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Artificial Intelligence as an Opportunity or a Curriculum Trajectory in the 21st Century? Towards Embracing Unfamiliar Discourses

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Abstract: This theoretical paper contributes to the ongoing debate on Artificial Intelligence (AI) in relation to curriculum and implementation in post-colonial South Africa. We contend that AI, as perceived, conceived, and implemented within the curriculum space, presents an ambivalent terrain marked by fear, uncertainty, and anxiety among stakeholders, as its presence has interfered with the everyday work of educational practitioners. Cognizant of this problem, we locate our theorisation within the framework of Sustainable Learning environments and address two questions: (1) What are the opportunities of AI in relation to the curriculum in post-colonial South Africa? (2) What challenges are faced in the implementation of AI, especially in rural contexts where technological opportunities are not equivalent to those in urban areas? In this paper, we highlight that while AI tools like ChatGPT may appear daunting for integration into teaching and learning—potentially undermining educators' authority and raising ethical concerns—there is an urgent need to rethink and restructure teacher education. This restructuring should align with the evolving demands of an AI-enhanced curriculum and address the shifting expectations in educational contexts.

Keywords: Artificial intelligence, curriculum, sustainable learning environments, ChatGPT.

1. Introduction

Although AI has existed for a while and is transforming various aspects of human life—including the way we work, communicate, and express ourselves (Harwell & Tiku, 2023; Roose, 2023)—it still brings anxiety and suspicion. The advent of the COVID-19 pandemic facilitated the growth and forced adoption of technology within the education sector in the Global South. While disruptive, the pandemic served as an eye-opener for educators, highlighting the need for alternative methods of teaching and learning. It reminded us that traditional face-to-face instruction may not always be ideal, especially during global disruptions and the continuous development of new approaches.

Additionally, new research has become essential to find alternatives in teaching and learning, leading to increased investment in understanding AI as the future of education. The need to integrate IA is not unique to South Africa; it is also observed in various countries across the Global South (in this paper, the term "Global South" refers to deprived learning contexts such as rural, farm, and township schools in South Africa). While many people in the Global South were beginning to understand and accept AI as the future, its complications became apparent with the rise of ChatGPT. According to Kamalov, Calonge, and Gurrib (2023, p. 10), a turning point in the adoption of AI occurred in November 2022 with the introduction of ChatGPT.

The emergence of AI has found many educators and academics unprepared to differentiate between work generated by ChatGPT and work produced by students. Consequently, the implementation of AI through ChatGPT is deemed illegal in various contexts. Additionally, it is considered immoral, illegal, and unethical and renders schooling irrelevant in some contexts when students acquire

qualifications through cheating. Despite this dilemma and the fear of immorality, the use of AI continues unabated, especially among students who perceive it as a valuable tool for teaching and learning. Acknowledging these concerns, we agree with Chen et al. (2020, p. 75265) that "there has been increased application of artificial intelligence, going over and above the conventional understanding of AI as a supercomputer to include embedded computer systems." Furthermore, AI denotes the "use of computers that perform cognitive tasks usually associated with human minds, particularly learning and problem-solving" (Baker & Smith, 2019, p. 10). In this paper, as we discuss AI, we invite our readers to contextualise our arguments within the definition proposed by Chen et al. (2020, p. 75265):

> *"…a supercomputer, a computer with immense processing capabilities, including adaptive behaviour, such as the inclusion of sensors, and other capabilities, that enable it to have human-like cognition and functional abilities, and indeed, which improve the supercomputers interaction with human beings."*

The definitions and descriptions provided above encompass the development of machines capable of performing human-like functions, including cognitive processes, learning, decision-making, and adaptation to the environment (Chen et al., 2020, p. 75265). In light of this discussion, we align our argument with the observations of Roll and Wylie (2016), which emphasise the necessity for educators and researchers to adopt a bolder stance, embrace greater risks, and engage with new contexts and domains as a form of learning rather than resistance. We recognise, however, that many academics and educators in the Global South are not fully prepared to embrace artificial intelligence (AI). Some even continue to contest AI as immoral, particularly in the Global South, where the educational system has not adequately adapted to new pedagogical approaches. This situation is exacerbated by stagnant curriculum packages that are slow to respond to the changes introduced by AI.

Consequently, curriculum packages regard online teaching and learning as synonymous with embracing AI, reflecting a minimalistic understanding of AI and its role in education within certain contexts of the Global South. Within this ambivalent landscape, we aim to explore the opportunities that AI can offer within the context of the curriculum. We do not suggest that no advancements are occurring in relation to AI in schools; rather, we assert that there has yet to be a coordinated approach to its implementation at both practical and policy levels. Thus, this paper intends to contribute to the ongoing discourse on the effective utilisation of AI in teaching and learning. Additionally, we addressed the challenges encountered in the integration of AI within educational settings. We believe that this article illuminates the realities of AI and curriculum as a learning curve, stimulating new ideas for the meaningful incorporation of AI in both the present and future of education.

In the following section, we discussed the theoretical framework of the study, which focuses on sustainable learning environments.

2. Theory: Sustainable Learning Environments

This paper is located within the framework of Sustainable Learning Environments (SULE). This framework is widely used in various contexts to buttress an education system that addresses the lived realities of students. Within the South African context, the ideas of SULE used in this paper are premised on the work of Sechaba Mahlomaholo, who, throughout his academic career, was a harbinger of education advocating for justice and emancipation. Defining SULE as a theory of learning, Mahlomaholo (2012, p. 430) argued that it,

> *"…starts from providing an enabling educational legislative and policy context through the provision of adequate and conducive infrastructure, the necessary teaching and learning resources, the improvement of teacher competencies to discharge their duties effectively, the*

> *involvement of parent communities and the creation of learner-centred holding environments where [students]' community cultural wealth is valued and validated."*

SULE encompasses learning contexts, including collaboration, compassion, critical thinking, and creativity (Mahlomaholo and Mahlomaholo, 2022). In addition, Mahlomaholo (2010) believed that for education to be meaningful, it must be democratic in selecting curriculum packages, research, engagement, and innovation towards meeting students' needs. Furthermore, SULE denotes that all students are important and should have access to education regardless of the circumstances, including the use of and access to AI tools and facilities to enhance learning. Therefore, SULE involves an active approach by societies to enhance and protect human dignity, equality, and freedom for all of a country's citizens (Mahlomaholo, Nkoane, and Ambrosio, 2013).

Thus, for AI to effectively and meaningfully penetrate all spheres of society, it must be contextualised within SULE. In this sense, all students are valued and given equal access to technology and its devices to promote learning in the context of AI. SULE, in the context of embracing AI, embodies the belief that learning environments, opportunities, and spaces in teaching, learning, curriculum, and governance of the education enterprise are enabled, prompted, and sustained (Le Blanc, 2015). In this way, students are exposed to the new dynamics of learning within the milieu of AI. SULE, especially in the context of AI, emphasises that curriculum packages should evolve over time. This ensures that all students, particularly in the Global South, are familiar with the AI trends that have significantly influenced the world of work, where they will seek employment.

We agree with the World Economic Forum (2024, p. 3) that "education systems must adapt to prepare young people for tomorrow's technology-driven economies and to help students learn alongside these emerging technologies." In summary, we employ SULE as a lens to explore the opportunities and challenges of AI. SULE emphasises inclusivity, ensuring that all students are provided with the opportunity to reflect and learn from the trends brought by AI. It also advocates that curriculum packages should evolve over time to ensure that learning is meaningful and effectively responds to the dynamics introduced by AI. In the following section, we discussed some of the opportunities that AI provides within the curriculum.

3. Artificial Intelligence as a Curriculum Opportunity

As we discuss the opportunities provided by AI, we also acknowledge that it has presented various trajectories, beliefs, and conspiracies that have downplayed its role in education. Despite the challenging terrain, we submit, in line with Alam (2021), that AI has contributed to meeting the needs of students. This section addressed the opportunities presented by embracing AI in the curriculum.

3.1 Enhances quality education

The aim of the curriculum and its reforms is to enhance quality education through various tools and the adoption of best practices. The emergence of AI has, in many ways, contributed to this goal. As we explore this point, we assert that AI in the field of education is here to stay despite any unforeseen developments in the future. What is critical is developing strategies to ensure quality education. This perspective contrasts with the view that there has been an increasing application of artificial intelligence, which has expanded beyond the conventional notion of AI as a supercomputer to include embedded computer systems (Chen, 2020, p. 75265). Cognizant of this and recognising the need to enhance quality education, we argue that AI has enabled educators to work smarter and explore various learning platforms and programs that can contribute to quality education. Additionally, AI has facilitated personalised coaching and mentorship for students, enhancing their learning performance in preparation for future challenges (Grassini, 2023).

Moreover, AI has allowed many private and city schools to create smart classrooms fully equipped with cutting-edge technology, resulting in improved quality education. However, we acknowledge

that some rural schools in the Global South are not yet equipped with the relevant technologies that support online learning (Dube, 2020), which serves as a basic entry point for the effective use of AI in teaching and learning. Recognising this, we argue that as we integrate AI into South African schools, we must ensure that rural and marginalised students are included, as the effects and impacts of AI are pervasive throughout society, regardless of awareness. Despite this trend, we emphasise that educators should embrace the new insights brought by AI, as the goal is to improve the quality of education. Consequently, with quality education, students would be stimulated to learn. This leads us to our second point regarding the opportunities provided by AI in the curriculum.

3.2 AI stimulates interest in learning

The use of AI in the curriculum has stimulated significant interest in learning. Various AI platforms have made learning interesting and rewarding. Through AI, it is easy to acquire information, enabling students to explore more insights within a short period of time. AI can continuously optimise and improve the learning environment, stimulating the enthusiasm, initiative, and creativity of students (Colchester, Hagras, Alghazzawi, and Aldabbagh, 2017). However, while we appreciate that AI stimulates learning, it has also brought challenges.

Instead of students conducting research and using creativity to deepen their understanding, there is a growing trend where students simply acquire information from tools such as ChatGPT and submit it for grades without actively engaging with the generated content. Consequently, lecturers and educators have developed a negative attitude towards AI, as it renders students lazy and uncritical, which undermines the goal of creating SULE. In addition to this challenge, AI is contributing to the idea that education is shifting towards a "teacher-proof" curriculum, implying that human educators may no longer be considered essential with the rise of AI. Despite this problem, AI has provided an opportunity to stimulate learning because information is readily available.

3.3. Provides an opportunity for reforms in the teacher education

Teacher education remains a challenge in the adoption of AI. The curriculum in many universities remains stagnant over a long period of time, which makes it difficult to open spaces for the use of AI as a tool for teaching and learning. Since AI has announced its presence forcefully, there is a need for curricula to respond to it. In fact, the emergence of AI in the Global South has underscored the necessity for a reevaluation of the curriculum in teacher education. As AI revolutionises education, there is also a need for teacher education programs to focus on preparing educators to integrate AI into the curriculum effectively. We support the notion by Huang, Saleh, and Liu (2021, p. 205) that AI in the field of education has an opportunity to reform teaching and learning. Reforms in teacher education would assist educators in acquiring knowledge about technology that can enhance teaching and learning and optimise educational stakeholders' needs and benefits (Nguyen, 2023, p. 4225). It would be disingenuous for academics in teacher education to expect effective implementation of AI by educators who are not trained in the use of AI in teaching and learning. Considering the above discussion, it is essential for universities to prepare educators for the use of AI in teaching and learning.

3.4 Promotes individualised learning of students

Education in the 21st century requires education to meet the needs of the students so that they can survive the realities presented by AI. The current classroom in most of the Global South finds it difficult to meet every student's unique learning needs, preferences, and rates of progress (Dimla, Sumaway, Torres, & Dela, 2024). The foregoing is prevalent in rural contexts where classes are overcrowded with a limited supply of educators to meet the demands. To ensure that students in the Global South are emancipated to learn effectively under deprived conditions, the integration of AI can contribute to a positive move in addressing the diverse expectations for students. As students engage with various AI tools, individualised learning is promoted. While agreeing that AI promotes

individualised learning, it presents challenges in most Global South schools where curricula and examinations are centralised. The challenges that remain to be addressed are how, in a centralised curriculum and examination system, AI can promote individualised learning. The response to this question requires a critical policy position on AI to guide educators and students on the use of AI in a centralised education system. Despite the challenges noted here, we agree with Dishon (2017) that AI has the impetus to provide a personalised learning plan according to the students' needs and learning environment (Dishon, 2017). In addition, VanLehn (2011) argues that AI has created systems that are as effective as human one-on-one tutoring, which is critical to improving learners' performance.

3.5 Helps to improve school safety

In an era where crime is prevalent even within the curriculum space, it is critical that schools find ways to create safe environments. One of the alternatives to improve school safety is embracing AI. AI has brought various technologies that can curb crime within schools. To buttress this notion, Kim, Soyata, and Behnagh (2018, p. 44) argue that AI technologies such as face recognition, human body analysis, image recognition, students' head-up frequency, frequency of mobile phone usage, and smile frequency are used to monitor and analyse students in class or within the school premises to obtain relevant data (Kim, Soyata, and Behnagh, 2018) that can be used to improve the school environment. In addition, AI, through face recognition, can efficiently identify suspicious outsiders, improving the safety of the student hostel (Huang et al., 2021). Thus, with South Africa battling violence in schools, AI can help mitigate the challenges of school violence. In summary, when understood and embraced, AI can be a step in the right direction toward ensuring safer schools.

4. Artificial Intelligence as a Curriculum Trajectory in Post-colonial Reforms

In this section, we will discuss some of the challenges that we encounter in the Global South in relation to AI. The challenges discussed do not diminish the opportunities that we have already highlighted. Instead, they aim to generate conversations that can lead to the holistic embrace of AI, especially in rural contexts where the realities of AI have not been well articulated or accepted. The first trajectory that we discuss relates to ChatGPT.

4.1 Difficulty in understanding the role and space of ChatGPT

The resistance to AI in the field of education intensified with the emergence of ChatGPT. While educators and students were still grappling with what AI could offer, ChatGPT introduced a new dimension that led many to perceive AI as immoral and designed to cheat the education system. To elaborate on this point, Kamalov et al. (2023) assert that the introduction of ChatGPT catalysed the discussion around the benefits and dangers of AI. It marked a turning point in many individuals' perceptions of AI. Therefore, it is critical to contextualise the readers regarding ChatGPT. For some students, ChatGPT meant that there was no need to spend many hours developing an assignment since ChatGPT could easily do so. This also meant that students were no longer engaging with the content, thereby undermining efforts to create sustainable learning conditions and provide quality education. In other words, the emergence of ChatGPT escalated academic dishonesty. Additionally, some students do not check the accuracy of the information provided by ChatGPT, as assignments often lack direction and generate varied answers for the same question. Thus, scholars such as Sallam (2023) and Gravel et al. (2023) assert that ChatGPT responses may not always be accurate or reliable, particularly for specialised subjects.

Moreover, ChatGPT may generate incorrect or fabricated information (Johnson and Verdicchio, 2017). Based on our experience, most students use ChatGPT without acknowledging its use. They boast about deceiving educators and lecturers to obtain good grades. In essence, while seeking to improve teaching and learning, the use of ChatGPT has brought about various challenges, which Akgun and Greenhow (2022, p. 434) capture as;

> *"…introducing AI into education can create new ethical and societal risks, including perpetuating systemic bias and discrimination, compromising students' privacy, increasing student monitoring and surveillance, jeopardising student autonomy, disadvantaging traditionally marginalised students, and amplifying racism, sexism, xenophobia, and other forms of inequity."*

We conclude this section by arguing that conversations about ChatGPT are essential for understanding its role in teaching and learning, without compromising the moral foundation that has informed curriculum practices in post-colonial South Africa. We align with the observation by Mishra and Heath (2024, p. 15) that "as AI permeates society, ethical concerns like privacy, surveillance, and algorithmic bias will require continuous evaluation, regulation, and guidelines." Educators should critically examine AI tools such as ChatGPT to mitigate any potential harm to students' learning outcomes and academic success (Trust, Maloy, and Nikmatullah, 2024, p. 35). This can be achieved by drawing on best practices from contexts where ChatGPT is effectively integrated into teaching and learning.

4.2 Fear of humans being replaced

In some sections of the Global South, there is fear that the emergence and development of AI has the potential to render people jobless (Badet, 2021; Heinrich and Witko, 2021; Rinochart and Edwards, 2019; Tiwari, 2023). Consequently, what would be the value of education when jobs are taken by machines exhibiting high levels of intelligence? To support this point, we note Gherhes' (2018) observation that AI is feared as a replacement for humans by robots, leading to unemployment and rendering human contributions unnecessary. A new way of thinking should emerge since AI is something that is here to stay. As such, education should continue to probe new avenues for job creation. AI requires people to think differently, and the curriculum is one of the best platforms to explore AI extensively with the aim of eliminating the fear of AI. We conclude this point by noting that by integrating AI into educational frameworks, we can help shape a future where AI complements rather than threatens human employment.

4.3 Stagnant teacher education in response to AI

One of the challenges facing the adoption and implementation of AI is the slow pace of change in the curriculum within teacher education programs. While in the previous section, we argued that AI creates new possibilities for educators, most of the teacher training or education still lags behind in embracing change. The current initial teacher training prepares educators for the traditional classroom, paying less attention to preparing them for handling classes influenced by technology. Cognizant of this challenge, we argue that curriculum packages should keep up with technological development trends to ensure the education offered to students remains relevant. Therefore, there is a need for reskilling, upskilling, and lifelong education among educators to assist students in grasping the realities of AI. The upskilling of educators should consider the realities faced by rural students in their deprivation. It should include education on the basics of AI in education and prepare educators for the direction in which the world is moving with AI implementation. However, teacher education alone cannot address all the challenges faced by rural students in deprived contexts. Therefore, the government should play a major role in providing basic infrastructure to support learning under AI. This will not only create sustainable learning conditions but also improve the ontology of rural students and boost confidence among educators.

5. Conclusion

In this paper, we discussed the opportunities provided by AI in the curriculum. We highlighted that AI has brought significant changes to the curriculum. The changes have threatened the traditional ways of teaching, and in many cases, educators are not prepared to embrace AI. While AI is appreciated, there are still segments of society that perceive it as immoral and believe it hinders

learner creativity, especially concerning ChatGPT. We contend that while ChatGPT presents challenges, it is important to bring this conversation to the table. This approach allows students to benefit from ChatGPT while remaining mindful of ethical considerations. We also contend that while AI is crucial for enhancing learning, rural students remain disadvantaged and excluded from technologies. To establish sustainable learning conditions, it is crucial that our approach to AI is holistic and inclusive, ensuring no child is left behind as we navigate this unfamiliar and sometimes intimidating territory. In conclusion, we emphasise that AI is here to stay, and curriculum packages must evolve promptly to ensure that our education system aligns with the AI culture engulfing society.

6. Declarations

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