

Challenges of Integrating AI Ethics into Higher Education Curricula in West Africa: Nigerian Universities Narrative



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Artificial intelligence (AI) is becoming more pervasive and intriguing. This is because AI is improving our lives by doing much of the difficult work for us, such as driving our automobiles, performing medical tasks, accounting tasks, and a variety of other tasks. It can also acquire new knowledge. It is a non-human machine that can be used to achieve a difficult goal. Although AI has demonstrable benefits, the collection, use, and misuse of data required to train and feed AI, as well as the algorithm itself, may expose people to risks they are not aware of (Borenstein and Howard 2021). This calls for the need to build next generation of AI technologies that can make a difference by integrating Ethics in AI. In 2018, the world became really concerned about AI ethics, and that was not because suddenly across borders, across sectors, we became enlightened. It is because for any good AI ethics research, the source and the quality of data used is very important and should be adequate. There are issues of social media, the world is under threat, algorithms may reinforce discrimination and even amplify it. Important questions are being raised since the machine is aiming at replacing humans, could artificial intelligence be harmful to humanity? In response to these issues, more institutions started to focus on AI Ethics. Africa will not be left out. This calls for the need to integrate AI ethics into higher education curricula in Africa. AI Ethics will help to build a human-centric approach, where tomorrow's challenges and citizens' aspirations are considered. We also believe that it will help to safeguard humanity.

Despite warnings from people like Elon Musk about the existential risk AI technology poses to humanity (Vincent 2017), the reality is that it is a useful tool, even in education but it needs human control. AI does not have awareness of itself, nor does it have something called "empathy" which is the fundament of ethics. Despite the clear need to understand how AI affects people around the world, a truly global perspective remains a critical blind spot in the ethics conversation. The United Nations, national

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legislators and industrial bodies in developed countries are asking these questions and are already acting to protect their constituents from some potentially negative effects of AI, such as algorithmic discrimination and voter manipulation (Gwagwa 2019).

1 AI Ethics

Over the past few years, various measures and initiatives have been put in place to promote ethical development and use of AI technology. But currently, ‘ethics’ is not being used for artificial intelligence the way it ought to. An AI system will do whatever task it has been ordered to do even if these tasks are unethical, illegal, or lead to adverse outcomes. Ethics is simply defined as “doing the right thing at the intersection of technology innovation and accepted social values” (O’Brien 2020). It is about behaviour and about ways of thinking, especially in situations where the choice made can affect the dignity and wellbeing of others. AI Ethics is about integrating ethical constructs into how organizations develop new technologies. Ethics is not only important in technology (and especially AI), but it should be the foundation of any innovation.

AI will radically transform and disrupt the world, but right ethical choices for AI can make it a force of good for humanity. Until governments, business sector and academics start thinking about bringing codes of ethics into the AI discussion there is no anchor for the AI disruption. There is a need for setting up global AI ethics standards. Codes of ethics for expert bodies have broader national or global context. An international regulatory model is essential for the responsible design, development and deployment of AI (Hashmi 2019).

Figure 1 shows AI Ethics principles which is the framework needed to build ethical AI.

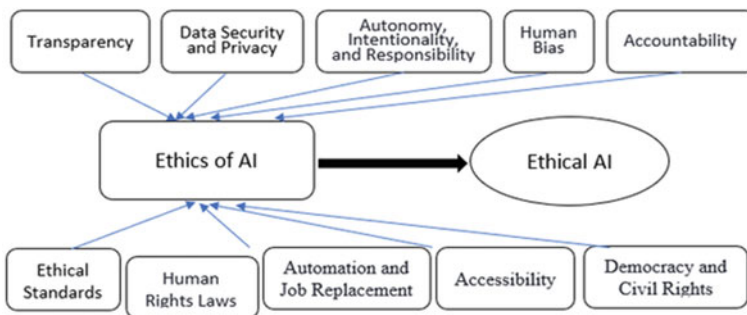


Fig. 1 AI Ethics: Framework of building ethical AI. Source <https://www.researchgate.net/profile/Keng-Siau-of-building-ethical-AI.ppm>

Ethics of AI studies the ethical principles, rules, guidelines, policies, and regulations that are related to AI. Ethical AI is an AI that performs and behaves ethically. One must recognize and understand the potential ethical and moral issues that may be caused by AI to formulate the necessary ethical principles, rules, guidelines, policies, and regulations for AI (i.e., Ethics of AI). With the appropriate Ethics of AI, one can then build AI that exhibits ethical behaviour (i.e., Ethical AI) (Siau and Wang 2020).

Figure 1 establishes the framework for AI ethics listing the factors or principles that needs to be considered in defining the ethics of AI in order to build ethical AI. They include transparency, data security and privacy, autonomy, intentionality and responsibility, Human bias, accountability, ethical standards, human rights laws, automation and job replacement, accessibility, democracy, and civil right. Even though defining the ethics of AI is multifaceted and convoluted, putting the ethics of AI into practice to build ethical AI is not easy. Ethical sensitivity training is required to make good ethical decisions. In theory, AI should be able to recognize ethical issues. If AI can make decisions, how can it be designed and developed for it to be sensitive to ethical issues? Long-term and sustained efforts are needed. Nonetheless, understanding and realizing the importance of developing ethical AI and starting to work on it step by step are positive steps forward. Many institutions, such as Google, IBM, Accenture, Microsoft, and Atomium-EISMD, have started working on building ethical principles to guide the development of AI. Ethical AI should do no harm to humans (Siau and Wang 2020).

Therefore, to ensure AI remains human-centric, companies developing or using AI should promote ethical debates that lead to codes of conduct based on principles that will safely guide humanity.

2 Importance of Ethics in AI Courses

AI does not have awareness of itself, nor does it have something called “empathy” which is the fundamental of ethics. It could be developed with good intentions, but still, draft into something less morally approved. So, ethics is not only important in technology (and especially AI), but it should be the foundation of any innovation (Hoes 2019).

The growing presence of AI calls for its political, economic, and social consideration and, most importantly, ethical implications. It is therefore crucial to lay the groundwork to avoid situations in which machines make decisions that affect individuals in the future, such as creating biases that single out or exclude individuals based on race or gender. Failure to adopt ethical frameworks to address issues that may arise in terms of personal data collection and processing can damage a business’ reputation and cause direct and possibly irreparable harm to consumers.

Recognition of the need for ethics education in computer science, information technology, engineering and other related disciplines goes back at least a hundred years, but it has only been since the 1990s that expectations for ethics education have been adopted by accreditation bodies (Furey and Martin 2018). It also raises the

need for real and honest dialogue about how we build and adopt these technologies responsibly.

AI Ethics is not currently a course in computer science, engineering, information technology departments in Nigeria federal and state Universities. What all the Universities in Nigeria has in its Benchmark Minimum Academic Standard (BMAS), is AI BMAS. For example, in University of Port Harcourt, AI is not a stand-alone program, but it is a core course, for computer science, and electrical/electronic engineering undergraduate students. The same applies to the graduate (MSc and PhD) computer science and electrical/electronic students. It is not an elective course nor a stand-alone programme. It is a core course.

There is a deep concern about the increasing wide-reaching societal impact of AI approaches. This calls for the academia, to create ethical awareness while teaching AI. They should educate students and the workforce whose jobs are evolving with AI, on how human checks and balances can be enforced on AI machines.

AI systems should be developed and used according to the following rules: respect for human autonomy, prevention of harm, fairness, and explicability. The attention is paid to certain social groups: children, disabled people, and other groups at risk of exclusion. AI may be beneficial, but it comes with risks that are sometimes difficult to predict and identify. This calls for the need to integrate ethics into AI course. For instructors, there is need to develop curriculum that not only prepares students to be artificial intelligence practitioners, but also to understand the moral, ethical, and philosophical impacts that artificial intelligence will have on society. To avoid running the risk of not being ethical, AI technology must be build based on ethics and every outcome of the algorithms used for implementing it, should be understood.

Figure 2 shows a diagrammatic representation of what Ethics in AI means.

From Fig. 2, it is important to include ethics in AI course because it will eliminate or reduce bias, provide trust, the system developed will be transparent. It can be explained and interpreted, it will protect human privacy, and it will be built and used with ethical purpose in mind.

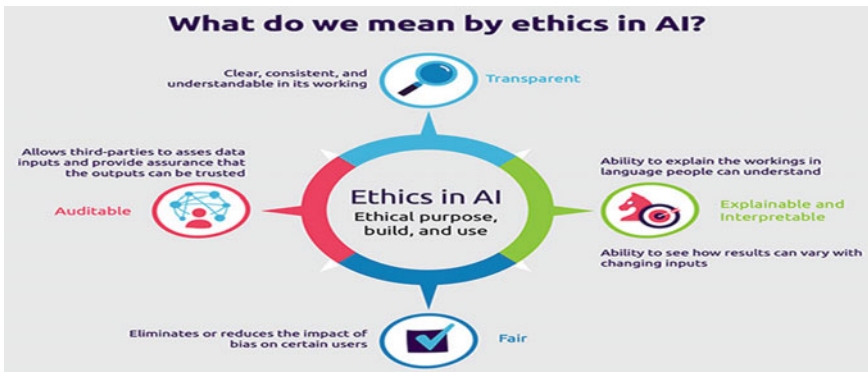


Fig. 2 Ethics in AI. Source <https://img2.helpnetsecurity.com/posts2019/ethics-ai.jpg>

3 The Need to Integrate AI Ethics into Higher Education Curricula

It is vital that there is open, informed dialogue and transparency about the ethical quandaries of AI and education if trust is to be developed in the technology. The teaching profession has a long history of leading public discussion and providing accessible explanations on complex issues which affect students and their families and of grappling with issues of fairness, ethics, duty of care, and accountability in schooling. This makes the teaching profession well equipped, to both use AI technology for good and to ask critical questions regarding when and how machines should guide student learning and decision processes within educational settings, and whose values should be imbued into AI-powered systems (Southgate 2018).

The goal of teaching ethical theory is to better equip students to understand ethical problems by exposing them to multiple modes of thinking and reasoning. This is best accomplished by helping them understand the powers and limits of each approach, rather than trying to demonstrate the superiority of one approach over the other.

Teaching ethics in AI classes is important since AI technologies and their applications raise ethical issues, it makes sense to devote one or more lectures of an introductory AI class (or even a whole course) to them. Students should think about the ethical issues that AI technologies and systems raise, they should learn about ethical theories that provide frameworks that enable them to think about the ethical issues and apply their knowledge to one or more case studies, both to describe what is happening in them and to think about possible solutions to the ethical problems they pose. AI Ethics is a rich topic that should support a full-semester course. As such there is need to integrate AI Ethics as part of computer science and engineering university programs (Eleanor et al. 2020). To effectively integrate AI Ethics into higher education curricula in West Africa, requires collaboration between universities across countries and research institutes. Responsible AI networks in West Africa should be encouraged.

An on-line survey was conducted by the researcher, to find out if universities offer AI ethics as a program. Figure 3 presents the feedback of some selected universities in Africa that offer AI ethics as a program. From the figure, 88.5% of the selected universities, do not offer AI ethics as a program, while 11.5% offer AI ethics as a program.

4 AI Ethics for Africa's Development

Despite the global nature of the ethical implications of artificial intelligence, attention has focused primarily on the US and the EU, with growing awareness of China, especially its increasing AI capabilities, its impact on the Global South and the global geopolitical order. Despite the clear need to understand how AI affects people around the world, a truly global perspective remains a critical blind spot in the

Does your Institution offer AI ethics as a course/program?

26 responses

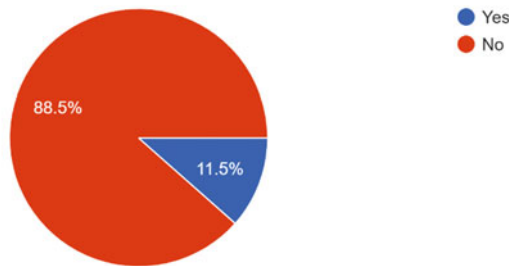


Fig. 3 The percentage of institution in some West Africa and African countries that offer AI ethics as a program

ethics conversation. The United Nations, national legislators and industrial bodies in developed countries are asking these questions and are already acting to protect their constituents from some potentially negative effects of AI, such as: algorithmic discrimination and voter manipulation.

Is Africa included in the processes of the emerging global AI ethics initiatives, including the nascent ones in Africa? And are issues that are relevant to Africa being addressed in such initiatives? (Gwagwa 2019).

West African higher institutions are playing a critical role in growing the AI ecosystems through AI and data science programmes, research labs and AI centres of excellence. These efforts are expected to lead harnessing AI full potential in the economic development of Africa. Although AI holds high potential for the African continent, it also carries along risks and harms that must be considered to achieve responsible and sustainable AI for development. Universities have a critical role in shaping the landscape of AI ethics in Africa. AI ethics can be described as “a set of values, principles, and techniques that employ widely accepted standards of right and wrong to guide moral conduct in the development and use of AI technologies” (Eleanor et al. 2020).

Figure 4 shows a conceptual framework that can provide a solid foundation to address the way socially responsible intelligent AI systems are build. This approach aims to form a set of standards as an ethical blueprint that developers and customers will make use of. For example, ethical laid down laws should be followed; what is AI forbidden to do, is human life rights been considered, and in making regulations is the right AI tools been used (Girard 2020).

Figure 5 shows the graphical feedback of the online survey conducted by the researcher on, the challenges of integrating AI ethics into higher institutions curricula in Africa, from selected African countries. Responses were gotten from some AI experts from different universities while conducting the online survey for this work. From Fig. 5, there are 17 feedbacks from the universities in Nigeria, two from

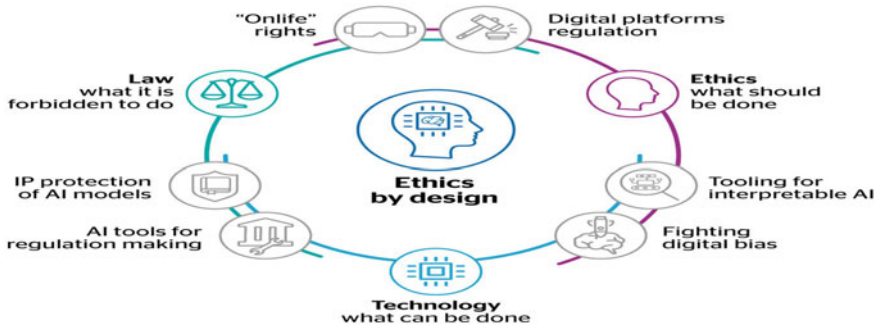


Fig. 4 AI ethics by design. Source Girard (2020)

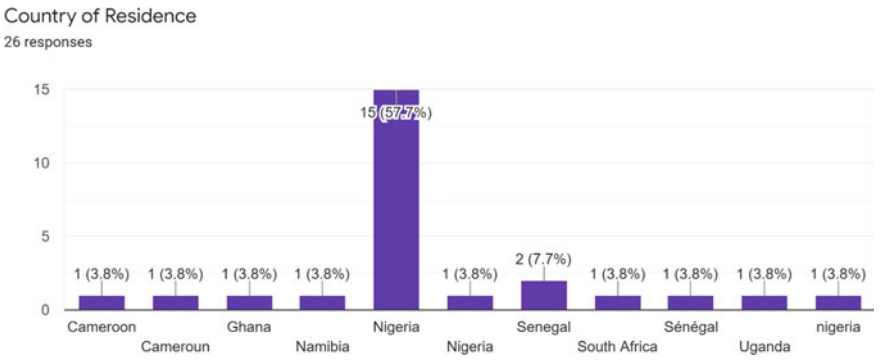


Fig. 5 Survey report from some African countries

Cameroon, one from Ghana, one from Namibia, two from Senegal, one from South Africa, and one from Uganda.

5 Challenges of Integrating AI Ethics into Higher Education Curricula

There are challenges associated with integrating AI ethics into higher education curricula in Nigeria. The main challenge is that the regulatory body, Nigeria Universities Commission (NUC) has not made it mandatory for higher institutions to include it into the curriculum. Other known challenges include long protocols and processes that must be followed during program approvals/accreditations by NUC at the universities, universities must follow the approved BMAS. New programs/departments, curriculum must be approved by NUC after which it must go through the university highest decision body (The senate) for final approval. Lack of enough experts in AI ethics field and having the right tools to work with. Not having access to AI ethics

courses and, getting lecturers to include it in their lecture material since it is not in the approved curriculum. Lack of an AI code of ethics, and existing documents regulating AI ethics, may hinder the development of new applications for intelligent devices in the future (Słonic and Kaczorowska 2020).

There are challenges of lack of well-equipped AI laboratories and hubs in the universities with the necessary technical tools for data collection.

6 Solution to Challenges of Integrating AI Ethics into Higher Education Curricula in West Africa

Figure 6 shows the process involved in accreditation of all programs in Nigeria universities. NUC accreditation for all higher institutions in Nigeria is done every five years. Programs undergo accreditation and can only function if they obtain full accreditation after following the protocols and rules laid down by NUC. Higher institutions must use the BMAS from NUC.

Nigeria universities being the case study in this work, already has AI BMAS in its curricula. To integrate AI ethics into Nigerian universities curriculum, potential efforts should be made by NUC (who happens to be the major stakeholder in Nigerian higher institutions), to make it mandatory for higher institutions to include AI ethics into the curriculum, for its complete integration and implementation which

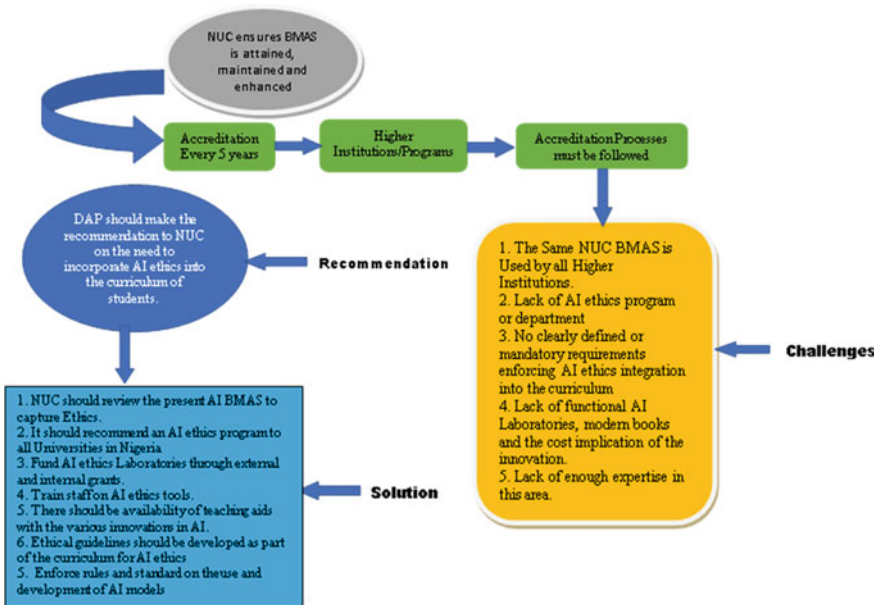


Fig. 6 NUC course integration/accreditation process

is expected to be practical driven. AI ethics awareness should be created at higher institutions focusing on technology, governance, and legal aspects. Stand-alone AI Ethics program/department should be made mandatory for all higher institutions.

Experts should be engaged who understand how to evaluate the impact of these systems on our society, particularly in terms of learning how to work effectively with AI systems and harness them for good. These experts should train the trainer on how to integrate ethics into AI curriculum and use AI ethics tools and stick to the existing ethics and standards of developing AI ethics systems.

Government should equip higher institutions with the necessary technical tools, AI laboratories, and modern books to expertly navigate AI ethical challenges. For good AI research, AI Hubs should be established.

Nigerian Universities and Africa Universities in general needs more of this Hubs from the government, private industry, professional organizations, and tech companies, to solve local problems in Nigeria and in Africa in general. Government should develop, and implement AI ethics standards and regulations, extend governance platforms by including AI stakeholders, academia, and practitioners in the governance bodies. They should develop and implement policies and guidelines that will help to build a strong data foundation that is fair and of good quality. There is a need to develop and implement ethical and regulatory frameworks along with sustainable mechanisms to unlock the availability and value of data to maximize the use of AI while limiting possible harms (Romanoff and Hidalgo-Sanchis 2019).

AI Ethics education should be made more accessible to everyone through E-learning. Integrating AI Ethics into the West African Universities' curricula will help to examine the most pressing ethical issues related to AI.

7 Conclusion

AI Ethics could potentially offer benefits to lecturers, researchers, and students in the form of personalized learning and pedagogical agents designed to deliver appropriate and sequenced content and feedback to learners. However, AI is still in a relatively early stage of development for education and there is much work to be done around the ethical and legal frameworks that can ensure that the technology is used for good and not harm, and that transparent processes are in place to ensure accountability at classroom, University community, and University systems levels. Academia's, University leaders and policymakers should be engaged with developments in AI ethics for education and the society, to empower students and researchers in the present and for future change.

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