Publish or perish in the era of artificial intelligence: which way for the Kenyan research community?

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1. Introduction

Research constitutes the quest for novel and enhanced insights, operating within a systematic and socially structured framework guided by diverse objectives and values (Anh, 2022). Even though the pursuit of truth stands as the paramount obligation within the realm of science, the realization of this objective in its entirety remains an elusive prospect. This is because the majority of findings are subject to conditions and limitations, notwithstanding the inherent significance of scientific norms as guiding principles for the collective endeavor of the research community in pursuing truth.

Research ethics encompasses a broad spectrum of principles, practices and institutional frameworks that foster and oversee scientific undertakings (Michalos, 2014). It embodies a codification of moral conduct in the scientific domain and can be examined from various perspectives including norms delineating acceptable scientific conduct concerning the attainment of precise, sufficient and pertinent knowledge; norms governing research collectively; the relationship with research participants and the integration with society at large.

Isaac Newton, in a letter dating back to 1676, articulated the notion that "If I have seen a little further, it is by standing on the shoulders of giants" (Jo *et al.*, 2022). The metaphorical usage of "Giants" can be construed as a reference to the extensive body of published research and the broader scientific milieu. Past scientific advancements form the foundation of contemporary science, and each researcher owes their work to these findings. Citing previous research in scientific writing holds significance, as it acknowledges the contributions of others, bolsters the credibility of one's work by showcasing reliance on reputable information sources, illustrates the interconnectedness of different research endeavors and aids readers in locating additional resources.

In the present day, ethics play a pivotal role in safeguarding the rights of research participants through principles such as voluntary participation, informed consent and safeguarding participants' rights. However, achieving these standards frequently poses challenges for researchers.

Even when clear ethical standards and principles are in place, there can be moments when the necessity to conduct accurate research clashes with the rights of potential participants. No set of ethical norms can reasonably predict every ethical situation. Furthermore, a mechanism must be in place to ensure that researchers examine all relevant ethical considerations while developing study designs. To address such needs, most institutions and organizations have developed policies, guidelines, and constituted agencies, boards and committees to enforce ethical research by reviewing concepts and research proposals, thereby protecting organizations and researchers from potential legal ramifications of failing to address important ethical issues (Mwangi *et al.*, 2021).

In Kenya, some agencies/committees have been constituted to guide the enforcement of ethics. They include the National Commission for Science, Technology and Innovation (NACOSTI), Postgraduate Boards and Institutional Research Ethics Committee (IREC) or Institutional Review Boards (IRB). Professional regulatory agencies such as the Internet Society, Computer Society of Kenya, ICT Authority, Kenya Medical Research Institute, Kenya Medical Practitioners and Dentists Council; Kenya Plant Health Inspectorate Service; Engineers Board of Kenya, Institute of Certified Secretaries and Institute of Chartered Public Accountants, among others, are also available.

To further provide the legal framework upon which these agencies operate, policies, regulations and guidelines have been established namely Science Technology and Innovation Act, 2013, the Science, Technology and Innovation, Legal Notice No. 108 (Research Licensing) Regulations, 2014, Research and Outreach policies developed by research institutions, ethical guidelines developed by IREC of research institutions, access to information policies developed by libraries of research institutions, Data Protection Act, 2019, Copyright Act 2001 (revised 2014), NACOSTI Guidelines on Research Licensing and Institutional Affiliation, 2019 and Intellectual property policies developed by research institutions

Legally, research institutions must guarantee high-quality research, academic and artistic growth, all while adhering to established scientific, artistic, pedagogical and ethical standards. Despite frequent blurring, the distinction between law and ethics remains fundamental. Both are normative, but ethical norms express themselves as suggestions rather than prescriptions and prohibitions. As a result, each institution should adopt ethical research norms per the principles of academic freedom and self-regulation.

2. Problem statement

The scientific community in Kenya is currently experiencing a division regarding the popular slogan "publish or perish." This divergence stems from the enduring role of publications as a measure of research competition, a standard for career progression and a form of acknowledgment and reward. Rather than fostering meticulousness in scholarly writing, the focus has shifted toward augmenting the volume of papers produced, consequently compromising the

caliber of research outcomes. Instances include authors opting to publish solo to accrue all promotion credits, thereby eschewing interdisciplinary collaboration, while others seek credit in publications where their contribution is minimal to amass more promotion credits. This situation is further exacerbated by the increased use of generative artificial intelligence (AI) tools. Such unethical conduct necessitates attention. This study, therefore, strives to identify some of the unethical conduct and proposes the best practices to avoid ethical misconduct.

3. Methodology

The study was based on a review of the content of policies, procedures and rules and regulations held by three universities in Kenya and NACOSTI and a review of past studies that have been carried out to identify ethical trends that could be used to promote ethical conduct in research and publications.

4. Impact of artificial intelligence on the traditional publish or perish culture among researchers

The use of AI has significantly impacted the traditional "publish or perish" culture in academia, both by introducing efficiencies and by raising new ethical and practical challenges. AI tools such as ChatGPT and Google Bard have revolutionized the way academic research and publications are approached, offering assistance in conducting literature reviews, writing manuscripts and generating references, thus potentially increasing the volume of publishable material (Storey, 2023). This could alleviate some pressures of the "publish or perish" culture by making the publication process more efficient. However, the ease of generating content with AI has led to a surge in submissions, indicating a potential inflation in the number of academic outputs with varying quality (Dupps, 2023). Moreover, the integration of AI in academic publishing has sparked a debate on authorship, plagiarism and the originality of AI-generated content (Kurian et al., 2023). The concern is that AI could contribute to a dilution of quality and integrity in scholarly publications, with instances of AI-generated manuscripts posing serious ethical challenges, including the risk of plagiarism and the difficulty in ensuring the originality and authenticity of AI-assisted research (Buchanan, 2023).

Furthermore, the adoption of AI in academia has sparked discussions about the need for transparency in revealing AI's role in research outputs and the possibility of acknowledging AI as a contributor or coauthor in publications (Esplugas, 2023). This reflects a broader shift toward recognizing the influence of digital tools on academic productivity and the quality of scholarly discourse (Ang et al., 2023). Therefore, it is evident that despite challenges arising from the use of AI, there exist opportunities for enhancing research and publication processes. For instance, it can support researchers in overcoming language barriers, data analytics and image recognition, improving the accessibility and dissemination of research findings to a wider audience. However, AI must be used cautiously due to its limitations in knowledge, expertise and integration challenges which may hinder its full potential (Thomas et al., 2023). Therefore for AI to fully transform the "publish or perish" culture, institutions must develop new and/or review existing standards and guidelines to govern AI use in academic writing and publishing to guarantee the integrity and quality of scholarly works. This is still missing in most existing policies and regulations in Kenya.

5. Unethical practices/research misconduct

Research misconduct encompasses activities such as falsification, fabrication or plagiarism (FFP) in various stages of the research process, including proposal development, literature review, data collection and reporting of results (Braga, 2023). Falsification involves distorting research materials, equipment or methods by manipulating, omitting, or altering data or outcomes, thereby misrepresenting the research findings (Braga, 2023). Deception can also occur in the utilization of research tools, materials and methodologies. Moreover, misleadingly editing images or visual representations or focusing excessively on minor details constitutes falsification. Instances of subtle manipulation, whether by researchers or research assitants aiming to impress their supervisors, can be challenging to detect in a study.

Fabrication involves the creation of data or results from scratch (Armond et al., 2021). This entails generating or adding data, observations or descriptions that were not obtained during the data collection or experimentation phase. Fabrication may occur, for instance, when finalizing remaining experiments. Assertions regarding outcomes should be grounded in factual data sets, and drawing conclusions based on incomplete or assumed information constitutes fabrication. Not only are studies that were never conducted included in this category but also those that artificially inflated their results or presented retrospective analyses as randomized trials. Investigating such matters can be complex, as it is not always evident who is the more reliable source: the whistleblower or the researcher.

Plagiarism is the act of appropriating someone else's work and presenting it as one's own without proper acknowledgment of the sources. It involves taking another individual's ideas, procedures, findings or words without due attribution (Elsayed, 2020). The repercussions of plagiarism extend beyond damaging the reputation of the individual researcher to compromising the integrity of the research itself. The task of preventing plagiarism falls upon both researchers and research institutions. It contravenes the scientific principles of honesty and demands originality, modesty and collaboration. Researchers are obliged to reference their sources appropriately when building upon the findings of others.

Plagiarism can manifest in various ways, encompassing the appropriation of ideas, hypotheses, concepts, theories, interpretations, designs, images and results, among others. Failure to cite a work adequately after mentioning it at the beginning of one's work and subsequently extensively utilizing its content may also constitute plagiarism (Braga, 2023). Other forms of plagiarism such as self-plagiarism occur when authors recycle their own previously published content without acknowledging its prior publication. Although less severe than plagiarizing others' work, self-plagiarism is still ethically problematic and is an attempt to mislead the audience.

Other than FFP ethical misconduct may include manipulation of images, wrong choice of statistical analysis

methods, p-hacking, republishing articles, salami slicing and student–supervisor authorship disputes and conflicts caused by the use of publications for both scientific processes and reward systems such as promotion (Friese and Frankenbach, 2020). Also, conflict may arise in circumstances of multiple authorship and when professional judgment about a core interest is impacted by a secondary goal, such as financial gain, the possibility of conflict of interest and bias exists.

6. Avoiding ethical uncertainties in research: making ethical decisions

Agencies and committees have devised a framework that addresses the challenges posed by the publish or perish dilemma, safeguarding the excellence of research outcomes for the academic community. Some of the strategies are discussed as follows.

6.1 Open research library

There is a growing recognition of the need to shift the emphasis on researcher assessment toward responsible research practices, transparency, accountability and quality teaching. To this end, initiatives such as the Open Research Library which aim to enhance access to research findings within the academic community have been developed to support researchers in Kenya (Owango and Souza, 2022). Embracing Open Science practices, which promote transparency in research, can also play a crucial role in reshaping the research culture toward a more balanced and impactful approach (Bouter, 2024). In addition, institutionalizing San Francisco Declaration on Research Assessment and the Hong Kong Principles which advocate for rewarding various research outputs beyond just publications and incentivizing responsible research practices is key (Bouter, 2024).

6.2 Partnerships and consortia

Efforts to enhance research accessibility through partnerships, such as the one between TCC Africa, Knowledge Unlatched and the Kenya Libraries and Information Services Consortium have helped to introduce the Open Access Research Discovery Tool to the Kenyan academic community (Osure et al., 2017). Through funding from various institutions such as the German Academic Exchange Service, the British Council and the European Union, institutions in sub-Saharan Africa have built partnerships between the global North and South with a specific focus on capacity building of researchers for quality scientific investigations. In addition, through partnerships, institutions have benefited from cutting-edge research laboratories that have helped to spur ethical research conduct among various research communities in Kenya. Resources have also been provided locally by institutions such as Kenya Education Network (KENET) which has developed research infrastructures, such as the Certification Authority which facilitates Kenyan researchers to access global high-performance computing resources, indicating progress toward overcoming limitations in local computing resources (Vargas et al., 2022).

6.3 Comply with the acceptable standards of informed consent

The cornerstone of ethical human subjects research is informed consent, which must be based on the principles of intelligence, knowingness and voluntariness, and should be seen as an ongoing process rather than a one-time event (Mistretta, 2022). When conducted appropriately, the process of obtaining consent ensures that individuals are participating in the research voluntarily and with comprehensive awareness of the potential risks and advantages. Consequently, researchers are required to disclose any information that could reasonably impact the willingness of participants to engage in the study in a manner that is understandable and valued. Participants should be informed about the objectives of the study, the anticipated timeframe and the methodologies used. Also, information should be available on the participants' entitlement to refuse participation and withdraw from the research post-commencement, along with the repercussions of such actions. In addition, reasonably foreseeable factors, such as potential hazards, discomfort or negative consequences should be disclosed. Boundaries of confidentiality, encompassing data encryption, deletion, sharing and retention, as well as instances where confidentiality may need to be breached should also be disclosed.

6.4 Maintain confidentiality and privacy

The right of individuals to confidentiality and privacy is a key component of all research. Therefore, researchers must create methods to determine whether participants are willing to discuss delicate topics without putting them in uncomfortable situations. This could imply that they provide detailed data collection tools and allow participants to stop if they feel uncomfortable. Researchers should explain to their participants how their data will be used, as well as what will be done with case materials, images and audio and video recordings, and obtain their consent. Personal data must normally be de-identified, and research material anonymized before publication or distribution. In some cases, researchers must strike a compromise between secrecy and the need to notify. Before beginning a study, the researcher should be aware of the ethical considerations/guidelines as well as the legal obligations for privacy and data sharing.

6.5 Data dissemination

Dissemination of research data may vary depending on the organization sponsoring the research. However, open data platforms have facilitated this endeavor. For instance, Kenya's ICT Authority and governmental bodies such as the Ministry of Agriculture have established an open data repository (Kenya Open Data) where data from diverse sectors can be accessed at no cost. Global entities such as the World Bank, the Food and Agriculture Organization of the United Nations, Relief Web, the Princeton Visual AI Lab and Open Data Africa, all provide open data resources for academic use. Publication of open data can accelerate research by enabling more scholars to analyze the available data. Furthermore, accessible data may contribute to reducing data-related ethical transgressions, such as data fabrication or manipulation.

6.6 Uphold scientific objectivity

Norms for acceptable scientific inquiry must be promoted by both researchers and research institutions. Misconduct is a major violation of good scientific practice related to the communal commitment to seeking the truth. The transition from viewing objectivity as a "view from

nowhere" to understanding it as a relationship between objectivity and trust highlights the importance of transparency and the acknowledgment of values in scientific research (Stamenkovic, 2023). Researchers must remain truthful and uphold the principles of integrity in all forms of research and at all stages of the research process. Institutions must have mechanisms in place to deal with allegations and suspicions of unethical conduct and establish routineness that promotes integrity and prevents misconduct.

6.7 Obtaining approval for research

Before commencing research involving human or animal participants, it is imperative that an ethical review entity, such as NACOSTI, IRB or IREC grants permission for the study. Failure to obtain consent before initiating research with human or animal subjects could result in severe legal and moral consequences. In situations where authors fail to present evidence of approval, some journals may choose not to consider such publications if they entail investigations with humans or animals. For instance, as reported by The Guardian in 2019, a scientist was found guilty of illicitly attempting to alter the genetic composition of twin girls (McCurry, 2024). The scientist purportedly initiated the research after falsifying documents from an ethics review committee. This is primarily because conducting research without prior approval violates laws, institutional protocols and guidelines.

6.8 Avoidance of plagiarism

In footnotes, endnotes and in text, it is critical to cite previous work appropriately and distinguish between direct quotes and paraphrasing. Paraphrasing should not be so close to the source material that it becomes a quote. Many journals have editors that use tools to check for plagiarism in the submissions they receive. Some of the most extensively used software packages include Copyscape, Grammarly, iThenticate, PlagScan PlagTracker, Quetext, Ouriginal, Unicheck and ProWritingAid.

These tools and other technological solutions look for similarities between articles and are effective in detecting text-based plagiarism by comparing submitted work against a vast database of academic and online sources. However, they may

struggle to detect more sophisticated forms of cheating such as contract cheating and collusion, which can be harder to prove (Johnson *et al.*, 2022). In addition, some students attempt to evade detection by submitting work in non-text formats or by using hidden glyphs and alternative character sets that traditional text-matching software may not accurately identify (Pal *et al.*, 2023). While these tools are valuable for identifying blatant plagiarism, incorporating natural language processing techniques into plagiarism detectors can enhance their accuracy in detecting plagiarism by analyzing text structures and relationships. Also, linking resemblance with plagiarism necessitates human interpretation.

6.9 Other best practices

Other best practices include upholding the freedom to explore, generate and transmit scientific knowledge to the general public; cultivating positive relationships with IRBs to amicably resolve any stumbling blocks before projects begin; institutional accountability to ensure that research is ethical and responsible by preventing misbehavior and promoting research ethics guidelines and procedures; respect for human dignity and personal integrity in topic selection, study subject, reporting and publication of research findings; provision of relevant information on the study to the research participants; establish and follow good processes for guaranteeing the quality of datasets, as well as for any reuse or deletion of registers or other data that may be related to individuals in a study; respect for vulnerable study populations such as women, youth and children; adherence to established authorship and collaboration standards; provision of proper citations and references to the literature used, whether primary or secondary; and adhering to the rules for their neutrality as well as the impartiality of others.

7. Conclusion

Ethics in scientific research and writing cannot be overstated, as they play a crucial role in ensuring that researchers adhere to the appropriate standards and principles of scientific inquiry. We must rigorously adhere to ethical guidelines when making decisions to protect the dignity of participants, maintain the objectivity of the study and establish accountability and

responsibility among researchers and institutions, all while maintaining the essential scientific freedom we seek. In the words of Isaac Newton, it is paramount to acknowledge and honor the contributions of others while maintaining factual accuracy in one's research endeavors. While there are concerted efforts and initiatives to bolster the Kenyan research community, systemic issues such as funding, infrastructure and cultural attitudes toward research persist. The "publish or perish" scenario for Kenyan researchers is thus a challenging path, requiring both systemic reforms and enhanced support mechanisms to foster a conducive research environment.

8. Recommendations

The study recommends that the Kenyan research community must navigate the dynamics of publishing to contribute meaningfully to global scientific knowledge while addressing local socioeconomic goals. Establishing, reviewing and adhering to policies, procedures and guidelines on publication provides a framework upon which scientific investigation can remain relevant to enhance positive outcomes while minimizing negative impacts. IRB, IREC, NACOSTI and other regulatory agencies and committees should be at the forefront of raising awareness of ethical conduct in research studies and provide clear guidelines for incorporating generative AI in studies. The primary objective of any study should be to address inquiries that could benefit society at large rather than individual gratifications. Therefore, efforts should be made to mitigate risks to the fullest extent possible.

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