

Artificial Intelligence and Human Interactions: Awareness, Benefits and Challenges in Skills Acquisition in Nigeria

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Abstract

Advancement of computing power has radically changed our lives. Artificial Intelligence (AI) is revolutionizing the world through the way we use data and machines. The study therefore discussed about Artificial Intelligence and Human Interactions in Nigeria, it examined its theory and the potential applications of AI in human life, by accessing the awareness, benefits and risks of its application. The study adopted a descriptive survey design and applied a quantitative survey methodology using self-administered questionnaire to collect data from a total of 60 potential sampled respondents in selected Industries and Institution in Ibadan, Oyo State, Nigeria. The findings revealed that employees in Nigeria aware that AI solves the problem of uncertainty in the engineering field and has a simple structure that is easy to understand. AI is an effective way of controlling machines, provides solutions to various industrial problems, perform their tasks with 99.9% accuracy that humans cannot possibly match but could displace many existing jobs, seems dangerous if organisations use AI unethically. However, development of AI for the societal benefits and Technical Education will be hampered if the concerns of covering privacy and security protection for personal data are not properly addressed by formulating appropriate policy, laws and regulations. The study hereby recommends that coordination amongst various ministries in Nigeria to supervise AI applications. Government agencies, policymakers and practitioners should formulate a comprehensive regulation to control the usage of AI technology. Authorities operating in e-business environments need to create proper rules and regulations to make the systems secure.

Keywords: Artificial Intelligence (AI), Human Interaction, Information Communication Technology (ICT), Skill Acquisition, Survey Design.

Introduction

Technology has become a major part of our daily lives and we depend on different types of technologies in almost every situation (Livari et al, 2020). Since third industrial revolution and the introduction to computing power, our lives have been radically changed. One of the technologies that are revolutionizing the way we use data and machines is artificial intelligence (hereafter known as AI). Most of us have probably heard about AI, and it sounds fancy and modern, but the history of AI goes back to the 1950s when the mathematician Alan Turing was grappling with the question "Can machines think?" (Somers, 2013). Today financial executives and professors believe that AI technology will revolutionize the financial industry. Since 2013 over 3600 AI start-ups have been founded and raised a total of \$66 billion in funding. This could be the start of the so-called 4th industrial revolution

whereas businesses and individuals are forced to rethink how technology is utilized (Skilton & Hovsepian, 2018).

Most people are not very familiar with the concept of artificial intelligence (AI). As illustration, when 1,500 senior business leaders in the United States in 2017 were asked about AI, only 17 percent said they were familiar with it (Fleischmann et al, 2017). Several of them were not sure what it was or how it would affect their companies. They understood there was considerable potential for altering business processes but were not cleared how AI could be deployed within their own organizations (Fleischmann et al). Despite its widespread lack of familiarity, AI is a technology that is transforming every walk of life. It is a wide-ranging tool that enables people to rethink how we integrate information, analyse data, and use the resulting insights to improve decision making (West, & Allen, 2018).

Major artificial intelligence researchers and other sources define this field as the study and design of intelligent agents, in which an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success. John McCarthy, who coined the term as far back as 1955, defined it as the science and engineering of making intelligent machines. Artificial intelligence systems also can understand a natural language or perceive and comprehend a visual scene and perform other types of feats that require human types of intelligence (Asemi & Asemi, 2018).

Benefits of AI are many, one very important thing is the significant positive impact AI will make on the world economy. The technology is expected to add a staggering \$15.7 trillion to the global economy by 2030. Just to put that in perspective, China's entire GDP in 2018 was \$13.61 trillion and Norway's GDP in 2018 was \$434.75 billion (World Bank, 2019). This tremendous growth can be explained by factors such as increased worker productivity, detection and prevention of cyber security threats, identification of cost saving patterns, and improved personalization of products and services. Further, it's estimated that an \$800 billion revenue shift will happen because of AI and its power of personalization within financial services, healthcare, and retail (Chui, 2017).

Artificial intelligence research is also divided by several technical issues. Some subfields focus on the solution of specific problems. Others focus on one of several possible approaches or on the use of a particular tool or towards the accomplishment of particular applications. The central problems (or goals) of artificial intelligence research include reasoning, knowledge, planning, learning, natural language processing (communication), perception and the ability to move and manipulate objects (Sniecinski, & Seghatchian, 2018). General intelligence is still among the field's long-term goals. Currently popular approaches include statistical methods, computational intelligence and traditional symbolic artificial intelligence (Sumathi, & Paneerselvam, 2010). Artificial Intelligence has a wide variety of applications in areas such as natural language processing, machine translation, social network analysis, machine learning, deep learning, internet of things, image processing, audio analytics, graph analysis, visualization, simulation modelling,

robotics, computer games, biological modules, traffic control, and Engineering (Kamble & Shah, 2018).

This paper proposes a proactive research agenda for the ethical and equitable application of AI in Nigeria. Under girding this agenda is a broad overview of the technologies associated with AI and the opportunities and challenges they present. It was aimed at discussing about Artificial Intelligence, Benefits and Challenges to Human Life in Nigeria, examine the theory and history behind AI to better understand the used cases and what the technology can do. Discuss the potential applications, risks, and implications of using AI, identify the current and future use of AI in human life and discuss how AI can be utilized in engineering field. The study was limited to data sourced from journals/articles, questionnaires, and some online information from the internet.

Literature Review

Artificial intelligence (AI) is intelligence incontestable by machines, as against the natural intelligence displayed by animals as well as humans. Leading AI textbooks emphasize this as the study of "intelligent agents"; system that perceives its surroundings and takes actions that maximize its likelihood of achieving its goals (Madhuri-Paradesi,, 2019). Some well-liked accounts use the term "artificial intelligence" to explain machines that mimic "cognitive" functions that humans go along with the human mind, like "learning" and "problem solving", but this definition was rejected by major AI researchers (Poole & Mackworth, 2010).

AI applications embody advanced net search engines (i.e., Google), recommendation systems (used by YouTube, Amazon, and Netflix), understanding human speech (such as Siri or Alexa), self-driving cars (e.g., Tesla), machine-controlled decision-making and competitor at the best level in strategic game systems (such as chess and go) (Yablonsky, 2019). AI analysis had over-shadowed many alternative approaches to solve complex problem since its exegesis, as well as simulating the brain, modelling human drawback determination, logical system, and massive databases of data and imitating animal behaviour. Within the initial decades of the twenty first century, extremely mathematical applied mathematics machine learning has dominated the sphere, and this system has well-tried extremely roaring, serving to unravel several difficult issues throughout the world (Bond, 2020).

The various sub-fields of AI analysis are targeted around explicit goals and the use of explicit tools. The normal goals of AI analysis embody reasoning, information illustration, planning, learning, tongue process, perception, and the ability to manoeuvre and manipulate objects. General intelligence (the ability to unravel a capricious problem) is among the field's long-run goals (Roberts, 2016). To unravel these issues, AI researchers have tailored and integrated a good vary of problem-solving techniques -- as well as search and mathematical optimisation, logical system, artificial neural networks, and ways supported statistics,

likelihood, and social science. AI additionally attracts upon engineering science, psychology, linguistics, philosophy, and lots of alternative fields.

The field was based on the belief that human intelligence "can be therefore exactly delineated that a machine will be created to simulate it". This raises philosophical arguments concerning the mind and also the ethics of making artificial beings endowed with human-like intelligence. These problems are explored by story, fiction and philosophy since antiquity, fantasy and futuristics have additionally advised that, with its huge potential and power, AI could become an existential risk to humanity (Womack, 2013).

The introduction of AI applications to the world brings tremendous potential for both good and harm. AI makes possible innovative, data-driven, technical innovations to help address pressing social problems. AI can facilitate scientific breakthroughs, improve medical diagnoses, increase agricultural productivity, optimize supply chains, and equalize access to education through highly personalized learning (Smith, & Neupane, 2018). However, like most new technologies, AI also has the potential to exacerbate existing problems and create new ones. Contributing to social ills, AI might reinforce structural inequalities and bias, perpetuate gender imbalances, threaten jobs, and introduce other unknown risks and unintended consequences.

In Food Industry, findings shown the teeming competition and increasing demand in the food industry, the industry has begun to embrace AI technologies in a bid to maximize profits and explore new ways to reach and serve the consumers. AI has been successfully deployed for applications such as sorting fresh produce, managing supply chain, food safety compliance monitoring, effective cleaning in place systems, anticipating consumer preference and new product development with greater efficiency and savings on time and resources. However, there are challenges to adoption of AI technologies which include cost, cultural changes, expert skill requirements, transparency issues and one-track minds. Despite these challenges, research is on-going on optimized production process using AI, but it is important to note that the benefits of AI application in food industry greatly outweigh its challenges.

Catherine, Sergio & Xuequn (2020) study discussed artificial intelligence (AI) – powered applications as a commercial service with a focus on the hotel industry. This research approached from the customers' perspective and examines how AI and employee service quality influence customer satisfaction and loyalty. The study was conducted in multiple hotels in Portugal and focused on departure guests who had experienced both AI and employee services associated with the surveyed hotels. The results shown that both AI and employee service quality explain significant variances in overall service quality assessment as well as customer satisfaction and loyalty. However, only certain service quality dimensions made unique variances in the outcomes of interest. Doing Regression Analysis of both AI and employee service quality in the same equation, AI becomes negative and insignificant.

Hanane & Jiang study (2022) studied on the Impact of Artificial Intelligence on Sustainable

Development in Electronic Markets. The main objective was to examine the behavioral, cultural, ethical, social, and economic challenges of AI-enabled products and services in consumer markets and discuss how businesses might shape their approaches to address AI-related ethical issues. The findings highlighted some key issues which are; the security and privacy of consumers, AI biases, individual autonomy, wellbeing, and issues of unemployment. Therefore, companies that use AI systems need to be socially responsible and make AI systems as secure as possible to promote the sustainable development of countries. The results suggested that AI has undoubtedly transformed life and has both positive and negative effects. However, the main aim regarding AI should be to use it for the overall goals of humanity.

Consequently, the roll-out of future AI applications requires a healthy critical perspective and an ongoing public dialogue. Concerted efforts are warranted to ensure the equitable and inclusive development and deployment of AI. These efforts should focus on enabling Nigerians to take advantage of AI so they can benefit from the immense value the technology can bring. At the same time, care and vigilance will be required to mitigate risks, identify and respond to unintended harmful consequences. Such an approach is critical so as not to exacerbate inequalities and social instability.

Research Design and Validity of Research Instruments

This study adopted a descriptive survey design with approach to ensure accurate description of the study under investigation and reduces bias in collection of data. We applied a quantitative survey methodology using self-administered questionnaire to collect data to examine the research objectives. The study population included in this study were Ibadan Electricity Distribution (IBEDC), British American Tobacco Company (BAT), International Institute of Tropical Agriculture (IITA), STAFF OF FACULTY OF ENGINEERING AND COMPUTER SCIENCE (The Polytechnic Ibadan) and ROMEO OIL A non-probability simple random and sampling technique was adopted in the selection of respondents from each of the randomly selected establishments while ten (10) respondents each were chosen from the selected population of the study.

The instrument used for this research was questionnaire. The questionnaires were divided into section A and B. The first section included information about the respondents' demographic characteristics while the presiding sections generate the information in respect to the research questions. It comprised both positive and negative questions structured based on the constructs of this study, using a five-point Likert scale. The Likert scale was used to measure opinions where questions were Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, strongly Disagree = 1 which were scrutinized for possible inferential deductions that helped fulfilled the purpose of this research. The reliability of this instrument was finally determined by conducting a proper scrutiny on the research materials and data sources. The analysis of contents is done using appropriate statistical tool for verifying the originality of the data obtained from relevant sources. Those data sent

and obtained through the Internet were subjected to rigorous editing and paraphrasing to ensure that plagiarism is avoided.

Data Analysis and Discussion of Result Findings

The method of data analysis was descriptive (frequency distribution). Statistical mode I was used through the Statistical Package for Social Science (SPSS) in analysing the data gathered.

The demographic characteristics of the respondents gave insight that helped understand the background characteristics of the respondents. These characteristics include gender, age, profession, how many applications of AI in each respondents work and how useful AI could be in each respondent area of work.

The demographic distribution of sampled respondents of staff working in IBEDC, AMERICAN TOBACCO, IITA, PNC, STAFFS OF FACULTY OF ENGINEERING AND COMPUTER SCIENCE (the polytechnic Ibadan) and ROMEO OIL was shown below (figure 1), it was seen that 52% of the respondents were female, while 48% of the respondents were male and twenty-five (25) of the respondents were below 30years, 29 were within 31-50years, while 6 were 51 and above (Figure 2). It was also seen that 30% of the respondents did not know effect/influence of AI in their establishments. 45% emphasized on its effect, however they could not specifically stated the areas, while 25% were well aware AI AI influence in their work.

Figure 4 shows how useful AI could be in each respondent area of work. This implied it is extremely useful for 21 of the respondents. It also showed that it is useful for 26 of the respondents while it is not useful for the remaining 13 respondents.

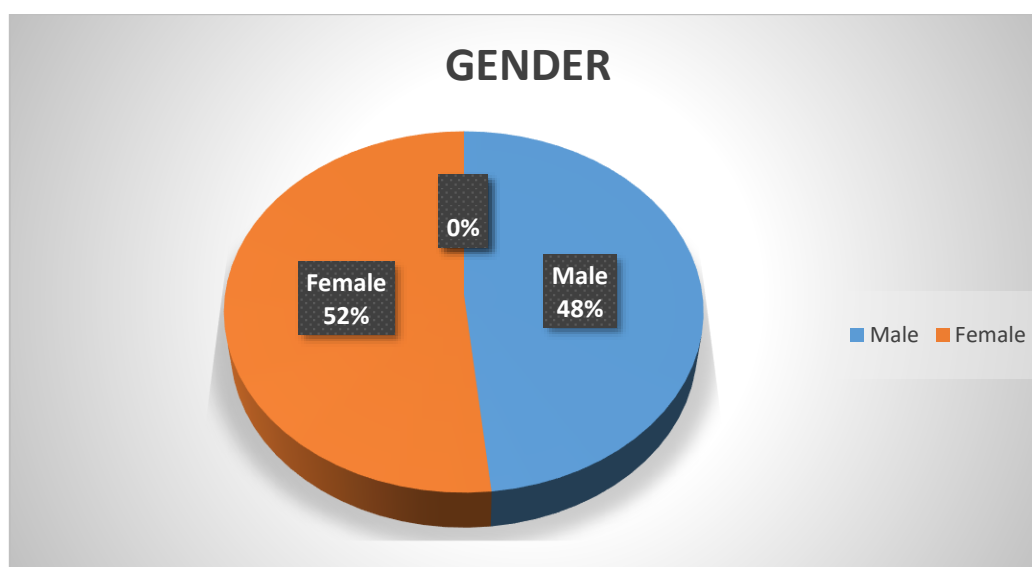


Figure1: Gender Demographic Distribution of Sampled respondents

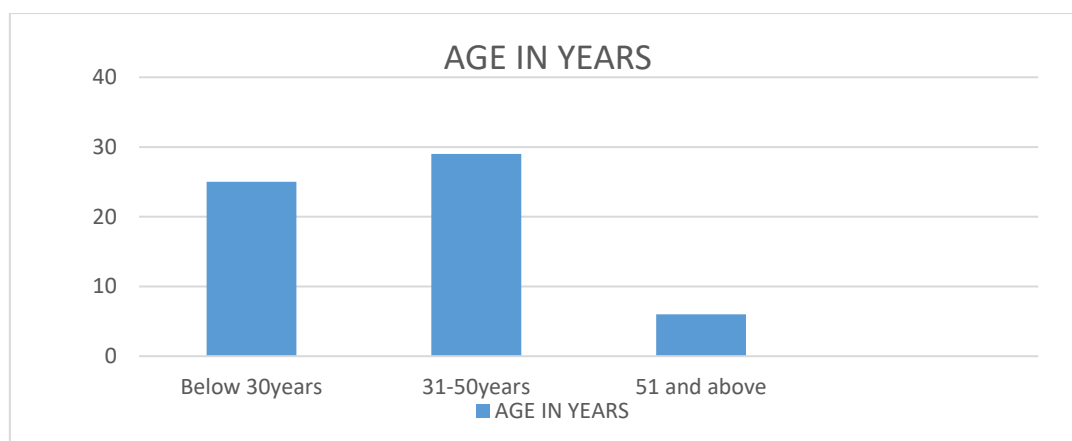


Figure 2: Age Demographic Distribution of Sampled respondents

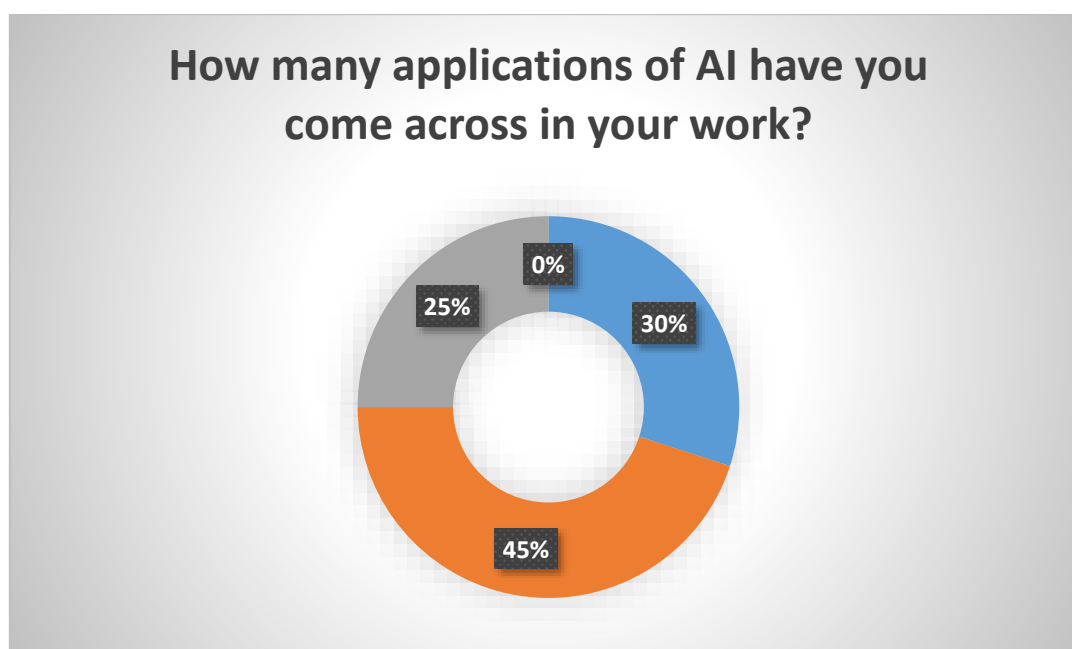


Figure 3: Demographic Distribution of Sampled respondents that have come across AI

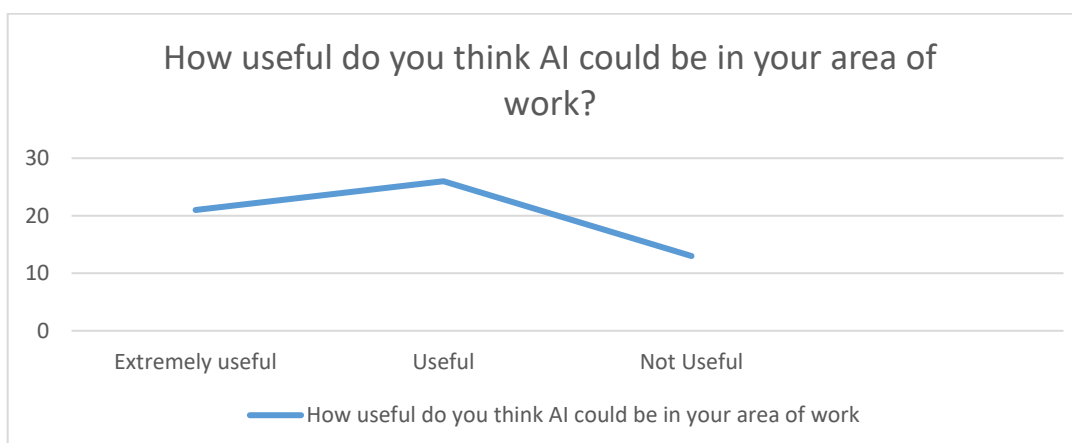


Figure 4: Demographic Distribution of Sampled respondents on usefulness of AI

From the analysis of questionnaire, the data gathered implied that the majority of the respondents under study are interested in using artificially intelligent systems in their daily life and believed that it can provide new economic opportunities for this country. 30% of the respondents strongly agreed that artificially intelligent agent would be better than an employee in many routine jobs, 38.3% agreed, 11.7% were neutral while 20% disagreed. It was also accepted that Artificial Intelligence can have positive impacts on people's wellbeing, while 20% disagreed with the statement.

Also, 38.3% strongly agreed that AI provides cyber security by detecting anomalies in user data patterns, 31.7% agreed, 25% were neutral, 3.3% disagreed while 1.7% strongly disagreed. It can be inferred that AI can serve as a cyber security for its users. 40% strongly agreed that AI can facilitate scientific breakthroughs, 30% agreed, 16.7% were neutral while 13.3% disagreed. The implication of this result means that AI can be a great advantage for those in scientific field.

With respect to potential applications and use of Artificial Intelligence (AI) in human, the findings from this research revealed that AI solves the problem of uncertainty in the engineering field in the Country and has a simple structure that is easy to understand. Also, AI is an effective way of controlling machines, provides solutions to various industrial problems, perform their tasks with 99.9% accuracy that humans cannot possibly match.

The data gathered showed that the majority of the respondents under study are interested in using artificially intelligent systems in their daily life and believed that it can provide new economic opportunities for this country. It was also accepted that Artificial Intelligence can have positive impacts on people's wellbeing, serve as a cybersecurity for its users and can be a great advantage for those in scientific field.

Regarding the risks and implications of using Artificial Intelligence (AI) in human life, it was discovered that AI could displace many existing jobs, seems dangerous and organisations use Artificial Intelligence unethically. Lastly, another important finding of this research work was that Artificial Intelligence can be used to spy on people and the fear of been overpowered by AI is among the implications of using AI. Although with slight difference, the respondents believed that Artificial Intelligence is more dangerous than nuclear weapons.

Conclusion and Recommendations

Throughout the world people are depending on use of AI and it is expected this trend will increase with passage of time. Development of AI for the societal benefits in Nigeria could be hampered if the concerns covering privacy and security protection for personal data are not properly addressed by formulating appropriate policy, laws and regulations. Those are required to be consistently implemented with good governance. Focus is to be given to see that in the name of protection of privacy, the authority should not be unreasonable and over strict, because in that case, development with the help of AI will be impeded causing an

obstruction towards societal growth. The authority should be vigilant to stick to the ethical standard in structuring AI-program. In Nigeria, there is no strict AI-policy and absence of this might hamper progress because the society wants to take the help of AI and at the same time expects to keep data privacy duly protected. This balance will be ensured by strict adherence to the policy of AI which should be, of course, consistent, reasonable and executable.

Based on the findings above, the study recommends a reliable coordination amongst various ministries to supervise AI applications and to create a repository of all research works covering AI activities for improving studies on AI. Besides, we need to establish centers to enhance facilities for research work covering AI and to formulate the testing mechanisms to weigh performances of AI. Government agencies, policymakers and practitioners should also formulate a comprehensive regulation to control the usage of AI technology. Lastly, authorities operating in e-business environments need to create proper rules and regulations and make the systems as secure as possible for people.

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