

Artificial Intelligence and Academic Research: Understanding the Potential and the Threats to Academic Writing

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Abstract

Background: Artificial intelligence is already altering the world and raising important questions for society, the economy, and governance. Scholars have largely focused on the utility of AI for human existence. Limited scholarly works seem to specifically address the potential and the adverse effects of AI-dominated use in the area of academic research.

Objective: This paper attempts to reflect on the implications of the adoption of Artificial Intelligence (AI) in academic research. Specifically, it examines the potential and possible threats of AI to academic research.

Methodology: The paper adopted an exploratory research approach that seeks to explore the emerging AI relationship with academic research to stimulate further study in the new field. Data were collected through a literature search to support the polemic discussion of the issues raised.

Results: The paper posits that Artificial Intelligence's dominant use in academic research has the potential to analyse large datasets with speed and ease, reduce plagiarism, and improve literature review. However, it is likely to limit critical thinking, academic creativity, and the creation of indolence among academics and can also induce machine-mediated plagiarism, known as AIgiarism.

Conclusion: The paper concludes that though the application of Artificial Intelligence presents some advantages in the field of education, unethical reliance on it diminishes human creativity in scholarship and formerly recognises indolence in academic activities.

Unique contribution: The paper has articulated a discussion that can inform ethical and legal framework on the application of Artificial Intelligence in academic research.

Recommendation: AI tools need to be developed to distinguish between AI-supported research write-ups and human-written papers. This is important to discourage AIgiarism (plagiarism), which is inevitably thrown up by intelligent software applications.

Keywords: Artificial Intelligence, Academic Research, Academic Indolence, Critical thinking, AIgiarism

Introduction

The introduction of Artificial Intelligence (AI) in the management of society has the potential to improve performance in administering society (Forbes Technology Council, 2018; Manyika, 2022; Ng et al., 2023). Studies have shown that the application of AI will not only lead to an increase in productivity but will improve performance with precision (Baidoo-Anu & Ansah, 2023; Garzez & Lamb, 2023; Huang et al, 2019). Artificial Intelligence is a technology that is transforming every walk of Life. "It is a wide-ranging tool that enables people to rethink how they integrate information and analyze data and use the resulting insights to improve decision-making" (West & Allen, 2018:1). Experts have argued that AI will improve people's existence over the next decade; making life easy and simple to leave. It is hoped that advancing AI will improve human capacity and aid operational processes with the projection that people will be better off in a world of AI mediation

The unfolding penchant for AI-mediated existence will have major implications for society in general. The choice of developing strong AI will highly affect society's decision-making pattern.

Specifically, when strongly operated, AI will affect academic research in diverse ways. How exactly AI processes affect academic research now and in the foreseeable future needs to be studied and understood. Here lies the problem of the paper.

Academic research is “the creative and systematic work undertaken to increase the stock of knowledge” (Organization for Economic Co-operation and Development, 2015, p. 1). It is a thorough investigation into an issue involving the use of appropriate methodologies to answer the question being investigated. It involves data collection, analysis and interpretation while controlling bias to advance and expand knowledge. Academic research is an important aspect of scholarly existence that promotes new knowledge. Because of its utility, it is important that its existence should not be threatened.

AI is gaining fast attention in the academic world and providing new opportunities that have shaped the way research is conducted to advance new knowledge. However, the reliance on AI-powered academic research has also thrown up challenges that require robust attention in order to balance innovation with responsibilities as we traverse the inevitable world of AI in contemporary research. As artificial intelligence is already altering the world and raising important questions for society, the economy, and governance, scholarly works have largely focused on the utility of AI for human existence. Limited scholarly works seem to unravel the adverse effect of AI-dominated existence in the area of academic research. What are the moral considerations in advancing the influence of strong AI in academic research? What does unfettered AI adoption mean for academic creative thinking? Given the advancement of AI at a rapid speed, what consideration is given to a binding ethical framework? The unease on whether the application of AI in academic research can be accountable, transparent, unbiased and explainable is geometrically heightening. This paper shares this apprehension and attempts to examine the potential effect of AI on academic research.

The objective of the Paper

This paper attempts to reflect on the implications of the adoption of Artificial Intelligence (AI) in academic research. Specifically, it examines the potential and possible threats of AI to academic research.

Method

This paper adopts an exploratory research design. An exploratory study is a study “undertaken to gain a better understanding of a problem or issue, to clarify or define parameters of the problem or to refine a general idea into a more specific research problem” (SurveyMonkey, 2023:1). An exploratory study allows for a thorough understanding of an issue that is emerging. Its goal is to investigate a problem that is not clearly defined, investigated, under-investigated or poorly understood. As a grounded theory research, it attempts a panoramic view of a subject area to form the basis of further research in the area of thought. Artificial Intelligence and academic research are emerging and will require robust discourses to understand their implications for the knowledge industry. Data for the paper were gathered through existing literature and online sources as one of the data collection methods of exploratory studies.

Exegesis on Artificial Intelligence

The Artificial Intelligence thought could be traced to the 1956 Dartmouth workshop, where AI's mission and major players were birthed (Halpin, 2005). As stated in the Dartmouth workshop, the study of AI "is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it" (McCarthy et al., 1955:1). However, before the Dartmouth conference of 1956, scholarly efforts were made in the context of Artificial Intelligence. For instance Alan Turing had in 1950 published a work titled "*Computing Machinery and Intelligence*". This work attempted to test machine intelligence called "The imitation game", proposing to consider the question of whether machines could think (Turing, 1950). In 1952, Arthur Samuel had also "developed a program to play checkers" considered to be the first machine to learn the game of checkers independently (Samuel, 1983).

Beyond the 1956 Dartmouth conference, which formerly christened machine learning as Artificial Intelligence (Tableau, 2023), AI research has grown rapidly as a mainstream idea, showing remarkable improvement. Notable timeline in early AI research achievements includes the creation of LISP (acronym for List Processing) by John McCarthy in 1958, the creation of the term "Machine Learning" by Arthur Samuel in 1959, the creation in 1961 of the first industrial robot known as Unimate which worked on an assembly line at General Motors in New Jersey to move die casings and welding parts on cars considered hazardous to human beings (Tableau 2023). Other research included the first expert system created by Edward Feigenbaum and Joshua Lederberg, which aimed at replicating the thinking and decision-making ability of Man. Joseph Weizenbaum, in 1966, created the first 'chatterbox' (chatbox) called ELIZA that uses natural language processing (NLP) to discuss with humans. The standard car created in 1961 by James L Adams was the first example of an autonomous vehicle. When it was demonstrated in 1979, it effortlessly navigated a room full of obstacles without assistance from humans (Tableau 2023). These early achievements possibly encouraged the robust research into artificial intelligence geared towards precise problem-solving. What is actually artificial intelligence? In providing answers to this question, two types of conceptions of AI will be examined. The first is to glean AI from the angle of artificially doing what intelligent humans can do. In this context, artificial intelligence is the ability of a digital computer or computer control robots to perform tasks commonly associated with intelligent beings (Copeland, 2021). In this context, AI is designed to assist humans perform responsibilities naturally assigned to them or deliberately designed to displace intelligent humans. What is it that is considered human abilities that AI is displacing or assisting humans to perform? Manyika (2022:8) identified them to include "visual perception, speech recognition, and the capacity to reason, solve problems, discover meaning, generalise and learn from experience". This is a human-centred approach to defining artificial intelligence.

The other perspective looks at AI as a creation of machines to perform the roles they were created for. The perception is not on the usurpation of the roles of intelligent humans but simply looking at an intelligent system. In this case, AI is seen as "any system that perceives its environment and takes action that maximises its chance of achieving its goals" (Poole, 1998:147). This definition, at best, falls under weak AI or what is also known as narrow AI. This type of AI system is designed and limited to specific tasks alone. They "excel at their designated functions but lack general intelligence (Duggal, 2023). The latter definition seems to avoid the actual intent of AI and equates

AI to the normal tools and associated technologies that assist humans in making a living. Strong AI goes beyond that to mimic human intelligence and act with precision. It is a deliberate creation to undertake human intelligence unaided. It is, therefore, simply "a set of science theories and technologies (including mathematical logic, statistics, probabilities computational neurobiology, computer science)" that aims to imitate the cognitive abilities of a human being. Strong AI or General AI is a "method of making a computer, a computer control robot or a software think intelligently like the human mind. It possesses human-level intelligence or even surpasses human intelligence across a wide range of tasks. Strong AI will be capable of understanding, reasoning, learning and applying knowledge to solve complex problems in a manner similar to human cognition (Duggal, 2023). In simple terms, Strong AI means that computers and other machines or robots will be programmed to think, reason and act with precise human intelligence. It can take decisions and perform the cognitive ability of the human.

Types of Artificial Intelligence

Artificial Intelligence research and discussions are ongoing. Available discourses suggest different types of AI that could be available to society. Because of its emerging nature, the direction of AI research does not, in the interim, establish a taxonomy but a preliminary storyline that can assist in showing the direction of AI and how far it has come and where it is possibly leading (Betz, 2023). Betz (2023) has distinguished AI according to its capabilities. These capability-based types of AI explain what we need to know about AI and what can possibly be expected from it.

Artificial Narrow Intelligence: This type of AI is narrow in its actions. It is designed to accomplish specific actions. This AI does not learn independently. It is goal-oriented and designed to perform a single task (Kanade, 2022: b). It cannot learn skills independently beyond its design. Such single task could include generating data science reports and analyzing it, weather update tracking or playing games. The AI system does not go beyond the task assigned to it.

As one of the most significant human innovations and intellectual accomplishments, narrow AI or what is also referred to as weak AI, has its benefits for human usage. Narrow AI processes data and accomplishes tasks faster than humans. This facilitates quicker decision-making and increases productivity and efficiency. Narrow AI systems also promote the ease of accomplishing tasks and make life easier in performing organizational tasks. In performing a single task, narrow AI is better than humans. For example, a narrow AI programmed to detect cancer cells can do that well than a trained Radiologist. Narrow AI is a launching pad for research into more advanced AI technology. Narrow AI is not without its challenges and limitations. Because it cannot work independently, it is prone to human failings. It can only perform what it was programmed to do. In this case when the human operator wrongly defines a task, the machine is likely to bring out a false conclusion. "Narrow AI lacks self-awareness, consciousness, emotions and genuine intelligence that can match human intelligence. Narrow AI operates under a predetermined and predefined set of parameters, constraints and contexts (Kanade, 2022: b).

Artificial General Intelligence (AGI): This AI equates with human cognitive ability. The design is to make machines think, learn, and perform at the levels of human beings. This AI is still at the hypothetical level. (Morozov, 2023). The thinking behind AGI is that; machines can be created to perform the intellectual tasks as humans or animals (Hodson, 2019, Shevlin et al. 2019). AGI is seen as an autonomous system that goes beyond human capabilities in most economically valuable

tasks (open, 2018). It incorporates cognitive flexibility, adaptability and general problem-solving skills. Performing any tasks a human being is capable of performing is the intention of AGI.

The AGI as an intelligent system with comprehensive knowledge and cognitive computing capabilities does not exist, at least for now. It remains at the level of science fiction. When AGI eventually comes, it is likely to draw much utility. One major advantage of AGI will be its "ability to access and process huge data sets at incredible speeds". This will mean that the "broad intellectual capacity of AGI will exceed human capacities" (Hashemi-Pour & Lutkevich, 2023:1). AGI will be so creative to be able to "read and comprehend human-generated codes and improve it". AGI will project a sensory perception of colour recognition and perceive depth and three dimensions in static images. It will possess fine motor skills involving a level of imaginative perception. It will possess an intuition that will enable natural language understanding. Researchers in AI, such as Hashemi-Pour and Lutkevich (2023), hold the conviction that AGI will possess higher-level capabilities, which will include handling various types of learning and learning algorithms, using different kinds of knowledge and belief systems.

AGI development is still at the theoretical level and is not certain when its development will be realised. Kurzweil (2012) believes that its realization may be possible in a few decades. Others, such as Brooks (1999) and Ford (2018), argue that it might take a century to achieve, while some contend that it might never be achieved (Roser, 2023). Arguments abound as to the potential threat of AI to human existence. OpenAI (2018) contends that it poses an existential risk to humans. It is further argued by the AIcontentfy Team (2023) that AGI will lack creativity as programs can only follow what is inputted and the patterns created. Machines cannot exhibit the randomisation associated with humans. Again, AGI will not have the innate ability to learn from its experiences and mistakes. AGI machines will lack the emotions to catch the needed attention of the marketing outfit.

Artificial super Intelligence (ASI): According to Ahmanson (2023), Artificial super intelligence "is a hypothetical form of artificial intelligence that surpasses human intelligence across all fields from creative arts to scientific research". ASI is expected to perform better than the best human minds in every sphere of existence. It will be capable of surpassing human intelligence in cognitive skills. It will be able to develop thinking skills of its own and be responsive to emotions. These are qualities exhibited by humans only. ASI "is considered the most advanced, powerful and intelligent type of AI that transcends the Intelligence of some of the brightest minds such as Albert Einstein" (Kanade, 2022:1 a). At this rate ASI will be super dominant in all spheres of human interests. It will be extreme in intelligence in the areas of mathematics, science, humanities, sports, medicine, emotional relations and marketing. In other words ASI superior "capabilities will apply across many disciplines and industries and include cognition, general intelligence, problem-solving abilities social skills and creativity" (Barney, 2023:1). ASI machines are "self-aware and can think of abstractions and interpretation that humans cannot" owing to the limited thinking ability of the brain, which is limited to a few billion neurons (Kanade, 2022: a). The human-like capabilities of super AI are captured in Figure 1. It is speculated that ASI would improve problem-solving by analyzing large chunks of data with precision. It will aid faster and more accurate decision-making in many fields of human activities, including healthcare, politics and scientific research. In simple terms, ASI will be more efficient and productive. Unlike humans, ASI machines will be available for use any time of the day. This is likely to increase productivity. It is

speculated also that ASI will be more creative than humans (Barney, 2023). In other words, it is likely to create more cures for illnesses that humans have been finding difficult to treat. The creation of ASI has been viewed to present a potential danger to human existence. Rogue States could use the technology to compromise human security. It would create massive unemployment as many jobs performed by humans are likely to be automated. Most worrisome is the projection that it could pose existential risks to humans. The system could take control of nuclear weapons and eliminate humans on earth (Barney, 2023).

HUMAN-LIKE CAPABILITIES OF SUPER AI

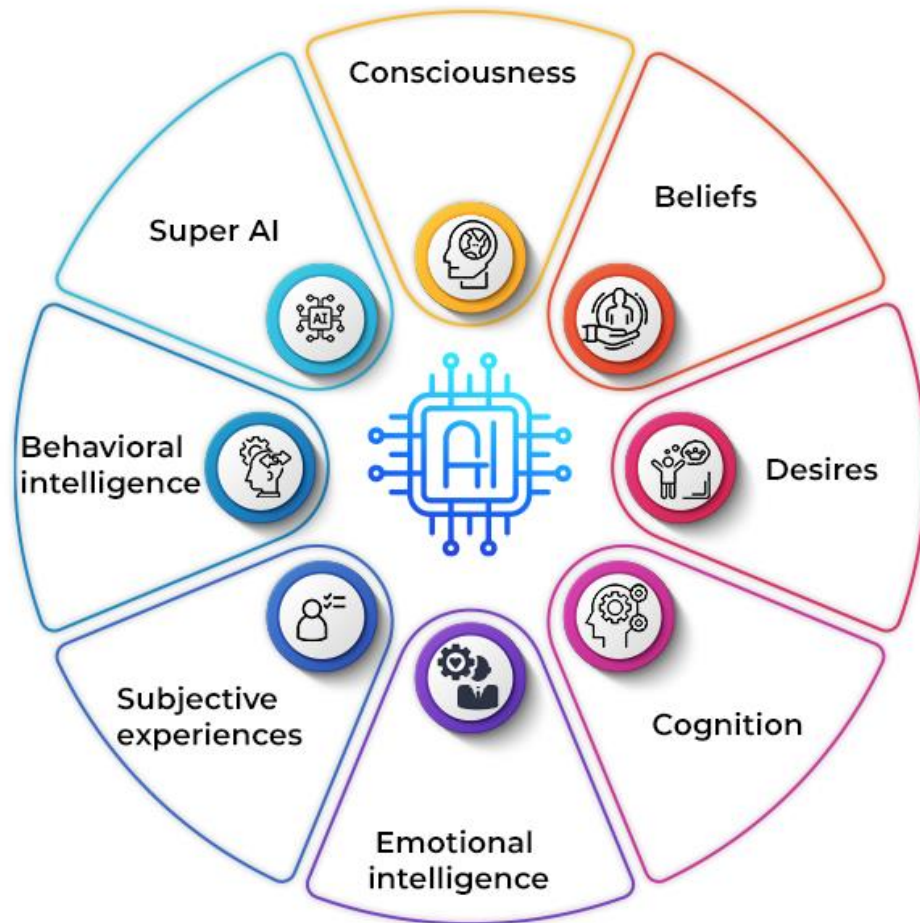


FIG. 1: Human-like capabilities of Supper AI

Source: Kanade, 2022: a

Benefits of Artificial Intelligence to Academic Research

In recent years, attention has been directed to the application of AI to academic research. The academic world is undergoing changes in the ways and manner in which research is conducted. Emphasis is fast shifting towards machine learning, and it seems obvious that the gap between human and machine learning is becoming slimmer in contemporary times. The research industry seems to be influenced tremendously by a transformative technology called artificial intelligence. In 2014 alone, about 2.5 million scientific articles were published in about 28 journals published in the English language alone (Enago Academy, 2023). This shows the swiftness with which scientific articles are written and published through the support of AI tools. AI is an exciting discovery that offers a guiding light on the parts of academic writing. Patel's 2022 statement (as quoted in Grove 2023) posits that "now is the most exciting time to be a researcher". Robust exposure to AI tools has accelerated research in diverse disciplines, leading to cutting-edge discoveries in medicine (Jones, 2023).

How is AI useful in basic academic research? It is contended that artificial intelligence has brought tremendous changes to academic research. We shall attempt here to establish some of the utility of AI to academic research.

Improvement in data analysis. It is argued that the application of AI in research has the capacity to analyze vast amounts of multiple data with utmost accuracy and efficiency within an infinitesimal period of time. As posited by Abbadia (2023:1), data analysis through AI technologies has the potential to "identify patterns, correlations and trends that may not be easily discernible through traditional methods". Data analysis is an important aspect of a research study. Where the analysis is wrongly done, it affects the results and misleads the application. AI tools such as JULIUS and GPT-4's advanced data analysis can, according to Jones (2023), "autonomously analyse and visualise complex data sets revealing hidden patterns that can guide further research".

Literature review and knowledge synthesis: The application of AI tools in basic research has the potential to assist tremendously in literature review and knowledge synthesis. AI tools can scan a large range of academic papers with speed and ease and extract relevant information and data for analysis. Establishing a gap in the literature is one basic requirement in academic research. This has often eluded many academic writers as they often repeat research others have carried out. This often emanates from the difficulty of traversing the barrage of literature in the area of study. With advanced AI technology, literature can be searched with ease to be able to establish the gap between what is and what is yet to be researched. Jones (2023) argues that "AI platforms like SCISPACE and Jennie can help generate preliminary literature review". TLDR and Askyour PDF are tools in this direction.

Detection of plagiarism: One big challenge in academic research is plagiarism. As observed by Uya (2005) "plagiarism in scholarship has become such a major problem worldwide". Kessler's

study, reported by cleveland.com, reveals that 86% of students cheated while studying, 76% copied assignments word for word from others, and 70% used their electronic devices to cheat (Academic Research Guide Association, 2023). Menshawey et al. (2023), who attempted to determine plagiarism among Covid-19 articles in infectious disease journals between 2020 and 2021, concluded that plagiarism was prevalent in COVID-19 publications. "It is better to fail in originality than to succeed in imitation" (Herman Melville, 1850). How do we drastically diminish plagiarism? Proponents of Artificial Intelligence have argued that AI tools will drastically deal with the issue of plagiarism. Enago Academy (2023) submits that by "using natural language processing, AI can forgo the traditional algorithms for detecting plagiarism in favour of software that can identify whole sentences or paragraphs that have been reworded"

Detection of questionable submissions: Academic integrity is important in academic research. One common ethical issue surrounding academic research is deliberate misinformation or misrepresentation of facts. How do we determine that the data presented in an article are true representations of facts when they are macabre information that could be very difficult to filter? It is argued that AI tools have the capacity to deal with questionable submissions. Jones (2023) emphasises that AI apps like Mirror Think can help scholars scrutinise papers, verify questionable assertions and act as vigilant guardians of academic integrity.

Detection of data modifications: Data modification is another area of academic theft in research writing. Researchers often modify data to arrive at a predetermined result or desired outcome. Morally depraved scholars who lack the verve in creative writing often pick previous works and pattern the existing published data to suit what they want to achieve. This is an academic theft that is becoming rampant. Unauthorised access to data can lead to data stealing and changes to suite depraved intentions (Cloudmask, 2023). AI technology has the capacity to detect such modifications (Sharma, 2023).

Grammar checker: Poor grammatical expressions remain a constant challenge in academic writing. Many articles have been denied publication not on account of irrelevance but because of poor grammatical expressions. This challenge is dominant among non-English speaking writing communities. AI grammar checkers have been found to comprehensively correct grammar errors. AI technology edits articles with almost accuracy and uses grammatically correct English. Grammarly and ChatGPT as AI tools "can polish manuscripts using real-time corrections" (Jones, 2023).

Accurate referencing: References acknowledge the sources of ideas that support one's research. When this is not done correctly, it could attract some academic penalties. Journals have also applied different referencing styles, which are often modified from time to time. Most writers often find it difficult to painstakingly format their references accurately. The use of ChatGPT as an AI tool can format references accurately using any referencing styles such as APA, Chicago, MLA, etcetera.

Threat of Artificial Intelligence to Academic Research

Artificial intelligence, for now, is at the level of Artificial Normal Intelligence (ANI), where machine-mediated programming is used to support human activities. Artificial General Intelligence (AGI) and Artificial Superintelligence (ASI), which are superior forms of AI, are still

at their hypothetical level. Advancement into this higher forms of AI will mean that machines so created will surpass human intelligence and act better than the best human brains on Earth.

While AI reduces educational stress and improves learning experience through the availability of its tools, it presents many disadvantages (Mazhar & Safdar, 2023). Machine-supported academic writing portends serious threats to academic research, places many disadvantages in the field of education, and can present a major setback in the intellectual strength of supposed academics. We present below some of the threats.

Reduction of creativity: Reliance on AI to develop academic papers reduces the creativity associated with human intelligence. Human intelligence, according to Sternberg (2023:3), is the "mental quality that consists of the ability to learn from experience, adapt to new situations, understand and handle abstract concepts and use knowledge to manipulate one's environment". This intellectual capability allows humans to learn from experiences and concepts, create new ideas on the basis of their experiences, and understand and apply logic and reason. Machines are yet to achieve this complex cognitive feat, at least not at the level of Artificial Normal Intelligence (ANI), which is the level of AI currently operational. Using AI to develop academic writing will elude this sensitive touch in scholarship.

Artificial intelligence machines will produce what they were programmed to offer. In producing an essay or article, AI tools will depend only on what information or data already exists on the web or archives. It will only harvest ideas already circulating in the web. Since Artificial Normal Intelligence (ANI) does not have the natural cognitive ability of humans, it does not think and will not create anything new. Its precision in academic research is only to the extent of what is already archived and circulating. AI will only be transcribing what knowledge already exists. If a social science researcher places a command on an AI software to produce an essay on a research topic and within a few minutes a paper of 3000 words is ready, where are the articulation and ideas coming from if not recycling, reframing and rewording of existing documented ideas on the issue area? The beauty of academic research is in creating new ideas born out of the researcher's experiences. This is eluded in AI machine-dominated writing.

Diminution of the rigour in scholarly research: Another danger of AI on academic research is the diminution of the rigour associated with scholarly research. Academic writing rigour here refers to the "meticulousness, consistency and transparency of the research" (Atlas.ti, 2023). It has to do with involving stringent methods to ensure that research findings are credible, dependable, transferable and confirmable. Credibility here refers to "the extent to which the results accurately represent the participants' experience" (Atlas.ti, 2023). The use of machines to write does not allow most researchers to spend time in the field with human research participants and persistently observe their behaviour. Academic writing is expected to be rigorous. In other words, they are expected to be critical and discerning about what they want to produce, driven by their observations and experiences. Machines powered by AI do not do these. Machines are not always correct. Machines can misinform based on the data available to them. What is "garbage in" is what is "garbage out". Relying on machine information will be misleading in some cases.

Promotion of academic indolence: Another threat of AI to academic research is the promotion of academic indolence. What do we mean by this? It will become clearer if we understand indolence to mean "a state of laziness, idleness or general lack of motivation to engage in activities. It denotes

a disposition towards avoiding work, exertion or effort. Often considered a negative trait, indolence can hinder personal growth, productivity and success" (Rephrasely, 2023). Academic research comes with its energy and industriousness, which produces, in the end, original results born out of scholarly commitment to academic productivity. AI makes scholars who depend on it to be relaxed and carefree because the software is readily available to produce your paper by 90%. It has a debilitating effect on the output of higher education students. They no longer craft students' papers as AI software such as NERD AI are readily available to turn in an essay of about 3000 words in a few minutes. In the foreseeable future, the products of academic institutions that depend on AI software for their academic work will be so limited in knowledge of academic exercises. AI would create artificial academics by removing their intellectual capacities (Ahmad et al., 2023). As Sarwarl (2018:2) has pointed out, it will push scholars to "think like algorithms without understanding". In clear terms, task automation creates laziness among scholars.

Limiting critical thinking: Relying on AI will limit critical thinking in scholarship. Critical thinking, according to Scriven and Paul (1987: 4), "is the intellectually disciplined process of actively and skillfully conceptualising, applying and analysing, synthesising, and/or evaluating information gathered from or generated by observation, experience, reflection, reasoning or communication as a guide to believe and action". The Paul-Elder framework of critical thinking it as an analysis of thinking dealing with the elements of thought, evaluation of thinking which focuses on universal intellectual standards and improvement of thinking which centres on the intellectual trait. As Elder (2007:3) puts it, "people who think critically consistently attempt to live rationally, reasonably and empathically. They work diligently to develop the intellectual virtues of integrity, civility, empathy, intellectual sense of justice and confidence in reason". These are qualities of intellectual human researchers that give a researcher a sense of commitment and fulfillment. The beauty of scholarly research also lies in the knowledge of the methods of logical inquiry and reasoning. AI machines deny this bonding that critical thinking offers in a research endeavor. Scholars, in the long run, will become passive learners who will not be able to think critically and independently. AI machines and software are not humans and can, therefore, not offer these high cognitive skills, including metacognition, associated only with intelligent humans. Machines do not think and, therefore, cannot reflect. They merely deliver one way as programmed. In all, AI hinders the development of important cognitive skills.

Data leakage and privacy violation: Intellectual property rights are a revered culture in the academic community. What will the faith of this culture be in the face of AI-mediated scholarship? AI collects substantial amounts of data and analyze them to produce the programmed resource. AI is capable of flouting this culture. Data harvesting by AI tremendously affects private and personal data. Privacy risks arising from data breaches lay in the application of AI to basic research. Data breach is the unauthorised access to data or information by an individual, groups or machines. Cloudmask (2023) submits that when unauthorised access is gained, they can steal and often make changes to the data. The consequences are numerous. It can lead to licking confidential information and the theft of intellectual property (Cloudmask, 2023). Kharif (2017) revealed that in 2016, data breaches rose by 40% over 2015. With the emergence of advanced AI software, data breaches could be astronomical.

Termination of academic humans in core research publishing activities: In the so-called pursuit of efficiency, which the proponents of AI emphasise, humans are likely to be purged from major

academic activities. AI dominance is geared towards minimal human intervention for the purposes of efficiency in the entire process of peer review of articles for publication. The claim is that this process will be automated without involving academic humans. AI, in this context, is considered a neutral actor. How is this correct? Who designed the machines? What is the guarantee that the prejudices of the past are not institutionalised in technology? (Gendron et al 2022) to give a predetermined outcome? As rightly argued by Harrow School (2023), AI systems are built on vast datasets and if these datasets contain biases, they can perpetuate unfairness and discrimination. AI stands the risk of algorithmic bias. It is becoming clearer that AI will always, as noted by Crawford (2021:8), act as a "registry of power". What it is designed for is what it will manifest. If it is designed with prejudices, it will always produce prejudicial results. Intelligent humans are still very necessary in peer review processes and other meaningful academic activities. After all, the hyping of machines to be too fast and accurate in decision-making is not, in all cases, correct. Dourish (2016) argued that machines are not all that Fair, efficient and superior to human intervention. AI will provoke a human repudiating effect in academic research activities, especially in the area of research evaluation. As AI takes over, the historical role of academic humans in research evaluation will diminish and become utterly insignificant - turning academic humans into redundant entities in this regard.

The issue of AIgiarism: AIgiarism refers to the use of AI tools to clone academic work. The level of AIgiarism by academic writers have increased because of the assistance provided by AI software. AI tools such as chat GPT and NERD AI can propel this practice, which could be very difficult to detect. Ali Khalaf (2024) expressed worry over the irresponsible and unethical manner in which Artificial Intelligence chatbots such as chatGPT and other associated software are used by students to perpetuate academic dishonesty in schools. Ali Khalaf is not alone in this worry. With the ability of ChatGPT to respond to questions and generate coherent text on any topic (Cotton et al, 2022; Musugesan, 2023) King and ChatGPT (2023), Ibrahim (2023) and Yeadon et al (2022) concluded that the software is an effective tool for completing students essay across college campuses and marks a new vista in AI-supported AIgiarism. Authors are also deeply involved (Musugesan, 2023). Cheap academics have found a rescue in this software and have continued with AIgiarism unhindered.

The question of copyright: When AI generates an essay, who owns the copyright? Here, two entities should be contesting for the copyright ownership. On the one hand, the person that provided the prompt that generated the content using the software will be claiming ownership. At the other end the trainers of the chatbot who provided the necessary dataset will be at liberty to claim the copyright. This confusion and tension will lead to legal challenges. In the Nigeria context does the copyright law protect a non-human authorship? These are some of the concerns that will be thrown up in the near future over authorship of AI-assisted academic papers.

The model of the potential and threats of Artificial Intelligence to academic research is presented in Figure 2.

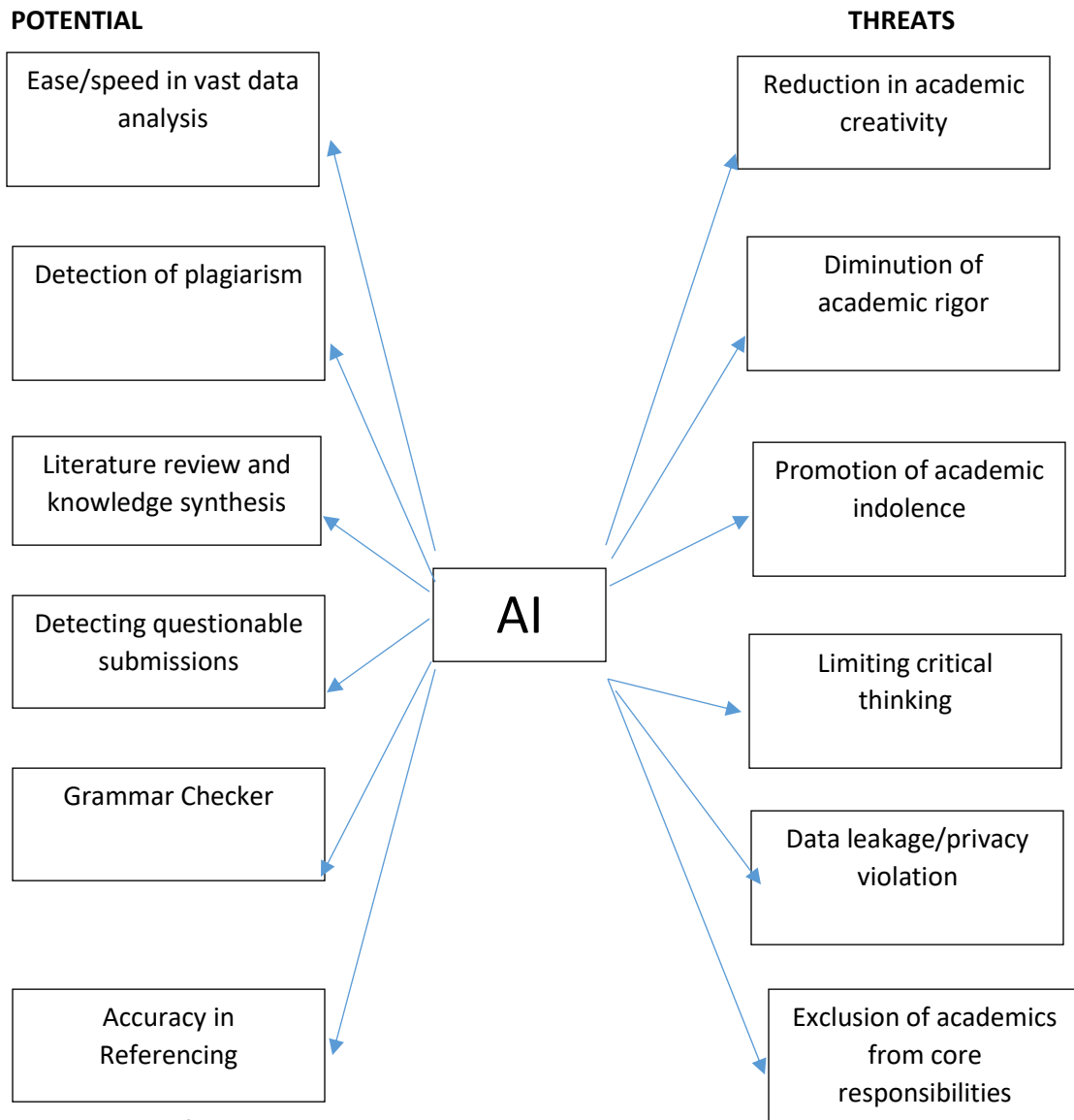


Fig. 2: Model of AI Potential and threats to academic research
Source: Authors' configuration

Developing the Ethical Code: Issues to Consider

In developing the inevitable Artificial Intelligence ethical code, policy makers need to take few issues into consideration. We attempt a suggestion of some of them.

The need to develop AI software and machines by a community of stakeholder experts: Diverse range of stakeholder experts need to converge to develop and deploy AI systems. It should not be a system by one man. This is to ensure that algorithmic biases are reduced to the barest minimum. A team is likely to identify potential biases and deal with it than a single expert.

Developing ethical guideline for the use of AI in academic research: Guideline for the use of AI in academic research is important and urgently needed. These guidelines should address the issue of accountability and explainability of AI algorithms and to ensure that both the developers and users of AI tools are responsible in its usage to avoid tangential development in the application of AI.

Transparency: In order to continue to build trust in AI systems, AI should be developed to have a clearer and unhindered understanding of its tools, behaviour and outputs. Every stakeholder should be able to clearly understand the ways an AI system works, especially how it processes data and makes final decisions. Researchers should adopt a multi-faceted approach to ensuring the transparency of AI in academic research. The use of an interpretable algorithm could sort reliance, provision of clear documents, and maintain a record of data sources and model versions (LinkedIn, 2023). These will address the core competencies of transparency dealing with explainability of technical components that involve the internal working of the algorithms, system governance, which deals with evaluation processes and documentation, as well as transparency of impact, which involves easy communication of the purposes and capability of the AI software to stakeholders (Cole, 2023).

Establishment of a common language: A common language will make machine learning easy to grasp and accessible. The scientific community can use this language to gauge the configuration of the programmed AI system. A common AI language can be used by AI society as recommended by Maestre to “Review Work carried out through publication in an environment conducive to discussion and correcting models” (Banco Bilbao Vizcaya Agentaria, 2018:2). This discussion is not limited to expert in AI computing but open to people with different profile to gauge the impact of such reviews on “Decision making when designing algorithms” (Maestre 2012:1). This process tantamount to algorithm auditing as described by Banco Bilbao Vizcaya Agentaria (2023:2), to mean a “Systematic review of work that allows all processes to be documented and establish review mechanism that assigns a quality guarantee seal to models”.

The importance of developing a strong ethical guidelines for the development and application of AI is to guarantee a responsible AI. A responsible AI is Explainable, Monitorable, Reproducible, Secure, Human-centered, Unbiased and Justifiable (Hashemi-Pour & Lutkevich, 2023). The model is presented in Figure 3.

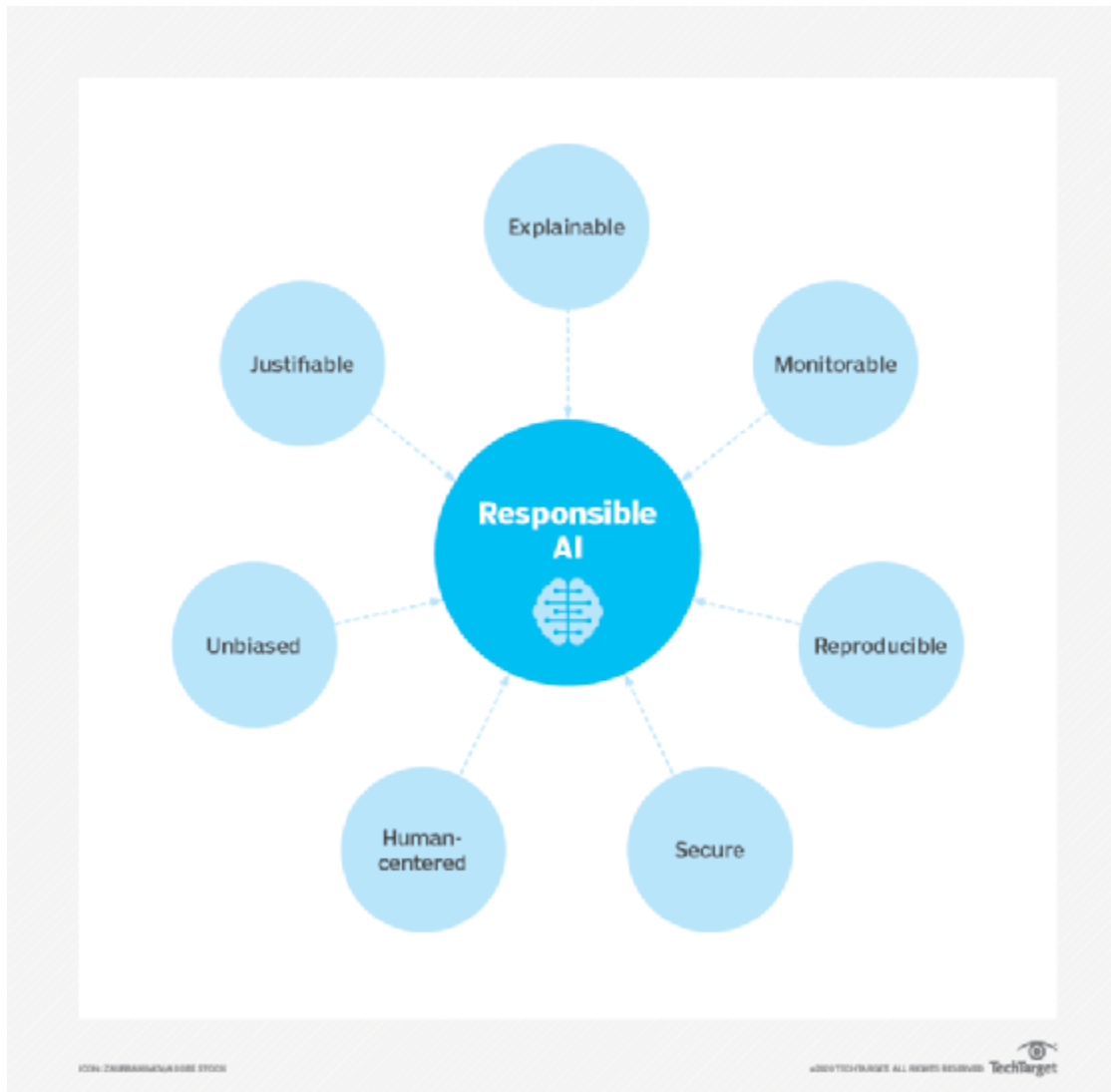


FIG. 3: Model of Responsible AI

Source: Hashemi-Pour & Lutkevich (2023).

Conclusion

In this study, we analysed the potential and threats of the application of AI to academic research. We submit that though the reliance on AI for academic activities presents possible interesting potential, it has the capacity to reskill academics and limit critical thinking among them and establish in the near future the culture of academic indolence. The AI dominance in scholarship will place academic research, which is an interacting human activity, at serious risk of extinction. The emergence of conversational Artificial Intelligence Chatbots capable of generating organised text as requested has gained massive acceptance by students and scholars across the education landscape. For instance, “ChatGPT as a general-purpose conversational AI can answer both broad

and specific questions and generate well-written text on any topic on the fly with the capacity to refine the response following the users' feedback" (Murugesan, 2021, p. 3). The power of Artificial Intelligence has been accepted as a powerful tool in academic research, promising to take research to an enviable height. However, despite the promises AI offers to the academic community, it presents possible challenges to academic research. Its use should be entrenched in sound ethical grounding powered by international administration outfits such as the United Nations and other regional integrations.

Recommendations

As an exploratory study, the paper recommends as follows:

1. As the future of academic research illuminates with AI, further studies are required on how AI can be adopted responsibly and ethically. A balance has to be struck between the application of AI and the indispensable role of human scholars.
2. Studies on AI transparency are imminent. Researchers should ensure a great deal of transparency about how AI models work for academic purposes in order to justify decisions made by such machines.
3. Studies on the development of higher AI tools are important to distinguish between AI-assisted research write-ups and human-written papers. This is important to discourage AIgiarism, which depraved academics shamelessly engage in.
4. Studies on academic labour reskilling in the emerging AI wave are important. One way to adapt to the AI wave that is surely around is to reskill academic labour. Scholars need to understand its operation and adapt to its ethical considerations. AI certainly will change the way academic research is done. Scholars need to adapt to it. However, AI certainly will require government policy to be responsibly domesticated

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