CHAPTER TWENTY

APPLICATION OF ARTIFICIAL INTELLIGENCE IN THE LEARNING AND PRACTICE OF JOURNALISM IN NIGERIA

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Introduction

The mass media and their operations, including the teaching and practice of journalism the world over, are getting sophisticated daily due to technological advancement and developments (Guanah, 2019). A school of thought may argue that there can never be any electronic shortcut to disseminate news and information that will displace the journalist because reporters and editors will always be needed to blend thousands of bits of information to create a package people will read, enjoy and understand, yet recent technological developments say the contrary as it is evident with Artificial Intelligence (AI). Artificial Intelligence is now applied to almost all aspects of human endeavour, including journalism, and it is playing an increasingly major role in modern society. According to Guanah (2021), AI brings about better and faster service delivery and more efficient ways of work performance that are mostly cheaper to execute, apart from labour-saving. Guanah, Obi & Ginikachukwu (2020) noted that the emergence of Artificial Intelligence (AI) is gradually having effects in most facets of the society and no area tends to be exempted from this AI bug; "all these indicate that AI has the potential to cause significant disruptions to many hitherto known and established ways of doing things all over the world, including Nigeria" (p. 46).

Clearly, AI has also introduced a paradigm shift in the learning and practice processes of journalism where it is now being used to speed up research, gather and disseminate information, cross-reference data, and boost quality outcomes by enhancing the journalistic process.AI is also being used to summarise complicated write-ups into bite-sized content for social media and to create short videos from text in seconds or collect information from various sources. The co-founder of Narrative Science predicts that up to 90% of articles will be written by AI within 15 years (Hall, 2018). AI has the ability to deepen news coverage and personalise it for individual or group of readers or viewers. The adaptation of AI in journalism is sometimes referred to as "automated journalism." This is a situation whereby, with little or no human input after programming, algorithmic processes and convert data into narrative news texts.

Some AIs can even write and broadcast news independent of the human journalist, and also improve the quality of news. Hence, Guanah, Agbanu & Obi (2020) argue that "just as the advent of AI has impact on various sectors of the society, it also affects journalism practice in numerous ways, especially now that journalists can use AI-generated smart templates to gather and disseminate news reports easily on various issues" (p. 699). When there is clean, accurate and structured data for AI to process, it can generate routine news stories for repetitive topics.

Hitherto, it may be compulsory for a news reporter to be physically present to cover a news event, sometimes at the risks of his life, but today, with AI-powered drones, a reporter can even cover a war situation while not being present at the theatre of war. This agrees with Ladi Ojora`s assertion that, "True Artificial Intelligence is the empowerment of computer systems with the ability to independently learn and make decisions exclusively of the programmer or system that created it" (as cited in Ndiomewese, 2017, p.2). The advent of the AI technology is causing disruptions, both positively and negatively, in all aspects of human life, including journalism studies and practice. Though it has the propensity to displace people from their jobs, yet it enhances efficiency. Majority

of the journalism training schools and media houses in Nigeria are yet to fully inculcate AI into their operations (Guanah *et al*, 2020) even though it has come to stay. Earlier, Adeniyi (2011), has observed that Mass communication schools in Nigeria do not imbibe e-learning as much as it is required in their curricular, and this makes students to graduate without acquiring the adequate skill needed to enable them be E-reporters. AI is an integral part of E-learning. Now that AI is a global phenomenon, how does it impinge on journalism studies (learning) and practice in Nigeria? What are the practical steps that can be taken to prepare Nigeria`s media industry for the utilisation of AI in its tasks? This work serves as a call for the recognition of the inevitability of AI in media practice. It also lays the foundation for discourse on this pertinent issue. It offers a "take-off" template hence it is tagged as an "introductory outline."

Rationale for Adopting AI Journalism

Though most media organisations in Nigeria are not fully utilising the AI technology at present, yet, since the world is a global village, our educational system must align itself with what is tenable elsewhere in the world so that our mass communication and media studies graduates can keep pace with the latest technology in reporting so as to comfortably operate in any part of the world after graduation.

Already, there is an increasing awareness among media practitioners of the inevitability of the adoption of AI in media practice in Nigeria. Mass media practice now goes beyond theoretical postulations to new areas of praxis that are hugely influenced by technology. No doubt, technology adoption is accelerating the media process with AI taking the lead, therefore, media studies` students must be prepared on how to fully participate in this new phase. However, some of the main challenges before media students and practitioners in Nigeria today include knowledge about AI and the availability cum adoption of the relevant AIs to work with. They need right robust training, driving adoption and resources. Since the world is gravitating towards an AI-powered dominated workforce, our students have to get acquainted with the latest technology to become compliant with the future demands, and this must be inculcated into the current teaching and learning of journalism and media studies in Nigeria. Nevertheless, work on automated journalism is still relatively scarce in Nigeria, and a template is yet to be worked out on how to go about it. As such, this chapter introduces students and journalism teachers to AI. It defines AI, types of AI available, and highlights some of the use AI is being put into media practice in some parts of the world.

Theoretical Approach

This work was anchored on the Technology Acceptance Model (TAM). TAM is one of the most influential extensions of Ajzen and Fishbein's (1980) theory of reasoned action (TRA) in the literature. According to Venkatesh (2000), Davis's technology acceptance model, as espoused in Davis (1989) and Davis, Bagozzi & Warshaw (1989), is the most widely applied model of users' acceptance and usage of technology. It was developed by Fred Davis & Richard Bagozzi (Davis 1989, Bagozzi, Davis & Warshaw 1992). TAM is said to have replaced many of TRA's attitude measures with the two technology acceptance measures, which are: ease of use and usefulness. TRA and TAM, both of which have strong behavioural elements, assume that when someone forms an intention to act, that they will be free to act without limitation. Albeit, in the real world, there will be many restraints, such as limited freedom to act (Bagozzi, Davis & Warshaw, 1992).

The Technology Acceptance Model (TAM), version 1, according to Davis, Bagozzi & Warshaw (1989), is an information systems theory that models how users come to accept and use a technology. This theory proposes that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, that is, Perceived Usefulness (PU) and Perceived ease-of-use (PEOU). Davis (1989) describes PU as the degree to which a person

believes that using a particular system would enhance his or her job performance. He also terms and defined PEOU as the degree to which a person believes that using a particular system would be free from effort.

Venkatesh & Davis (2000) and Venkatesh (2000) observed that with further studies, the TAM was expanded and upgraded to TAM 2 while Venkatesh, Morris, Davis & Davis (2003) noted it was extended and elevated to the Unified Theory of Acceptance and Use of Technology (UTAUT). According to Venkatesh & Bala (2008), a TAM 3 is in the offing in the milieu of e-commerce with an inclusion of the effects of trust and perceived risk on system use. This theory perfectly fits with this work because its two tenets, perceived usefulness (PU), and Perceived ease-of-use appropriately accommodate artificial intelligence and its usage in the learning and practice of journalism in Nigeria.

What is Artificial Intelligence?

Ali Shafti defines AI "as a non-human device or algorithm being able to do behaviours and actions that are possible only for a person of human intelligence, or maybe not even possible for humans, so above human intelligence" (as cited in Handley, 2018, p. 2). According to Makridakis (2017), artificial intelligence or machine intelligence can be said to be the process of making machines intelligent and that intelligence can be seen as the quality that enables an entity to function appropriately and with foresight in its environment.

Though there is no internationally agreed definition of AI, yet, Vinuesa, Azizpour & Nerini (2020) define AI as any software technology with at least one of the following capabilities: perception, including audio, visual, textual and tactile (e.g., face recognition), decision-making (e.g., medical diagnosis systems), prediction (e.g., weather forecast), automatic knowledge extraction and pattern recognition from data (e.g., discovery of fake news circles in social media), interactive communication (e.g., social robots or chat bots), and logical reasoning (e.g., theory development from premises). They submit that it encompasses a large variety of subfields, including machine learning. Drawing from some of the foregoing definitions of AI, it can be concluded that machines can be empowered with intelligence to perform some acts maximally, even better and faster than humans, with little or no human input.

Artificial Intelligence and Machine Learning are sometimes referred to as one and the same. Michael I. Jordan, one of the foremost authorities on AI and machine learning (ML), observes that, most of the time when we talk about AI, we really mean ML. According to him, "ML is an algorithmic field that blends ideas from statistics, computer science and many other disciplines to design algorithms that process data, make predictions and help make decisions" (as cited in Asay, 2021, p.2). Though, Ark (2020) sees machine learning as a functional subset of AI, a big data and enabling technologies, Wu (2019) says machine learning is when a computer model is trained with a "teaching set" of data to identify patterns, insights and predict substantially faster and more effectively than a human being. He cites Siegman as putting it that machine learning is "finding patterns in large amounts of data and making predictions based on historical data" (p. 2).

There are many news houses that now use AI to gather, edit, and report news stories. There are robots that can write real news and AI algorithms that can convert papers that maybe considered complicated to simple news stories that the public can understand. In other words, with AI, cognitive labour can be offloaded to computers. The use of AI in journalism practice, whereby news articles are generated by computer programmes, apart from being generally referred to as automated journalism, are also referred to as algorithmic journalism or robot journalism (Graefe, 2016; Dörr, 2016; Cohen, 2015).

Types of Artificial Intelligence

There are different types of Artificial Intelligence. Heath (2018) opines that at a very high level, AI can be split into two broad types of 'Narrow AI' and 'General AI.' He describes Narrow AI as "what we see all around us in computers today: intelligent systems that have been taught or learned how to carry out specific tasks without being explicitly programmed how to do so" (p. 3). He describes the

'General AI' as "the type of adaptable intellect found in humans, a flexible form of intelligence capable of learning how to carry out vastly different tasks, anything from haircutting to building spreadsheets or to reason about a wide variety of topics based on its accumulated experience" (p. 3). Furthermore, he espoused that there is a natural overlap between robotics and AI. He explains that AI is only one of the technologies used in robotics, while the use of AI is helping robots move into new areas such as self-driving cars, delivery robots, as well as helping robots to learn new skills.

Problems Associated with AI and Media Practice

The way people communicate today, and how journalists and media content producers go about their duties have changed tremendously, courtesy the advent of new media technologies. We are yet to see the last in the use of these technologies due to the introduction of Artificial Intelligence (AI) in the gathering, producing, and dissemination of news.

However, there are some problems associated with the practice of automated journalism; one of such problems, according to Caswell & Dörr (2017), is the major constraint on the potential to automate journalistic writing, namely the absence of data models sufficient to encode the journalistic knowledge necessary for automatically writing event-driven narratives. Machine learning are said to work most efficiently with the availability of sufficient data for it to pick up on models from which they learn from, and then improve the system consequently. Hall (2018) notes that AI also has difficulty with unstructured data; He said AI easily translate materials like tabulated results of sports games or earnings data into articles by using standardised templates, but it is yet to be used elaborately in the creative economy which are majorly made up of unstructured data and are mostly available today.

The issue of who to credit as the author of an automated story is yet to be resolved. Participants of a study on algorithmic authorship like Montal & Reich (2016) believe that the programmer should be credited as the author while some other participants are of the opinion that the media outlet that publishes the story should be identified as the author. Added to the foregoing, the cases of transparency, credibility and verifying authenticity come up when it is difficult for readers to know who wrote a particular article between a robot and a human (Dörr & Hollnbuchner, 2017). Credibility wise, Gillespie (2014) notes the observation of critics who doubt if algorithms are really fair, accurate and free from subjectivity, error or attempted influence. Hall (2018) opines that when it comes to verifying authenticity, AI cannot distinguish whether the input it receives is accurate or inaccurate. This is to say that if AI receives questionable input, it equally dishes out false output. This is why Hall (2018) agrees that AI lacks self-awareness, for it is unable to explain its output, why it wrote what it did or how it got there.

Hall (2018) claims that AI cannot be held legally accountable even when it disseminates and promotes defamatory materials; he, therefore, advocates that human accountability be embedded in all stages of the content value chain to curb the promotion of damaging information by the algorithms they have developed. There are also concerns that the automation of journalism will lead to massive loss of employment for journalists as publishers switch to using AIs. This fear is not sustainable because there are still some aspects of the journalism job where AI still relies on the human journalists known as auto editors since they lack capabilities such as creativity, humour and critical-thinking. Artificial intelligence is programmed by humans, and consequently it can make mistakes which may be costly or dangerous sometimes, hence Christian Lous Lange declares that "Technology is a useful servant but a dangerous master" (as cited in Kwakpovwe, 2021, p. 49). Nonetheless, judging from the numerous functions AI performs, it is agreed upon that the advantages quite outweigh the disadvantages.

Usage of AI by Media Organisations

Hall (2018) avows that there are three ways that AI is changing the practice of journalism, to wit; (a). Automating routine reporting. This helps to rapidly expand coverage, (b) providing faster insight. AI has the ability to instantaneously react to real-time data with the outlines of a story, and (c) lowering barriers to entry. AI does reduce the human element in the content creation process.

Forbes has tested an AI tool known as *Bertie*. It intends to provide reporters with rough drafts and story templates. There are different types of AIs being used in journalism. They include Narrative Science which emphases on natural language generation for enterprise; Monok-Auto-generated news articles using Neural Networks for NLG; BBC- Streamlining media workflows (news aggregation and content extraction); Storykube which uses artificial intelligence to support the entire process of newsmaking (from data-gathering to text generation) and fact-checking, and many others. Diakopoulos (2019) talks about data mining systems that alert reporters to potential news stories, while news bots offer new ways for audiences to explore information. Desmond (2020) attests that at Microsoft, AI is using algorithms to identify trending news stories from dozens of publishing partners, helps to rewrite headlines and adds better photos or slide shows to accompany content.

The Wall Street Journal and Dow Jones have also experimented with the technology to help with various tasks, including the transcription of interviews or helping journalists identify "deep fakes," which are convincingly fabricated images generated through AI (Peiser, 2019). *The Guardian* uses the proprietary artificial intelligence software called "ReporterMate," an experimental automated news reporting system. Karaca (2019) affirms that Journalists can identify artificial audio and video media created using AI techniques. He drew on the expertise of BBC News specialists and linguists around the world who track and verify media from all over the world, identifying fraudulent and unreliable content.

Robot reporters are designed to produce large quantities of information at quicker speeds. At the Associated Press, AI robots write two to six paragraphs on sports scores and for quarterly business earnings reports (Desmond, 2020). According to Hall (2018), the Associated Press was able to expand the number of companies it reported on from 300 to 4,000 using AI to generate reports on corporate earnings. Cohen (2015) reports that with software from Automated Insights and data from other companies, they can produce 150 to 300-word articles in the same time it takes journalists to crunch numbers and prepare information.

Reuters is in partnership with Graphiq, a service that uses AI to build and update data visualisations. Hall (2018) mentions that the tool enables faster access to data, and, once they are embedded in a news story, the visualisations are updated in real time. Karaca (2019) also confirms that Reuters uses Lynx Insight, which uses automated data analysis to identify trends and irregularities, and to suggest stories to journalists. In the same vain, Desmond (2020), reveals that Bloomberg News has AI robots scanning large databases, seeing alerts as trends or anomalies emerge. This helps the reporters to settle for the ones to follow up, carrying out fact-checking, putting the stories in context and then conducting interviews. Peiser (2019) iterates that Bloomberg News uses an automated technology known as *Cyborg* to publish roughly a third of its content. Cyborg is said to be able to assist reporters in churning out thousands of articles on company earnings reports each quarter. It can dissect a financial report the moment it appears and spit out an immediate news story that includes the most pertinent facts and figures.

Desmond (2020), citing Unite AI, reports that Xinhua, the Chinese state news agency, has released a new artificial intelligence 3D news anchor named Xin Xiaowei, and modeled after Zhao Wanwei, one of the agency's human news presenters. This is an addition to the existing list of virtual presenters being developed by the agency. According to the search engine company Sogou, which co-developed the technology, the new AI anchor utilises "multi-modal recognition and synthesis, facial recognition and animation and transfer learning" (Desmond, 2020, p. 2).

Suggested Tips for AI and Media Studies

The basics of effectively utilising AI for media practice is having a foundational knowledge of how to operate the computer; that is, having the basics of computer programming. This is aptly represented by the mini computer (mobile phone) which almost everybody has access to. Though one does not need special training to know how to operate a mobile phone, but in the case of the computer, basic skills are required. These basic skills become handy when it comes to the use of AI in the mass media. As a base for learning about AI, which will then be introduced to journalism, Ark (2020) mentions AI4K12, an initiative of leading computer scientists, as identifying five big ideas that every student should know about AI. They are:

i. **Computers perceive the world using Sensors.** Examples include speech recognition and computer vision; emerging issues include the nature of intelligence and the limitations of human and computer perception.

ii. **Agents maintain Representations of the World and use them for reasoning.** Examples include types of algorithms, the work they do and their limitations.

iii. **Computers can learn from Data.** Examples include types of machine learning—yet there are concerns about issues such as bias in training data.

iv. **Intelligent Agents require many Types of Knowledge to interact naturally with Humans.** Examples include interacting with digital assistants, chatbots and robots. Emerging issues involve the nature of consciousness and limitations of AI interaction.

v. **AI Applications can impact Society in both Positive and Negative Ways**. Emerging issues include the use, fairness and transparency of algorithms and likely social impacts**.**

It will not be out of place if every journalism students get to know how AI is reshaping media practice and journalism landscape. They should not only know about how AI operates, but should be able to apply it to their chosen profession. AI will enable students to learn the technical and conceptual tools, and to understand the basics of most of their courses as well as introduce them to the dynamics of AI. To have a grasp on the workings of AI, therefore, mass media teachers can simplify everything about AI by lacing the fundamental concepts of AI, which includes learning about data science and ethical design, into the various courses they teach. With this, teaching about AI will be more attractive and interesting, and students will be made to develop passion for its usage when they get conversant with the abilities of AI.

Students should be able to recognise AI and its impact on the mass media, and therefore be proactive in using AI to discharge their duties as journalists. Consequently, anticipated course outlines for AI should include learning "how to turn data into a text report using Automated Insights, an AI tool that enables journalists to develop dynamic templates that convert structured data into human-readable articles" (Marconi, 2017, p. 3). This will enable students to become skilled in secondary data handling, contextualisation or interpretation of specific data. The course contents for students should be able to introduce them to state-of-the-art software used in data collection so that they can gather relevant data when and where necessary, carry out analysis, and write their news stories independently. AI can be very useful in teaching Digital editing and computer retouching. This is a course where students are taught, in practical terms, the use of graphics and editing packages which will enhance their skills in creating and manipulating images. The course entails manipulating programs like gimp, ultimate paint, skecil, pixie, inkscape, paint.net, smoothdraw NX, imageforge, brush strokes, project dogwaffle, sodipodi, karbo 14, artweaver, gimpshopdotnet and imagemagick. Other areas of the

course include animation and 3D programmes: terragen, google sketchaUp, art of illusion, blender, 3D canvas, graphix, 3D Plus, Daz 3D, Anim8or, synfig, BRL-CAD, MindsEye and maya personal learning editor. With AI, these topics can be easily understood by the students especially when it is combined with online books and online courses on machine learning and deep learning that features Python, R. Python and JavaScript machine learning models. They are popular and rich rosters of machine learning and deep learning libraries, optimised implementation, scalability, and versatile features.

When AI is taught along with multimedia scripting and new communication technologies by media schools, the students get integrated early into the usage of AI in the performance of their duties as journalists. With this, students can be seamlessly introduced to writing scripts for multimedia, using different software packages in multimedia scripting. They will also be introduced to the various technologies of communication; features, application and impact. It also teaches basic knowledge about the Internet and the various search engines and directories of the World Wide Web which covers areas as browsing, e-mail, mailing lists, newsgroups, chat and Web publishing. However, these depend on the availability of training data of related fields to train the algorithms and develop the right AI model that can work flawlessly in respective course.

Conclusion and Recommendations

This chapter is just a precursor of the discourse on AI and journalism learning and practice in Nigeria. It is meant to provoke more elaborate discussions which will lead to its being made part of the journalism curricula in journalism and media studies` institutions. AI has come to stay and the disruptions it has brought to journalism practice will continue as long as technology improves rapidly. Thus, based on the literature reviewed, the followings were recommended for implementation:

Journalism schools should have curricula that embrace technology that will effectively prepare potential journalists for the future use of AI for their work. Journalism students should be equipped with basics of computer programming and skills for working with data. They should be tailored to fit into our peculiar environment, taking into consideration the type of erratic power supply we do experience in Nigeria. Students must be armed with information about AI technology and how media related AI are relevant to their profession.

Data science and AI software companies that develop and provide these algorithms to news outlets, such as Automated Insights, Narrative Science, United Robots and Yseop, could be invited to media studies` schools to train and demonstrate to students specifically in the use of AI digital for media practice so that students, lecturers, and practicing journalists can acquire rounded training both in school and the industry. Likewise, media houses and journalism schools can go into alliance with local AI experts like the University of Lagos AI Club; this should be with the aim of building machine learning models to solve different journalism problems. It is on record that the University of Lagos AI Club clinched the first place in the Beginner level in Africa in UmojaHack 2021 held in March 2021. The AI Club also brought home the first prize in Nigeria at the first and second editions of The Hackathon, organised by Zindi Africa in 2020 (University of Lagos, 2021). Media houses should make frantic efforts to improve on adaptability since we are approaching an automated future. To survive the "onslaught" of AI on journalism practice, media houses in Nigeria have to start to put in place strategies to cope with AI in future. They have to be trained on how to use AI responsibly.

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