

Knowledge Societies:

Artificial Intelligence and the Media



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CHAPTER 9



IMPERATIVES OF ARTIFICIAL INTELLIGENCE (AI) FOR 21ST-CENTURY SMART UNIVERSITIES IN NIGERIA

Adebola Adewunmi Aderibigbe



Introduction

Artificial intelligence (AI), a subfield of computer science, is difficult to define, as advancement in science and the numerous applications are too wide to pin down to one definition. It is the body of science, algorithm and machines that are able to perform some versions of learning and independent problem-solving based on advanced software and hardware components. IHC (2018) referred to AI as the intelligence demonstrated by machines or software, made possible by a number of technical process designed to solve a wide range of problem. Artificial intelligence was coined by John McCarthy in 1956 as a branch of computer science concerned with making computers behave like humans. It is the study of computation that makes it possible to perceive, reason and act (Pannu, 2015).

Various areas of artificial intelligence have been applied to education, medicine (through computer-assisted diagnosis for scan), business, transportation, agriculture, household security, military and defence, and engineering, among others. It has been deployed to advance the natural operations of communities all over the world, including education communities, particularly the university. Following the 2020 COVID-19 national lockdown that brought about major disruption to the activities of primary, secondary and

tertiary institutions; this paper posits that the consideration of artificial intelligence in the processes of the university in particular may help to ensure unbroken operations of Nigerian universities.

A smart university has been used loosely to describe an academic environment that embeds technology in education at the tertiary level. As a result of the technological realities of the twenty-first century, a university can no longer operate with the traditional orientation, whether from administrative or academic angles. The reality of the increasingly shrinking globe made possible by advanced technology continues to redefine what we are used to across many frontiers. Therefore, it is imperative for universities to be smart. The COVID-19 pandemic has shown that the current way Nigerian universities are run may not be sustainable in the face of continuous disruptions happening all over the world. Therefore, there has to be a deliberate discontent with the traditional way of doing things, leading to a transition, maybe gradually, to smart university operations.

In recent years, the number of people seeking access to formal education has increased. In Nigeria, there is a growing number of the country's population seeking university education, with many factors inhibiting them. These factors range from inadequate carrying capacity of the universities to cost of private universities for the lower middle class. The problem of carrying capacity of the country's government-owned tertiary institutions continually poses a huge challenge to access. This is because of the surge in the number of vibrant young Nigerians. According to O'Neil (2021) as of 2019, Nigeria, with a population of 200,000,000, had 43.69% of its population in the age bracket of 0-14 years. This figure has attendant implication for access to education considering the growing demand for tertiary education in the country.

Following the COVID-19 pandemic, the world is beginning to realize that technology is a strong determinant of success in the future of education. Some Nigerian universities could not cope under the COVID-19 national lockdown, as their operations had been dependent on interpersonal interactions amongst learners and faculties. Some were however able to navigate the lockdown easily with the help of modern trends in technology. This shows that, in view of the unpredictable nature of the global climate, the use of technology, factored into the general operations of universities, by policy, is the way to go.

This paper proposes few thesis statements that will be discussed to show that many universities in Nigeria may not be ready for the future of tertiary education. The future of tertiary education after the COVID-19 pandemic is the education delivered without borders. The reliance on interpersonal engagement for teaching, for learning and for administration is gradually being replaced by hybrid engagement involving technology. The following thesis statements are advanced to justify the need for artificial intelligence in the operations of universities in Nigeria:

- i. Artificial intelligence will facilitate knowledge-based system for governance - where space and time will not be a factor for performance and excellence.
- ii. Artificial intelligence will facilitate a learner-friendly academic environment where students are trained at their own pace.
- iii. Artificial intelligence will break the doors of university libraries and assist in making the materials in the library active rather than passive.
- iv. Artificial intelligence will assist the human resources units of Nigerian universities to be more analytical and predictive, rather than being responsive.
- v. Artificial intelligence will improve the security of lives and property within a university.

Artificial intelligence will facilitate knowledge-based system for governance - where space and time will not be a factor for performance and excellence.

Many universities in Nigeria today adhere strictly to the model inherited from the United Kingdom, which confers power on the highest hierarchy. Conferring powers on management is not the problem; the issue is waiting for management to give feedback. In organizational communication, feedback, especially from the head, is a determinant of how efficiently and fast the processes of that organization are sustained. Let us assume that there are submissions of requests, say from the colleges, faculties and directorates on the table of the vice-chancellor of a university, and the vice-chancellor and his management team have made a trip abroad on a strategic partnership for the

university. Artificial intelligence can be used to drive the management process to the point where, on the go, the management team is able to attend to management matters and communicate decisions to constituent units without being physically present in the university. This is affordable, effective and less cumbersome.

Similarly, a management member can, from anywhere in the world, give speeches and participate in the activities of the university without necessarily being compelled to send a representative. In some universities, the absence of a management team member puts a halt to the activities of that office. By the very nature of university operations, a university should run uninhibited and must be able to supply power to all its units through communication and prompt feedback. To what extent can a senate meeting hold without converging on a senate building? To what extent can a congregation meeting hold without being physically present in a hall? To what extent can council make decisions without council members travelling to the university? These are factors that impinge on the speed at which feedback is obtained for efficient running of a university. And because no one is able to ascertain or predict the extent of future disruption like what was experienced during the COVID-19 lockdown, it is important to rely on technology to bind the university operations in such a way that the business of the university will become unbroken and the calendar of the university will not be revisited for continued adjustments. Artificial intelligence holds enormous powers and possibilities to make this happen.

Artificial intelligence will facilitate a learner-friendly academic environment where students are trained at their own pace.

A well-positioned university is a laboratory of the community or society from where innovations emerge to cure community or societal ills. In the case of Nigeria, this may not totally be the case. This is because of the paucity of funds for the universities. These universities today may not be smart enough. A smart university is one where all the infrastructures interact. Artificial intelligence can make this possible. The twenty-first century learning environment should encourage adaptive learning (Alam and Kendall, 2018) (AL) rather than assumptive group learning (AGL). Adaptive learning is a method of education that leverages specific computer algorithms to tailor the educational strategy to each student's need (AbuAlnaaj Ahmed and Saboor, 2020). The AL addresses the needs and speed of individual learners, adapting to the style and pace of learning for each student, as against the traditional method that disregards the individual needs of learners. This can only happen in classroom environment

that deploys AI. In a smart classroom session on mathematics for instance, it is not assumed that all the participants are of equal cognitive competence. The classroom is time-bound for the teacher, but it holds a continuous session for the students, factoring in animations and other hybrid forms of learning to augment the understanding of the students.

A smart classroom is not locked. It can be easily moved around on phones and tablets and the interaction revisited from time to time. Problem-solving in a smart classroom is not and should not be limited to submission of test and assignment. A smart classroom must encourage students to come up with applicable problems and must confer on them the power to come to the centre of discussion and alternative responsibilities and roles of class leadership, with the lecturer or facilitator merely observing and regulating the class activities. It must, however, be of a controlled number of participants to be effective. In addition, such a classroom should be able to converge on the web, where there are relevant tools for enhanced and deeper learning. For instance, if a learner wishes to gain a deeper understanding of a concept outside the classroom interaction, a smart classroom will be able to locate a video or visible teaching in related areas on the Internet for viewing.

Artificial intelligence will break the doors of university libraries and assist in making the materials in the library active rather than passive.

The library, in any university is a pivotal knowledge hub, considering the traditional design for a library to operate. Today, the university library in the face of technology is a complement. The role of artificial intelligence in library operations or what some people term as smart libraries has been abundantly discussed in the literature. The features of intelligent management of the library have been identified by Yu, Gong, Sun, and Jiang, (2019:709) as an intelligent warehousing management with three characteristics as follows:

(1) realize the self-service management of the book library with the goal of automatic book circulation and paper document management; (2) the books can be stored randomly on the bookshelf, no need for the book number, reducing the multifarious bookshelf arrangement; (3) Introduce a robot system to realize the management of automatic and unmanned counting, checking and sorting of book storage.

There are many universities in Nigeria today that will serve their purposes better than they currently do only if AI is deployed into the library operations. AI will bring about what is called Self-services in the library. It has also been noted by Yu, Gong, Sun, and Jiang, (2019:710) that:

The technology of library self-service application service is relatively mature, and the forms and contents of services are also rich and diverse. The main representatives are: Self-service seat management system, self-service library ATM, self-service print copy management, lecture training appointment management system, etc. Self-service applications have the following advantages over traditional application services: (1) Break through the space-time boundary with artificial intelligence to realize instant service in no-show; (2) Extend the service form of library services and expand the scope of service targets, thereby reducing the logistics and labor costs of library services; (3) Enhance the user's willingness to participate and protect the service application privacy of reader users; (4) Promote the rational allocation of service resources and reduce the probability of service errors caused by manual services.

Artificial intelligence will assist the human resources unit of universities to be more analytical and predictive rather than being responsive.

The human resources (HR) of any university is a crucial venue for a large amount of data on the human capital of that university. First-rate universities hold such data with a high level of professionalism. Many Nigerian universities are yet to come to value the need to recruit professionals in the HR department. What obtains in many universities is rotational distribution of administrative staff to all the arms of the registry with the intention of making them study all aspects of the registry department before they attain the director's cadre. While this is good, a department like HR should be given to specialists to manage. The HR job today continually yearns for information technology (IT) solutions. Some of the issues in HR are recruitment, skills management, turnover, human

resources development and attrition. These issues approached independently come with a lot of demands. A university with staff strength of over five thousand cannot rely on Microsoft Excel alone to handle the delicate nature of human capital management and its dynamics. Some IT solutions for HR issues are artificial intelligence algorithm, machine learning, neural network mining, big data, data warehouse, enterprise resource planning software, frameworks or websites and many other analysis methods. According to Berhil, Benlahmar and Labani, (2020), some of the artificial intelligence algorithms used today are Decision Tree, Random Forest, Multi-layer Perception and Logistics Regression. These software applications help to save time as they help to offer deep analysis and problem-solving in HR-related issues.

One of the ways by which a traditional university is identified is the use of paper. Apart from cost, papers, by their nature, are to be moved by hand. This is why there has to be clerical officers who will move administrative papers vertically or horizontally. The physical movement of any paper, depending on the size of the organization, is reliant on time factor. There are many other uses for which papers are subjected in a university. For instance, papers are used for registration, for continuous assessment, and for examination. With the increasing subscription for universities in Nigeria, space for safekeeping of confidential papers and the associated risks of arson and theft of vital documents continually malign the accountability of the universities. These same materials could be safely kept by machines, and AI could be used to reach them whenever the need arises.

Artificial intelligence will improve security of lives and property within a university.

Security is an important environmental demand of a university. In fact, it is one of the considerations for parents, particularly in private universities. The security network of a university must be strong because of security-related matters. Universities usually spend huge sums of money on security because of the demands of the patrons. The hostels in a private university, for instance, is one of the most sensitive areas needing strong security network to avoid cases of kidnapping, rape, theft, bully or arson. There is an array of artificial intelligence tools that can serve as complement to the human security presence in the hostel. Notable among them are facial recognition, fingerprint authentication and student behavioural pattern learning. In a model drawn by

Rajkumar and Sundai (2018:232) the following was proposed:

Hostel management system enhances security of the students. Student's daily attendance is maintained by biometric system. Student's attendance status alerts can be sent through SMS to parents. The absentees report was very useful for the pre-calculation of food preparation. This system provides an easy process for monitoring hostel student's activities by the warden. In the proposed model, two biometric devices are placed in the warden room and watchman room at the main gate. The student must place their fingerprints in both of these devices. This technique increases the protection of the outlets and used to collect the exit time and date of the students.

There are many other physical security concerns that AI is capable of addressing within the university environment. The use depends largely on the economy of the university and the willingness to risk trial and adoption of AI. Artificial intelligence video analytics through video surveillance of university facilities can help solve the problem of insecurity once and for all. Video surveillance provides intelligent monitoring of the environment and this serves as a powerful complement to the uniformed security men. Nigerian universities are usually big. They constantly battle encroachment from the host communities, many of whom come into the university to farm or transact business. Video surveillance helps to monitor movement and alert the university, of impending danger. Video analytics works with software installed on computers; with the help of relevant data, intelligent surveillance becomes easy.

Some challenges that might confront the adoption of AI in Nigerian universities

A lot of careful planning has to precede the adoption of AI. The university must sit to consider the cost and be willing to confront the challenges on the way of adopting AI for administrative and academic matters. One of the challenges that may confront the adoption of AI technologies is that they are complex to build and require experts, who are in short supply in Nigeria. The challenge of

expertise can be resolved over time, especially when there is administrative will. The moment a university knows it needs AI, it should make deliberate effort to train staff in the Computer Science, Engineering, Physics or Mathematics programme, who may be sent abroad to get the required skills. Such a staff should be made to show commitment upon return in order not to be lost to other universities through premium wage or other promises. There is an initiative in Kigali, Rwanda referred to as the African Masters of Machine Intelligence (AMMI) launched in 2019 in partnership with Google and Facebook and committed to providing state of the art research exposure to African students within Africa. Universities in Nigeria can leverage this to increase capacity.

As Okoroma (2007) puts it, the National Universities Commission (NUC) is one of the agencies of the Federal Ministry of Education empowered by law to maintain minimum academic standards in Nigerian universities and carry out accreditation functions. Discussions on the inclusion of AI in university processes must begin at this level. International organizations like the United Nations Educational, Scientific and Cultural Organization (UNESCO) must begin to dialogue with the NUC through the Federal Ministry of Education in this regard. Universities that are willing to adopt this should initiate discussions with the NUC. This is because, when AI is considered for teaching and assessment of students, the accreditation of universities will be affected, as AI may tamper with the existing templates familiar to the NUC.

Another possible challenge for the adoption of AI technologies is resistance borne out of the fear that AI may take the jobs that humans do. This challenge has to be properly managed because definitely the adoption of AI will open up a number of redundancies in places where manual operations have been solely relied upon. But, this will take time and will not take effect immediately. Rather than resort to laying off workers, a lot can be done to reskill people for value addition in other areas of the university that yearn for human competence.

Conclusion and Recommendations

This paper has attempted to discuss the imperatives of AI technologies for universities in Nigeria. This was done using thesis statements for discussions. These statements were then discussed using some realities within the context of discussion. From the discussion, it is clear that Nigerian universities have a lot to do before AI can become an integral part of their academic and administrative operations. The paper recommended a gradual adoption of AI

technologies because of cost and the fear that AI will replace human jobs. The UNESCO's Internet Universality ROAM-X principles offer a guide for fair and equitable adoption of AI technologies even for universities. The ROAM-X prism posits that digital development should be aligned with human rights, openness, accessibility and multi-stakeholder governance to guide the ensemble of values, norms, policies, regulations, codes and ethics that govern the development and use of AI (UNESCO, 2019).

Human Rights and AI in Universities in Nigeria

For a university to have good basis for adoption of AI, there must be a firm legal document on all the areas of AI application in the university. This should take care of issues of right to freedom of expression, right to privacy, and right to equality and participation in public life. This should also attempt to draw some limits to what learners and teachers are able to do within a good legal boundary, especially when engaging themselves and the external public through AI.

Openness in AI: Data, Markets and Opportunities

The matter of openness is a huge subject for a university. There are journal outlets that are still close access. Close access journals are journals that one pays for before being allowed to access them. This brings to question a number of issues around this sort of practice, especially in a data-driven society. If libraries will be open and accessible anywhere students are, a lot more has to be done to make knowledge open to them. The question that comes to mind here are copyright issues that may arise from unethical conducts that may stem from plagiarism. Again, AI can be used to address matters like this. Plagiarism thrives when stolen information is not visible on the web. AI has the capacity, using complex algorithms, to identify already published but plagiarized material. University policies should address these and other matters.

Inclusive Access for AI development

One of the vital features of a smart university is the willingness to accommodate language diversity as a tool for education. Artificial intelligence can help to advance access of foreign students to Nigerian universities if there are tools that help make foreign languages intelligible. This can only happen where there is willingness to create a databank of language features from

where AI can navigate and interpret. The physically challenged persons can also benefit greatly from AI. With AI, sight should no longer be an impediment for inclusive education in Africa.

Multi-stakeholder Approach for AI Governance

For decision-making, especially at the early stage of adoption of AI, universities must consider a wide level multi-stakeholder approach. Private and public companies, students, staff, employers of labour, among others, should be brought on board before decision is made on AI adoption. These stakeholders will help to shape the realities and help broaden the scope of reasoning and contents. For students, universities should not prioritize academically strong students alone, as students across all levels of academic performance have something significant to contribute where the atmosphere is friendly for them to ventilate their ideas.

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