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EMPOWERING DIGITAL CITIZENS: NAVIGATING DATA PRIVACY AND ARTIFICIAL INTELLIGENCE THROUGH DIGITAL LITERACY IN UGANDA

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ABSTRACT

As the world steadily advances into the digital age, and as attitudes of the masses leap towards artificial intelligence, Uganda as a whole, lags several steps behind. This paper provides a comprehensive exploration of the intersection between digital literacy, data privacy, and artificial intelligence. Exploring the components of digital literacy and its implications in an ever-evolving digital landscape, the paper discusses the importance of data privacy, and the measures necessary to safeguard information in the digital age. It further explores the significance of AI education, the ethical considerations that should underpin its implementation, and their impact on equipping individuals with the skills necessary to navigate the digital scenery. This holistic examination sheds light on the crucial journey towards empowering Ugandan digital citizens.

1.0 INTRODUCTION

* LLB Student at School of Law, Makerere University [2020 – 2024]. This article is as a result of the remarks made by different stakeholders at the Essay Writing Competition Award Ceremony hosted by the Centre for Technology Disputes Resolution – Uganda (CTDRU) on 25th August, 2023 at Eureka Place Hotel, Kampala, Uganda. The author is appreciative of Mr. Obbo Ian Solomon's guidance and direction in writing this paper. The author takes full accountability and responsibility of all mistakes and errors in the paper.

1.1 Background.

In the digital age, the ability to use office software such as word processors, email and presentation software, the ability to edit and create images, audio and video, and the ability to use a web browser and internet search engines are the skills that, according to the *UK Royal Society,* teachers of other subjects at secondary school should be able to assume that their pupils have, as analogue of being able to read and write.[1] In Uganda's contemporary economy, the importance of digital literacy cannot be inflated. The modern workforce relies heavily on technology for communication, collaboration, and information sharing.[2] Job roles across various sectors now require familiarity with digital tools and platforms.[3] However, the reality remains that a large fraction of Uganda's population is digitally illiterate. Not all individuals have equal access to digital devices and the internet, leading to disparities in digital literacy. A 2019 study of ICT in Uganda revealed that 36% of non-internet users are digitally illiterate with 23% stating that they do not know how to use the internet and 13% giving a negative assessment about their need for the internet.[4] Nevertheless, without adequate digital literacy, individuals may find themselves at a disadvantage in terms of employability and professional growth.

1.2 Understanding Digital Literacy in the Digital Economy.

Digital literacy has become an indispensable skill in today's digital economy. Today, the term "digital literacy" encompasses more than just the ability to use a computer or access the internet. It refers to the competence to navigate, evaluate, and communicate effectively on a variety of digital platforms. The

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1 UK, The Royal Society (2012), Shut down or Restart? The Way Forward for Computing in UK Schools available at <https://royalsociety.org/~/media/education/computing-in-schools/2012-01-12-computing-in-schools.pdf> [Accessed 04th January, 2023]

2 Alex Christian, BBC (2022), Why 'digital literacy' is now a workplace non-negotiable. available at <https://www.bbc.com/worklife/article/20220923-why-digital-literacy-is-now-a-workplace-non-negotiable> [Accessed 31st January, 2024]

3 Alex Gay, Adobe Blog (2019), How Digital Literacy Affects the Modern Workforce. Available at <https://blog.adobe.com/en/publish/2019/03/14/how-digital-literacy-affects-the-modern-workforce> [Accessed 31st January, 2024]

4 Alison Gillwald et al (2019), The State of ICT in Uganda available at <https://researchictafrica.net/wp/wp-content/> [Accessed 23rd August, 2023]

University of Western Sydney has defined digital literacy as having the skills you need to live, learn, and work in a society where communication and access to information is increasingly through digital technologies like internet platforms, social media and mobile devices.[5] According to the *UNESCO Institute for Statistics,* Digital Literacy refers to the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship.[6] It includes competencies that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy.[7] This proficiency extends beyond technical skills, encompassing critical thinking, information evaluation, and the ability to discern credible sources.

The components of digital literacy include technical skills, such as operating digital devices and software, as well as the ability to interact with various digital media. According to the *World Telecommunication/ICT Report***,** the related concept of information literacy consists of providing people with concepts and training in order to process data and transform them into information, knowledge and decisions.[8] It includes methods to search and evaluate information, elements of information culture and its ethical aspects, as well as methodological and ethical aspects for communication in the digital world. As the *European Commission* observes, digital literacy lays out five digital competence areas that include information and data literacy, communication and collaboration, digital content creation, safety and problem-solving.[9]

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5 Western Sydney University Library Study Smart (2020), What is Digital Literacy <https://www.westernsydney.edu.au/studysmart/> [Accessed 23rd August, 2023]

6 UNESCO Institute for Statistics (2018), A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 <https://uis.unesco.org/sites/default/files/documents/> [Accessed 23rd August, 2023]

7 ibid

8 International Telecommunication Union, World Telecommunication/ICT Development Report 2010: Monitoring the WSIS Targets <https://www.itu.int/pub/D-IND-WTDR-2010> [Accessed 24th August, 2023]

9 European Commission, Educating and Training Glossary <https://www.cedefop.europa.eu/en/tools/vet-glossary/glossary> [Accessed 24th August, 2023]

Additionally, a digitally literate individual should possess information literacy – the capacity to assess the credibility and relevance of online information. Business, travel, education, and finance among other sectors have now been largely digitized through platforms such as Jumia, Glovo, Safeboda, Uber, Duolingo and Wattpad. Additionally, digital literacy is particularly crucial given the prevalence of fake news and misleading content in the digital sphere. For instance, in December 2022, X (formerly known as Twitter), introduced the Community Notes feature to create a better-informed world by empowering people on "X" to collaboratively add context to potentially misleading posts.[10] Furthermore, digital literacy plays a pivotal role in fostering entrepreneurship and innovation.

The digital economy provides countless opportunities for individuals to create, market, and sell products and services online. Those who are digitally literate are better equipped to navigate e-commerce platforms, digital marketing strategies, and data analytics tools, thus enhancing their chances of success in the competitive digital marketplace. In the context of education, digital literacy is transforming the way knowledge is accessed and shared. Online learning platforms, digital libraries, and open educational resources are redefining traditional educational paradigms. Students equipped with digital literacy skills are more adept at engaging with these resources, conducting research, and collaborating with peers in virtual environments.

2.0 DATA PRIVACY AWARENESS AND PROTECTION FOR DIGITAL CITIZENS.

Data privacy awareness and protection have become paramount in an increasingly digital world. This is because the advent of technology and the proliferation of online platforms have revolutionized how individuals interact, work, and conduct everyday activities. However, this digital transformation has

[10] About Community Notes on X – Twitter Help Centre available at <https://help.twitter.com/en/using-x/community-notes> [Accessed 25th August, 2023]

also brought about concerns regarding the collection, storage, and processing of personal data.

2.1 What is data privacy?

Data privacy generally refers to the right individuals have to control their personal information and determine how it is used by organizations and entities. *Bigelow* defines data privacy as an aspect of data protection that addresses the proper storage, access, retention, immutability and security of sensitive data.[11] As personal data becomes more valuable and vulnerable, understanding the implications of data sharing and taking proactive measures to safeguard information is vital. According to *Buckbee,* data privacy or information privacy is a branch of data security concerned with the proper handling of data – consent, notice, and regulatory obligations. More specifically, practical data privacy concerns often revolve around the following;

a) Whether or how data is shared with third parties.
b) How data is legally stored or collected.
c) Regulatory restrictions.

For digital citizens, understanding and advocating for data privacy is crucial for several reasons. First and foremost, personal data has become a valuable commodity in the digital economy. According to *Mediavision Interactive,* every time you visit a website, use social media, accept T&Cs, sign up for a form or approve cookies, your data is collected – and companies are willing to pay enormous amounts of money to own it.[12] According to *Costa-Cabral,* companies compete to acquire and process personal data although the rivalry is subject to

[11] Stephen J. Bigelow (2022), Data Privacy (Information Privacy) <https://www.techtarget.com/searchcio/definition/data-privacy-information-privacy> [Accessed 24th August, 2023]

[12] Media vision Interactive (2021), In Less than Two Decades, the Value of Personal Data Has Increased by 1800% |Data Discoveries <https://www.wearemiq.com/blog/value-of-personal-data/> [Accessed 25th August, 2023]

the application of competition law.[13] Such companies gather user information to tailor advertisements, offer personalized experiences, and even make strategic decisions. Without proper safeguards, this data could be exploited for financial gain or to manipulate individuals' choices.

2.2 How to safeguard data privacy.

Data breaches and cyber-attacks have become pervasive threats, leading to the exposure of sensitive personal information. These breaches can result in identity theft, financial fraud, and irreparable damage to an individual's reputation. Therefore, data privacy awareness is essential to protect oneself from potential harm. To ensure data privacy protection, several measures can be taken.

(a) First, individuals must be educated about the types of data collected, the purposes for which it is used, and their rights regarding its handling. As *McAfee* observes, technology has made it easy for data to be breached and get into the wrong hands.[14] For instance, in the first quarter of 2023, 6.41 million data records were leaked in worldwide data breaches.[15] Knowing one's rights is key to understanding how one's data can be protected, but there are simple practices to protect one's privacy to avoid becoming a victim of identity theft.[16] It is imperative to note that privacy protections are guaranteed under inter alia, *Article 27 of the Constitution.*[17] Therefore, As *Deighton* observes, failing to protect sensitive data can lead to serious financial and legal troubles and it can also damage one's reputation and

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13 Francisco Costa-Cabral and Orla Lynskey (2017), Family Ties: The Intersection Between Data Protection and Competition in EU Law |available at <https://core.ac.uk/download/pdf/77615074.pdf> [Accessed 25th August, 2023]

14 McAfee (2022), What is Data Privacy and How Can I Safeguard it |available at <https://www.mcafee.com/learn/what-is-data-privacy-and-how-can-i-safeguard-it/> [Accessed 24th August, 2023]

15 Unlike popular opinion, data breaches happen not only via the internet but also through Bluetooth and text messages; Ani Petrosyan (2023), Data Breaches Worldwide - Statistics & Facts available at <https://www.statista.com/topics/11610/data-breaches-worldwide/#topicOverview> [Accessed 29th January, 2024]

16 ibid

17 Article 27 of the Constitution of the Republic of Uganda, 1995.

put one's ethics into question.[18] Before one starts creating strategies to ensure data protection, one needs to know what kinds of data one is collecting and how sensitive it is. This knowledge empowers individuals to make informed decisions about sharing their personal information and engaging with digital services.

(b) Second, robust data protection regulations and laws are necessary to hold organizations accountable for mishandling data. In Uganda, Regulations like the *Data Protection and Privacy Act, 2019* and the *Data Protection and Privacy Regulations, 2021* set standards for data privacy, granting individuals greater control over their personal data and imposing penalties for non-compliance.[19] The Act which mirrors the *European Union General Data Protection Regulation (GDPR),* revolves around several principles concerning data protection and collection.[20] For example, *Section 9 of the Act* prohibits the collection and processing of special personal data and inter alia, provides that a person shall not collect or process personal data which relates to religious or philosophical beliefs, political opinion, sexual life, financial information, health status or medical records of an individual.[21] The Regulator of Data Protection and Privacy in Uganda is the *Personal Data Protection Office* which is an independent Office under *National Information Technology Authority (NITA-U).*[22] The office is established under *Section 4 of the Act* and *Regulation 3 of the Regulations* as inter alia, the body responsible for implementation and enforcement of the Act.[23]

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18 Oliver Deighton (2021), Remote Learning Best Practices: The Importance of Protecting Data Privacy |available at <https://elearningindustry.com/remote-learning-best-practices-importance-of-protecting-data-privacy/amp> [Accessed 24th August, 2023]

19 Preamble to the Data Protection and Privacy Act, 2019.

20 The GDPR is a European Union Regulation, a very important component of EU privacy law and human rights law. it governs the way people can use, process and store personal data.

21 Section 9 of the Data Protection and Privacy Act, 2019.

22 Regulation 3, 13 and 14 of the Data Protection and Privacy Regulations, 2021.

23 Section 4 of the Data Protection and Privacy Act, 2019.

(c) Furthermore, digital citizens should adopt secure online practices, such as using strong and unique passwords, enabling two-factor authentication, and being cautious about sharing personal information online. This is because no matter how sophisticated the platform one is using is, it contains a reasonable amount of sensitive data.[24] Thus, a strong data protection policy is no longer a nice-to-have, it's a necessity.[25] Regularly updating software and applications is also crucial, as it helps protect against known vulnerabilities that can be exploited by malicious actors.[26] According to *Norton,* software updates help patch security flaws which would have otherwise paved way for hackers.[27] Personally identifiable information such as emails and bank account information is valuable to cyber criminals since they can use it to commit crimes in one's name or sell it to the dark web to enable others commit crimes.[28] Updates not only reinforce security but also add new features that advance the current ones.

Data privacy awareness and protection are paramount for digital citizens in today's digital landscape. Governments, organizations, and individuals must

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24 Oliver Deighton (2021), Remote Learning Best Practices: The Importance of Protecting Data Privacy available at <https://elearningindustry.com/remote-learning-best-practices-importance-of-protecting-data-privacy> [Accessed 25th August, 2023]

25 ibid

26 Threat actors usually try to target the most sensitive information. In 2023, more than 52 percent of all data breach incidents in global organizations involved customer personal identifiable information (PII), thus making it the most frequently breached type of data. Roughly four in ten data breaches involved employee personal identifiable information. Furthermore, 76 percent of social engineering attacks resulted in the loss of credentials, with financial and insurance companies encountering the highest share of breached credentials; Ani Petrosyan (2023), Data Breaches Worldwide - Statistics & Facts available at <https://www.statista.com/topics/11610/data-breaches-worldwide/#topicOverview> [Accessed 29th January, 2024]

27 Elliotd (2019), 5 Reasons Why General Software Updates and Patches are Important. |available at <https://tekmanagement.com/5-reasons-why-general-software-updates-and-patches-are-important/> [Accessed 25th August 2023]

28 Norton (2021), The Importance of General Software Updates and Patches <https://asia.norton.com/blog/how-to/the-importance-of-general-software-updates-and-patches> [Accessed 25th August 2023]

collaborate to create an environment where data privacy is respected and protected, ensuring a safer and more secure digital experience for all.

3.0 ARTIFICIAL INTELLIGENCE (AI)

Artificial Intelligence is rapidly transforming various aspects of society, from healthcare to finance, education, and beyond. However, along with its potential benefits, AI brings forth a range of ethical considerations that demand thoughtful examination. This chapter delves into the ethical dimensions of AI, highlighting key concerns and the importance of responsible AI development.

3.1 To what does the term 'Artificial Intelligence' refer?

Abbreviated as "AI", it generally refers to the intellect of machines or software, as opposed to the intelligence of humans or animals. The *Oxford Languages Dictionary* defines 'AI' as the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages. According to *TechTarget,* AI refers to the simulation of human intelligence processes by machines, especially computer systems.[29] According to *Copeland,* AI is the ability of a digital computer or computer-controlled robot to perform tasks with intelligent beings.[30] The term is frequently applied to the project of developing systems endowed with intellectual processes, and characteristics of humans such as the ability to reason, discover meaning, generalize, or learn from past experience.[31] Examples of applications or systems with artificial intelligence include speech recognition gears like Siri and Alexa,

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29 Nick Barney, Sarah Lewis (2023), Artificial Intelligence (AI) Governance <https://www.techtarget.com/searchenterpriseai/definition/AI-governance > [Accessed 06th September 2023]

30 B.J. Copeland (2023), Artificial Intelligence <https://www.britannica.com/contributor/BJ-Copeland/4511> [Accessed 06th September 2023]

31 ibid

creative tools such as ChatGPT and AI Art, conversation simulators like Chatbot, recommendation systems as applied by Netflix, Amazon and YouTube to suggest movies or products, computer vision which includes self-driving cars, robotics, virtual assistants, language translation and smart home systems among others.

3.2 AI Education and Ethical Considerations

The rise of AI has brought about a paradigm shift in the way societies operate, from business and industry to healthcare, education, and beyond. According to *Culican***,** as AI technologies continue to advance and become integral to various sectors, it is imperative that individuals are equipped with the knowledge and skills to navigate this AI-driven landscape.[32] In this respect, AI education is becoming increasingly essential in preparing individuals for a future deeply intertwined with AI. Promoting AI education with a strong emphasis on ethics is vital. Furthermore, learning about AI is no longer an optional interest – it is a necessity.[33] Courses and discussions on AI ethics can help individuals understand the ethical challenges posed by AI technologies and encourage them to consider the societal impact of AI development.

AI education offers several benefits. Firstly, it empowers individuals to understand the capabilities and limitations of AI systems. Importantly, AI education should be extended to all categories of people. For example, according to *Bojorquez & Martinez,* excluding students from AI Education contributes to the digital divide, increases the skills gap, brings about economic inequality and leads to loss of creativity and innovation among others.[34] To mitigate these dangers, it is essential to promote equitable access to AI Education for all

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32 Jamie Culican (2023), Navigating the Future: The Imperative of AI Learning |available at <https://www.linkedin.com/pulse/navigating-future-imperative-ai-learning-jamie-culican> [Accessed 6th September, 2023]

33 ibid

34 Hector Bojorquez, Michelle Martinez (2023), The Importance of Artificial Intelligence in Education for All Students available at <https://www.languagemagazine.com/2023/05/31/the-importance-of-artificial-intelligence-in-education-for-all-students/> [Accessed 21st October, 2023]

students, regardless of their background or socioeconomic status.[35] This understanding is crucial for making informed decisions about AI adoption and for critically evaluating AI-generated outcomes.

Secondly, AI education nurtures a pool of professionals capable of developing, implementing, and maintaining AI technologies. As *Mohan* observes, AI in Education has become a hot topic because it changes how we learn quickly.[36] Technology has always played an important role in education, but its current use is more prevalent than ever, thanks to the increased availability of smart devices and web-based curriculum.[37] Additionally, AI Education is essential for driving innovation and ensuring the responsible development of AI applications. According to *Modi,* by embracing AI, educators can create dynamic and personalized learning environments, nurturing the next generation of innovative thinkers and problem solvers.[38] There is thus need to harness the full potential of Generative AI in education, empowering learners to embrace knowledge, curiosity, and creativity in their pursuit of excellence.[39]

However, AI education must be approached with a strong emphasis on ethical considerations. Ethical awareness and reasoning are crucial for individuals engaging with AI technologies to ensure that their applications are aligned with human values and societal well-being. Key ethical considerations in AI education include the following.

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35 ibid

36 Prem Mohan (2021), Artificial Intelligence in Education available at <https://timesofindia.indiatimes.com/readersblog/newtech/artificial-intelligence-in-education-39512/> [Accessed 06th September, 2023]

37 Ibid

38 Dipen Modi (2023), Transforming Education: The Power of Generative AI in Fostering Innovative Learning <https://www.linkedin.com/pulse/transforming-education-power-generative-ai-fostering-innovative-modi> [Accessed 21st October, 2023]

39 Ibid

3.2.1 Transparency and Accountability.

One of the primary ethical considerations in AI revolves around transparency and accountability. As AI systems become more complex and sophisticated, they often operate as "black boxes," making it challenging to understand the reasoning behind their decisions. According to *Blackman & Ammanath***,** transparency is an essential element of earning the trust of consumers and clients in any domain.[40] And when it comes to AI, transparency is not only about informing people when they are interacting with it, but also communicating with relevant stakeholders about why an AI solution was chosen, how it was designed and developed, on what grounds it was deployed, how it's monitored and updated, and the conditions under which it may be retired.[41] But most times, this is not done. According to *Deloitte,* this lack of transparency can have profound consequences, especially in critical domains like healthcare and criminal justice.[42] Ethical AI necessitates developers to create systems with explainable algorithms, enabling users and stakeholders to comprehend the basis for AI-generated outcomes. In this regard, AI education should emphasize the importance of transparency in AI systems. Individuals must understand the reasoning behind AI decisions and the implications of automated actions.[43] Moreover, ethical AI education should underscore the need for developers to be accountable for the outcomes of their creations.

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40 Reid Blackman and Beena Ammanath (2022), Building Transparency into AI Projects available at <https://hbr.org/2022/06/building-transparency-into-ai-projects> [Accessed 07th September, 2023]

41 Ibid

42 Deloitte (2019), Transparency and Responsibility in Artificial Intelligence: A call for Explainable AI available at <https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/innovatie/deloitte-nl-innovation-bringing-transparency-and-ethics-into-ai.pdf> [Accessed 07th September, 2023]

43 Reid Blackman and Beena Ammanath (2022), Building Transparency into AI Projects available at <https://hbr.org/2022/06/building-transparency-into-ai-projects> [Accessed 07th September, 2023]

3.2.2 Human-Machine Collaboration.

Automation and job displacement pose ethical challenges as well. While AI has the potential to streamline processes and enhance productivity, it could also lead to job loss in certain sectors. Several people have expressed the constant fear and concern of losing jobs to AI. For example, according to the *OECD Employment Outlook,* AI is likely to significantly impact jobs.[44] Occupations in finance, medicine and legal activities which often require many years of education, and whose core functions rely on accumulated experience to reach decisions, may suddenly find themselves at risk of automation from AI.[45] As of 2022, it was forecasted that 2.3 million jobs will be created and 1.8 million eliminated by AI.[46] In regards to the legal profession, *Patrice* denotes that attorneys won't lose their jobs to AI, they'll lose their jobs to other attorneys who use AI.[47] Ethical AI development involves ensuring that the benefits of automation are coupled with re-skilling and up-skilling initiatives to mitigate the negative impact on the workforce. AI does not only impact the professional fields but other sectors as well. For example, musicians like Nicki Minaj, while commenting on……, have expressed their concern towards the same, thus-

> "*if they can add your [favourite] artist on a song [without] paying that artist, without publishing, then that's what they'll do."*[48]

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44 OECD Employment Outlook 2023: AI and Jobs, an Urgent Need to Act available at <https://www.sharing4good.org/article/oecd-employment-outlook-2023-artificial-intelligence-and-jobs-urgent-need-act> [Accessed on 17th October, 2023]

45 ibid

46 Bergur Thormundsson (2022), The number of jobs created and eliminated due to artificial intelligence (AI) worldwide in 2022 available at <https://www.statista.com/statistics/791992/worldwide-jobs-creation-elimination> [Accessed on 31st January, 2024]

47 Joe Patrice (2023), Lawyers at High Risk of Losing Jobs to Artificial Intelligence Concludes OECD Based On… Nothing But Vibes |available at <https://abovethelaw.com/2023/07/lawyers-high-risk-losing-jobs-artificial-intelligence/> [Accessed on 17th October, 2023]

48 Ivan Korrs (2023), Nicki Minaj Discourages Barbz to Share AI-Generated Songs on social media available at <https://www.musictimes.com/amp/articles/95596/20230828/nicki-minaj-discourages-barbz-share-ai-generated-songs-social-media.htm> Also, <https://x.com/nickiminaj/status/1695945715711942980?s=48&t=acbHMKoThd4JkyhGM20CXw> [Accessed 10th September 2023]

Ethical AI education should highlight the concept of human-machine collaboration rather than replacement. Because, as *Wilson & Daugherty* observe, while AI will radically alter how work gets done and who does it, the technology's larger impact will be in complementing and augmenting human capabilities, not replacing them.[49] Human-machine collaboration brings human and artificial intelligence together to deliver more valuable insights than either could alone.[50] Emphasizing the strengths of both human and AI systems and exploring their synergies encourages responsible and ethical AI adoption.

3.2.3 Safety and Governance.

Generally, AI Governance aims to close the gap that exists between accountability and ethics in technological advancement. According to *Barney & Lewis,* artificial intelligence governance refers to the legal framework for ensuring AI and machine learning technologies are researched and developed with the goal of helping humanity navigate the adoption and use of these systems in ethical and responsible ways.[51] But then again, safety and the potential for AI to cause harm are paramount ethical concerns. Autonomous systems, like self-driving cars and drones, raise questions about their decision-making in scenarios where human lives are at stake. According to *Kompella***,** safety managers and teams can benefit from AI-driven digital transformation, much like their counterparts in finance and marketing departments.[52] Ethical AI requires careful consideration of risk management and the establishment of fail-

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49 H. James Wilson and Paul R. Daugherty (2018), Collaborative Intelligence: Humas and AI Are Joining Forces available at <https://hbsp.harvard.edu/product/R1804J-PDF-ENG> [Accessed 10th September, 2023]

50 Decoder: Human-machine Collaboration available at <https://www.thoughtworks.com/insights/decoder/h/human-machine-collaboration> [Accessed 10th September, 2023]

51 Nick Barney, Sarah Lewis (2023), Artificial Intelligence (AI) Governance available at <https://www.techtarget.com/searchenterpriseai/definition/AI-governance> [Accessed 10th September, 2023]

52 Kashyap Kompella (2023), How AI can Transform Industrial Safety available at <https://www.techtarget.com/searchenterpriseai/tip/How-AI-can-transform-industrial-safety> [Accessed 19th October, 2023]

safe mechanisms to prevent catastrophic outcomes. The companies developing these pioneering technologies have a profound obligation to behave responsibly and ensure their products are safe before introducing them to the public, a duty to build systems that put safety first and to do right by the public and earn people's trust.[53] According to *D'Agostin*, when it comes to providing a safe, supportive workplace for everyone, AI is an increasingly capable tool that enhances physical safety at a critical time.[54] This is because when AI takes on repetitive or dangerous tasks, it frees up human labour to carry out work that we are better equipped for – tasks involving aspects of creativity and empathy. Educating individuals about the safety of AI systems and the need for regulatory frameworks is essential. Ethical AI education should emphasize the importance of designing AI systems with built-in safety measures and adhering to ethical guidelines and regulations.

3.2.4 Bias and Fairness.

Bias and fairness are also crucial ethical facets of AI. Machine learning algorithms learn from historical data, which may carry biases present in society. As *Pagano et al* observe, when these biases are encoded into AI systems, they can perpetuate discrimination and reinforce existing inequalities.[55] Ethical AI demands that developers actively identify and mitigate bias in training data and algorithms, ensuring that AI systems provide fair and equitable outcomes for all users, regardless of their background.[56] According to *Manyika et al,* the problem

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53 Ensuring Safe, Secure, and Trustworthy AI available at <https://www.whitehouse.gov/wp-content/uploads/2023/07/Ensuring-Safe-Secure-and-Trustworthy-AI.pdf> [Accessed 10th October, 2023]

54 Tina D'Agostin (2021), Four Ways Artificial Intelligence Is Enhancing Physical Safety in the Workplace available at <https://www.forbes.com/sites/forbestechcouncil/2021/10/28/four-ways-artificial-intelligence-is-enhancing-physical-safety-in-the-workplace/amp/> [Accessed 18th September, 2023]

55 T.P. Pagano (2023), Bias and Unfairness in Machine Learning Models: A Systematic Review on Datasets, Tools, Fairness Metrics, and Identification and Mitigation Methods. <https://www.mdpi.com/2504-2289/7/1/15> [Accessed 18th September, 2023]

56 ibid

of bias associated with AI is not entirely new.[57] Back in 1988, the *UK Commission for Racial Equality* found a British medical school guilty of discrimination as the computer program they used to determine which of its applicants would be invited for interviews was found to be biased against women and those with European names.[58] Thirty years later, algorithms have grown considerably more complex, but we continue to face the same challenge.[59] Addressing bias in AI algorithms is an ethical imperative. AI education should educate learners about the potential for bias in AI systems and the measures to identify, mitigate, and prevent biased outcomes because understanding fairness and its significance in AI is essential for promoting equitable solutions.

3.2.5 Privacy and Data Ethics

Privacy is another significant concern in the era of AI. The extensive collection and analysis of personal data to train AI models can infringe upon individuals' privacy rights. As *Kerry* observes, the evolution of artificial intelligence magnifies the ability to use personal information in ways that can intrude on privacy interests by raising the analysis of personal information to new levels of power and speed.[60] The challenge for the state is to pass privacy legislation that protects individuals against any adverse effects from the use of personal information in AI, but without unduly restricting AI development or ensnaring privacy legislation in complex social and political thickets.[61] Striking a balance

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57 James Manyika, Jake Silberg, and Brittany Presten (2019), What Do We Do About the Biases in AI? available at <https://hbr.org/2019/10/what-do-we-do-about-the-biases-in > [Accessed 18th September, 2023]

58 Government of the UK, Independent Report (2020), Review into Bias in Algorithmic Decision Making. available at <https://assets.publishing.service.gov.uk/media/5fbfbd0de90e077ee2eadc53/Summary_Slide_Deck_-_CDEI_review_into_bias_in_algorithmic_decision-making.pdf> [Accessed 18th September, 2023]

59 James Manyika, Jake Silberg, and Brittany Presten (2019), What Do We Do About the Biases in AI? available at <https://hbr.org/2019/10/what-do-we-do-about-the-biases-in- > [Accessed 18th September, 2023]

60 Cameron F. Kerry (2020), Protecting Privacy in an AI-Driven World available at <https://www.brookings.edu/articles/protecting-privacy-in-an-ai-driven-world/> [Accessed 18th September, 2023]

61 ibid

between data utilization for AI advancements and preserving individuals' privacy rights is an ethical imperative. According to *Zia***,** this means finding ways to utilize data while respecting privacy rights, obtaining consent, and implementing measures to protect personal information. Clear data usage policies, robust encryption methods, and the principle of data minimization must guide the ethical deployment of AI technologies. As *Khan* opines, although the reliance on large amounts of data can compromise individuals' privacy, looking back at the history of AI, we see its potential to shape our future and enhance intelligence in machines.[62] AI education must educate individuals about the ethical use of personal data. Learners should understand the implications of data collection, storage, and sharing by AI systems, and the importance of respecting individuals' privacy rights.

3.2.6 Accounting for Social Impact.

Ethical AI also encompasses the broader impact of AI on society. This includes issues related to unemployment, the concentration of power among AI developers and corporations, and the potential erosion of human agency as AI systems influence decision-making processes. As *Sen* observes, AI has become one of the most transformative technologies of the 21st century, impacting every aspect of our lives, from the way we work and learn to the way we communicate and interact with one another.[63] However as *Cheng-Tek Tai* denotes, despite the many benefits of AI, there are also concerns about its impact on society.[64] With regard to whether AI will become a menace to society, *Duggal* points out that it is

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62 Minhas Majeed Khan (2023), Striking a Balance: Navigating the Advantages and Disadvantages of AI in Academia <https://www.linkedin.com/pulse/striking-balance-navigating-advantages-disadvantages-ai-phd> [Accessed 19th October, 2023]

63 Amarjit Sen (2023), The Impact of Artificial Intelligence on Society: Opportunities, Challenges, and Ethical Considerations available at <https://www.linkedin.com/pulse/impact-artificial-intelligence-society-opportunities-challenges-sen> [Accessed 19th October, 2023]

64 Michael Cheng-Tek Tai (2020), The Impact of Artificial Intelligence on Human Society and Bioethics <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7605294/> [Accessed 16th September, 2023]

important to remember that AI is only as good as the person who uses it, it is not a job killer but a job transformer.[65] In reality, most of us encounter AI in one way or another, almost every single day of our lives.[66] From the moment one wakes up to check one's smartphone to watching another Netflix recommended movie, AI has quickly made its way into our daily lives.[67] Thus, as *Sen* further observes, the impact of AI on society is both exciting and challenging. It has the potential to transform the way we work, communicate, and interact with technology, but it also raises concerns about the displacement of jobs, bias and discrimination and the potential for misuse or abuse. AI education should encourage learners to consider the broader societal impact of AI applications. This involves critically evaluating the potential consequences of AI on employment, economic inequality, and human rights.

As AI continues to reshape the world, ethical considerations must remain at the forefront of its development and deployment. Transparency, fairness, privacy protection, and accountability are foundational principles that must guide AI innovation. Striking a balance between technological advancement and ethical responsibility ensures that AI systems contribute positively to society while upholding fundamental human values.

65 Nikita Duggal (2023), Advantages and Disadvantages of Artificial Intelligence [AI] available at <https://www.simplilearn.com/advantages-and-disadvantages-of-artificial-intelligence-article> [Accessed 19th October, 2023]

66 ibid

67 Nikita Duggal (2023), Advantages and Disadvantages of Artificial Intelligence [AI] available at <https://www.simplilearn.com/advantages-and-disadvantages-of-artificial-intelligence-article> [Accessed 19th October, 2023]

4.0 DIGITAL LITERACY AND BUILDING A PRIVACY-CONSCIOUS AI CULTURE: ROLE OF STAKEHOLDERS.

Promoting digital literacy, data privacy awareness, and AI education requires a collaborative effort involving government agencies, education institutions, and civil society organizations. There are distinct roles that each of these stakeholders plays in equipping individuals with the skills and knowledge necessary to navigate the complexities of the digital age.

4.1 Government Agencies.

Government agencies play a crucial role in setting the regulatory framework and policies that shape digital literacy, data privacy, and AI education. They establish guidelines for data protection, define ethical standards for AI development, and allocate resources for educational initiatives. Government intervention ensures a consistent and standardized approach to digital education and privacy protection. By creating laws such as the Data Protection and Privacy Act (2019)[68] and the Data Protection and Privacy Regulations (2021),[69] governments promote a culture of privacy and accountability.[70] The main regulator for data protection in Uganda is the Personal Data Protection Office ('the PDPO') under the National Information Technology Authority (NITA-U) which is responsible for overseeing the implementation and enforcement of the Act.[71] These government agencies can provide funding for educational programs, establish certification standards for AI professionals, and facilitate partnerships between different stakeholders to enhance digital literacy efforts.

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68 The Data Protection and Privacy Act (2019) mirrors the European Union GDPR of 2016.

69 The Data Protection and Privacy Regulations (2021) were published by the Minister of Information Communication and Technology (ICT) and National Guidance on March 12, 2021.

70 The Act and the Regulations are intended to support the implementation of the right to privacy guaranteed to every person under Article 27 of the 1995 Constitution of the Republic of Uganda and further, to complement sectoral laws for regulated activities that had previously incorporated data provisions.

71 Section 4 of the Data Protection and Privacy Act (2019); Regulation 3 of the Data Protection and Privacy Regulations (2021).

4.2 Education Institutions.

Education institutions are at the forefront of imparting digital literacy, data privacy awareness, and AI education to learners of all ages. As *Angoda* observes, universities and schools, together with local governments, and NGOs must be able to uphold and adhere to requirements specified in the *Data Protection and Privacy Act, 2019.*[72] Furthermore, learning institutions should design curricula that integrate these essential topics into various subjects, preparing students to engage responsibly in the digital world. According to *Akgun and Greenhow*, education institutions teach students how to use technology safely, evaluate online information critically, and navigate AI technologies ethically.[73] They can offer specialized courses on data privacy, cybersecurity, and AI ethics to provide in-depth knowledge to interested learners.[74] By incorporating hands-on projects and real-world scenarios, education institutions ensure that learners can apply their knowledge practically,[75] and contribute to research that advances AI understanding and addresses ethical concerns.

4.3 Civil Society Organizations.

Civil society organizations play a pivotal role in raising awareness, advocating for policy changes, and mobilizing communities to participate in digital literacy, data privacy, and AI education initiatives. As *Espey* observes, they often bridge the gap between government policies and public understanding by providing accessible resources, workshops, and awareness campaigns.[76] They serve a

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72 Emmanuel Angonda (2022), Universities, Schools Should Always Ensure Data Privacy. | available at <https://www.monitor.co.ug/uganda/oped/letters/universities-schools-should-always-ensure-data-privacy--3747548> [Accessed 16th September, 2023]

73 Selin Akgun and Christine Greenhow (2022), Artificial Intelligence in Education: Addressing Ethical Challenges in K-12 Settings available at <https://pubmed.ncbi.nlm.nih.gov/34790956/> [Accessed 16th September, 2023]

74 ibid

75 UNESCO (2022), Minding the Data: Protecting Learners' Privacy and Security available at <https://unesdoc.unesco.org/ark:/48223/pf0000381494> [Accessed 16th September,2023]

76 Jessica Espey (2018), The Role and Impact of Civil Society in Supporting Sustainable Development and Tackling Humanitarian Challenges available at

range of very diverse functions for example; they may act as watchdogs holding governments and other public and private actors accountable,[77] for instance The Unwanted Witness released the Privacy Scorecard Report in 2022 which evaluated 32 companies in Uganda to determine their compliance with Uganda's Data Protection and Privacy Act of 2019.[78] Civil society organizations raise awareness about the importance of digital literacy and the risks associated with inadequate data protection. As *Davies* opines, they also promote the ethical development and deployment of AI technologies by organizing forums, discussions, and debates on AI ethics.[79] Conversely, governments and the tech industry need to recognize that engaging with civil society when it comes to the AI debate is not merely a nice added extra, but an absolute necessity.[80] Lastly, through collaboration with schools, community centres, and online platforms, these organizations ensure that digital literacy reaches underserved populations and vulnerable groups.

In a harmonious collaboration, these stakeholders strengthen the impact of their efforts, which is to say;

- Government agencies establish legal frameworks that guide education institutions and civil society organizations in promoting digital literacy, data privacy, and AI education.
- Education institutions implement government guidelines by integrating digital literacy, data privacy, and AI education into their curricula.

<https://globalperspectives.org/en/publications/gp-policy-paper-aurora-dialogues-berlin-2018/> [Accessed 16th September, 2023]

77 Ibid

78 The Unwanted Witness is a civil society organization aimed at raising awareness about the risks associated with the processing of personal data online and offline. It has released the Privacy Scorecard Reports as a tool to assess privacy practices of companies and organizations available at <https://www.unwantedwitness.org/privacy-scorecard-2/> [Accessed 16th September, 2023]

79 Rhodri Davies (2018), Sorting Algorithms: Civil Society's Role in Ensuring AI is Fair, Accountable, and Transparent available at <https://digitalimpact.io/sorting-algorithms-the-role-of-civil-society/> [Accessed 16th September, 2023]

80 Ibid

- Civil society organizations act as intermediaries, disseminating knowledge, advocating for ethical practices, and mobilizing individuals to engage with digital literacy and privacy initiatives.

Together, these stakeholders create a comprehensive ecosystem that empowers individuals with the skills and understanding needed to navigate the digital landscape responsibly. As technology continues to evolve, their collaborative efforts will be essential in ensuring that individuals can thrive in a digital world while safeguarding their privacy and ethical principles.

5.0 Challenges and Potential Future Outlook for Digital Literacy in Uganda.

Implementing comprehensive digital literacy programs that cover data privacy and AI understanding in Uganda presents a unique set of challenges and holds promising future prospects. This chapter examines these challenges and the potential outlook for digital literacy initiatives in the Ugandan context.

5.1 Challenges

5.1.1 Access to Technology and Internet Connectivity

One of the primary challenges in Uganda is the digital divide, where access to technology and reliable internet connectivity is unevenly distributed. It is thus not surprising that digital connectivity is one of the four pillars of the recently launched G7 *Partnership for Global Infrastructure and Investment (PGII).*[81] In 2020, a UN Report revealed that 87% of the populations in developed countries have access to the internet whereas only 19% of the populations in developing

[81] Danielle Nelson (2022), Digital Connectivity: The Benefits of Inclusive Internet Access available at <https://www.usglc.org/blog/digital-connectivity-the-benefits-of-inclusive-internet-access/> [Accessed 16th September, 2023]

countries had access.[82] In 2021, the *GSMA*[83] estimated Uganda's smartphone adoption at 16% and the mobile phone penetration at 49%.[84] The National IT Survey 2022 Report revealed that the proportion of households in rural areas using smartphones is 13%, much less than that of urban households at 31%.[85] Digital infrastructure, including reliable internet connectivity and telecommunication networks, therefore, serves as the backbone of modern economies. According to *Rossotto & Nedayvoda,* new technologies are transforming infrastructure sectors such as transport, energy and mining.[86] Technological innovations have impacted every aspect of life, from the global economy to humanitarian assistance. As *Nelson* observes, a lack of digital inclusion exacerbates existing inequities in already-marginalized groups of people such as the poor, women, youth, and people with disabilities.[87] Without internet connectivity and access to the internet in today's world, people are essentially handicapped for they can only lag behind in everything they do.

5.1.2 Limited Resources and Infrastructure.

Uganda's educational system faces resource constraints that affect the availability of up-to-date technology, software, and learning materials required for comprehensive digital literacy initiatives. As a developing country, Uganda

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82 United Nations Department of Economic and Social Affairs, World Social Report 2020: Inequality in a Rapidly Changing World available at <https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/02/World-Social-Report2020-FullReport.pdf> [Accessed 14th September, 2023]

83 GSMA, also known as the GSM Association, Global System for Mobile Communications is a non-profit industry organization that represents the interests of mobile network operators available at <https://www.gsma.com> [Accessed 14th September, 2023]

84 Frankline Kibuacha (2021), Mobile Penetration in Uganda, <https://www.geopoll.com/blog/mobile-penetration-uganda/> [Accessed 15th September, 2023]

85 National IT Survey 2022 Report available at <https://www.nita.go.ug/sites/default/files/2022.pdf> [Accessed 15th September, 2023]

86 Carlo Maria Rossotto & Anastasia Nedayvoda (2021), Digitizing Infrastructure: Technologies and Models to foster transformation available at <https://blogs.worldbank.org/digital-development/digitizing-infrastructure-technologies-and-models-foster-transformation> [Accessed 17th September, 2023]

87 Danielle Nelson (2022), Digital Connectivity: The Benefits of Inclusive Internet Access available at <https://www.usglc.org/blog/digital-connectivity-the-benefits-of-inclusive-internet-access/> [Accessed 17th September, 2023]

obviously faces several financial constraints which impact digital development negatively for instance, insufficient funding and inadequate infrastructure, as prone in most of Uganda's rural areas hinders the effective implementation of digital literacy programs. In the 2022/2023 Financial Year, the Uganda National Budget allocated only 83.1b shillings to digital transformation, and 20.73b shillings to innovation technology, out of the 48.1 trillion shillings total national budget.[88] According to *Franklin Templeton***,** digital transformation is at an unprecedented point as global consumers continue to embrace new commerce tools and to increasingly prefer digitally augmented experiences even post COVID.[89] Thus, limited resources and infrastructure pose a significant danger to digital literacy, hindering access to vital online information and education. This is because without adequate tools, internet connectivity, and training, individuals and communities can become marginalized in an increasingly digital world.

5.1.3 Awareness and understanding.

A significant portion of the population may lack awareness of the importance of digital literacy, data privacy, and AI understanding. Creating awareness and conveying the benefits of these programs to individuals in urban and rural areas is a challenge that requires tailored communication strategies. A 2021 survey by the *Uganda Bureau of Statistics (UBOS)* indicates that a staggering 88% of Ugandans have never used the internet, and for those that use the internet, only 7% use it on a daily basis.[90] When it comes to mobile phone usage, 49% of Ugandans use their own phone while 39% rely on other mediums as their source

88 Finance Minister to read Sh. 48.1 trillion Budget available at <https://www.newvision.co.ug/category/news/finance-minister-to-read-sh481-trillion-budge-NV_136165> [Accessed 18th September, 2023]

89 Franklin Templeton (2023), Why Technology available at <https://www.franklintempleton.com.sg/campaigns/investing-in-technology-and-innovation> [Accessed 18th September, 2023]

90 Uganda Bureau of Statistics (UBOS) National Labour Force Survey 2021 available at <https://www.ubos.org/wpcontent/uploads/publications/11_2022NLFS_2021_main_report.pdf> [Accessed 24th September, 2023]

of communication and acquiring information.[91] According to *Reynolds*, the understanding of the concept of digital literacy has to go through long-term development and its current appearance is characterized by complexity and technology skills but also cognitive and attitudinal components of behaviour.[92] Bridging this digital divide is essential for equitable access to information, education, and economic empowerment.

5.1.4 Language and Cultural Diversity.

Uganda's linguistic and cultural diversity poses a challenge for designing digital literacy content that is accessible and relevant to various regions and communities. There are over 56 tribes in Uganda.[93] Almost all these tribes speak different languages and have different cultural practices. As *Button* observes, among the most noticeable disadvantages of cultural diversity include language barriers, social tension, and civic disengagement. Language barriers can hinder the effectiveness of educational materials and initiatives whereas social tension hinders awareness and community engagement. Language barriers also hinder communication, comprehension, and adaptation of new technologies. *Grazzi* denotes that the fact that 80% of online content is in English constitutes an important barrier to ICT diffusion in developing countries for several reasons.[94] First, the use of indigenous languages may be widely spread among the

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91 UNDP (2022) The Challenges of Digital Public Infrastructure in Uganda available at <https://www.undp.org/uganda/blog/challenges-digital-public-infrastructure-uganda> [Accessed 24th September, 2023]

92 Reynolds, R. (2016), Defining, designing for, and measuring "social constructivist digital literacy" development in learners: a proposed framework. *Education Tech Research Dev.* Doi:10.1007/s11423-015-9423-4 available at <https://link.springer.com/article/10.1007/s11423-015-9423-4> [Accessed 25th September, 2023]

93 The People, Settlements and Tribes in Uganda available at <https://www.gorillatrips.net/people-settlements-tribes-uganda/> [Accessed 25th September, 2023]

94 Matteo Grazzi (2012), ICT in Developing Countries: Are Language Barriers Relevant? Evidence from Paraguay. Available at <https://www.sciencedirect.com/science/article/abs/pii/S0167624511000448> [Accessed 25th September, 2023]

population; second, the information content on the Web and in software are not readily available in local languages. However, these are not reasons to avoid diversity but rather, factors to keep in mind as society heads towards a more diverse future.

5.1.5 Teacher Training and Capacity Building.

To implement digital literacy programs effectively, educators need adequate training to teach data privacy and AI concepts. Capacity building is the process by which individuals and organizations obtain, improve, and retain the skills, knowledge, tools, equipment and other resources needed to do their jobs competently or to a greater capacity.[95] According to *OECD***,** as education systems increasingly respond to new societal, economic and digital needs, implementation of policies takes on new importance.[96] A key element of successful implementation of policy reform is ensuring that local stakeholders have sufficient capacity to meet this challenge and in particular, they need adequate knowledge of educational policy goals and consequences, the ownership and willingness to make change, and the tools to implement the reform as planned.[97] Thus, the lack of teacher training and capacity building in Uganda greatly hinders the promotion of digital literacy as educators struggle to integrate technology into their teaching methods since they are not equipped to teach critical digital literacy skills.

5.2 Future Outlook: Measures for empowering digital citizens in Uganda.

Promoting digital literacy, data privacy awareness, and AI education requires a multifaceted approach involving education institutions, government agencies,

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95 Kumari, Sujata. (2022). Teacher's Views on Training and Capacity Building in Education. International Journal of Advanced Research in Science, Communication and Technology. 279-285. 10.48175/IJARSCT-2545 available at <https://www.researchgate.net/publication/358628143_Teacher%27s_Views_on_Training_and_Capacity_Building_in_Education> [Accessed 10th January, 2023]

96 Burns, T and F. Gottschalk (2019), Educating 21st Century Children: Emotional Wellbeing in the Digital Age, Educational Research and Innovation, OECD Publishing, available at <https://doi.org/10.1787/b7f33425-en> [Accessed 25th September, 2023]

97 Ibid.

civil society organizations, and industries. Nevertheless, several measures can be implemented through which individuals can become empowered digital citizens who can navigate the digital world responsibly, protect their data, and engage with AI technologies ethically.

5.2.1 Government Support and Policy Initiatives.

The Ugandan government's commitment to digital transformation can pave the way for comprehensive digital literacy programs. Government regulations and policies play a significant role in promoting digital literacy, data privacy, and AI education. Authorities can establish standards for data protection, mandate the inclusion of these subjects in education curricula, allocate resources for infrastructure development, and support initiatives that enhance public awareness. In principle, Uganda is well grounded when it comes to the enabling regulatory framework to allow digitization to thrive however, the challenge is implementation.[98] These include the *Electronic Transactions Act, 2011*; the *National Information Technology Authority, Uganda Act, 2009*; the *Data Protection and Privacy Act, 2019* and the *Data Protection and Privacy Regulations, 2021*.

Additionally, the Ministry of ICT and National Guidance has designed the Digital Uganda Vision, a National Policy and Strategic Framework that reviews, integrates and improves existing ICT strategies, policies and plans into one overarching vision for Uganda.[99] This policy is aligned with the country's *National Development Plan (NDP III)* as well as the Uganda Vision 2040.[100] This goes to show that there are a number of regulations and policies in place however, there is thus dire need to promote implementation and adherence to the existing data

98 UNDP (2022) The Challenges of Digital Public Infrastructure in Uganda available at <https://www.undp.org/uganda/blog/challenges-digital-public-infrastructure-uganda> [Accessed 28th September, 2023]

99 Ministry of ICT and National Guidance, Digital Uganda Vision available at <https://ict.go.ug/initiatives/digital-uganda-vision/> [Accessed 28th September, 2023]

100 UNDP (2022) The Challenges of Digital Public Infrastructure in Uganda available at <https://www.undp.org/uganda/blog/challenges-digital-public-infrastructure-uganda> [Accessed 28th September, 2023]

protection regulations because their enforcement is paramount in building a privacy-conscious AI culture.

5.2.2 Partnerships and Collaborations.

Fostering a digital-literate Uganda requires collaboration between government agencies, non-profit organizations, private sector entities, and international organizations which can pool resources and expertise to address the challenges of digital literacy programs. As *Birch* observes, during the pandemic, collaboration became centre stage as companies scrambled to communicate and get work done fully in a remote environment.[101] According to *Follin,* in this era, every business is a digital business and, every function and role within the business is now touched by varying levels of digital technology, which is why collaborative partnerships between technology and business teams need to become the norm.[102] Such partnerships can lead to the development of localized content, technology solutions, and capacity-building initiatives and additionally, result in the development of educational materials, workshops, seminars, and community outreach programs. Through collaboration, best practices can be shared, innovative approaches developed, and a broader range of beneficiaries reached. By working together, stakeholders can create more comprehensive, accessible, and sustainable digital literacy programs that empower individuals with the skills and knowledge needed to thrive in the digital age.

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101 Martin Birch (2021), The Importance of Considering Collaboration During Digital Transformation available at <https://www.forbes.com/sites/forbesbusinesscouncil/2023/02/10/the-importance-of-considering-collaboration-during-digital-transformation/> [Accessed 03rd October, 2023]

102 Sandy Follin (2022), Transformation Requires Collaborative Partnerships between IT and Business available at <https://www.linkedin.com/pulse/transformation-requires-collaborative> [Accessed 03rd October, 2023]

5.2.3 Mobile Technology and Innovation.

The increased use of mobile phones in Uganda offers an avenue for delivering digital literacy content and educational resources. As *Cohen* observes, mobile technology has transformed the way communication and collaboration happen in different fields and sectors.[103] A survey by the Uganda Communications Commission has revealed that as of March 2022, there were 30.6 million mobile phone subscriptions and over 4300 base station sites in the country.[104] The technology enables quicker and more accurate communication beyond geographical boundaries, in all time zones, and organizational hierarchies.[105] Mobile technology also facilitates access to crucial information, potential services, and enormous opportunities to improve the quality and productivity of various domains and sectors including healthcare, learning and education, finance and banking, and governance.

According to *Macwan***,** mobile technology was a mystery two decades ago but now, it has become something of a necessity in both rural and urban areas.[106] On the other hand, innovation creates new ideas that lead to the discovery of new ways to get things done in society. According to *Kylliainen***,** the ability to resolve critical problems depends on new innovations and developing countries need it more than ever.[107] Without innovation, there is nothing new and without anything new, there is no progress. Leveraging mobile technology and innovation

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103 Derek Cohen (2023), The Societal and Business Importance of Mobile Technology Today available at <https://www.topdevelopers.co/blog/importance-of-mobile-technology/> [Accessed 04th October, 2023]

104 The National Survey on Conformity of Telecommunications Base Stations in Uganda to ICNIRP Guidelines and ITU Standards available at <https://www.ucc.co.ug/wp-content/uploads/2022/09/National-EMF-survey-August-2022.pdf> [Accessed 04th October, 2023]

105 Derek Cohen (2023), The Societal and Business Importance of Mobile Technology Today available at <https://www.topdevelopers.co/blog/importance-of-mobile-technology/> [Accessed 04th October, 2023]

106 Urvish Macwan (2017), Mobile Technology, Its Importance, Present and Future Trends available at <https://www.finextra.com/blogposting/14000/mobile-technology-its-importance-present-and-future-trends> [Accessed 04th October, 2023]

107 Julia Kylliainen (2019), The Importance of Innovation – What Does it Mean for Businesses and our Society? available at <https://www.viima.com/blog/importance-of-innovation?hs_amp=true> [Accessed 04th October, 2023]

for learning platforms and applications can help reach a broader audience, including those with limited access to traditional computers, thereby promoting digital literacy.

5.2.4 Community Engagement and Awareness Campaigns.

Community engagement and awareness campaigns play a significant role in educating individuals about the importance of digital literacy, data privacy, and AI ethics. These campaigns can be run by government agencies, civil society organizations, and educational institutions, for example, by engaging community leaders, local influencers, organizations, and using a variety of media channels to reach a wide audience. As *Babani* observes, due to the influence of COVID, people are more digitally active around the country and this makes it all the more crucial to see how literate they are digitally and helps them evaluate the information online with the help of these resources.[108] According to *Tanner***,** the past decade has seen huge technological leaps for mankind, which we have adapted at an incredible pace.[109] Many of the digital tools we now consider standard were only invented in the past 20 years, and the progressions seem to be unending.[110] Imperatively, encouraging participants to spread awareness within their communities may cause a ripple effect thereby extending the impact of the digital literacy initiatives.

5.2.5 Adaptation of Content.

Creating culturally relevant content in multiple languages can address language and cultural diversity challenges. Uganda appears on the *UN List of Least*

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108 Vinay Babani (2021), Avoid an Infodemic available at <https://www.thehindu.com/education/why-awareness-of-digital> [Accessed 07th October, 2023]

109 Charli Tanner (2022), Digital Awareness – An Essential of Today's Increasingly Interconnected World available at <https://www.ranky.co/growth-hacking-and-inbound-marketing-blog/digital-awareness-an-essential-of-todays-increasingly-interconnected> [Accessed 07th October, 2023]

110 Ibid.

Developed Countries (LDCs),[111] and still faces a large digital divide gap. Localizing educational materials ensures that they resonate with the diverse population in Uganda. As *Tanner* denotes, if the sheer pace of digital evolution wasn't enough for us to frequently refine our technological skills, the fact that the world now essentially relies on digital platforms to keep spinning should be.[112]

The speed at which technology is currently progressing forces us to regularly learn new digital skills and techniques however, an awareness of the digital world can provide much more than just a sense of keeping up.[113] According to *Nzomo & Mambo***,** adaptation of technology has received a significant attention in various international dialogues on economic development issues largely due to the gradual understanding of the vital role of industry in economic growth and the recognition of the role of technology in the process of industrial development.[114] As technology continually evolves, individuals must adapt to new digital environments, tools, and trends to stay informed and engaged. Being efficient in adapting to new digital tools and platforms empowers individuals to navigate the digital landscape with confidence and keep up with the ever-changing digital world.

5.2.6 Lifelong Learning Approach.

The rapidly evolving nature of technology requires that education on digital literacy, data privacy, and AI is an ongoing process. Offering continuous learning opportunities, such as webinars, conferences, and online courses, ensures that individuals stay updated with the latest developments and best practices.

111 UNCDP, List of LDCs, Reviewed every three years. <https://unctad.org/topic/least-developed-countries/list> [Accessed 07th October, 2023]

112 Charli Tanner (2022), Digital Awareness – An Essential of Today's Increasingly Interconnected World <https://www.ranky.co/growth-hacking-and-inbound-marketing-blog/digital-awareness-an-essential-of-todays-increasingly-interconnected-world> [Accessed 07th October, 2023]

113 Ibid.

114 Nzomo, M.M. Mambo, Shadrack Maina (2013) Adaptation of technology available at <https://ir-library.ku.ac.ke/handle/123456789/12536?locale-attribute=en> [Accessed 11th October, 2023]

Adopting a lifelong learning approach can accommodate individuals of all ages and backgrounds, recognizing that digital literacy is an ongoing process, thereby bridging the digital-divide gap. According to *Baharuddin,* dealing with the rise of technology requires people to be encouraged and ready to obtain lifelong knowledge and skills in the learning environment.[115] This is because, as *Babani* observes, digital literacy is becoming increasingly significant to distinguish between fact and fiction however, it cannot be taught through traditional means of learning and thus, people should carry on self-learning.[116] Exploring content by them will promote finding the authentic content that is lost behind misinformation. As already discussed, digital literacy is not just about mastering how to use existing literacy, Ugandans must learn the ability to adapt and adjust as technology advances by embracing and effectively utilizing technology tools and platforms so as to develop digital literacy skills.

5.2.7 Adopting a Tailored Curriculum.

One of the most effective measures for promoting digital literacy, data privacy, and AI education is integrating these topics into formal education curricula in a tailored manner. This simply means that these are customized to meet the specific needs, interests, and goals of an individual student considering their individual strengths, weaknesses, and learning preferences. By doing so, students can develop essential skills early on, enabling them to become informed and responsible digital citizens. According to the *Lcom Team,* to build a digital

115 Mohammed Fazli Baharuddin (2016), Digital Literacy Awareness among Students available at <https://www.researchgate.net/publication/309506225_Digital_Literacy_Awareness_among_Students> [Accessed 11th October, 2023]

116 Vinay Babani (2021), Avoid an Infodemic available at <https://www.thehindu.com/education/why-awareness-of-digital-literacy-is-becoming-increasingly-important/article35599195.ece/amp/> [Accessed 11th October, 2023]

literacy program that is both equitable and effective requires developing a comprehensive scope and sequence for the curriculum.[117]

A digital literacy curriculum must be vertically aligned to reflect when skills will be introduced and how they will expand and develop so that students are prepared to meet expectations in relevant grade levels.[118] As *Kleem* observes, digital initiatives allow learning to be more easily tailored to the specific needs and learning paths of students and thus allow students greater freedom to learn at a pace suited for them.[119] As more technology becomes integrated into our workspaces and homes, the long-term success of our students will be dependent on preparing them properly for their lives post-graduation. There is thus need to develop comprehensive curricula that cater to diverse age groups and backgrounds, ensuring that the content is relevant and engaging for various learners.

5.2.8 Collaborative Learning.

Generally, collaborative learning is an educational approach that encompasses active participation, discussion and cooperation among students. According to *Herrity,* it involves working as a group to solve a problem or understand an idea and ensures that students remain engaged in content while thinking critically and sharing ideas with their peers.[120] As *Laal* denotes, there are benefits associated with the concept of collaborative learning and by understanding the

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117 Lcom Team (2023), How to Map the Scope & Sequence for your Digital Literacy Curriculum available at <https://www.learning.com/blog/mapping-digital-literacy-curriculum-scope-sequence/> [Accessed 11th October, 2023]

118 Ibid

119 Jason Kleem (2020), The Benefits of a Digital Curriculum (Even after the Pandemic) available at <https://vinsonedu.com/blog/benefits-of-digital-curriculum-after-pandemic/> [Accessed 11th October, 2023]

120 Jennifer Herrity (2023), 11 Benefits of Collaborative Learning (Plus Tips to Use it) available at <https://www.indeed.com/career-advice/career-development/benefits-of-collaborative-learning> [Accessed 18th October, 2023]

benefits, we can truly use this learning style to our benefit.[121] The premise of collaborative learning is basically through cooperation by group members in contrast to competition which individuals often apply in most aspects of their lives.[122]

Additionally, offering specialized courses and workshops focused on digital literacy, data privacy, and AI education can provide in-depth knowledge to individuals who want to delve deeper into these subjects. These courses should cover topics such as understanding algorithms, recognizing phishing attempts, and exploring the ethical implications of emerging technologies.[123] The authorities thus need to promote collaborative learning environments where participants can share experiences, exchange ideas, and collectively develop strategies for responsible digital engagement. Collaborative learning should also incorporate practical exercises that allow participants to interact with data privacy tools and AI applications, enabling them to apply their knowledge in real-world scenarios.

5.2.9 User Empowerment and Continuous Evaluation/Auditing.

Empowering users to have control over their data and AI interactions, and regularly assessing and auditing AI systems for privacy compliance is integral to a privacy-conscious culture. According to *Davenport,* AI auditing refers the research and practice of assessing, mitigating, and assuring an algorithm's safety, legality and ethics.[124] This involves identifying potential vulnerabilities, addressing privacy concerns, and updating systems to align with changing data

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121 Morjan Laal (2012), Benefits of Collaborative Learning available at <https://www.sciencedirect.com/science/article/pii/S1877042811030205> [Accessed 18th October, 2023]

122 Ibid

123 Bri Stauffer (2022), How to Teach Digital Literacy Skills available at <https://www.aeseducation.com/blog/teach-digital-literacy-skills> [Accessed 18th October, 2023]

124 Joe Davenport (2022), What is AI Auditing available at <https://www.holisticai.com/blog/ai-auditing> [Accessed 18th October, 2023]

protection regulations. Comprehensive audits encompass the entire pipeline of the system's life cycle, addressing areas such as the reporting and justification of the business case, assessment of the developing team, and test datasets.[125]

Additionally, AI applications should allow users to customize privacy settings, provide opt-out mechanisms, and offer transparent data management options. As *Tan* observes, in the realm of Human-Centred AI, three essential elements guide the creation of successful products namely: building trust band transparency, user autonomy and control, and societal value and alignment.[126] By empowering users through user autonomy and control, AI producers can create systems that align with users' needs and preferences. Prioritizing user feedback, enabling customization, and ensuring transparent data privacy and security practices foster trust and enhance the user experience.[127] User empowerment in AI is very vital for it ensures that individuals have control and understanding over AI systems whereas continuous evaluation of the same is crucial to maintain accuracy and fairness. Together, these practices help build trust and ensure responsible AI deployment.

5.2.10 Industry and Expert Involvement.

In any field or sector in society, to make a reasonable change and have a sensible impact, one must seek the participation of experts and major industries. The influence of such drivers in digital literacy cannot be undermined. As *Anderson & Rainie* observe, experts in education, technology, and the labour market agree that digital literacy is crucial for people's personal and professional lives.[128] To

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125 Ibid

126 Sarah Tan (2023), How to Empower User Autonomy and Control in Your AI Products available at <https://medium.com/@sarahtan.twh/how-user-autonomy-and-control-drive-human-centered-ai-innovation-be39aeea68ee> [Accessed 18th October,2023]

127 Ibid

128 Anderson, J., & Rainie, L. (2021). The future of digital spaces and their role in democracy. Pew Research Center available at <https://www.pewresearch.org/internet/2021/11/22/the-future-of-digital-spaces-and-their-role-in-democracy/> [Accessed 18th October, 2023]

this end, companies and industries that are at the forefront of technology can contribute by providing resources, expertise, and real-world insights to educational initiatives for example data protection by design. Integrating data protection principles into the design phase of AI projects is also a fundamental step. According to *Spurava & Kotilainen,* findings show that the ability to engage effectively and wisely with information is crucial in decision-making situations and should be developed together with comprehension of the operational and business logic of algorithm-driven digital media platforms as information infrastructure.[129] Developers should thus prioritize privacy by design where the creation and development of systems integrates privacy protection measures from the onset. This proactive approach minimizes the chances of privacy breaches later in the development process.

5.3 Comparison to other jurisdictions.

In navigating data privacy and artificial intelligence through digital literacy, it is imperative to compare the situation at hand to other jurisdictions. In the realm of data privacy, Uganda has established robust laws such as the *Data Protection and Privacy Act, 2019* and the *Data Protection and Privacy Regulations, 2021* which mirror the *European Union General Data Protection Regulation (GDPR)* as earlier discussed. The GDPR is said to be the toughest privacy and security law in the world.[130] Since its coming into force on May 25th 2018, trading blocs, governments, and privacy organizations took note, and over the years, it has inspired new data privacy legislation worldwide.[131] For instance, other African countries like Kenya, Mauritius, Nigeria, and South Africa have also enacted

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129 Guna Spurava & Sirkku Kotilainen (2023), Digital Literacy as a Pathway to Professional Development in the Algorithm-Driven World available at <https://www.idunn.no/doi/10.18261/njdl.18.1.5> [Accessed 21st October, 2023]

130 Ben Wolford (2019), What is GDPR, The EU's New Data Protection Law? <https://gdpr.eu/what-is-gdpr/> [Accessed 31st January, 2024]

131 Mike Woodward (2021), 16 Countries with GDPR-Like Data Privacy Laws available at <https://securityscorecard.com/blog/countries-with-gdpr-like-data-privacy-laws/> [Accessed 31st January, 2024]

GDPR-like laws.[132] These measures demonstrate a commitment to safeguarding privacy rights in our increasingly digital world, thereby setting a commendable standard for responsible data governance.

However, the case is very different when it comes to AI. There are no comprehensive laws governing AI and so, people use AI as they please. It is thus not surprising that in March 2023, 'Balenciaga Pope' went viral.[133] Similarly, in December 2023, fans of Nicki Minaj broke the internet as they used AI to create 'Gag City' that captured the attention of several brands and celebrities worldwide.[134] Urgent attention is required to establish frameworks ensuring responsible development and use of AI, safeguarding ethical considerations and privacy concerns. Therefore, notes should be taken from countries that have somewhat progressed in this regard. For example, at the end of 2022, the United Kingdom Ministry of Justice opined that sharing deep-fakes without a person's consent could result in imprisonment.[135] Taiwan has also implemented a similar bill.[136] In the United States, several states including California, Texas, and

132 Ibid.

133 Dan Di Placido (2023), Why Did 'Balenciaga Pope' Go Viral? <https://www.forbes.com/sites/danidiplacido/2023/03/27/why-did-balenciaga-pope-go-viral/?sh=4ab7898f4972> [Accessed 31st January, 2024]; Kalley Huang (2023), Why Pope Francis Is the Star of A.I.-Generated Photos <https://www.nytimes.com/2023/04/08/technology/ai-photos-pope-francis.html> [Accessed 10th January, 2024].

134 Conor Murray (2023), Nicki Minaj Fans Are Using AI to Create 'Gag City' – A Vibrant Pink World Inspired by Her New Album available at <https://www.forbes.com/sites/conormurray/2023/12/07/nicki-minaj-fans-are-using-ai-to-create-gag-city-a-vibrant-pink-world-inspired-by-her-new-album/amp/> [Accessed 31st January, 2024]

135 A deepfake is an image, or a video or audio recording, that has been edited using an algorithm to replace the person in the original with someone else (especially a public figure) in a way that makes it look authentic [Mirriam Webster Dictionary]; Oliver Lock (2023), The Legal Issues Surrounding Deepfakes and AI Content available at <https://www.farrer.co.uk/news-and-insights/the-legal-issues-surrounding-deepfakes-and-ai-content/> [Accessed 31st January, 2024]

136 Jason Pan (2023), Bill to Curb Deepfake Pornography Clears Legislature available at <https://www.taipeitimes.com/News/front/archives/2023/01/08/2003792190> [Accessed 31st January, 2024]

Virginia have made non-consensual deep-fakes a criminal offense.[137] These initiatives are commendable for they safeguard the integrity of personal images and videos.

In regulating the use and development of AI, focus should lay on persons that are likely to be marginalized. For instance, it is not uncommon for women to be particularly targeted by deep-fake pornography which is often broadcast without consent.[138] In one of the most recent cases, teenage girls as young as 11 were targeted and the pictures were shared with their high school classmates via social media.[139] In January, 2024, AI-generated pornographic pictures of Taylor Swift widely circulated on the social media platform X (formerly Twitter), and eventually made their way to other platforms.[140] Researchers have said that the number of explicit deep-fakes have grown in the past few years, as the technology used to produce such images has become more accessible and easier to use. Therefore, Uganda needs to take a stand against this form of technological abuse.

6.0 CONCLUSION

Implementing comprehensive digital literacy programs covering data privacy and AI understanding in Uganda is a complex endeavour with inherent challenges. To this end, collaboration and concerted efforts with strategic planning, government support, and innovative approaches, are essential. This paper has

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137 Oceane Duboust (2023), 'Violating and dehumanising': How AI deepfakes are being used to target women available at <https://www.euronews.com/next/2023/12/11/violating-and-dehumanising-how-ai-deepfakes-are-being-used-to-target-women> [Accessed 31st January, 2024]

138 Sophie Compton & Reuben Hamlyn (2023), The Rise of Deepfake Pornography is Devastating Women available at <https://amp.cnn.com/cnn/2023/10/29/opinions/deepfake-pornography-thriving-business-compton-hamlyn/index.html> [Accessed 31st January, 2024]

139 Oceane Duboust (2023), 'Violating and dehumanising': How AI deepfakes are being used to target women available at <https://www.euronews.com/next/2023/12/11/violating-and-dehumanising-how-ai-deepfakes-are-being-used-to-target-women> [Accessed 31st January, 2024]

140 AP Staff (2024), Taylor Swift AI-generated Explicit Photos Spark Outrage available at <https://www.livenowfox.com/news/taylor-swift-ai-generated-explicit-photos-spark-outrage.amp> [Accessed 29th January, 2024]

highlighted the significance of digital literacy in a rapidly evolving technological landscape and the crucial role of education and awareness in safeguarding data privacy and effectively engaging with artificial intelligence. In an age where digital technologies are integral to our daily lives, being a digitally literate citizen is not a luxury but a necessity. Moreover, the ethical considerations surrounding artificial intelligence demand careful scrutiny and thoughtful policymaking. The engagement of various stakeholders is pivotal in fostering a privacy-conscious AI culture.

Looking ahead, Uganda stands on the precipice of an exciting digital future. This article has advocated for a concerted effort to equip its citizens with the knowledge and skills needed to navigate this evolving landscape. In doing so, Ugandans are urged to preserve their privacy so as to effectively harness the benefits of technology and understand the nuances of data privacy and AI. Ultimately, empowering digital citizens through digital literacy is not just a goal; it is a path to a brighter, more informed, and more secure digital future for Uganda.

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