6. REPORTING SCIENCE AND TECHNOLOGY IN NIGERIA: CHALLENGES AND IMPLICATIONS FOR DEVELOPMENT

Tsegyu Santas, Kelvin Inobemhe, & Sharifatu Gago Ja'afaru

Abstract

With the breakthroughs in information and communication technologies comes a paradigm shift in journalism practice where specialised reporting has taken centre stage in the media industry today. Hence science and technology reporting is a vital area that needs to be given adequate attention by the media and the society. Despite the importance of science and technology reporting to the development of society, its practice is bedevilled with a lot of problems. Same is the case in Nigeria as no significant attention is given to the area either by the appropriate authorities or other stakeholders like the media industry. Using the expository library method of research the paper notes that the science and technology reporter in Nigeria is faced with the problem of capacity building, public illiteracy and phobia of science, lack of a clearly articulated government policy on science and technology and lack of technical, scientific and technological equipment to drive science and technology reporting in the country. The study concludes that because of the importance of this specialised area in journalism government should invest huge material and human resources in terms of funds, provision of specialised training and workshops for journalists to be empowered with the skills required in reporting and disseminating science and technology information to the public.

Keywords: communication, development, journalism, reporting, science, technology

Introduction

There is no doubting the fact that the influences of science and technology in our world are widespread and enormous. The breakthroughs in science and technology are visibly evident in all spheres of our national life (Billingsley, 2020). Science and technology have been exploited to harness human and material resources to meet human needs and satisfy human wants (Soola, 2009). The media are instrumental in shaping public understanding of scientific issues. It is well recognised that the media plays an influential role in public response to scientific issues. The mass media has unparalleled reach as a communication mechanism. It also has substantial power to set agenda for public discussion. Due to the enormous roles played by the mass media, people rely on them as important source of scientific and other forms of information. However, the mass media often does not provide adequate coverage of science related issues.

Science journalism has been described as a dying profession due to newsroom closures of science desks across the globe (The Global Science Journalism Report, 2013, as cited in Waithera, 2019). The report further shows that the number of dedicated science sections in newspapers fell from about 95% to 34% between 1989 and 2005. This is similar to the recent report credited to Pew Research Center where the verdict that along with public trust, science journalism continues to shrink (Flatow, 2024). This development has resulted in insufficient knowledge to promote scientific literacy among the public and to help scientists gain expertise in areas outside their own fields. It has equally created

a series of problems for science journalism as an area of focus because it relies on scientific research and discoveries to thrive.

Africa is no exception to this state of science journalism, but it appears Africa's challenges are different. A study by Rooyen (2012) discovered that the state of science and technology coverage in the print media of South Africa was quite low. The study found out a small percentage of science and technology articles were published during the research period. In Africa, and all over the world, science stories are overtaken by politics, sports and business news. Some of the few science stories that are published and/or broadcast sometimes portray a lack of understanding of the issues being addressed due to the 'formal training deficit' on science journalism on the Continent. Stories are also often written based on press releases without adding value, providing analysis or further reporting. This has fueled "churnalism", where news organisations republish verbatim press releases issued by public relations agencies and campaign groups, raising concerns of the quality of science reporting (Waithera, 2019).

This scenario puts scientists and the public at considerable risk for commercial interests to exploit the opportunity for earned media by issuing as "news" what is actually a promotion for a product, service or company. It is a news culture of science-unfriendliness and also devoid of high ethical standards (Tran & Nguyen, 2023). This has undermined the coverage of science and technology issues in the society. It is resulting in the loss of interest by the science and tech-savvy audience who ordinarily try to catch-up on scientific discoveries and ground-breaking findings and results through the media. It also signals a bleak future for science journalism even in the face of the advancement in digital technology for the media industry.

There is also a general lackadaisical attitude to the coverage of science and technology issues in the media industry in Nigeria. Nwagbara and Azoriwa (2018) aver that the lack of interest shown by the media towards science and technology issues in Nigeria can be partly attributed to the kind of complex and technical language science experts use in explaining what happens in their field. This makes it difficult for journalists to understand and report such issues properly. It is also equally important to underscore the importance of science and technology to national development. Development is one of the goals of science and technology reporting. Coverage of science and technology issues by the media will create awareness and provide a pathway for national transformation to a struggling economy like Nigeria.

In Nigeria, the state of science and technology situation is grim. This is why the fate of science communication reportage in the country is a serious cause to worry about, for science without science communication is obscure science (Dutta & Batta, 2013). It is against this background that this study examines the challenges of reporting science and technology issues in Nigeria. The study also interrogates the implications of the inadequate coverage accorded to science and technology issues to Nigeria's development.

Objectives of the Study:

The objectives of the study were to:

1. Examine the challenges of reporting and technology issues in Nigeria.
2. Interrogate the implications of the inadequate coverage accorded to science and technology issues in Nigeria's development.

Conceptual Review

Science and technology reporting refers to the application of journalistic principles in conveying information about science and technology issues, topics, and development to the public, through the mass media. It is that specialised branch of journalism which consists of the process of gathering newsworthy information about happenings in science and technology world, processing the raw information and presenting it to the public through straight-news reports and features in the media (Nwabueze, 2009). Like many other technical areas of journalism, it is not done haphazardly and may also come with its unique rigour for practitioners.

The concept of science means different things to different individuals. When we talk about science so many things come to our minds. Etymologically, the word "science is derived from the Latin word "Scientia" which means "knowledge". It is an intellectual activity carried on by humans that is designed to discover information about natural world in which humans live and to discover the ways in which this information can be organised into meaningful patterns (Okoro & Adibe, 2013). In line with this definition, Metlay cited in Ohaja (2010) sees science as the activity of discovering new knowledge which includes the development of prototype inventions. Science could also refer to the organised study of man and the universe by means of observation, measurement and experiments. Scientists try to find the rules which govern the universe. Science is the concerted human efforts to understand, or to understand better, the history of the natural world and how the natural world works, with observable physical evidence as the basis of that understanding.

On the other hand the word "technology" was coined from the two Greek words "technie" which means "art", "craft" or "skill" and "Logia" which means "study of". Technology thus refers to the ways of doing or making things. It refers to the making, modification, usage, and knowledge of tools, machines, techniques, crafts, systems and methods of organisation, in order to solve a problem or perform a specific functions (Adibe, 2012, as cited in Okoro & Adibe, 2013). Technology could be seen as the activity which leads to the widespread availability of products based predominantly on scientific knowledge.

Although science and technology are indispensable in modern world, researchers widely believe they receive marginal coverage in the media. Perhaps this explains why Funkhouser in Ohaja (2010) asserts that public awareness of current science is dismayingly low to say nothing of knowledge or understanding. In view of the critical function of science and technology to national development, adequate coverage of science and technology should be seen as imperative when one considers overwhelming public interest in several scientific areas.

Serious attempts have been made by scholars to conceptualise the term development. The consequences are the existence of an array of definitions. Everett Rogers cited in Nwosu (1990) defines development as a widely participatory process of social change in a society intended to bring about social and material advancement (including greater equality, freedom and other valued qualities in life) for the majority of people through their gaining control over their environment. Rodney (1972) views development as that which implies increased skill and capacity, greater freedom, creativity, self-discipline, responsibility and material well-being. A major concern of development communication is the determination to use the mass media for social engineering that would bring about wealth and thereby ensure individual and collective well-being. In this sense, the mass are to be used to highlight development programmes and to persuade citizens to participate for increased productivity (Udoaka, 1998, as cited in Anorue, 2007).

Relationship between Science, Technology and the Mass Media

It has long been acknowledged that the media play an important role in society by providing information that is critical to the way people comprehend and make sense of the world in which they live (Luhmann, 2000; McQuail, 2005, as cited in UNESCO, 2011). The media do these by representing issues, interpreting and evaluating them and in the process helping make sense of the world and events on behalf of their audiences (O'Shaughnessy & Stadler, 2008, as cited in UNESCO, 2011). Technical jargons, complex scientific language and analysis of research goals, objectives, and results are just aspects of what the media do in science journalism and reporting.

In terms of communicating science, the media are seen as "brokers between science and the public, framing the social reality for their readers and shaping the public consciousness about science-related events. It is unique to note that "They are, for many readers, the only accessible source of information about science and technology" (Nelkin, 2001, as cited in UNESCO, 2011, p. 5). In short, the way people understand science and technology is influenced to a significant degree by media coverage, interpretation and presentation. To a reasonable extent, the audience relies on experts' interpretations of complex scientific findings for knowledge and understanding. This is made possible by the media.

The mass media provide the forum in which the relationship between science and the public is constructed and pursued, "and it is in this forum that the public make moral judgments about science" (Gregory & Miller, 2000, p. 2). Furthermore, Weigold (2001) notes that news media have historically accorded science great importance, but that modern news organisations are more likely to view science as a niche area and that science news competes with all other kinds of news for limited space and time. Journalists, or their editors, are the "gatekeepers" who decide which science stories to cover according to their own news values. Their story selection can also be influenced by their own preferences, complexity of the material, deadlines, access to science news, the availability of scientists for interviews, limited space and time, and many more factors.

Scientists therefore need to understand how the mass media operates if they wish to achieve media coverage. But, scientists and journalists live in very different worlds. Science has its own rules and so does the media. Scientists cannot change their methods or findings to suit the media and neither will journalists change the way they report to suit scientists. Journalists sometimes accuse scientists of speaking in jargon and being inaccessible; scientists often feel that the media either misunderstands or deliberately misrepresents them and their science. For scientists and journalists to work together effectively, it is important to remember that they construct knowledge about the world differently.

It is not surprising that the meanings of scientific messages evolve when they move from a journal article to a news story. Inaccuracies and biases creep in. Uncertainty makes way for certainty. Tentative advances become breakthroughs, and hopeful developments become cures. Scientists and journalists are also governed by very different norms. Scientists value detail, objectivity and certainty. They want to add lots of restrictions and caveats to the information and do not usually adapt it for a specific audience. Journalists are looking for a story, and they think of their readers, viewers and listeners all the time. They need drama, human interest, relevance and everyday applications. They also want to get to the real person behind the lab coat, a person who may even have a sense of humour. They want to know about the challenges and rewards of being a scientist.

Journalists also need compelling, simple visuals and info-graphics that will pull people into the story. Scientists must understand that journalists are trained to ask critical and probing questions. They can legitimately refuse to act as conduits for the point of view that a specific interest group wants to get across or as mere mouthpieces for institutional news. They will judge a story according to the news

values and interests of their own readers, listeners or viewers. Collaboration between scientists and journalists works best when both parties recognise it as a partnership. Scientists have authority and expertise, and new knowledge to share. Journalists have the skill to turn this into a story that will capture the attention of ordinary people.

Scientists who make an effort to understand the media and who learn to "play according to their rules" are able to control the media agenda more effectively, resulting in a mutually beneficial working relationship with most journalists and mass media outlets. Gregory and Miller (2000) conclude that collaborating with journalists and adapting to journalistic conventions may give scientists more, rather than less, control over the emphasis and tone of the resulting story, but warns that 'the last word will always go to the journalists, because science journalism is much more about journalism than it is about science" (p. 4).

In a survey of more than 1 300 biomedical researchers in five countries, it was discovered that interaction with the media was widespread, and that the relationship between science and the media seems to be better than often assumed (Peters et al., 2008, as cited in Joubert, 2015). The authors offer a number of possible reasons for this, such as increased professionalism in science journalism; more efficient communication strategies resulting in more influence on the media coverage of science; and a change in the criteria used to assess media performance from scientific content and quality-oriented criteria to strategic, PR, effect-oriented criteria. They acknowledge that it is advantageous for science journalism that researchers are getting better at working with the media, but warn of the dangers of scientists seeking increasing control over science coverage. That is why it is essential to have 'strong science journalism' that can be analytically critical and investigative – that can both 'credibly praise and criticise' science.

Additionally, Bauer (2009) also warns about the risks for science communication that arises from the commercialisation of research funded by private companies. He points out that pressure from marketing and public relations lead away from science writing to public relations, resulting in sensationalism, hype and exaggerated claims. These risks increase the need for vigilance on the part of knowledge consumers and a more critical public for science. The author concludes that, in this changing context, the paradigm of science communication is no longer to deliver public acceptance, but to enhance public scrutiny of private scientific developments.

It goes without saying that science journalism as seen in newspapers, magazines, popular science publications, radio, television, film and the internet are a major means of communicating and popularising science. On the other hand, scientists through research, teaching and publications often need to engage the public through the media to engender public understanding of science and engage in other activities that may help improve scientific literacy among the population (Dutta & Batta, 2013). Such activities may include coverage of a follow-up effort by scientists or even a case-by-case treatment of research findings to validate new results. It could also be about dismantling conspiracy theories in the science world and proving that only scientific information should be relied upon in taking decisions about anything including personal health of individuals.

A practical example that may align with the foregoing statement is scenario surrounding the Covid-19-related conspiracies on preventive and curative measures. Access to social media and new media technologies exposed users to all manner of conspiracies in the wake of the outbreak and subsequent spread of the virus to different territories of the world. But again, science journalism was effective in that regard as it possesses the power to stimulate the gathering and dissemination of research-based information that would assist the public in making good health decisions – altogether leading to better health outcomes for the generality of the people. This aligns with a research finding that during the pandemic there were interactions between science journalists and scientists primarily for the purpose

of occasioning improvement in scientific culture of society, promote favourable attitudes of the public toward research and to achieve a society with better-educated individuals on health matters (Marín-González et al., 2023).

The spread of scientific findings from research on Covid-19 and related health information and communication was a major approach in the right against the pandemic. Awareness campaigns in the media based on sound scientific foundations proved useful in the fight to reduce the spread of Covid-19 in Nigeria (John, 2023; Ogah et al., 2022). This is another great relationship between the science (as seen in research), technology (as in the use of media technology), and the mass media (as demonstrated in the packaging of media messages) all in a bid to push back the dangers of a pandemic (as seen during the Covid-19 pandemic outbreak in the world and Nigeria in particular.

Methods

This study is qualitative and so considered secondary data gathering methods. It is based on a review of existing data in form of literature in online materials, government reports, journal articles, and articles in book chapters as well as textbook. These were synthesised to arrive at the position on the challenges associated with reporting science and technology issues in Nigeria while also creating discourse points as per implications of the inadequate coverage accorded to science and technology issues in Nigeria's development.

Literature Review

Breakthroughs in science and technology issues necessitated the creation of science beat and desk in most media organisations today. Hence, specialised reporting has become a novel component in the field of journalism. The science and technology beat could be described as a two-in one beat. It consists of a gamut of issues, topics, developments, trends, and happenings etc. Some of the issues covered by reporters in this field include health, environment, scientific inventions and prediction, to agriculture and news about industrial safety in our world (Nwabueze, 2009). According to Guenther (2019) science journalism as specialised journalism genre is about science, technology, and medicine, and was professionalised in the 20th century's second half. It must be noted that the areas of reporting remain complex to the lay-audience who may not have the requisite education and exposure to understand science and technology-related information in the original form as often released by a science institute or organisations.

Therefore, it is necessary to bridge the gap between the highly complex and technical field of science and technology and the media audience because science naturally involves terminologies and jargons that the general public can barely identify with. It is the place of journalists to break down this scientific language to the level the public would understand. This does not in any way imply reporting incorrectly to the point of losing the meaning of what is being reported. It has also been noted that "science and technology reporting in precision journalism where accuracy is of the essence" (Alao & Olawumi, 2014, as cited in Nwagbara & Azoriwa, 2018, p. 3). Accuracy is considered indispensable in reporting science and technology (Allard, 2023; Gordon and Betty Moore Foundation, 2018). This is chiefly because once the wrong information is provided to the public and then they take action relying on such, the rippling effect may be devastating. A case in point is the Covid-19 health communication efforts by concerned stakeholders through the media. Health is reference here because a bulk of science writing in both developed and developing world center on medicine and health (Bauer et al., 2013). This puts science and technology reporters on their toes to do good by the profession.

Consequently, the dissemination of accurate and precise information on curative and preventive measures was just the only way out of the health situation such as the Covid-19 pandemic. Again, the

complexities of the issues and moments of the pandemic reveal the need for transmission of precise information. Chen et al. (2021) lend credence that on the basis of China's experience, there is need for precise information transformation during the pandemic. This is a part of the larger advocacy for precise and accurate dissemination of science communication especially in times of great needs. Such accurate science communication was just the way out of the issue especially during Covid-19. Access to information is considered to be part of the indices to know that the world is on course to sustainable development (UNESCO, 2019).

Furthermore, Dickson (2012) argues that science communication is an essential component of development strategies and that all stakeholders must have access to relevant scientific information in a form they can easily understand – in other words, they need access to well-communicated science. He notes that scientists are recognizing the need not only to communicate more freely among themselves – hence the growth of the open access movement – but also to communicate the significance of their work to both policy-makers and to the general public, particularly when it has important social implications. Referring to lessons learnt from public debates about nanotechnology and genetically-modified organisms, he reflects on the importance of such debates, and the role of science journalists and other communication professionals in ensuring that they take place in an informed way. Such debates should be based on evidence of both the benefits and potential down-sides of new technologies.

The media have a critical role to play in facilitating the public understanding of science and technology. Journalists typically assume the position of "intermediaries" between the scientist and members of the public who are interested in a given scientific subject or issue. In line with this reason, Farr (1993) attempted to understand the social representation of science – that is, how science is captured in the public imagination – would be incomplete without analyzing the media representation of science. Yet in Africa, very few studies have systematically investigated the volume, quality, scope, and perceptions of the coverage of science and technology.

A study conducted by Rooyen (2002) examined the state of science and technology coverage in the print media of South Africa. It concluded that there were relatively few science and technology articles in the sample of newspapers studied. Very few studies have systematically investigated the volume, quality, scope, and perceptions of the coverage of science and technology. This clearly shows that most African media and journalists are yet to give proper attention to science and technology issues in the continent. This is however a major issue for concern as it relates to the development of a continent that has most countries categorised/designated as developing or underdeveloped in the real sense of the word "development".

There is also the need to give science and technology reports a "human face" if such report should appeal to the public (Udo 2014, as cited in Nwagbara & Azoriwa, 2018). Udo further notes that most science and technology issues will at all times have a human application. Thus, reporters should always find out how the incident they are reporting affects the lives of the people, readers and listeners. Ingram and Henshall (2008) advise that to effectively report science and technology, the reporter should build up a basic knowledge about the science and technology beat, read widely as there are daily advancements in the field, make contacts, he or she should know as many scientists as possible.

In a study by Batta and Iwok (2019) on "perception of science communication culture by communication scholars in a periphery nation (p. 525)" interrogated the perception of science communication studies and research, science content in the Nigerian media, political attention accorded science communication, stakeholders/actor diversity, means of disseminating science matters, and public interest in science issues among Nigerians. Employing the survey research design to execute the study, findings of the study show that 49% of the respondents reported that the science

content in the media was inadequate, 65% reported a meager/political attention to science communication, and 63% reported a low diversity of actors/stakeholders in science communication among others. Based on the findings, the study recommended that the government, the industry, politicians and all stakeholders should strive to invest heavily in primarily, secondary, and tertiary science education, science communication legislation improve science journalism and promote science communication research.

Similarly, Tsanni (2021) noted that scientific literacy in Nigeria is low due to lack of science coverage in the Nigerian media. This in itself is a major problem of learning and knowledge in the country. Accordingly, science journalism training is said to be absent in Nigeria; a situation that has resulted in a few journalists and editors with a science background (Meyer, as cited in Tsanni, 2019). These issues contribute to the dearth of science knowledge in segments of the Nigerian society. The media plays a critical role in the education of its audience (Kapur, 2018; Keefer & Khemani, 2014; Preeti, 2014; Raju, 2019; Ritakumari, 2019) who are members of the public. This is part of the traditional function of the mass media. However, when practitioners are not knowledgeable in science and technology, how are they able to impact such on the populace. The answer is as good as anyone's guess.

Obstacles Facing Science and Technology Reporters in Nigeria

A number of challenges have posed great obstacles to journalists covering science and technology beat in Nigeria. One of such problem is knowledge gap in the field of science and technology. Ordinarily, reporting science issues should be of great interest to the media because of the importance of such issues to society. Unfortunately, there is a widely held view that this is hardly the case because journalists and the media often do not possess the knowledge and attendant interest to cover science and technology. Nwafor (2013) confirmed this position when he avers that in most newsrooms in Nigeria media houses, reporters are reluctant to take up assignments dealing with science and technology and most time are compelled by external factors and forces to cover a field neglected for a long time. This is especially so in Africa where there is no critical mass of journalists with specialised scientific and technological expertise; and where there is a lack of skills necessary for comprehension and interpretation of science and technology information for onward dissemination to disparate audiences as news, features and other texts.

Closely related to the knowledge gap in science and technology is the lack of value attached to science and technology in Nigeria. In Nigeria for instance, there is a preference for other disciples compared to science and technology. Even though successive governments try to introduce several policies to encourage science and technology in the country, the discipline has continued to receive less interest from the citizens. This is couple with the fact that the country is not yet technologically developed; only few trained experts in science and technology are available. This problem has deeply affected the educational system in the nation which is why several journalists are not equipped with the basic knowledge of science and technology in journalism profession.

Sensationalism and mistrust is a generally problem that scientist and journalists battle with very often. Although accuracy and balance are considered key pillars of journalism, it seems that competition and incompetence have played a role in sensationalism and in the dumbing down of important issues. Whilst this cannot be generalised, this is unfortunately a regular occurrence in African journalism. In fact, incompetence and lack of expert knowledge have been identified as part of the problem and have created tension and mistrust between journalists and scientists. This mistrust has been perpetuated by the fact, and sometimes myth, that journalists will always misreport or sensationalised information.

"There is some kind of cold war between the media and scientists. Scientists are reluctant to give information because they fear that the journalists will report inaccurately," argues Tenywa whose statement is supported by William Balikuddembe of *The Sunrise* newspaper and chairman of the Uganda Science Journalists Association (UNESCO, 2011, p 3). This frosty relationship made scientists not to be open to media men to disclose their scientific research or works. Whereas the journalists may just be out there to report the issues, the infusion of opinions by some reporters may appear to be at variant with the objectives of the research that led to the scientific results in the first instance.

In the same vein, Ineji (2014) opines that the ethics of science, which bars scientists to be quoted in the mass media on certain discoveries and breakthroughs usually, discourages journalists from science beat. He further notes that this is against the background that every journalist wants to quote sources to give credibility to their stories. This ethical standard usually makes journalist's to be reluctant in reporting science and technology in Nigeria. The case of Dr. Jeremiah Abalaka, a Nigerian doctor is a case in point. Dr Abalaka who claimed to have found the cure for HIV/AIDS has not been properly reported by the mass media because of his refusal to open up on the procedure of the development of his vaccine. His refusal to open up had created the impression that science is complex and no journalist is ready to report his discovery without attribution to source of information (Ineji, 2014).

Inadequate training of journalists on science and technology reporting is another obstacle. Journalism training institutions in Nigeria are yet to integrate science communication courses in their curriculum. Hence prospective journalism students in training are not equip with the requisite skills on what it takes to report science related issues. In this regard, Ineji (2014) contends that most mass communication schools and colleges do not have science courses in their curricula where as they have courses like law, psychology, sociology and other humanity courses in their curricula. He further notes that this makes graduates of mass communication to be deficient in science and hence creating the fear that science is exclusively complex than any other field. .However, this scenario is changing gradually as the mass communication curriculum in Nigeria is currently being unbundled to reflect the reality of the times in journalism profession globally. The foregoing has been corroborated that "Africa's failure to rebalance its educational offerings from humanities and social sciences, towards STEM subjects constitute the most serious challenge to its ability to sustain its current economic growth and be one of the world's leading continents in manufacturing and exports" (Khumbah, 2016, as cited in Batta & Iwok, 2019, p. 257).

Closely related to the above is the lack of research materials on science and technology in Nigeria. Ineji (2014) observes that this problem makes journalists to be helpless in reporting science issues because reporting science effectively requires that a journalist should make reference to scientific materials. Hence since materials are not readily available journalists hardly embark on research to know current trends in the scientific world. This compounds the myth that science is complex to report to the public. This is against the background that if journalists are to report science effectively they have to engage in research that would unravel the implications of scientific discoveries to the common man.

In addition, the technical language of science also complicates issues to most journalists reporting this beat. Due to lack of background in science discipline most journalists are unable to break down scientific information for public consumption. Little wonder so many journalists shy away from reporting science and technology issues. Stocking (1999, p. 30), argues that "journalists' lack of scientific knowledge or training is one of the most commonly cited reasons for reporting patterns that media critics define as problematic". Given this lack of knowledge, many journalists do not possess the skills to question scientific and technological innovations particularly when the innovators or scientists seek to hide their negative aspects.

The challenge of a local news culture that may not be friendly towards the promotion and development of science and technology journalism is another serious obstacle. It is indeed a challenge because the style of report as well as the reluctance to report on issues that promote science may as well dim the light in the area of journalism. This can be seen from a similar study conducted in Vietnam that identified the challenge of science-unfriendly news culture as one obstacle facing science and technology journalism (Tran & Nguyen, 2023). This implies that

Implications for Nigeria's Development

Scientific literacy is very important to national development. When majority of the public are not literate on science and technology issues they will be misled. Dickson (2012) emphasises the need to stem the flow of bad information or misinformation about science in the society. According to him, one of the ways in which the media should stem the flow of misinformation about science is for the media industry to always cross check and verify facts and information from scientists before they let out information to the public domain. Going by the Nigerian situation, most people are not scientifically literate because of the phobia associated with science and technology. Hence, this has huge implications to Nigeria's development. When people are not literate in science they will find it very difficult to read or listen to media reports on scientific inventions or discoveries. This is one of the reasons why science news is not interested to most of Nigerian public.

The importance of scientific literacy and its implications to public policies around the world has been acknowledged (Kennedy & Overholser, 2010, as cited in Dutta & Batta, 2013). They stress that if only a small number of people in a democracy is knowledgeable about science and technology, the level of public discourse becomes low and policy making poor. They add that citizens require some level of scientific knowledge about issues such as energy policy, climate change, evolution, and disease prevention to stimulate progress. Such progress can only be stimulated in a knowledge-based foundation. In other words, the nation that prioritises capacity development through the education of its citizenry in science and technology may just be on its way to growth and progress.

The state of science and technology development in Nigeria is very bleak and not encouraging at all. Agbakwuru (2017) cited in Batta and Iwok (2019) reported that even though the federal government declared a state of emergency on science and technology sector in Nigeria there is yet a commensurate commitment to implement government policies and strategic plans on science development in the country. The lack of implementation of government policies on science and technology has cause the country to retrogress in its development in all spheres of national life. Nigeria is lagging behind in national development because of government poor attitude towards science and technology. Dickson (2012) argues that science communication is an essential component of development strategies, and that all stakeholders must ensure that they participate towards the growth and development of science and technology.

One of the things that drive innovation in terms of development is research. Research is a major factor that facilitates development and progress in any country. This has been buttressed with the assertion that research and development are two distinct yet inseparable (Mahr et al., 2023; Namanji & Ssekyewa, 2012). Therefore, investing in science and technology would mean that the government must be ready to inject funds and resources towards research that would lead to national transformation. Nigerian Journalists and scientists have been neglected by government in terms of provision of research grants to fund researches on science and technology. This situation has made Nigerian journalists ill-equipped with the requisite skills to report science issues. In fact, it is also the case elsewhere in Africa as skills gap was identified as a major challenge that hinders science reporting by science and technology journalist practicing in the continent (Afadhali, 2024). If this will be curbed,

it is imperative for the government and the private sector to heavily invest in science and technology development in the country.

It is an exercise in futility to delve into science and technology reporting without the necessary technical equipment and gadgets. Gulma (1999) observes that though Nigeria is well endowed with human and material resources, including technologists and engineers, it is however, deficient in technology as the human and material resources are not properly utilised. Perhaps this explains why science reporting has been accorded low premium among most media organisations in Nigeria. This is especially pathetic among government media outfits. The paucity of the needed technology required for venturing into science reporting is seriously lacking in the country. This is in contrast to most developed nations where these gadgets are readily available. This is the reason why Nigerian scientists should be supported with the required resources needed to invent locally made equipment that would fit into our environment and thus meet the demands for science and technology reporting in Nigeria. Put in another way, and in line with the position of Mamboleo et al. (2023), the intellectual, financial and technical capacity of journalists especially those in the developing world must be strengthened to enable them generate science news report and even provide the audience a blend of local content and perspective.

Conclusion

The paper was able to establish the fact that reporting science and technology is very important to the survival of society. This is imperative because virtually everything in the society runs entirely on the wheels of science and technology. It is because of this reason that the mass media must educate the public on issues relating to science and technology. For the media to do this job effectively the journalist must be well trained with the skills to gather, process, and disseminate scientific information to the audience. The paper argues that media coverage and reportage of science and technology has been low in Africa and Nigeria owing to the fact that government has not accorded it the priority it deserves. A majority of Nigerian journalists are not well trained in reporting science and technology. This problem stem from the fact that they have not been expose to the rudiments of science communication during their training days in school. Hence, venturing into it in real life becomes complex and difficult. In addition, most media organisations in the country do not have modern technological equipment required for science communication coverage. In view of the importance science and technology reporting occupies in the scheme of things in the society the government must ensure that the give adequate attention to this area by providing the human and material resources needed to rejuvenate this specialised aspect of journalism profession in Nigeria.

References

Afadhali, J. P. (2024). Science journalism rises in Africa despite challenges. *Jam Lab Africa*. https://jamlab.africa/science-journalism-rises-in-africa-despite-challenges/

Allard, A. (2023). Nudging accurate scientific communication. *PLoS One*, 18(8); e0290225. https://doi.org/10.1371/journal.pone.0290225

Anorue, L. I. (2007). Toward a more result-oriented development communication in Nigeria. *International Journal of Communication: An Interdisciplinary Journal of Communication Studies*. 6, 43-57. https://journal.ijcunn.com/index.php/IJC/article/download/141/138/

Batta, H. E., & Iwok, U. (2019). Perception of science communication culture by communication scholars in a periphery nation. *The Nigerian Journal of Communication.* (16)2, 523-550. https://tnjc.org.ng/wp-content/uploads/Vol16N2Full/Perception-of-Science-Communication-Culture.pdf

Bauer, M. W. (2009). The evolution of public understanding of science - discourse and comparative evidence. *Science, Technology and Society*, 14(2), 221-240. https://doi.org/10.1177/097172180901400202

Bauer, M. W., Yulye, J., Ramos, R., Massarani, L., Amorim, L., & Howard, S. (2013). Global *science journalism report: working conditions and practices, professional ethos and future expectations*. Our Learning Series, Science and Development Network. London School of Economics and Political Science. https://eprints.lse.ac.uk/id/eprint/48051

Billingsley, K. (ed.) (2020). *Science, technology, & society: a student-led exploration*. https://pressbooks.pub/anne1/chapter/conclusion

Chan, W., Zhang, W., Li, L. (2021). Precise transmission for COVID-19 information: based on China's experience. *International Journal of Environmental Resources and Public Health*, 18(6). https://doi.org/10.3390/ijerph18063015

Dickson, D. (2005). The case for a deficit model of science communication. Paper presented to PCST Working Symposium, Beijing. https://eathscience.rice.edu/wp-content/uploads/2018/01/dickinson-2005-deficit-model-scinet.pdf

Dickson, D. (2012). Science communication: an essential component of development strategies. The UNESCO Courier. https://overseas.mofa.go.kr/unesco-en/brd/m_8666/view.do?seq=674606

Dutta, A. & Batta, H. (2013). Theoretical and practical perspectives on science communication around the world: a literature review. In D. Wilson, & H. Batta (eds.), *Science, health and environmental communication* (pp. 1-53). Ibadan: Ibadan University Press.

Farr, R. M. (1993) .Common sense, science and social representations. *Public Understanding of Science*, 2. 189-204. https://doi.org/10.1088/0963-6625/2/3/001

Flatow, I. (2024). Science journalism is shrinking – along with public trust in science. *Science Friday*. https://www.sciencefriday.com/segments/science-journalism-trust-in-science/

Gordon and Betty Moore Foundation. (2018). Just the facts: the importance of accuracy in science journalism. https://www.moore.org/article-detail?

Gregory, J. & Miller, S. (2000). *Science in public: communication, culture and credibility*. Cambridge: Basic Books.

Guenther, L. (2019). Science journalism. *Oxford Research Encyclopedia of Communication*. https://doi.org/10.1093/acrefore/9780190228613.013.901

Gulma, M. A. (1999). National research policy with focus on engineering and energy. In P.O, Adeniyi (ed.), *Research capacity building for sustainable development in Nigeria* (pp. 51-57). Lagos: UNILAG Consult

Ineji, P. U. (2014). Print media coverage of science: the fear and myth. *Mkar Journal of Media and Culture*. (1) 2, 90-95. https://

Ingram, D., & Henshall, P. (2008). Reporting science and technology. *The News Manual.* https://www.thenewsmanual.net/manuals/volume2.

John, S. G. (2023). Impact of media messages on containment of Coronavirus pandemic in Nigeria. *Journal of Public Health in Africa*, 14(2), 2048. https://doi.org/10.181/jphia.2023.2048

Joubert, M. (2015). Science communication: an introduction to theory and trends. Stellenbosch University. https://www.drussa.net/drussa.mobi

Joubert, M. (2019). *Handbook series: 5 essays: science communication. an introduction to theory and trends*. Drussa: Development research uptake in sub-Sahara Africa. https://www.drussa.net/drussa.mobi.

Kapur, R. (2018). Role of media in the development of education. *ResearchGate*. https://www.researchgate.net/publication/323725768

Keefer, P., & Khemani, S. (2014). Mass media and public education: the effects of access to community radio in Benin. *Journal of Development Economics*, 109, 57-72. https://doi.org/10.1016/j.jdeveco.2014.03.010

Mahr, N., Michael, R., & Scalia, S. (2023). Research & development: R&D definition, process & examples. *Study.com*. https://study.com/academy/lesson/what-is-research-and-development-definition-methods-examples.html

Mamboleo, G., Chebutuk, R. D., & MAtu, N. (2023). Science as a beat in journalism: current status and implications for the future. *Journal of Media and Communication*, 2(1), 66-72. https://doi.org/10.51317/jmc.v2i1.375

Marín-González, E., Navalhas, I., Dijkstra, A. M., de Jong, A., & Luís, C. (2023). Science journalism in pandemic times: perspectives on the science-media relationship from COVID-19 researchers in Southern Europe. *Frontiers in Communication*, 8: 1231301. https://doi.org/10.3389/fcomm.2023.1231301

McQuail, D. (2005) *Mass communication theory* (5th ed.). London: Sage.

Namanji, S., & Ssekyewa, C. (2012). Role and nature of research in development. *Makerere Journal of Higher Education*, 4(1), 1-10. https://ajol.info/majohe

Nwabueze, C. (2009). *Reporting: Principles, approaches, special beats*. Owerri: Topshelf publishers. Enugu. Daisy press.

Nwagbara, G. U., & Azoriwa, E. C. (2018). Owerri journalist's attitude towards science and technology reporting. *Novena journal of communication*. 6, 1-11.

Nwosu, I. (1991). Perspective on development communication. In K. B. S. T. Boafa (ed.), *Development communication*. Nairobi. African Council for Communication Education.

Ogah, A. I., Alom, K., Gbakighir, M., Ogayi, A. J., & Awuna, G. (2022). The media in the containment and management of the spread of Covid-19 pandemic in Nigeria. *Mkar Journal of Media and Culture*, 7(1), 262. https://www.researchgate.net/publication/372524658

Ohaja, E. U. (1998). Lecture notes on science and technology. Department of Mass Communication, University of Nigeria Nsukka.

Okoro, N. & Adibe, K. N. (2013).Science and technology reporting and writing. In N. Okoro (ed.). *Contemporary Readings in Media and Communication Studies*. (pp. 240-255) .Enugu: St Benedette publishers Ltd.

Preeti. (2014). Education and role of media in education system. *International Journal of Scientific Engineering and Research*, 2(3), 174-177. https://www.ijser.in/arhives/v2i3/SjlwMTMxNTg=.pdf

Raju, R. (2019). Role of media in education. *Think India Journal*, 22(10), 9499-9506. https://www.researchgate.net/publication/362945587/

Ritakumari, S. (2019). Educational media in teaching learning process. *Bhartiyam International Journal of Education & Research*, 8(III), 7-13. https://www.gangainstituteofeducation.com/documents/Singh-Ritakumari.pdfs

Rodney, W. (1972). *How Europe underdeveloped Africa*. Abuja. Panaf Publishing, Inc.

Rooyen, C. V. (2002) .A Report on science and technology coverage in the SA print media. Foundation for Education, Science and Technology.

Rooyen, C. V. (2012). A Report on Science and Technology Coverage in the SA Print Media. Foundation for education, science and technology. University of Stellenbosch: South Africa.

Soola, E. (2009). Reporting and popularizing science and technology for socio-economic development. A paper presented at the first Idowu Sobowale International Conference held at Olabisi Onabango University, Ago-Iwoye, Ogun State.

Stocking, S. Holly (1999) How Journalists Deal with Scientific Uncertainty. In S.D, & S.R Carol (eds.). *Communicating uncertainty: media coverage of new and controversial science* (pp. 23-42). Mahwah, NJ. Lawrence Erlbaum Associates.

Tran, M., & Nguyen, A. (2023). Besieged from all sides: impediments to science journalism in a developing country and their global implications. *Journal of Science Communication*, 22(04). https://doi.org/10.22323/2.22040204

Tsanni, A. (2019). Unique models fuse science with journalism in Nigeria. *The Open Notebook*. https://www.theopennotebook.com/2021/01/19/unique-models-fuse-sciene-with-journalism-in-nigeria/

UNESCO (2011). Media coverage of science and technology in Africa. https://www.upf.edu/pcstacademy/_docs/cosce_en_03.pdffile:///C:/Users/HP/Downloads/OSD_Science_communication_chapter_for_drussa_handbook_-_Web.pdf

UNESCO. (2019). Access to information: a new promise for sustainable development. https://unesdoc.unesco.org/query?q=Corporate:%20%22UNESCO%22&sf=sf:*

Waithera, H. W. (2019). Science in the media: African science desk baseline assessment report. Nairobi. African Academy of Science.

Weigold, M. F. (2001). Communicating Science – a review of literature. *Science Communication,* 23 (2), 164-193. https://doi.org/10.1177/1075547001023002005