RESEARCH ARTICLE

Revolutionising Accounting Education through AI: Is Africa Ready for personalised learning, improved Assessments, and skills development?

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Abstract

Artificial intelligence (AI) will likely reshape Africa's accounting education system. Pertinent issues such as the availability of AI infrastructure, policy framework, data ecosystem, ethical considerations, and the degree of readiness should be considered. The paper examines how AI can revolutionise accounting education and the readiness of African countries. A systematic literature review approach was adopted. The paper finds that the development and deployment of AI in Africa are still in their nascent stages. Nonetheless, the paper established that AI could enhance learning experiences through personalised learning, improve assessments, enhance skills development, and provide real-time feedback to educators and students. However, AI raises serious concerns about data privacy and protection, as well as the readiness of educators to embrace AI-enabled accounting education. The paper recommends integrating AI into the accounting curriculum, training and upskilling educators and collaborating with the industry to promote AI development and deployment in Africa.

Keywords: Artificial Intelligence, Accounting education, Africa, Personalised learning experience, Skills development

Introduction

The accounting profession's future is optimistic and technologically advanced, with immense potential. Embracing AI through accounting education can equip future professionals to thrive in this dynamic environment, necessitating changes in curricula to include coding education (Mbizi et al., 2022). AI's rapid development since 2022 has profoundly impacted various fields, including accounting education (Sebele-Mpofu, 2023). Technologies like chatbots, facial recognition, and large language models (LLMs) like ChatGPT-4 automate tasks and provide personalised feedback, significantly benefiting educators (Onesi-Ozigagun et al., 2024). UNESCO (2021) acknowledges AI's transition from academic backwaters to mainstream discourse. However, the evolving high-tech environment poses a challenge for African accountants to keep up with technological advancements, necessitating critical skills such as data analytics, ICT, and business intelligence. Educational institutions must integrate AI into the curriculum to equip students with these skills (Mbizi et al., 2022).
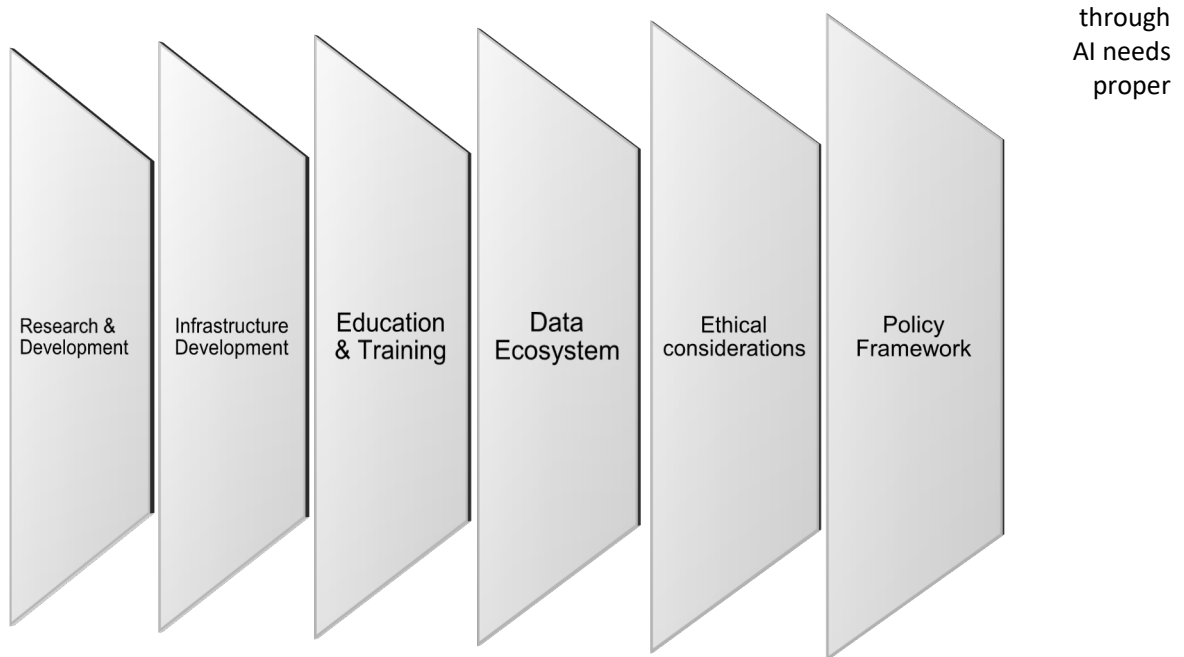
AI's integration into education, while enhancing competitiveness, also raises significant implications for achieving SDG 4: ensuring inclusive and equitable quality education and promoting lifelong learning (United Nations, 2015). It brings both opportunities and challenges, such as ethical and societal considerations and issues of access and equity in education (Onesi-Ozigagun et al., 2024; UNESCO, 2021). Although AI holds promise for transforming education, there is limited literature on its impact on accounting education. This paper addresses the factors necessary for incorporating AI in accounting education, the opportunities and challenges of AI in this

context, and the readiness of African accounting schools to integrate AI. It also explores how AI can reduce inequalities and promote digital literacy.

The paper aims to contribute to the literature by exploring AI's role in accounting education in Africa, offering recommendations for universities to collaborate with industry, and providing policy insights related to AI ethics in education. Keegan (2023) highlights the importance of adopting the right approach to leverage AI's transformative potential in education. Briggs (2023) emphasises the critical need for scholars to focus on generative AI in the education sector and establish ways to harness its benefits.

Factors that need to be addressed before the incorporation of AI in accounting education

Pertinent issues must be addressed before adopting AI to reshape accounting education in Africa. The Centre for Intellectual Property and Information Technology (CIPIT) (2023) suggests that for the African continent to incorporate AI in education successfully, it is imperative to consider factors such as policy frameworks, ethical considerations, education and training, research and development as well as data ecosystem and access to knowledge. In consensus, the World Economic Forum [WEF] (2024) points out that revolutionising education through AI needs proper

| Research & Development | Infrastructure Development | Education & Training | Data Ecosystem | Ethical considerations | Policy Framework |

planning, and issues such as policy frameworks, adequate infrastructure, internet connectivity, and conducive operating learning and teaching platforms must be considered. These pertinent issues will be discussed individually.

Figure 1: Factors affecting the adoption of AI in Accounting Education
Source: Authors' Compilation

Research and Development

Investing in AI technology is a systematic process, and this can only be done through surveys and interviews and a systematic literature review process. According to Brunel (2023), a cost-benefit analysis is paramount since it aligns the innovation needed on AI applications with the specific needs of accounting education, which extends to the accounting profession sector. This entails conducting research and development to establish the needs of both learners and teachers, and it is essential to bear in mind that adopting AI is based on contextual settings. As a result, each country should incorporate AI based on affordability and their specific need, and it is not a size fits all situation. The US Department of Education, Office of Educational Technology (2023) points out that research has a significant implication on the success of incorporating AI into education. They emphasise that research can strengthen the role of context in AI. It can be deduced that one of the classic challenges in AI is context. It is then imperative for academics and technologists to give context top priority. This is because AI will likely break and fall short of educational aims, and no attention is given to context-sensitive AI. Also, it is noteworthy that the African continent should emulate the initiatives rolled out by the US education system concerning Context-AI substances.

In conclusion, it can be deduced that academics recognise that successful breakthroughs using AI in education would undoubtedly necessitate incorporating additional context into the process frequently and early on. Russel (2019) adds that people must constantly modify their technology goals. The writer further states that when plans

are made, we frequently don't fully comprehend the context and that the goals need to be altered once we do. This means context needs to be given early and consistent priority in research and development to avoid winning a race to the wrong finish line.

Infrastructure Development

This is one of the primary considerations regarding incorporating AI in accounting education. In consensus, CIPIT (2023) attests that infrastructure and innovation investments are essential for economic growth and development. The exponential rise in computing power, the creation of increasingly complex algorithms, and the growing amount of data have all contributed to the rise of AI (Cheng et al., 2023; UNESCO, 2023). In addition, infrastructure accessibility, institutional and human capacity, and availability are all necessary for these advancements. As a result, the education sector can leverage AI benefits. Even though it is pivotal to consider the costs of using AI, this covers the expenses incurred in acquiring AI technologies, continuing upkeep and support, and the future requirement for further resources like infrastructure or knowledge (Brunel, 2023). Wiseman (2023) articulates that as higher education continues to undergo a transformative shift, educational institutions embrace technologies such as AI to attract new students, enhance their learning experiences, and uncover new research breakthroughs. These institutions must assess their infrastructure readiness to meet these high data demands. This is because, with a modern infrastructure capable of accelerating learning and research, the academic community stands on the brink of new possibilities waiting to be discovered.

On the other hand, Ruwoko (2022) avows that Africa needs data set infrastructure to benefit from AI, and accounting education is no exception. The data sets in Africa for machine learning and AI are largely inadequate. Data sets developed outside Africa do not carry the same patterns or signatures contextual to Africa and, therefore, would not provide accurate models. As discussed above, Africa has to develop contextual data within the continent and lay an elaborate data collection infrastructure.

Education and Training

Before incorporating AI in education, both educators and students need to be educated about what AI is and how it operates, as well as the benefits and challenges associated with the use of AI. There is a need to comprehend the origin of AI technology and the implementation process, and this can only be achieved if the educational system collaborates with industry experts. Students needs to understand its features, and experts can help. These experts can also suggest the type of AI suitable for accounting education and can check its authenticity. This means that before adopting AI tools in education, a curriculum needs to be designed that incorporates AI in the teaching and learning process, and interested stakeholder groups need to be knowledgeable to adopt it to enhance personalised learning, assessment, and skills development. Langley (2019) supports the inclusion of AI technology in the curriculum. In addition, the Association of Chartered Certified Accountants [ACCA Global] report (2023) adduces that the integration of AI in the finance profession offers a significant opportunity for innovation, efficiency and improved decision making. As a result, to fully harness the benefits of AI, ACCA Global is actively incorporating AI literacy into its curriculum. This will enable finance professionals to develop AI literacy and skills while being aware of the risks and challenges associated with its use. The authors suggest that AI lessons should cover the following: (1) systems perspectives that outline the interaction of mechanisms in developing knowledge, (2) coding, (3) ways to make use of AI as well as creating it from simple components as well as imparting knowledge to students about the pivotal capabilities of human and AI. Kayembe and Nel (2020) attest that digital pedagogy needs new rules for AI usage, and students must possess digital literacy to benefit from the digital economy, engage in global society, and enjoy employment opportunities. Notably, those mentioned above can be achieved through education and training programs.

Data Ecosystem

According to CIPIT (2023), the success of AI projects depends on the quality and quantity of data needed to train them, as incorrect data can hinder the system's ability to function effectively, such as in chatbots. The report further states that establishing vital ecosystems among stakeholders, including politicians, academic institutions, businesses, start-ups, and government agencies, is essential to ensuring the sustainable adoption of AI in Africa. UNESCO (2022) recommends that, AI technologies, local data sets from a variety of sectors, including education, must be created by AI researchers. Also, the predictive models get more accurate as more data is gathered, and innovation and AI are more successful in producing the desired results. However, Okolo, Kehinde and Obaido (2023) cites that in Africa, there are insufficient data sets for machine learning and AI, and data sets created outside the continent may not offer reliable models. This is because they might lack the same patterns or

characteristics exclusive to the continent. It can be concluded that the African continent must develop an infrastructure for gathering contextual data.

Ethical considerations

Ethics in this context refers to guidelines for the best conduct when developing and using novel technologies. UNESCO (2021:23) cites that "the ethical, inclusive and equitable use of AI in education impacts on the Sustainable Development Goals 4. There are issues centred on data and algorithms, pedagogical choices, inclusion and the 'digital divide', children's right to privacy, liberty, and unhindered development, and equity in terms of gender, disability, social and economic status, ethnic and cultural background, and geographic location". Following the above discussions, ethics is one of the primary considerations regarding incorporating AI in all sectors, and the education sector is not excluded. Some scholars refer to this kind of ethics as responsible or ethical AI, aligned with the principles and rules specific to AI systems. The primary reason for responsible AI is to ensure that the installed systems behave ethically. The key features of responsible AI include accountability, transparency, privacy, explicability, and bias evaluation (CIPIT, 2023). Other scholars cite that there is currently an ongoing process of implementing AI tools in Africa (Dell, Akpan and Carr, 2024; Mhlanga, 2022, Okolo et al., 2023). As a result, ethical AI needs to be deployed against biases and data breaches, which might negatively affect humans. Studies show that most systems are trained using data, values, and social concerns outside Africa, making the continent's dependence on developed AI products problematic. To tackle these obstacles, an African-responsible AI framework must consider ethical AI frameworks and African cultural values, guaranteeing suitable resolutions for Africa's distinct problems.

Policy Frameworks

Following up on the discussion of ethics, the education sector should develop policy frameworks and standards that govern the development, deployment, and usage of AI systems. It is also noteworthy that the researchers established that accountability is one of the principles of responsible AI. To achieve this aspect, Okolo et al. (2023) attest the African continent should adopt a multistakeholder approach and establish policies that govern the responsible use of AI to preserve rights and ethics in its formative design. On the other hand, Chan (2023) adduces that AI tools are rapidly gaining public access, necessitating urgent university AI education policies to equip students with the principles of this technology. This suggests that the education sector should invest in creating and applying laws that support acquiring human skills pertinent to AI systems (Dunn, 2021). In conclusion, educational policy frameworks should be practical and specific, meaning they can be contextualised.

Method

This study investigates how AI can transform accounting education in Africa using a qualitative systematic review approach. The systematic literature review enables an in-depth analysis, synthesis, and rigorous examination of multiple studies (Synder, 2019). Mpofu (2021:560) emphasises that this approach "focuses on identifying, evaluating thoughtfully, and synthesising all literature on the topic as opposed to the narrative approach, where the summary is done for many studies". Drawing from Synder (2019) and Mpofu (2021), the researchers used a standardised research protocol to identify, select, and evaluate relevant studies, enhancing the credibility and reliability of the findings. The study explores what African Higher Education Institutions need before integrating AI into accounting education and examines how AI can reshape the field. Databases like Google Scholar, Elsevier, Science Direct, Springer, and Scopus were searched using keywords such as "AI in education" and "Revolutionising Accounting education through AI in Africa". Papers were selected based on publication year, language, journal databases, and relevance, focusing on those published between 2019 and 2024, with exceptions for seminal theories dating back to the 1960s. The review included peer-reviewed journals, authoritative reports, and working papers discussing AI in accounting, resulting in a total of 33 articles after applying inclusion and exclusion criteria and mining citation lists.
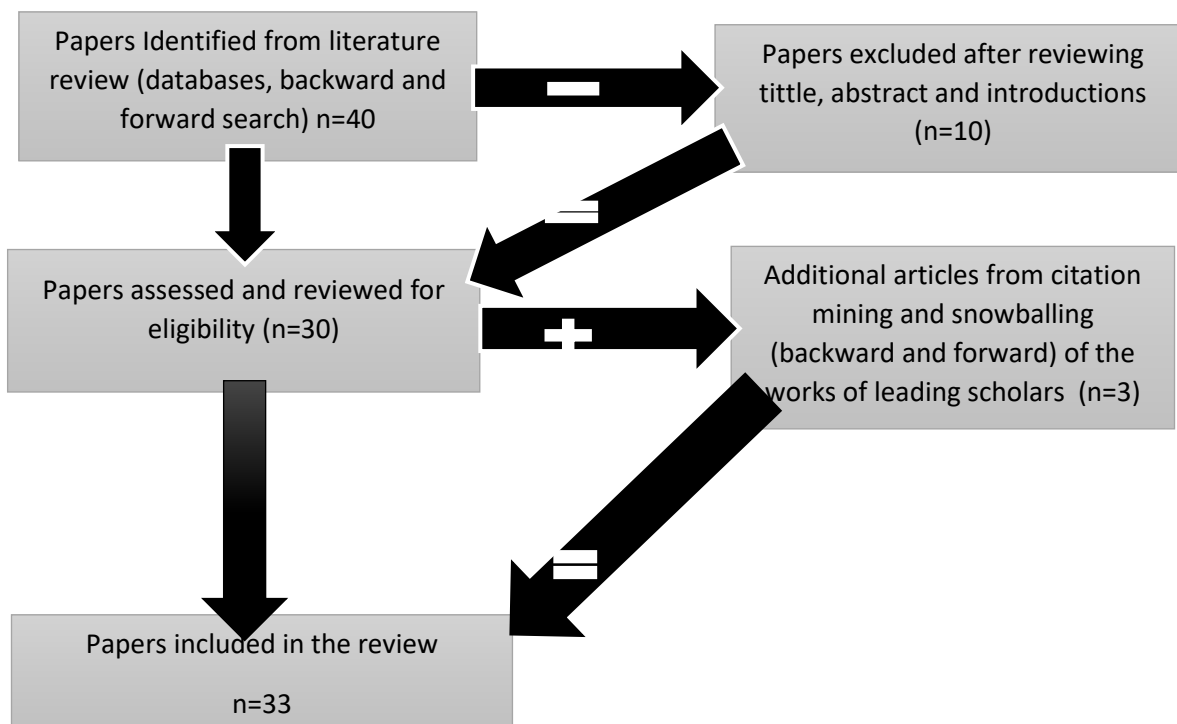
**Figure 2: Flowchart representing the literature review protocol**
Source: Researchers' Compilation

Findings

The systematic review adopted in this paper showed that AI can reshape accounting education by improving assessments and learning experiences through personalised learning, skills development, and real-time feedback. According to Onesi-Ozigagun, Ololade, Eyo-Udo, and Ogundipe (2024), enhancing educational experiences is essential for raising student interest, boosting grades, and creating a passion for learning that lasts a lifetime. It can be deduced that AI can customise learning experiences for each student, assuring that they get individualised education that fits their learning preferences and skill levels. However, it is essential to understand that AI poses threats and challenges in accounting education. The following section explores opportunities exclusive to Africa, illuminating how AI might transform accounting education throughout the continent.

Benefits of AI in Accounting Education

The field of accounting education is quickly evolving because of (AI), which offers numerous benefits impacting how educators instruct students. Mintz (2024), Mbizi et al. (2022), and Ballantine et al. (2024) confirm that AI is a powerful tool in accounting that can analyse big data sets, detect trends, and provide predictive insights that were once out of reach for humans. By integrating AI into the curriculum, accounting students can gain hands-on experience with cutting-edge technologies that automate and improve financial procedures such as data input, transaction oversight, and complex reconciliations (Mbizi et al., 2022). This enhances their technical skills while enabling them to focus on making strategic choices and utilising advanced problem-solving methods. In addition, Ologe (2020), and Shi (2020) share similar sentiments that AI-driven analytics will allow future accountants to make quick and decisive decisions by using predictive analytics to foresee customer behaviours and financial patterns. To achieve this, accounting education must evolve alongside AI advancements to equip graduates for a data-focused, tech-savvy business environment. Notably, integrating AI in accounting education is not just a betterment but a necessary advancement, providing improved efficiency, accuracy, and a competitive edge in the swiftly changing finance sector. This section unpacks individually the benefits of incorporating AI in accounting education that are outlined in Figure 4. These benefits are as follows: enhanced learning experience, real-time feedback, personalised learning, assessment skills development, and understanding of the ethical implications of AI. These are explained individually to get a better understanding of each. Notably, AI's benefits vary from scholar to scholar, and the variances are blurred by semantics.
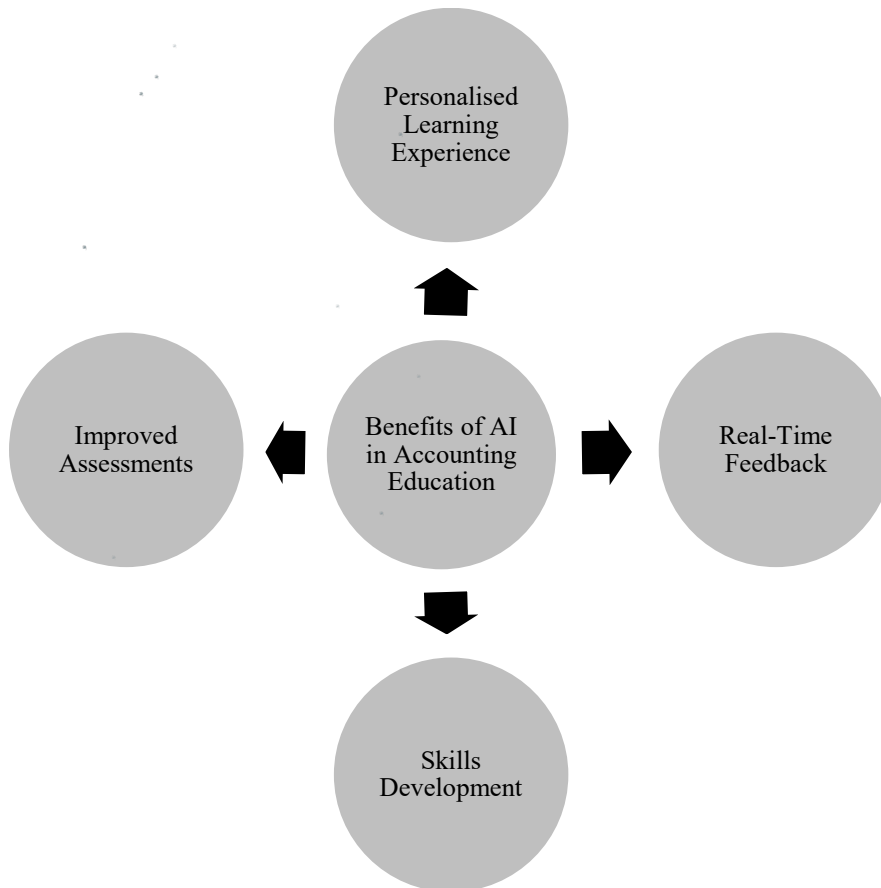
Figure 3: Benefits of Artificial Intelligence in Accounting Education
Source: Researchers' Compilation

Personalised learning experience

UNESCO (2021) cites that AI-enhanced personalised learning is a revolutionary approach to accounting education that adjusts the curriculum and offers students customised learning paths based on their goals, preferences, and previous knowledge. Using AI's data analysis skills, this approach uses each student's learning path, resulting in a more prosperous and exciting educational experience (Ologe, 2020; Onesi-Ozigagun et al., 2024). It also follows that personalised learning experiences linked to an AI system allow students to advance at their own pace in accounting, and it is noteworthy that the accounting profession is characterised by the intricacy of financial data, which can be daunting. As a result, students can focus on concepts they have mastered and ignore the challenges so they can learn at their own pace. Dewey (1902), an education philosopher, once said: "By allowing students to take charge of their education and apply what they learn to solve problems in the real world, this individualised approach not only increases material retention but also fosters a deeper understanding of accounting concepts". This implies that through experiential learning opportunities, personalised learning in accounting education can continue outside the classroom. AI can meet students' preferred learning styles and career goals by matching them with internships, field trips, or project-based learning opportunities (UNESCO, 2021). The practical skills needed in the accounting field, like analytical reasoning, moral judgment, and strategic decision-making, are developed through these experiences. In conclusion, AI in accounting education improves the educational experience and customises the learning environment to each student's preferred pace and learning style, increasing student engagement and motivation.

Real-time feedback

Real-time feedback provided by AI in accounting education transforms students' approach to receiving and applying criticism for enhanced learning. Onesi-Ozigagun et al. (2024) adduce that, through AI systems, students can efficiently pinpoint areas needing improvement and adjust their approach through prompt, practical feedback on assignments and evaluations. This implies that AI-enabled systems can assess students' responses to tasks such as quizzes, essays, and structured questions in real time, thus providing instant feedback on their performance. Similarly, Huang, Saleh, and Liu (2021) assert that AI can help students conduct self-assessment tests, get learning

feedback in time, help students improve their exercise levels, and reduce educators' teaching pressure. It can be deduced that, through AI, immediate feedback assists students in understanding their strengths and weaknesses, allowing them to focus their efforts on areas where they need improvement. Still, regarding real-time feedback, Mpofu and Sebele (2024) adds that by incorporating AI tools, educators can offer personalised support based on each student's learning path by analysing their answers and giving immediate feedback. As a result, this speeds up the learning process and fosters a dynamic and flexible classroom atmosphere. It creates a dynamic learning experience for students where ongoing feedback fosters their abilities and confidence in accounting practices instead of just providing criticism once.

Skills Development

Mintzer (2024) cites that AI's integration into accounting education is revolutionising the field in terms of skill development by giving students the tools they need to succeed in a business environment driven by technology. Ologe (2020) asserts that AI makes it easier to comprehend data analytics, machine learning, and algorithmic processes, which are becoming increasingly crucial in the accounting industry. This implies that the students learn how to use AI for tasks like financial decision-making, risk assessment, and predictive modelling, which are crucial skills for contemporary accountants. Additionally, as students interact with intelligent systems that push them to interpret complex data and make strategic decisions, AI helps students develop soft skills like problem-solving and critical thinking (Onesi-Ozigagun et al., 2024). It can be concluded that developing both smooth and technical skills guarantees that graduates are adept at using AI tools and flexible and creative thinkers who can spearhead the change in accounting procedures. Also, to ensure that the next generation of accountants is ready for the profession's changing demands, the skills taught in accounting education will become even more critical as AI develops.

Assessments Improvements

With the emergence of AI technologies, the education sector is poised to take a significant leap forward. High-tech assessments are expected to replace traditional formative and summative assessments. The integration of AI in education promises to revolutionise evaluation and analytics (WEF, 2024). AI-enabled assessments offer invaluable insights, such as identifying learning trends and evaluating non-standardised tests, expediting assessment processes, and providing timely feedback (UNESCO, 2021). Real-time analysis helps educators pinpoint strengths and weaknesses, facilitating targeted instructional strategies (Huang, Saleh, & Liu, 2021). AI incorporation is expected to mitigate bias and ensure fairer results (Abill, Kaledio & Louis, 2024). AI enhances grading accuracy, allowing educators to tailor lessons and foster student collaboration (UNESCO, 2021, 2023). Educational institutions must equip students and teachers with digital skills, as digital literacy is essential for AI integration in teaching and learning. AI plays a significant role in assessing student performance, reshaping educational assessments, and enhancing grading quality and efficiency. AI can provide real-world challenges to assess students' problem-solving abilities, offering authentic, real-time feedback on their readiness for industry absorption.

In conclusion, AI aligns student assessments with professional standards, equipping students with relevant skills for the tech environment. AI also supports academic integrity through high-end plagiarism checks and verified authorship methods, preserving institutional quality. AI enhances education beyond assessments, aligning it with industry needs and preparing the future workforce.

Discussion- Conclusions

As highlighted throughout the paper, AI has potential benefits for the African continent's educational systems. The successful development, deployment, and use of AI in education depends on the factors that could influence its incorporation, including infrastructure availability, ethical implications, data ecosystems, policy frameworks, and so on. The paper recommends that African countries incorporate AI in accounting curricula, train and upskill educators to enhance the readiness of the continent to integrate AI, invest in modern and adequate AI-enabled infrastructure, and collaborate with the industry to prepare students who can operate in an AI environment.

Integration of AI in curriculum

Education is essential to prepare the workforce for AI in the future. Overcoming the AI skills gap involves more than implementing more potent technology to speed up education. It also entails reconsidering the subject matter and delivery strategies employed in all educational levels of instruction. The curricular reform initiatives required to reshape accounting education need to define "AI competencies" in a way that goes beyond essential ICT competencies, as many African countries have done to enable students to identify and solve problems using computing techniques, methods, and technologies. According to Coetzee et al. (2021), curriculum development should emphasise equipping graduates with knowledge and skills that technology cannot replace. It ought to be

designed to impart and reinforce new skills and to change with the workforce's needs (Hussin 2018). This entails those educational institutions position themselves to be relevant in the face of the changes brought about by AI systems, in addition to preparing graduates for a continuous learning mandate.

Training and Upskilling educators

Even though AI can revolutionise accounting education and prepare students for the workplace, the chances of AI replacing educators are limited. Unanimously, educators will continue to be at the cutting edge of education, and it is incorrect to assert that AI may substitute teachers (UNESCO, 2019). According to Onesi-Ozigagun, Ololade, Eyo-Udo, & Ogundipe (2024), educators play a pivotal role in coaching, guiding, and supporting students in intricate and dynamic learning environments. As a result, educators need training and development programs to enhance their competencies and successfully incorporate AI into the teaching and learning process. This means that educators will acquire skills and expertise in using AI systems, analyse and interpret insights produced by AI, and dispose of personalised learning experiences that benefit students and educators in their respective faculties. In addition, Fundi, Isanusi, Oyelere, and Ayere (2024) assert that implementing teacher education and professional development programs in AI is crucial to boosting teachers' trust and adaptability to AI teaching. Policies and procedures should be in place, and AI ethics knowledge should be raised to support ethical AI applications. Based on the working paper on educational policies by UNESCO (2019) the researchers deduced that the training and education programs should take into consideration the following suggested competencies that will increase the value of educators, both at the in-service and preservice levels.

Collaboration with the Industry

Partnerships between industry and academia are necessary to ensure that educational programs are well-aligned with labour market needs and to share material and financial resources to integrate AI in accounting education properly (Onesi-Ozigagun et al., 2024). However, collaborations shouldn't be restricted to the industry and academic domains; intra-sector collaborations are just as vital as those between the two. UNESCO (2022) recommends that it is crucial for African countries to "implement multistakeholder approaches to AI governance, such as the triple, quadruple and quintuple helix models to bring together the private sector, academia, civil society, and government; in particular, ensure the engagement of youth organisations, gender equality advocates and stakeholders, small and medium enterprises, persons with disabilities, environment and climate change experts and under-represented groups in multistakeholder processes". It also follows that collaboration in research is encouraged via partnerships between academic institutions and research centres, which can hasten the growth of AI competence. However, for these initiatives to be successful, they must align with a more comprehensive national AI strategy with a distinct vision and set of goals.

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