



NIGERIAN JOURNAL OF EDUCATIONAL PHILOSOPHY

**PHILOSOPHY, ARTIFICIAL
INTELLIGENCE, AND DIGITAL
EDUCATION**

VOLUME 35 NO. 1, OCTOBER, 2025

ISSN: 0794-0114

e-ISSN: 2971-5652

Published by

PHILOSOPHERS OF EDUCATION ASSOCIATION OF NIGERIA (PEAN)

www.peanpapers.com.ng

Formatted & Printed in Nigeria by



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Deconstructing the Nexus: A Critical Analysis of Philosophy, Artificial Intelligence and Digital Education

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Abstract

The orchestrated and growing narratives supporting the emphasis on technology driven education, seem to stand out as the only way to go in education. Artificial Intelligence-driven education indeed appears separate from digital learning and equally separated from philosophically assisted educational approach. This paper presents a critical analysis of the integration of the disparate elements of philosophy. Artificial intelligence (AI) and digital learning. In this paper, the synthesis points out the perennial need for philosophical inquiry to be ever present in the entire business of educational process for effective and efficient products. This discussion points out the need for greater understanding and synthesis of the complete interaction between philosophy, education and technology, including AI and digital learning approach.

Introduction

Preamble:

The theme of this conference, Philosophy, Artificial Intelligence and Digital Education becomes quite auspicious at this point in time of reversals in Nigeria's University education curriculum. The change from BMASS (Basic Minimum Academic Standards) to CCMAS (Core Curriculum Academic Standards).

In CCMAS, the importance and need for philosophy of education and indeed all foundations of education courses, has been relegated to the background or apparently misapplied or entirely overlooked. This worrisome misapplication or relegation is leading to unintended consequences, both of personnel and programme rating. The critical importance of philosophical scrutiny of educational conceptions, curricular choices, plans and programmes, as well as the synthesis of ethical metaphysical and epistemological outcomes in education, cannot be overemphasized. Hence, the above conference theme has been aptly adjusted to critical analysis of the burning issue or rethinking or deconstructing the synthesis of the elements of philosophy, education and technology to bring about a unitary and balanced educational process and product.

Background

As we open our discussion of the thematic: Philosophy, Artificial Intelligence (AI) and Digital education; slightly adjusted to Deconstructing the Nexus: A Critical Analysis of Philosophy, Artificial Intelligence (AI) and Digital Education", we need to beneficially and significantly take resource to the scholastic approach and borrow from there the Latin cliché, which thus says: *initio disputandi, est definitio nominis*. It means that: for us to enter (meaningful) argument or disputation/discussion, we should first define our terms or terminologies. This is for the purposes of mutual understanding.

Definition itself is the specification of the essential properties of something. It is a clear statement of the criteria which uniquely identifies something. Definition is the setting bounds or provision of the unique *quidity* or essence of a thing of whatsoever under a view/review.

In this section let us therefore define and have the understanding of philosophy, AI and digital education. We shall further look at the importance of philosophical critique of education and discuss the statement and concern that the integration of AI in education, necessities a critical revaluation of philosophical assumptions and the implications thereof.

What is Philosophy?

Generally speaking, philosophy is defined as a body of natural knowledge, which is systematically and methodically ordered and required undertaking to explore and provides the fundamental explanation of all things. Loosely speaking therefore, philosophy can be nicknamed a busybody natural knowledge, which noses around to understand and give fundamental explanation of whatever that exists, (Iwuchukwu, 2000:33). Correspondingly, in the traditional definition Plato in the Republic, states that Philosophy is the study of the fundamental nature of knowledge, reality and existence (Plato, 380BC). Other traditional definitions say that Philosophy is the pursuit of wisdom” (Aristotle, Metaphysics 350:30). This is actively taken from the etymological definition of philosophy, as the “love of wisdom”. Further, philosophy is said to be “the critical examination of fundamental beliefs and values” (Kant: 1781). In the modern period, Bertrand Russell defined philosophy as the systematic and critical examination of the principles and assumptions underlying and fields of knowledge. (Russell, 1712) specifying the importance of philosophy is the study of the meaning and validity of beliefs, concepts and theories (Karl Popper, 1934). In contemporary times, philosophy had been further defined as the practice of thinking critically and reflectively about fundamental questions concerning existence, knowledge, values and reality (Simon Blackburn; 1974).

By extension, in our definition of our terms, we ask what then is philosophy of education? While Dewey answers, that philosophy of education is a way of thinking about education that emphasizes the role of experience and the importance of reflective thinking; Noddings, (1992) says that philosophy of education explores the fundamental nature and purpose of education, considering ethical, social and political dimensions: Biesta (2015) points out that philosophy of education involves critical reflection on the aims, processes and content of education, emphasizing the significance of democracy and social justice.

Hook, (1956), Paul Hirst and Richard Peters, and Hall-Guest (1936) and Akinpelu, (1981), in consonance with contemporary views all agree that philosophy of education is a very important intellectual engagement in critical and reflective thinking over the nature of field of education, as well as its ethical and social dimensions. In summary, therefore we can say that philosophy of education is an activity or an acquirable, thorough going critical habit which the individual educator applies or requires for the critical organization, analysis evaluation of educational theories and practices to reach sound and appreciable goal achievement in educational business. (Iwuchukwu, 2003).

What is Artificial Intelligence (AI)?

Comprehensive overview and classifications of AI

Artificial is the opposite of the original. Artificial intelligence (AI) refers to the capability of machine, to imitate original, intelligent human behavior. Artificial intelligence encompasses the development of systems that can perform tasks, typically requiring human intelligence such as reasoning, learning and problem solving (Russel and Norvia 2016).

Earlier John McCarthy stated that “Artificial Intelligence (AI) refers to the science and engineering of making intelligent machines, especially intelligent computer programmes (McCarthy, 1956).

It is on this note that AI is seen as a branch of computer science which is preoccupied with the effort to create systems, including reasoning, learning, problem-solving, understanding natural language and perceiving the environment (Poole, Mackworth and Goebel, 2020).

Classification: Artificial intelligence can be classified into three types viz; (1) Narrow or weak AI; (2) General or strong AI; and (3) Super intelligence. These basic classifications of AI indicate the capabilities functionalities and the applicabilities of the system.

Narrow or Weak: AI, refers to the system designed and trained for specific tasks and fully operate under limited set of conditions and designated task boundaries. Their capabilities are limited to specific tasks. Examples of this a type of AI are: virtual assistants like Siri, Recommendation algorithms on streaming platforms and chatbots (Pereira and Tishby, 2021). Weak AI also performs such tasks as facial recognition like on gadgets, phones, vehicles and security doors, laptops etc) as well as language translation (Yan Lecun, 2016).

General or Strong AI: This is designed with the capability of manifesting general intelligence which resembles the level of intelligence exhibited by human beings. Strong AI can be called human machines.

Super Intelligence AI: This type of artificial intelligence acts way beyond human intelligence in all fields. Bostroom, says that super intelligence (AI) is a system that surpasses human intelligence in virtually all domains, possessing capabilities far beyond human cognitive abilities, (Bostroom, 2014).

Super intelligence has the following characteristics: High intellectual power that can excel above human cognitive performance. It has the ability to act or perform tasks independently showing the possession of the capacity for autonomy. It can also develop a growth of its own or modify structure in order to advance in intelligence (Omochundro, 2007). Further, super intelligence manifests global directed behavior. Because it is characteristically autonomous, certain objectives it may pursue may be at cross purposes with those of humans and that is where the machine values crosses lines with those of human, (Bostroom, 2014).

Digital Education: Digital education refers to the use of digital technologies to support and enhance teaching, learning and assessment (UNESCO, 2020). Digital Education which is serial number two (2) of the eight (8) minimum development goals (MDGs) agreed upon by world leaders at UNESCO in the year 2000, is Education. For the avoidance of ambiguity, UNESCO defined education as

A fundamental human right and essential for the exercise of all other human rights. It promotes individual freedom and empowerment, and yields important benefit for societies and economies.

Correspondingly, in 2015, the United Nations General Assembly, in a document; *“Transforming our world, the 2030 Agenda for Sustainable Development”* adopted quality education as goal 4. The goal focuses on ensuring inclusive and equitable education and lifelong learning opportunities for all. For this reason, digital education becomes necessary. The SDSfund at <https://www.sdgfund.org> states under SDG4, that;

Digital education technologies, improve fundamental skills such as collaboration, problem solving and global awareness, equally, training technology can open future job opportunities.

These are types of digital education: Here we shall outline, eight of them. They are:

1. **E-learning:** When digital platforms and tools are employed for online learning the one is engaging in digital education, (Rosenberg, 2021).
2. **Blended Learning:** When there is a combination of online and offline methods in achieving education, the one is engaged in blended learning. (Garrison and Kanuka, 2004).
3. **Mobile-Learning:** Today's learning approach is enhanced by the use of mobile devices, such as mobile phones, tablets and lab-tops. The use of these mobile devices for the purposes of learning education is called mobile learning (Kukulska-Hulme and Traxler, 2005).
4. **Micro Learning:** This is the application of Bite-sized learning using digital platforms (Gaba, 2017).
5. **Virtual learning:** This is classroom without walls, which became globally popular during the covid-19 era. It is the style of accessing learning in virtual environments (Hew & Cheung, 2013).
6. **Flipped Classrooms:** This is a situation where tradition lecture homework format is reversed. (Bergmann & Sams, 2012).
7. **Personalized Learning:** The tailoring learning to individual needs. (National Education Association 2017).
8. **Open Educational Resources (OER):** Freely accessible educational materials (UNESCO).

Overview of the intersection of Philosophy, Artificial Intelligence and Digital Education

Philosophy, AI and digital education are multifaceted areas of study which assume a different status when exploring the business of education. The interconnectedness of philosophy artificial intelligence (AI) and Digital education is significantly a complex and evolving landscape. Each field influences and reshapes the other in multifaceted ways.

Philosophy as that body of natural knowledge which undertakes to give fundamental explanation of all things, provides foundational questions and frameworks for understanding AI and digital education. Correspondingly, artificial intelligence acknowledges drive innovations in digital education and challenges philosophical concepts of learning and cognition. Thus the intersection explores and reshapes the ethical, epistemological and ontological implications of AI-driven education.

Philosophy AI in Education: The following are critical areas of intersection between Philosophy and AI. The issues will be fully discussed under philosophical foundations of education and AI.

1. With reference to the intersection AI challenges the traditional notions of knowledge and learning (Winch, 2017).
2. AI in education raises concerns about bias, fairness and transparency in education (Selwyn, 2019). This is where AI locks horns with philosophical views in ethics. Philosophy plays a critical role in shaping the development and external considerations of AI.

3. Metaphysic and the ontological aspect philosophers explore fundamental questions about consciousness, intelligence and natural of mind, which directly impact the design and implementation of AI systems. “Artificial intelligence crosses the line between human learning and machine learning” (Bostroom, 2014). It is significant to note that there arise questions on what constitutes intelligence and consciousness. There are debates about the potentials of AI to supplement or surpass human capabilities (Bostroom and Thalkashky, 2014)
4. Phenomenology: This aspect of philosophy of education analyses the lived experiences of learning with AI (Handeger, 1953)
5. Critical Theory: This aspect of philosophy critiques the power dynamics and social implications of AI in education (Freire, 1970).

Key philosophical Questions

1. Can AI truly teach? (Searls 1980)
2. Is AI-driven education morally justifiable (Nussbaum, 2010)
3. Does AI-driven education embrace or diminish human learning (Dreyfus 1972)

AI in Digital Education

The Nexus, under reference here examines the intersection of AI in digital education. At this point we focus on personalized learning, intelligent tutoring and on bias and fairness concerns.

Personalized Learning: AI-driven education adapts to individual students needs, abilities and learning styles. These are examples:

1. Adaptive learning platforms like; Dream Box, Curriculum, Associations (Rand Corporation 2018).
2. Learning management systems (LMS) with AI-powered recommendations (e.g. Moodle and blackboard).
3. AI-driven educational games such as: Duolingo and Khan Academy)

Philosophical Foundations of Education and AI

The integration of Artificial Intelligence (AI) in education has sparked off a consternation of very serious disputations amidst philosophers, educators and technologists, such as software engineers and computer scientists. The focus here is to explore the philosophical foundations of AI and education and to take a critical look at the epistemological, ethical and metaphysical consequences of AI-driven education. These issues were skeletally raised above. It time to take indebt critical look at the issues of concern on AI-driven education.

Epistemological Foundations

Epistemology, deriving from two Greek words: episteme and logos means the examination/study of knowledge. The subject matter of epistemology is to study as examine the nature of knowledge. At the intersection under study, epistemological aspect of philosophy, examines the nature of knowledge and further looks at how AI affects learning.

Philosophers like Dewey (1916) and Dreyfus (1972) had put up the argument that AI challenges the traditional knowledge and intelligence. The impact of these scholars’ argument is that ability of Artificial Intelligence to process vast amounts of data and to recognize patterns, evoke series of questions about the nature of knowledge and intelligence.

Ethical Foundations

The issues of bias, fairness and transparency are ethical matters of concern in assessing AI-driven education. In highlighting the risk of AI obviously encouraging and perpetuating

existing biases, inequalities and exclusion, philosophers insist that AI systems should ensure that Transparency, fairness and accountability are secured.

Metaphysical Foundations

By the intersection of philosophy and AI-driven education, Metaphysics explore the interconnection between human and machine learning. Heidegger (1953) and Bandrill and (1994) explored the implications of AI on human existence and identity. These scholars argue that AI-driven education raises issues of concern about the certainty, albeit AI blurred the line between human and machine learning. The resultant concerns are questions about the nature of intelligence and consciousness.

Philosophical Theories and AI-driven Education

Concomitant with the strive in examining and rethinking the intersection of philosophy and AI-driven education, it is beneficial to point out that various philosophical theories inform AI-driven education. These theories are as follows:

Constructivism: It is a truism that AI enhances constructivist approaches to learning, especially, where students construct knowledge through experience (Vygotsky, 1978).

Pragmatism: The philosophical theory of pragmatism emphasizes practical approach and problem-solving character of education. It is notable and desirable that AI-driven education embodies pragmatic principles. (Dewey, 1916).

Critical Pedagogy: With regard to dynamics in global experiences, education and educational approaches tend to become equally dynamic.

For this season, AI-driven education is seen to facilitate or challenge existing power dynamics. In this wise, AI-driven education in one way or another, highlights the need for critical pedagogy. (Freire, 1970).

It is crystal clear that the philosophical foundations of AI-driven education are complex and multifaceted. As educational planners recommend AI-driven educational approach, it is only undeniably necessary that understanding the corresponding philosophical foundations of education in this regard, is crucial. This understanding will underscore the promotion of human flourishing and social justice through education.

AI in Education

As already observed, integration of AI-driven education presents complex and multifaceted challenges, besides the opportunities. It is a welcome development that artificial intelligence (AI) has been introduced to aid in the business of teaching and leaning. The AI-driven education has obviously revolutionized the digital education horizon in various way.

AI-assisted digital education is transforming learning approaches. It is facilitating teachings and teachers-learner interaction statuses. Besides the exploring the benefits, it is also quite auspicious to equally assess both the challenges, the future and prospects of AI-driven education. The following are benefits of AI in digital education.

Benefits of AI-driven Education

1. **Personalized Learning:** According to Baker (2013) AI-powered adaptive learning systems tailor education to individual needs of the learner. Other benefits are
2. Intelligent tutoring system: where AI-based tutors provide one-on-one support and enhancing student outcomes (Vonlehin 2011).

3. Automated grading reduces teacher workload and increases overall teacher efficiency (Williamson, 2017). Nussbawm, 2010) point out that AI-driven education enhance
4. Accessibility through the use of AI-management tools. In this wise students with disabilities enjoy education, thus promoting inclusivity in education.

Challenges and Concerns in AI in Digital Education:

As there are benefits so are there issues of concern and challenges in the adaption of AI-driven education. There exist issues of bias and fairness, digital divide, teacher training and concerns about commercialization.

1. On Bias and fairness, there is the concern that the AI-systems may perpetuate biases and compromising fairness. The system is fixed and flexibility is sacrificed at the alter of generalization, (Oneil, 2016).
2. Due to existing socio-economic inequalities, unequal access to AI-powered education enhances the prevailing disparities, (Selwyn, 2019).
3. There is the challenge of providing continuous training to teachers so as to enable them become executive experts in the use of AI in digital education.
4. With AI system in digital education, education turns out to become commodity for sale, and not everyone can afford it. The moral aspect of it is that value for sale profit now weighs against pedagogy (Peters, 2017).

Future Prospects and Directions:

In critically exploring the challenges of AI in digital education and weighing the fits thereof, the following are seen to be future prospects and direction of the integration.

1. **AI-Powered Learning Analytics:** It is desirable that advanced analytics will optimize learning pathways and outcomes.
2. **Virtual and Argumented Reality:** For the future, it is desirable that immersive experiences will redefine engagement and interaction.
3. **AI-driven teacher support:** By establishment of AI-driven, intelligence systems, it is expected that teacher professional development shall be enhanced.
4. **Rapid Growth of AI and Digital Education:** In critically examining the issue of AI in digital education, it is notable to observe that the globe is witnessing a rapid growth of AI-driven education. This approach is transforming the learning landscape with the speed of a revolution.

Various scholars discuss the fast growth of AI in digital education and it is noticeable in various ways:

1. Advancement for AI technology (Baker, 2013).
2. Increased internet penetration and digital infrastructure (Selwyn, 2019)
3. Education in the demand for online and flexible learning (Peters, 2017).
4. Government initiatives and investments in education technology (Williamson, 2017).

The benefits which drive the rapid growth of AI in digital education had already been noted as; personalized learning experiences, (Winch, 2017) enhanced accessibility and inclusivity and realizing UNESCO, sustainable development goal4 (UNESCO, 2015) and Nussbaum, 2010); Improved learning outcomes and efficiency (Vanlehn, 2011) and increase teacher productivity and support (Biesta, 2015).

Critical Perspectives on AI-Driven Education

While exploring the philosophical foundation, AI and digital education, it was clearly observed that the integration and intersection of those disparate entities has sparked of a consternation of far reaching conversation or disputation among various level of educators, philosophers and technologist. The intense debate centers on the issue that while it is notable that AI-driven education promises personalized learning and efficiency, critical perspectives highlight these serious worry about issues or challenges of bias, agency and social justice.

1. Beyond the worry that AI system can perpetuate existing biases and inequalities (O'Neil, 2016). It also a matter of outcry that biased algorithms and data sets can lead to discriminatory outcomes. There exist more concerns that avoidable educational disparities become enhanced by unguarded use of AI-systems in education (Selwyn, 2019).
2. The critical perspective that saddle the intersection of AI-driven education is the challenge of agency and autonomy where it is possible for over-trusted AI-driven education to undermine a human agency (the teacher) and autonomy of students self-directed learning, (Nussbrom 2010) and (Biesta, 2015).
3. Social Justice: The issue of social justice arises as a matter of grave concern that, AI in digital education can exacerbate existing power dynamics and causing negligence to social justice. Stereotyped data can, be over generalized to economic profit, neglecting achievement based on individual differences, thus treating unequals equally, (Giroux, 2011). In the same vein, there is concern that AI-driven education can perpetuate cultural harmonization and marginalize diverse (individualized) perspectives (Peters, 2017).
4. Surveillance and Control: The application of AI-driven education enables surveillance and control. This action undermines student privacy and autonomy (Williamson, 2017). The AI-driven education can create a culture of constant monitoring and student assessment.
5. Commercialization of Education: Due to the technology and machine systems attached to AI-driven education, teaching and learning now become commodity for profit over educational values and human flourishing (Selwyn, 2019).

Deconstructing the Nexus: Tensions and Complexities

Having explored the integration of philosophy, artificial intelligence (AI) and digital education, it is notable that the convergence has sparked of a multifaceted intense debate on the tensions and complexities that arise on the educational landscape. The task here therefore is to deconstruct the nexus of these disparate disciplines, philosophy, AI and digital education. In the deconstruction an examination of three critical dimensions: the human AI intersection and agency, power dynamics and control and the ontological implications of AI-driven education is undertaken.

1. **Human-AI Intersection and Agency:** The synthesis of artificial intelligence and digital education raises fundamental question about corporate interests and human agency (Biesta, 2015). As corporate interest influences and drives AI systems, pedagogy by the teacher is relegated to the background and the commercial interest associated with the AI technology systems subdue the value for educational values in place of the human teacher and pedagogy. Furthermore, AI systems mediate increasingly educational learning experiences. Human choices of the individual learners are often generalized, and neglected, negated, thus infringing on the autonomy of the learner. This

experience raises fundamental concerns in the integration (Heidegger, 1977) and Agency (Selwyn, 2019).

2. **Power Dynamics and Control:** Educational agencies, governments and technological industries wield a lot of power control, including surveillance with regard to contents and values in the business of education. (Williamson, 2017) and with regard algorithm bias O'Neil, (2016) are authorities in this area. Critical pedagogy theorists like Freire (1970) and Giroux (2011) highlight the importance of challenging dominant power structures.
3. **Ontological Implication:** There exist profound concerns over the ontological implications of AI-driven education. The integration seem to reconfigure traditional notions of knowledge (Deleuze, 1992) to the degree that these are concerns about clear distinction between human identity and machine intelligence

Summary

This paper set forth to critically analyze the intersection of philosophy, artificial intelligence (AI) and digital education. In the critical analysis an examination of the philosophical foundation of AI-driven education was made. The critical analysis highlighted the tensions and complexities between human and mechanism. The paper identified main areas of worry or concern in the application of artificial intelligence systems (AI) in digital education.

The identified key challenges in AI-driven education are the issues of bias, agency, social justice, surveillance and commercialization, critical perspectives raised by philosophers such as Foucault, Heidegger, Freire, Peters and Williamson significantly informed the analysis.

Conclusions

The convergence between the three disparate areas of philosophy, artificial intelligence (AI) and digital education, requires a critical introspection. Given that the desire for the integration of three subject areas is principally to achieve inclusive, seamless, balanced and comprehensive education for all, (as in UNESCO 2015, sustainable development goals (SDG) agenda number four) it is of utmost importance that the merger should be scrutinized. For this reason, it is imperative that the following issues of concern in the integration should be taken into consideration. They are:

1. Bias and fairness concerns;
2. The challenge of human agency and autonomy in AI-driven education;
3. There is need to ensure the promotion of social justice and cultural diversity in educational technologies, thus checkmating individual marginalization and over generalization by the human machine;
4. There is need to ensure transparency and accountability in AI decision-making, and
5. There is need to be wary of commodification and commercialization of education due to AI-technology systems and neglecting pedagogical values of education.

Recommendations

Having critically surveyed and analyzed the nexus of philosophy, AI and digital education and come to the above conclusions on issues to be address, these recommendations are put forth to maintain reliable AI-driven education:

1. It is needful to develop and sustain an inclusive AI development teams of worth,
2. There is need to implement bias reducing algorithms in AI-driven education
3. There is need to facilitate digital literacy at all levels of educational system.
4. There is every need to establish AI ethics frameworks
5. The establishment of continuous teacher training and support in professional development is very important, for sustainable development through the educational system.

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