

**PUBLIC COMMUNICATION OF SCIENCE, TECHNOLOGY
AND INNOVATION BY AFRICAN MEDIA RESEARCH
JOURNALS: INSIGHTS FROM EGYPT, NIGERIA AND
SOUTH AFRICA (2016–2023)**

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ABSTRACT

The public communication of science, technology, and innovation involves many channels, like publishing in peer-reviewed journals, using traditional and social media, science fairs and exhibitions, and scientists' blogs, among others. However, the place of African media researchers in innovation science communication remains a gap in academic discourse, as the focus has been on the role of traditional media or social media in promoting science. This study analysed how science, technology, and innovation (STI) are covered in selected African media research journals. Focusing on Egypt, Nigeria, and South Africa, the study employed content analysis of 1,174 articles published between 2016–2023, covering 135 issues of open-access media journals from Egypt (45 issues), Nigeria (45 issues), and South Africa (45 issues). Based on the African Renaissance framework, the study adopted a quantitative content analysis as a research method. The findings showed differences in the reporting of STI research: Nigeria had 59, Egypt had 30, and South Africa had 23. However, only 10 articles in the seven years researched innovative science communication, where Nigeria had 2, Egypt had none, and South Africa had 8. South Africa performed better in discussing innovations, with studies like a first-aid app for non-health workers, and agricultural data for food security in Ghana using interactive voice response technology. In comparison, Egypt and Nigeria mainly focused on examining existing media practices, like whether they are good at managing floods or agriculture, which suggests the traditional approach. The study recommended that African media journals should be consistent with the goal of self-determination in the African Renaissance by reporting innovations from research institutes, universities, and centres of excellence.

KEYWORDS: Science Communication, Innovation Science, African Media Research, Decolonisation Studies, and African Development.

INTRODUCTION

African Renaissance, a rebranding of Pan-Africanism thought of the 18th century, has been on the front burner of many nationalists like Senegalese Cheikh Anta Diop (1923–1986), Nigerian Nnamdi Azikiwe (1904-1996), Ghanaian Kwame Nkrumah (1909–1972), and South African Thabo Mbeki, among others who advocated for the growth and development of African states in all spheres of human endeavour, with science and technology playing pivotal roles. The African Renaissance has the goal and objective of emancipating African countries from their current state of multidimensional poverty, armed conflicts, human rights infractions, epidemics, and pandemics like HIV/AIDS, Ebola, and Mpox, as well as the lack of good governance (Evaldsson & Wessels, 2004). This movement birthed the African Renaissance Institute (ARI), headquartered in Gaborone, Botswana. ARI was founded in 1999 as a multipurpose African institution to implement an ‘aggressive development agenda.’ Specifically, ARI’s goal “is to establish the most effective way of mobilising and networking Africa’s human resources, intellectual wealth, and enterprise for an African renaissance in the third millennium.” (Olagunju, 2020, para. 3). Good governance, peace and security, health, culture, agriculture, and science and technology are part of its mandate (Olagunju, 2020). Noting the importance of science and technology, the ARI has a dedicated unit, the African Renaissance Institute of Science and Technology (ARIST), dedicated to leveraging science, technology, and innovation as catalysts for African development. ARIST works closely with universities, industry, government, and development partners to support research, education, and policy initiatives that drive progress across the continent (African Renaissance Institute for Science and Technology, 2024).

Science, the study of natural phenomena, is seen as the first step in developmental paradigms and the substructure for any meaningful transition from an underdeveloped state to a developed one. Technology, as applied science, plays a fundamental role in wealth creation, improvement of the quality of life, real economic growth, and transformation in any society. As noted, science and technology hold the key to the present and future development of any country. It has a direct impact on poverty alleviation, agriculture, health, education, economic and rural development, renewable energy, and environmental management (Anaeto, Asiabaka, Ani, Nnadi, & Anaeto, 2016).

Innovations are important in the growth of a country's economy, as they make scientific discoveries that improve production or create a fundamentally new

product (Pasholikov & Dudakov, 2020). Innovations are created or developed to disrupt traditional technologies and to usher in new ways of practice that are fast, efficient, and effective among the general users. Broadly, innovation is a new idea, a new object, or a new practice, like scientific knowledge or technical products. Innovation could also be a new application method, or updated tools, which are viewed as new facilitators of problem-solving, with deferred or on-the-spot acceptance in society. Innovation procedures are public and have community acceptance, with their structure and technology known. Also, innovation can be explained as creating new products, offering new services, or initiating a new process based on new ideas and stages (Khan, Khan, & Khan, 2020). Innovation impacts all disciplines and endeavours from academia, business, agriculture, and health, among others, and each sector strives for innovative ideas to better their respective domains.

For a long time, Africa has been wholly dependent on the Global North for its innovation, science and technology, and although African countries have made progress in increasing access to digital technology, only 0.5% of the world's scientific researchers are in sub-Saharan Africa and Africa accounts for less than 1% of global research and development (R&D) spending as noted by the United Nations (Duarte, 2024). In waves of decolonisation, thoughts like Afrikology, Afrocentrism, and Consciencism, among others, the argument is that Africa should develop its own innovations and apply its technologies to better the living conditions of its people. African Union (2020) noted that there is a need for African states to create models of innovation suitable to the continent and respective states and avoid the replication of models that, despite being successful elsewhere, cannot necessarily adapt to the socio-economic realities of African states. This objective can be achieved with the popularisation of science by scientists, journalists (mass media), or academics.

Globally, science communication is the field that explains the processes of how science is made public. It is the various channels of explaining scientific endeavours from the scientists or technologists to others, either fellow researchers or non-scientists. While science communication is the professional communication among scientists, using media like journal publications and conference presentations is for public communication of science and technology (PCST). This involves science museums, science centres, news outlets, media producers, community groups, and public information officers that aim to improve public engagement with science (Lewenstein, 2022).

The popularisation of science could be via public engagement, like science fairs and public demonstrations, or the use of mass media to communicate innovation to the public. Media researchers also scrutinise and evaluate the science-based practices to determine how both traditional and new media have impacted the audiences. Schäfer (2011) noted that media researchers evaluate science promoted by mass media by examining agenda-setting effects, the presentation of scientific disciplines, and the impact on public perception, recognising that media coverage influences audience understanding and engagement with science differently based on individual factors. Media researchers often evaluate the role of radio, television, and social media, among others, and use these media to popularise science among their audiences.

Media researchers also gauge the media's role in promoting science by investigating the audience's perceptions of the media and of scientific genres like health or nanotechnology. With so many media researchers evaluating and assessing science-based interventions, what is unknown is the dominance of either evaluative science communication or innovation science communication.

Innovation science communication is research into an existing or developing innovation using empirical and scientific research approaches by media researchers. They bring to the fore current scientific and technological developments for societal benefit. Unlike the analysis of how the mass media promotes science, technology, and innovation, innovative science communication takes a deep dive into investigating and communicating innovation in society. This means engaging with scientists, technologists, innovators, the public, and end-users to understand the basis, use, and impact of such innovations. The findings of such research can be publicised through mass media and media research journals. An example of innovation in science communication is the health technology assessment of neonatal innovations in global health research (Matyek, Etumnu, Odionye, Amadi, & Godswill, 2024). Therefore, this study aims to assess innovation science communication in selected media research journals in Egypt, Nigeria, and South Africa.

LITERATURE REVIEW

African technologies have always existed from time immemorial, but the colonisation of Africa diminished many of these technologies in favour of Western technologies. Ezenagu (2014) noted that the colonial era had factories that made products of different kinds using African raw materials. These undermined products

made by African indigenous technologies from blacksmiths, wood carvers, textile weavers, and dyeing, and in time, this dwindled the demand and made African products obsolete. Studies show that the status of STIs in Africa is more of a policy with groundbreaking prospects than operational, as these technologies have not made a meaningful impact, produced tangible results, or lacked effective implementation (Kahn, 2022; Forson, 2019). Despite this, STI is still produced yearly in different African states. ARIST has undergone research and produced innovations on superlubricity-low friction technologies (Kwame Nkrumah University of Science and Technology, Ghana), energy storage and generation (Worcester Polytechnic Institute, USA and African University of Science and Technology, Nigeria), drug delivery and nanoscience (University of Johannesburg), graphene production (Kwame Nkrumah University of Science and Technology Ghana), responsible artificial intelligence (Kwame Nkrumah University of Science and Technology in Ghana), water resources (Kwame Nkrumah University of Science and Technology, Ghana), pest control, and electric cars (Sunyani Technical University, Ghana). Apart from ARIST, there are various Centres of Excellence domiciled in African universities engaged in science, technology, and innovation. For instance, West African Centre for Crop Improvement (University of Ghana), African Centre of Excellence in Climate Change, Biodiversity and Sustainable Agriculture, Université Félix Houphouët-Boigny (Cote d'Ivoire), African Centre of Excellence in Dry Land Agriculture, Bayero State University (Nigeria) and Centre for Food Technology and Research, Benue State University (Nigeria), all having agriculture-based thematic areas.

The evaluation of science communication is generally understood as the systematic, data-based assessment of communication endeavours guided by specific objectives (Raupp & Osterheider, 2019, as cited in Volk & Schäfer, 2024). It can show the success of science communication, contribute to learning outcomes, justify spending, and serve as an early warning system to avoid crises related to STI (Volk & Schäfer, 2024). Evaluations are important for ensuring that the science communication of scientific projects is effective (Ziegler, Hedder, & Fischer, 2021).

Evaluative science communication is defined in this study as evaluation research of STI popularised by the mass media and research on audiences' perception of STI. For instance, studies such as the evaluation of radio communicative effectiveness on flood education and control (Onyechi, 2023) and exposure to agricultural radio programmes and adoption of improved farming practices among farmers (Ojo, 2024). While the former evaluates radio

communication regarding flooding (environmental communication), the latter evaluates the perception of farmers on the role of radio in improving farming practices (agricultural communication). This falls under the scope of studies that evaluate the mass media in informing audiences about agricultural and environmental concerns.

On the other hand, innovative science communication is conceptualised as the popularisation of innovation, processes, or technologies by media researchers. Danilina (2022) noted that effective innovation communication is created when an innovation culture predominates and contributes to a positive, constructive, and active perception of inventions, discoveries, and knowledge; popularising science is a significant step in building an innovation culture. Additionally, effective communication of science innovation is becoming very important as scientific breakthroughs and technological advancements shape everyday life, influencing areas from public health, environmental sustainability, and innovation in industry and education (Phogat, Rab, & Wan, 2025).

Peer-reviewed journals are popular and authoritative media of science communication. The peer-review process ensures that research findings from academics are accurate and trustworthy despite a few retractions in academic fields after further investigations (Kelly, Sadeghieh, & Adeli, 2014). Journals, in science-based disciplines, like engineering, medicine, zoology, among others, are possibly the sole medium of science communication by academics who still believe that the mass media and journalists may misrepresent their research findings to the public (Schipani, 2024). It now behoves science communication researchers, trained in qualitative and quantitative research approaches, to investigate, assess, and appraise these innovations and research findings from pure-science academics. This forms a second level of science communication where scientific and technical jargon is interpreted and explained for the public. Communicating innovation drives the popularisation of science and technologies, and may correlate with social change when an innovation is adopted.

METHODOLOGY

This study adopted the quantitative approach as the research design. This approach aligned with the objective of the study to assess innovation science communication in media research journals with emphasis on the frequency of the thematic areas of science, technology, and innovation communication. The research method was the quantitative content analysis, where the unit of analysis was journal

articles from each issue. The content categories were science, technology, and innovation media research articles. The population of the study was 1,174 articles published between 2016–2023 covering 135 journal issues (45 for each country) of online-accessible media journals that include articles from the *Egyptian Journal of Media Research* (<https://ejsc.journals.ekb.eg/?lang=en>), *Ebonyi State University Journal of Communication* (<https://www.ebsujmc.com/>), *Plateau State Journal of Communication Studies* (www.plasujocs.com), *The Nigerian Journal of Communication* (<https://tnjcm.org.ng/>), *Nasarawa Journal of Communication and Media Studies* (<https://njomacs.com/>), *Nigerian Journal of Communication Review* (www.njcr.com), *Covenant Journal of Communication* (<https://journals.covenantuniversity.edu.ng/index.php/cjoc/index>), *Communicare: Journal for Communication Studies in Africa* (<https://journals.uj.ac.za/index.php/jcsa/>), *The African Journal of Information and Communication* (<https://journals.co.za/toc/comcare/current>), *Communitas* (<https://journals.ufs.ac.za/index.php/com/index>). The systematic sampling was the procedure where every 1st and subsequently the 5th article in an issue was assessed, and generated an inter-coder reliability of 85% based on percentage agreement from three coders that gave a sample size of 112 articles on science, technology, and innovation from the selected journals. Descriptive Statistics was used as a method of data analysis using simple percentage analysis.

RESULTS

Table 1

Frequency of media research on science, technology, and innovation from 2016 to 2023

Country of Media Research	Frequency of STI research	Percent	Other Research	Percent
Nigeria	59	52.7	396	33.7
Egypt	30	26.8	553	47.1
South Africa	23	20.5	225	19.2
TOTAL	112	100	1174	100

South Africa had the lowest percentage in both categories, with only 20.5% of the STI-focused media research (23 out of 112) and 19.2% of the Other Research (225 out of 1,174) from 2016 to 2023. This, in effect, indicates that, in comparison to Nigeria and Egypt, South African production of media research was the lowest in

percentage terms in both fields. Nigeria, on the other hand, ranked highest in STI research at 52.7%, and Egypt ranked highest in Other Research at 47.1%. In the Other theme, the leading areas of media research in Nigeria were Political Communication in Nigeria (57 articles), Cyberculture in Egypt (52 articles), and Cyberculture in South Africa (53 articles). The other leading media research domains in Nigeria were Health Communication (47 articles), Social Media (33 articles), Media Framing (30 articles), and Development Communication (25 articles), which indicated broader thematic coverage than STI. Equally, in Egypt, studies in Social Media (50 articles), Media Framing (39 articles), Integrated Marketing Communication (29 articles), and New Media (28 articles) reflected varied interests in communication and digital-themed topics. In South Africa, the other focal areas included Public Relations (38 articles), Integrated Marketing Communications (28 articles), Gender (22 articles), and Health Communication (19 articles), reflecting a moderate but diversified range of media scholarship. This means that even with the lowest combined percentages, South Africa nonetheless carved out a prominent niche in Cyberculture research, just as Nigeria and Egypt carved out distinct areas of strength in Political Communication, Social Media, and other emerging communication disciplines. By comparison, Nigeria's comparative strength in STI research aligned with its relatively weaker performance in Other Research. Egypt's comparative strength lies elsewhere outside STI in broader media arenas like Cyberculture and digital communication, whereas South Africa, while generally low percentages overall, had focused specialisation in Cyberculture and other chosen themes, supplementing its limited placement in STI research.

Table 2

Frequency of Innovation Science Communication Research from 2016 to 2023

Country of Media Research	Evaluative Science Communication Research	Percent	Innovation Science Communication Research	Percent
Nigeria	57	55.9	2	20.0
Egypt	30	29.4	0	0.0
South Africa	15	14.7	8	80.0
TOTAL	102	100	10	100

South Africa is the leading producer of research on innovation science communication from the data, and 80 percent (8 out of 10) of all the reported studies between 2016 and 2023 are credited to it. This dominance reflects that, although South Africa registered the lowest rate of evaluative science communication research (14.7 percent), its media research has had a dominating trend toward innovation studies. The highlight on innovation could be a reflection of the country's research agenda regarding technology uptake, digitalisation, and knowledge transfer, where communication plays a critical function in making science and society open to industry. With the highlight on innovation, South African media research stands out from Nigeria, whose research is centred on evaluative science communication, and Egypt, whose research did not show any innovation-oriented research during the time frame. This evolution indicates that South Africa has carved out a niche in innovation science communication, evidencing a forward-thinking perspective in keeping with global movements towards innovation-driven development. However, because only ten innovation-themed studies were observed in total, the high ratio also stems from the limited sample size, and a great deal more research would be required to confirm whether this priority represents a long-term national research trajectory. One of the Nigerian science communication studies on innovation, in Volume 2, Issue 6 (2024) of the *Nasarawa Journal of Multimedia and Communication Studies*, was a study on vaccine hesitancy and child immunization and which argued that although the mass media alone cannot sufficiently address the problem, incorporating the evidence-based "New P-Process Model" into health campaigns would significantly boost behaviour change and reduce vaccine-preventable deaths. From South Africa, research on innovation science communication in the *African Journal of Information and Communication*, Volume 28 (2021), posits that interactive voice response technologies are transforming agriculture in Ghana by providing the highest potential in facilitating the dissemination of, retrieving, harvesting, and matching of information and services in the agricultural extension system. Another science communication innovation research published in the *African Journal of Information and Communication*, Volume 20 (2017), details the design of a first aid mobile app in South Africa as an automated clinical decision support system aimed at helping untrained healthcare providers administer fundamental emergency care to patients with no ready access to medical facilities.

DISCUSSION OF FINDINGS

Key findings of the data show that Nigerian researchers have focused on non-science, technology, and innovation research (52.7%), Egypt (26.8%), and South Africa (19.2%) from 112 research articles spanning 2016 to 2023. This finding does not support previous research that advocated for the communication of science and technology as central to present and future development in any country and on the African continent. For science communication to have a direct impact on poverty alleviation, agriculture, health, education, economic and rural development, renewable energy, and environmental management (Anaeto, Asiabaka, Ani, Nnadi, & Anaeto, 2016), the focus should be on popularising innovation rather than merely evaluating the role of the mass media in reporting science, technology, and innovation, as seen from the data (for example, Nigeria's 56% of evaluative science communication from 2016 to 2023). The implication is poor research engagement, weak investigative and interpretive research, and limited collaboration with scientists, science institutes, centres of excellence, technology hubs, innovation and incubation centres by media researchers. In this digital age, the last ten years in Africa have witnessed a growth of active innovative hubs, estimated at 1,031 as of 2021 (Züfle & Bickenbach, 2025). These hubs, often described as technology startups, churn out technologies and innovations that are not necessarily web-based applications (Matyek, 2017) but have practical developmental relevance. Such innovations need popularisation by journalists and African media researchers, as the low level of media coverage of scientific and technological breakthroughs reduces their potential for societal impact. Effective popularisation is especially crucial for innovations that can provide social goods and support development through knowledge creation (Mormina, 2018).

The second key finding is the very low research on innovation science. A high percentage of STI research remains evaluative, meaning it largely examines how the mass media has reported science, with focus on the medium rather than the innovation itself. Yet, studies such as the development of the first aid smartphone app in South Africa for use by non-health workers and the application of interactive voice response technology for agriculture in Ghana illustrate the potential of homegrown innovations to address basic challenges faced by African countries. These examples demonstrate the possibility of embedding the ideals of an African renaissance for societal development, which has also inspired the establishment of the African Renaissance Institute. Additionally, there is a clear gap between expectation and reality as shown by the data, since effective communication of

scientific innovations is increasingly vital as breakthroughs and technological advancements continue to shape daily life, with direct influence on public health, environmental sustainability, industrial progress, and education (Phogat, Rab, & Wan, 2025).

CONCLUSION

African countries, including Nigeria, Egypt, and South Africa, are making strides to break into the fold of first-world countries, and investments in science, technology, and innovation are a critical component for any meaningful development in the 21st century. The data have shown that from 2016-2023, there has been a lag by African media researchers in these countries to redirect research effort towards investigating innovations for social good and development. Media researchers must build a science innovation culture whereby innovations in their countries, states, and communities are researched into, not only for their popularisation but efficacy. While the data showed that a high percentage of mass media research focuses on key themes that are popular in society with high audience engagement, i.e., political communication, cyberculture, health communication, and new media, among others, African renaissance consciousness should not be relegated to media research. There is an urgent need for media researchers to join research and development institutes like the African Renaissance Institute of Science and Technology (ARIST), universities, and centres of excellence focused on science, technology, and innovation, promoting research outputs for social good development and progress to achieve self-sufficiency and less dependency on Western technologies. The study acknowledges several limitations. First, the scope, limited to three African nations, restricts the findings to these countries; there is a need to expand the scope with more countries, preferably with a regional focus due to existing regional cooperation among countries i.e. Economic Community of West African States, Southern African Development Community, East African Community, Middle East and North Africa, Economic Community of Central African States. Second, a qualitative study that will involve expert interviews with select African media researchers and science communicators on the reasons for the low research on innovation science communication will add depth to the future studies investigating this phenomenon.

RECOMMENDATION

This study recommends improving media research on science, technology and innovation in Nigeria, Egypt and South Africa with a focus on innovative

science research from research institutes, universities, and centres of excellence as a precursor to knowledge creation, which in turn, will instigate social change to mitigate common societal issues like the high rate of out-of-school children, communicable and non-communicable diseases, climate change and food insecurity, among others.

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