ARTIFICIAL INTELLIGENCE, THE ULTIMATE OPPORTUNITY OR THREAT TO THE ESSENCE AND INTEGRITY OF EDUCATION

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Abstract

Whilst the advent of the ever-growing technological era has come with multiple benefits that make everyday life comfortable and easy, hidden threats are now emerging in the education arena. Seemingly, the issue of Artificial Intelligence, has posed unlimited threats and opened doors of machine-based learning. Based on this premise, the quest of this study was to find out the extent and how students at institutions of higher learning use Artificial Intelligence to enhance their scores in given assignments, online tests and examinations. Two main research questions guided this inquiry: *a) What are the students' perceptions about Artificial Intelligence in the light of enhancing their tertiary education?*; and *b) How do students at institutions of higher learning use Artificial Intelligence during their learning?* A total of 45 Bachelor of Education final year students drawn from three different universities from three countries: Botswana, South Africa and Zimbabwe participated in this inquiry. Similar semi-structured questionnaires, oral group interviews and in-depth interviews were the data collection instruments used across the different countries. The TPACK theoretical lens was used as the main framework that guided the data collection and analysis. The collected data was analysed thematically for any emerging themes from a deductive to an inductive approach, through the technique of coding. It emerged that the digital age is posing threats and opportunities in educational settings. Opportunities in education include improved content representation and delivery to students, enhanced self-learning from AI scaffolding, immediate assessment of learning and feedback for learning efforts. The threats included academic dishonesty that involved the unethical misuse of AI to write online summative assignments, tests and examinations for inflated false scores that do not measure the academic competences of students. The need for plagiarism software that could effectively detect AI plagiarism emerged. The idea of avoiding online summative assessments and the use of sit in writing options could help in regaining the integrity of education in the context of tests and examination scores. Educators ought to be exposed to multiple training opportunities to improve their technological competences so that they can effectively monitor and manage the unethical use of AI by students.

Keywords: Artificial Intelligence, education, technology, integrity, digital age.

1. Intro and background

Whilst the advent of the ever-growing technological era has come with multiple benefits that make everyday life comfortable and easy, the integration of AI in various aspects of our lives has become unavoidable (Chen, Xie, Zou, & Hwang, 2020). Artificial Intelligence, as viewed in this inquiry, entails the applications of machine learning, algorithm productions, and aspects of language processing (Borenstein & Howard, 2023; Akgun & Greenhow, 2022). Seemingly, whilst the use of AI is a welcome development in this modern technological 4IR era, it has also ushered in hidden threats and opportunities that are now emerging in the education arena. The issue of AI has posed unlimited threats and opened doors of machine-based learning (Akgun & Greenhow, 2022). This is because AI encompasses the development of devices that have levels of intelligence, cognitive abilities, ability to learn, and ability to make decisions, like and even better than that of humans (Chen, Chen & Lin, 2020). Thus, one can argue that if AI can lead to all the conveniences in general life, then AI has the potential to also be used or misused in achieving good quality education or even unethical educational achievements respectively.

Whilst the use of Artificial Intelligence in Education [AIEd] (Ouyang & Jiao, 2021), is closely related to computer science, this development is now widespread and fully integrated in the field of education (Talan, 2021). In the education sector, AI is being used to facilitate decision making, teaching and learning (Ouyang & Jiao, 2021). AI has multiple roles in education. These include technological developments in areas such as cloud computing, mobile internet and delivering of learning content that suits the unique learning needs of individual students and assisted student learning by humanoid robots (Kabudi, Pappas, & Olsen, 2021).

The potential impact of AI on improving or discrediting the quality of education has not yet received special attention from education practitioners and education policy makers (Kabudi, Pappas, & Olsen, 2021). Thus, the purpose of this study was to investigate the opportunities and threats of AI to the integrity of education delivery. Two research questions guided this inquiry:

a) What are the students' perceptions about Artificial Intelligence in the light of enhancing their tertiary education?
b) How do students at institutions of higher learning use Artificial Intelligence during their learning?

2. Reviewed bodies of literature and the theoretical framework

The theoretical framework used in this study was a modified version of Technological Pedagogical Content Knowledge (TPACK) as propounded by Mishra and Koehler (2006). This framework emphasises that a teacher ought to have sound content or subject matter knowledge, pedagogical or knowledge of the best teaching strategies and technological knowledge for enhancing classroom teaching with technology. Whist the TPACK theoretical framework is mainly used to illustrate knowledge bases which a teacher ought to have to teach effectively with technology, in this inquiry, this theory was taken and adapted from the perspective of the students. In other words, the knowledge bases which students ought to have for their effective learning using technology, with particular reference to AI. As adapted from TPACK, three knowledge bases are highlighted. Firstly, knowledge about technology (TK) is crucial for enhanced student learning (Harris, Koehler & Mishra, 2008). Secondly, knowledge about subject content knowledge (CK), or the subject matter for learning, is important for the students to weave with technological use for their enhanced learning. Students' knowledge about technological use and how they can use technology to enhance their attaining of good grades results in knowledge about their self-directed learning (See Figure 1 for this depiction).

Figure 1. A modified version of the TPACK model (Mishra & Koehler, 2006), as used in this inquiry.
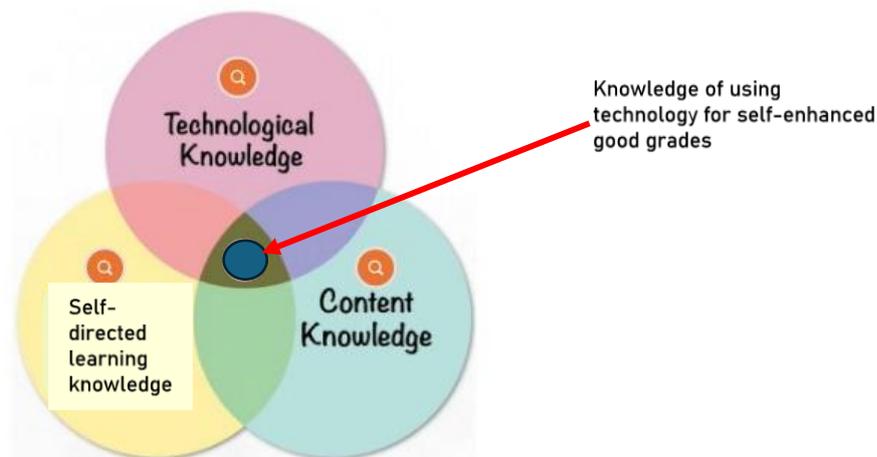
3. Literature on studies in use of AI in education

AI has been hailed for its novelty in delivering teaching and learning materials. Different studies have unveiled that AI provides new ways of content presentation and representations that make it easier for teachers to impart the content to their students. The use of AI in educational settings has also been found to empower teachers to teach in more effective ways that make it easier for students to grasp the content, increase student's content retention and understanding, and, also enhancing students' competence levels in the modern digital world (e.g. Kong, Man-Yin Cheung, & Zhang. 2021; Timms, 2016).

The application of AI in education has also been found to opening opportunities for improving the quality of self-directed or personal learning (Akgun & Greenhow, 2022). This is because AI has features such as intelligent tutoring that can provide support, scaffolding and give constructive feedback during personal learning by individual students (Ouyang & Jiao, 2021, Chen at. el, 2020).

AI has also been used to monitor students' emotional and psychological well-being during teaching and learning to maximize those process that enhance student learning. For instance, AI has facial recognition features that has been used by teachers to analyze student attitudes and behavior through analysis of student facial expression during teaching and learning. This has been found to makes it easier for teachers to prevent actions and processes that place student under unnecessary stress during teaching and learning goals (Chen et al., 2020).

The use of AI has also been integrated with widely used learning models. These learning models include problem-based learning, collaborative learning, blended learning, project-based learning, learning robots and even mobile learning. Robots has been found to act as teacher helping agents in routine activities such as learning to pronounce and spell words, and other learning activities that needs demonstrations (Chen et al., 2020). Such integration has been found to enhance student learning outcomes, academic performance, learning motivation, achievement, creativity and problem-solving skills (Chen, Xie, & Hwang, 2020).

4. Methodology

The study involved a sample of 45 students who were drawn from three different universities from three southern African countries: Botswana, South Africa and Zimbabwe. The sample was conveniently selected because the three institutions offered the same four-year Bachelor of Education program. A total of 15 students were drawn from each country to make the sample manageable within a limited time allocated to this study, and in the context of the large Geographical area needed to be travelled by limited field workers. Data was collected using three research instruments: questionnaires, group and in-depth interviews. The same individual questionnaires, oral group interviews were used with all the 45 students. In-depth interviews were carried out involving three of the 15 students from each country. The rationale for this was to have enough time for a one-to-one recorded oral in-depth interview with each of the respondents. Data was analysed thematically from a deductive to an inductive approach through the process of codding. The initial coding system was formulated based on the ideas in the literature (deductive approach). This coding system was modified and updated as new codes emerged from the data (the inductive approach). The modified version of TPACK, as shown in Figure 1 was the theoretical lens that guided the data collection and analysis in this inquiry. Table1 below shows samples of coded responses.

5. Results and discussions

Three main themes that emerged are shown in the Table 1 and these are discussed below.

Table 1. Themes that emerged from the data analysed. Key: e.g., S3B: Student 3 from Botswana, S14 Z: Student 14 from Zimbabwe; S7SA: Student 7 from South Africa.

Research Question	Emerging theme	Supporting statements from respondents
What are the students' perceptions about Artificial Intelligence in the light of enhancing their tertiary education?	Artificial Intelligence perceived as a powerful platform in education	**S7SA**: *AI is one of the <u>best things</u> to have ever happened towards uplifting students' learning.* [**high recognition**]
		S2B: *I think AI is <u>essential for every student</u> learning as it makes learning convenient even the comfort of one's home* [**high recognition**]
		S5Z: *How I wish I had been exposed to the use of AI since my early schooling years, that could have made my schooling less of a hustle in terms of the way content is being delivered to students* [**high recognition**]
How do students at institutions of higher learning use Artificial Intelligence during their learning?	Use of Artificial Intelligence to enhance students' performance/grades	**S4B**: *Since I started using AI, my personal learning has become so convenient. I no longer struggle to learn difficult content alone.* [**Important role of AI**]
		S8B: *I use AI to write my online tests and assignments* [**Important role of AI**]
		S7SA: *I use the intelligent tutoring component of AI to learn difficult concepts I struggle with* [**Important role of AI**]
		S13B: *AI is a tool which is useful for my learning, I like its multi-disciplinary nature as I find it useful for all my modules* [**Important role of AI**]
		S4Z: *I use AI to Scaffold my learning using the performance mapping feature of AI, that also evaluate my learning to give me immediate feedback* [**Important role of AI**]
	Unethical use of Artificial Intelligence to enhance grades	**S10B**: *If writing online exams or doing my assignments, AI is my close companion, I do not see the reason why I should struggle to think out answers when AI could do an equally great job for me at no cost* [**Academic dishonesty/unethical use of AI**]
		S11Z: *I use AI to write my online tests and assignments, my grades have since been good* [**Academic dishonesty/unethical use of AI**]
		S5SA: *I know that cheating in exams and tests is morally not fine but who does not want good grades at the end of the day?* [**Academic dishonesty/unethical use of AI**]

5.1. Artificial intelligence perceived as a powerful platform in education

The respondents from the three countries perceive the use of AI in education as welcome development which offers convenience in student learning. For instance, the response by **S5Z:** *How I wish I had been exposed to the use of AI since my schooling years, that could have made my schooling less of a hustle in terms of the way content is being delivered to students* denotes and underscores the idea that university students perceive the use of AI as playing a crucial role in their learning. The convenience in student accessing content for learning using AI is evident. This corroborates the postulations by Chen et al. (2020) who also unveiled that the use of AI in education has unlimited potential to improve the delivery of learning materials and content for learning to students.

5.2. Use of artificial intelligence to enhance students' performance/grades

Most of the respondents acknowledge the use of AI to enhance their learning and performance in education. For instance, when writing their tests and assignments, personal learning through AI tutoring, and scaffolding when learning difficult concepts through performance mapping features from the use of AI. For example, the following responses are indicative of this: **S4B:** *Since I started using AI, my personal learning has become so convenient. I no longer struggle to learn difficult content alone;* **S7SA:** *I use the intelligent tutoring component of AI to learn difficult concepts I struggle with;* **S4Z:** *I use AI to Scaffold my learning using the performance mapping feature of AI, that also evaluate my learning to give me immediate feedback.* These insights corroborate what has been found elsewhere, especially that the use of AI in education has offered unlimited opportunities to change and improve educational delivery in many countries and disciplines (e.g. Kong, Man-Yin Cheung, & Zhang. 2021; Timms, 2016).

5.3. Unethical use of artificial intelligence to enhance grades

Whilst the students predominantly use AI to increase comfort in and enhance their learning, the issue of academic dishonesty also emerged. For instance, the following comments by some of the respondents are indicative of the unethical use of AI by students to improve their scores: **S10B:** *If writing online exams or doing my assignments, AI is my close companion, I do not see the reason why I should struggle to think out answers when AI could do an equally great job for me at no cost;* **S5SA:** *I know that cheating in exams and tests is morally not fine but who does not want good grades at the end of the day?*

As evident in the above students, the use of AI in education has also ushered in threats of machine learning (Akgun & Greenhow, 2022), brazen plagiarism which led to falsified scores and student performance. Seemingly, this is the ultimate threat to the essence and integrity of education. This is because the graduates from different programs will, be mere shadows of what they were supposed to be in terms of graduate attributes. This has the potential to perpetuate cycles of mediocracy when such graduates go to places of work or even their become educators of the future crop of students.

6. Conclusions and recommendations

The emerging conclusions from this study include opportunities and threats in the use of AI in education. AI opportunities in education include improved content representation and delivery to students, enhanced individual learning from scaffolding, immediate assessment of learning and feedback for learning efforts, and convenience during learning in the comfort of homes. The threats entail the unethical misuse of AI during summative assessments such as assignments, online tests and examinations to get inflated false scores that do not measure the academic competences of students. There is a need for a rethink on the use of AI in education in terms of control mechanisms and type of assessments that could avoid AI plagiarism and unethical practices. There is also a need to come up with more plagiarism software that can effectively detect AI use in the writing of tests, exams and assignments. The option of sit in examinations and tests writing as opposed to online writing could help in regaining the integrity of education in the context of tests and examination scores. Educators ought to be exposed to multiple training opportunities to improve their technological competences so that they can effectively monitor the trends and use of AI by their students.

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