among others:

i]. Incorporating diverse perspectives to foster inclusivity and comprehensive ethical considerations in AI integration discussions.

ii]. Establishing and adhering to ethical guidelines to ensure responsible and ethical use of AI technologies in teaching and learning.
iii]. Encouraging dialogue on ethics and engaging in Philosophical reflections to address ethical challenges and promote ethical awareness among stakeholders.
iv]. Prioritizing digital literacy education to equip students with the knowledge and skills to effectively engage with AI technologies and navigate the digital landscape.
Through implementing the above listed recommendations and emphasizing ethical considerations and diversity in AI integration, Tanzanian universities can leverage the potential of AI to enhance teaching and learning outcomes while upholding ethical standards and fostering inclusivity in higher education settings.

References:

Amin, M. *Social Science Research: Conception, Methodology and Analysis*. Kampala:

Makerere University Press. E, 2005.

Anderson, M., & Anderson, S. L Machine 'Ethics*: Creating an Ethical Intelligent Agent*' AI

Magazine, 52[4],2011.

Baker, R. S. Data 'Mining *for Education,*' International Encyclopedia of Education, 7, 2010.

Banks, J. '*Teaching Strategies for Ethnic Studies.*'Pearson, 2003.

Binet, A '*The Development of Intelligence in Children* [S. B. Simon & K. Simon, Trans],

Harper,1965.

Bosley, J., Fox, A., & Srikumar, M. '*Demographic Bias in Dataset Creation and Models for*

Image Identification',2019.

Bostrom, N *'Superintelligence: Paths, Dangers, Strategies*'Oxford University Press.2014.

Brynjolfsson, E., & McAfee, *A Race Against the Machine: How the Digital Revolution Is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy,'*Digital Frontier Press, 2011.

Buolamwini, J., & Gebru, T '*Gender Shades: Intersectional Accuracy Disparities In Commercial Gender Classification. In Conference on Fairness, Accountability and Transparency*,'2018.

Cooper, D. R., & Schindler, P. S *Business Research Methods* [12th edition] New York: McGraw Hill,2013.

Feldstein, A. '*Addressing Faculty Perceptions of AI: An Experiment in Professional Development*, 2020: Educause Review, Available at: https://er.educause.edu/articles/2020/10/addressing-faculty-perceptions-of-ai-an-experiment-in-professional-development.

Floridi, L '*The Logic of Information: A Theory of Philosophy as Conceptual Design*,' Oxford University Press,2019.

Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., ... & Luetge, C. *People—An Ethical Framework for A Good AI Society: Opportunities, Risks, Principles, and Recommendations,* Minds and Machines, 28[4],2018.

Gencten, S. S.*'The History of Intelligence, Education, and Intelligence Testing*,' International Journal of Progressive Education, 14[6)], 2018.

Goodman, B., & Flaxman, S. *European Union Regulations on Algorithmic Decision-Making and 'A Right to Explanation'*AI Magazine,37[4],2016.

Gupta, A., & Gupta, N. *Research Methodology*. SBPD Publications, 2022.

Gutas, D. *Avicenna and the Aristotelian Tradition: Introduction to Reading* Avicenna's *Philosophical Works.* Brill,2012.

Hill, P & Johnston, S '*Access to Learning: Aligning Open Educational Resources with Learning Needs in Disadvantaged Communities*,' Journal of Interactive Media in Education, 2011.

Holmes, W., Bialik, M., & Fadel, C '*Artificial Intelligence in Education,'* Pearson, 2019.

Kothari, C. R. *Research Methodology: Methods and Techniques,'*New Age International, 2009.

Kothari, C. *Research Methodology, Methods and Techniques*,'New York: Willey Eastern, 2019.

Livingstone, S. '*Critical Reflections on the Benefits of ICT in Education,*'Oxford Review of Education, 2012.

Russell, S., & Norvig, P. '*Artificial Intelligence: A Modern Approach*,'2020.

Pearson.Selwyn, N '*Schools and Schooling in the Digital Age: A Critical Analysis'* Routledge,2011.

Siemens, G., & Gasevic, *D. 'Learning Analytics: Vision and Reality*,'American Behavioral Scientist, 2012.

Smith, J '*Participant Perceptions on Artificial Intelligence's Potential to Revolutionize the Education Sector: A Qualitative Analysis*,'Journal of Educational Technology, 15[3],2020.

Thorndike, E. L '*Intelligence and Its Uses,*'Harper,1920.

'*AI Ethics Guidelines: Building A Human-Centered AI*,' UNESCO,2023.

Wingate, B. '*Aristotle's Ethics,'*Stanford Encyclopedia of Philosophy,2022.

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