Artificial Intelligence as a Means of Instructional Approaches for Effective Curriculum Delivery in Higher Education in Nigeria

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ABSTRACT

The integration of artificial intelligence (AI) Instructional Approaches for curriculum delivery in higher education in Nigeria has emerged as a transformative opportunity for enhancing effective curriculum delivery. As these institutions face challenges such as limited resources, varying educational standards, and the need for personalized learning experiences, AI offers innovative solutions that can drive efficiency and improve educational outcomes. The application of AI in Nigerian tertiary institutions presents an opportunity to revolutionize curriculum implementation and evaluation. By fostering innovative educational practices, enhancing personalized learning, and leveraging data-driven decision-making, AI can help create a more effective and responsive educational system. Successfully using AI in education requires careful curriculum planning, development and delivery, teacher training, good infrastructure, AI instructional approaches and constant evaluation. Higher education institutions need to set clear goals for how they want to use AI instructional approaches during curriculum delivery, whether it's for improving personalized learning, making curriculum administrative tasks more efficient or engaging students better. Embracing this technology not only improves academic outcomes but also prepares graduates for the increasingly complex demands of the modern workforce. As institutions navigate this transformative journey, it is essential to prioritize training for educators and stakeholders to ensure successful AI instructional approaches for effective curriculum delivery in Higher institutions of learning

Keywords: Artificial Intelligence, Higher Education, AI Instructional Approaches, Curriculum Delivery Nigeria

INTRODUCTION

As Nigeria's educational landscape evolves, the integration of technology has become paramount in enhancing curriculum delivery. Among the emerging technologies, Artificial Intelligence (AI) stands out as a transformative tool that can significantly improve instructional approaches in Nigerian tertiary institutions. (AI) technologies including machine learning, natural language processing, intelligent tutoring systems, automated assessment tools, and administrative analytics have demonstrated capacity to enhance pedagogical effectiveness, streamline institutional administration, and expand research capabilities in universities worldwide (Luckin., Holmes, Griffiths, And Forcier, 2016). Nigerian tertiary institutions, which educate hundreds of thousands of undergraduates and postgraduates annually, face mounting pressure to modernize teaching and learning, improve graduate employability, and increase operational efficiency. Yet the trajectory and tempo of AI adoption in Nigeria are shaped by contextual realities: uneven internet access, low household computer ownership, nascent national AI policy alignment, and institutional resource constraints. Recent national level initiatives (e.g., Nigeria’s National AI Strategy) and regulatory guidance on e-learning signal momentum towards planned adoption, but significant gaps remain between policy intent and institutional capacity

Definitions

There is no universal accepted and adopted definition of AI, however, Council of Europe’s Ad hoc Committee on Artificial Intelligence (CAHAI) defines AI systems as follows:

"AI systems are algorithmic models that carry out cognitive or perceptual functions in the world that were previously reserved for thinking, judging, and reasoning human beings." (Leslie et al. 2021: 8)

UNICEF and Organisation for Economic Co-operation and Development (OECD) also gave the definition as:

"AI refers to machine-based systems that can, given a set of human-defined objectives, make predictions, recommendations, or decisions that influence real or virtual environments. (UNICEF 2021: 16)"

Global evidence on Artificial Intelligence in higher education

Internationally, studies document multiple AI use-cases in universities: adaptive learning platforms that personalize content and pace; automated grading and feedback systems that reduce instructor workload; intelligent chatbots for student support; plagiarism detection and proctoring systems for assessment integrity; and administrative analytics for enrollment, retention, and resource allocation (Luckin,.,Holmes., Griffiths. And Forcier, 2016; Prinsloo & Slade, 2020). Evidence suggests AI can improve learning outcomes when integrated thoughtfully with pedagogical design and human oversight.

Artificial Intelligence in Nigerian higher education:

A growing body of Nigerian scholarship and policy attention documents early-stage AI awareness and pilot implementations across universities (Ejeh and Igbokwe, 2025). Studies report enthusiasm among academics for AI's potential in research and instructional support, but highlight pervasive barriers: limited ICT infrastructure, inconsistent internet connectivity, insufficient digital literacy among staff and students, funding shortfalls, and the absence of comprehensive regulatory frameworks to address ethics, data privacy, and academic integrity (Adediran, 2024; Peni, 2024). National-level responses include a National AI Strategy and NUC guidance for e-learning that explicitly mentions AI-assisted assessment and the need to guard against malpractice a recognition that AI both enables innovations and complicates traditional academic integrity frameworks.

The Role of Artificial Intelligence AI in Nigerian Tertiary Institutions

The integration of AI in education has gained significant momentum over the past few years, driven by advancements in machine learning, natural language processing, and data analytics Educational institutions are increasingly leveraging AI technologies to create personalized learning environments, automate administrative tasks, and provide adaptive learning experiences tailored to individual student needs. As AI continues to evolve, its potential to reshape the educational landscape becomes increasingly evident.

1. **Personalized Learning Environments**: One of the most significant contributions of AI in education is the development of personalized learning environments. AI-driven platforms analyse students' learning patterns, strengths, and weaknesses, allowing educators to tailor instruction to individual needs. For example, a study by Holmes et al. (2022) demonstrated that an AI-based adaptive learning system improved student engagement and performance by offering personalized content and assessments.

2. **Intelligent Tutoring Systems (ITS):** Intelligent Tutoring Systems leverage AI algorithms to provide immediate feedback and support to learners. These systems simulate one-on-one tutoring experiences, adapting to students' learning styles and pacing. Research by Miao et al. (2023) highlighted the effectiveness of ITS in enhancing mathematics learning, showing significant improvements in students' problem-solving skills and conceptual understanding.

3. **Automated Administrative Tasks:** AI technologies are also streamlining administrative tasks in educational institutions. Automated systems can handle scheduling, grading, and resource allocation, allowing educators to focus more on teaching. A recent study by Zhao et al (2023) found that AI-driven administrative tools reduced workload for teachers by up to 30%, enabling them to devote more time to student interactions and personalized support.

4. **AI in Assessment and Feedback**: AI is transforming assessment practices by enabling real-time feedback and formative assessments. Tools utilizing natural language processing can analyse students'

written responses, providing immediate insights into their understanding. In a study conducted by Williamson et al. (2024), AI-based assessment tools demonstrated enhanced accuracy in grading compared to traditional methods, leading to more reliable and timely feedback for students.

5. **Enhancing Engagement through Gamification**: AI technologies are facilitating gamification in education, making learning more engaging and interactive. AI-driven platforms can create adaptive learning games that adjust difficulty levels based on student performance. Research by Holmes et al (2021) highlighted how gamified learning experiences powered by AI led to higher student motivation and improved learning outcomes in STEM subjects.

Effective use of AI in education

Successfully using AI in education requires careful curriculum planning, development and implementation/ delivery, teacher training, good infrastructure and constant evaluation. Higher education institutions need to set clear goals for how they want to use AI, whether it's for improving personalized learning, making administrative tasks more efficient or engaging students better. By setting measurable objectives and aligning them with the school's mission, administrators can ensure that AI initiatives are purposeful and focused.

Investing in teacher training and professional development is essential. Teachers need to learn how to use AI tools effectively and understand how AI can enhance traditional teaching methods. As AI is constantly evolving, it is essential that teachers stay updated with the latest AI advancements and teaching strategies through ongoing professional development programs.

Schools must have the right technology in place to support AI. Schools should also use flexible AI platforms that can grow and adapt to changing needs. Regular evaluation and feedback from students and teachers are crucial for assessing the impact of AI and making necessary improvements, ensuring that AI tools enhance the educational experience for everyone

Curriculum Delivery

Curriculum delivery entails putting in to practice the official blueprint that has been planned and developed by potential adopting units. Curriculum delivery is the actual carrying out of government policies and changes spelt out in prescribed courses of study, syllabuses and subjects in to classroom situation. It is one of the curriculum processes that are carried out in practical form. Here, the focus is on the teachers who are the main implementers, although there are external agencies who are involved in the implementation process. Curriculum delivery simply refers to how the officially designed course of study is translated by the teacher in to syllabuses, scheme of work and lessons to be delivered to students. (Pearson & Gallagher, 1983).,

AI Instructional Approach for Effective Curriculum Delivery

There are various strategies, and techniques for teaching. The use of a variety of instructional methods is necessary for effective and efficient curriculum delivery in tertiary institutions. A competent, professional as well as an efficient teacher should therefore always device different ways of facilitating the process of learning. The way a teacher presents the subject matter will make students like or dislike the subject. Appropriate methods of teaching are very vital for curriculum to be productive. The instructional approach that a teacher uses has potentials of promoting or hindering learning. (Yunusa,2008).

Effective AI Instructional approaches for proper curriculum delivery requires the use of different instructional approaches to enhance the skills and competencies of teachers. This includes the exploration of multiple perspectives by using the following participative and creative approaches (Irish Aid, 2017).

Voice and pitch management as a means of AI Instructional approach for effective curriculum delivery

One of the prominent features in online teaching is the voice of the teacher. Literature shows that effective communication between students and teachers is very important. Keeping voice pitch high and practicing vocal functioning like pauses, intensity variation is essential.

In traditional class teaching, body language, eye contact, and physical gestures are significant teaching tools. However, in online teaching, teachers should focus more on their voice and vocal functions. A recent study suggests that speaking gently (logical presentations of facts) is beneficial for students. It helps students in writing essential lecture points (Bao, 2020). It can be suggested here that universities should give training to their faculty members. Teachers should know about importance of maintaining slow voice and practicing vocal functions through logical presentations of facts. This will ensure effective learning for students during online teaching.

Formulating teaching strategies to enhance curriculum delivery

Greater interactivity in online course using AI Instructional approaches will enhance the overall online class success rate. Literature depicts that more student and teacher discussion can result in higher interactivity (Townsend et al., 2002). Online class participation can be one way of enhancing student involvement in lecture. Moreover, discussing case studies and asking questions can result in higher student involvement (Smith & Diaz, 2004). Thus, universities should arrange meetings with their colleagues. Through these meetings, devise them methods to develop more interactive online classes using AI Instructional approaches. Practicing these methods will encourage student presence and improve learning abilities. Teachers should prepare lectures beforehand and share case studies and questions with students via AI Instructional approaches.

Developing student learning abilities in online classes for proper curriculum delivery

AI technologies, such as adaptive learning systems, offer personalized educational experiences. By analyzing individual student performance and learning styles, these systems can create customized learning pathways that cater to diverse student needs. This individualized approach can lead to improved academic outcomes, as students engage with content that resonates with their learning preferences. Adaptive learning systems are completely different from the traditional in-class lectures. In traditional in-class lecturers, feels more control over student behavior. To deal with this concern, study shows that lecturers should devise different activities. Such activities which can enhance student learning skills. (Bao, 2020). Moreover, lecturers should ask challenging questions from students during online classes (Smith & Diaz, 2004). These practices will help in establishing better learning abilities for students. Moreover, these approaches will ensure that students are more focused in classes. Besides these, getting feedback from students about these adaptive learning systems can enhance the capacity of curriculum delivery in higher institutions of learning in Nigeria.

Teaching unit think critically, practically, and creatively for curriculum delivery

The instructional approach is very vital in any teaching and learning situation. Teachers need to learn how to use AI tools effectively and understand how AI can enhance traditional teaching methods. As AI is constantly evolving, it is essential that teachers stay updated with the latest AI advancements and teaching strategies through ongoing professional development programs. However, teaching staff should devise learning material, which is more creative. In other words, student should be expose to curriculum content with more innovative and practical work. Study shows that development of critically analyzing learning materials is difficult in traditional teaching method. Furthermore, thinking out of the box abilities is difficult task in traditional class settings (Persky & Pollack, 2010). However, in online classes, staff can assign individuals with real world case study. Then, they can ask students to give their ideas and opinions. This will help in developing student abilities and enhancing online study success rate, thereby adequately harnessing AI Instructional approaches for proper curriculum delivery in our tertiary institutions.

Proper curriculum delivery through AI flexible teaching and assessment policies

Due to lack of high-speed Internet connectivity in some areas of developing countries, students are unable to run with the pace of online lectures in higher institutions of learning. Students are unable to perform assignment submissions and even accessing lecture recording. A student only gets access to lecture recording through his uncle. His uncle lives at 2-hr drive where he downloads lecture and then bring it to him every week (Bao, 2020). To deal with such issues, teacher should show flexibility and give extra time to students. This will help students in easy submissions of assessments. Universities should train teacher not to put pressure on students. Instead, teachers should give students full support. This support can be in accessing online lectures and submitting

assignments using AI Instructional approaches.

This article established AI Instructional approaches for online teaching and learning that can aid effective curriculum delivery if practiced by higher educational institutes. These approaches will facilitate in delivering online education effectively. The case study was developed through analysis of developing countries universities, polytechnics and colleges of education online education. First, teachers should maintain slow voice speech and practice vocal functions. Second, teachers should develop interactive online classes and share class materials. Third, Higher Education Commission should make collaborations with telecommunication industries to overcome Internet-related issues. Fourth and fifth, teachers should enhance students learning abilities and get their feedback. Sixth, teachers should think more critically, practically, and creatively. Seventh, teachers should offer flexible teaching and assessment policies. Other includes setting up backup plans, transforming a large-class lecture course to some smaller modules, recording online lectures, and allocating teaching assistants.

Moreover, this article is a tool to help higher educational institutes to run online classes smoothly. This study particularly focuses on developing countries like Nigeria. It helps developing countries in implementing and preparing strategies for remote learning. This study can help in a successful online teaching migration during outbreaks like COVID-19.

CONCLUSION

Artificial Intelligence presents a unique opportunity for Nigerian tertiary institutions to enhance curriculum delivery effectively. By leveraging AI's capabilities, these institutions can provide personalized, engaging, and efficient educational experiences. As Nigeria embraces the digital age, the strategic implementation of AI Instructional approaches can play a critical role in shaping a more effective and adaptive educational landscape, ultimately preparing students for a competitive global workforce.

RECOMMENDATIONS

To harness the potential of AI Instructional approaches for effective curriculum delivery in tertiary institutions of learning in Nigerian, educators and policymakers should consider the following recommendations:

1. Develop a comprehensive AI education policy framework that integrates AI into curriculum development, teacher training, and educational infrastructure.

2. Promote partnerships between government agencies, educational institutions, and technology providers to facilitate the adoption and implementation of AI-driven educational solutions.

3. Invest in digital infrastructure, including internet connectivity and computer laboratories, to ensure equitable access to AI technologies across urban and rural areas.

4. Prioritize data privacy and security measures to safeguard student information and foster trust in AI-powered educational systems.

5. Invest in Professional Development: Equip educators with the skills and knowledge necessary to implement AI Instructional approaches effective curriculum delivery.

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