# Perception of Emerging Science, Technology, and Innovation by Academic Staff in University of Uyo and Akwa Ibom State University, Nigeria

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**Abstract**
The world today is experiencing rapid changes in science, technology, and innovation (STI). This is evident in synthetic biology, proteomics, robotics, renewable energy, artificial intelligence, and biotechnology. This study examines the level of awareness and perception of STI by university academic staff in Akwa Ibom State. Studies have reported the existence of emerging science, technology, and innovation, especially in the Western World but there is a paucity of research on the level of awareness, and perception of STI among academic staff in Nigerian universities, particularly in Akwa Ibom State. This study addressed this gap by assessing the level of awareness, understanding, and perception among academic staff in universities in Akwa Ibom State: University of Uyo and Akwa Ibom State University. This study is framed around Technological Determinism Theory and draws on a survey of 155 academics in 14 departments. The findings of this study, among others, indicate that there is a low level of awareness and understanding of STI among academics in the two universities, except in biotechnology and genetics; a significant number of academics in the two universities perceived STI as contributing to unemployment and inequality in the society. The study concludes that the low level of awareness among academic staff on the emerging STI has resulted in poor research output, teaching, and learning on STI. It is recommended that STI should be introduced into the academic curriculum of the two universities.
***Keywords: Awareness, science, technology, innovation, academics, Nigerian universities.***

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**Introduction**

In today's contemporary society, human development is accompanied by rapid changes in emerging science, technology, and innovation (STI). Science, technology, and innovation such as artificial intelligence (AI), robotics, biotechnology, nanotechnology, proteomics, synthetic biology, 3D printing, and drones, among others, have become the foundation upon which a sustainable economy can be developed. They have created enormous impacts in the various sectors – agriculture, communication, education, economy, environment, health, medicine, security, and aviation. They are also deeply rooted in our social life – in policy choices, how people care for themselves, and how they use environmental resources (Llorente, Revuelta, Carrio and Porta, 2019). Africa Capacity Building Foundation (2017) describes STI as a key enabler to achieving the development blueprint of any nation of the world. It is an important instrument used in understanding national and international efforts as many nations are beginning to move towards creating knowledge-based economies (Marburger, 2011; UNCTAD, 2022).

However, as established in the literature, rapid advances can have serious drawbacks if they surpass the ability of societies to adapt. There are fears, for example, that jobs are disappearing as more economic activity is automated, and that social media are exacerbating divisions, anxiety and doubt. There are concerns that STI will further widen inequalities, or create new ones. Most of these concerns have been raised in developed countries but the implications could be even more devastating for developing countries if poor communities and countries are either overwhelmed or simply left behind (Technology and Innovation Report, 2021).

In comparison with the rest of the world, Africa cum Nigeria seems to be characterised by poor STI infrastructure; a small pool of researchers; little effort in science and technology programmes; weak intellectual property framework; and low scientific outcome (ACBF, 2017). UNESCO's (2015) report suggests that Africa remains disadvantaged in overall STI efforts, attributing it to the low investments in STI capacity development. According to the report, out of about 5% of global gross domestic product, only 1.3% of global spending is on research and development. On many occasions, STI - a major factor for sustainable economic development - is not being prioritised within Nigeria's national agenda. For instance, it is reported that Nigeria's Gross Expenditure on Research and Development of 0.2% is one of the smallest in Africa even though Nigeria prides itself as the largest economy in the continent. Siyanbola, (2011) attributed the negligence towards STIs to many years of political uncertainty, policy inconsistencies, and lack of willpower of the policymaking authorities. In addition, proper communication of STI research outputs seems relegated in the discourse on evidence-based policymaking, especially in Nigeria (Schaal, 2008).

Other challenging areas include failure in articulately communicating research outcomes, inadequate funding of scientific research, weak research infrastructure, donor-influenced research priorities, and engaging skilled research personnel in STI (Sanni, Oluwatope, Adeyeye and Egbetokun, 2015; Mouton, 2017). Lack of awareness of the existing research results, applications of new technologies by most African industries; the absence of strong involvement of the users in defining the research agenda; absence of accurate data to enable targeting of STI policies and strategies, and the irrelevance of some research, is also identified as part of the challenges bedeviling Africa (Dhesi and Chadha, 2016). There is also a lack of proper utilisation, awareness, and public understanding and perception of STIs which have a strong correlation with the

development of a country (Mayne and Zapico-Goñi, 2007; Newman *et al*., 2013; UNDP, 2014). Given this, this study investigates the level of awareness, understanding, and perception of STI among academic staff at the University of Uyo (Uniuyo) and Akwa Ibom State University (AKSU).

**Statement of the Problem**

Nigeria as of 2021, occupied the 66th position out of 73 countries in an innovation capacity ranking (STI Report, 2021). Science, technology, and innovation-related activities in the country had been executed without a well-defined national direction. The public universities, research institutes, and research outfits in private companies, expected to be drivers of research and development and home-grown technologies seem to be lagging, thereby making Nigeria's economy progress slowly. The country is yet to have any globally recognized technological innovative expertise that emanates from its indigenous knowledge occasioned by STI. With the overwhelming educational and knowledge infrastructure of over 300 institutions of higher learning, research institutes, innovation agencies, and policy implementation departments and a large pool of skilled labour force including a sizeable number of diaspora, the economy is still technologically weak.

Studies have reported the existence of emerging science, technology, and innovation, especially in the Western World but there is a paucity of research on the level of awareness and perception among academic staff in Nigerian universities, particularly in Akwa Ibom State. In other words, how do members of the academic staff at the University of Uyo and Akwa Ibom State University perceive the emerging science, technology, and innovation (STI)? This is the gap in the literature that this study seeks to address.

**Research Questions of the Study**

The following research questions guided the conducted of the study

1. What is the level of awareness of emerging STI among the academic staff of the University of Uyo and Akwa Ibom State University?
2. Through which medium/ media of communication do the academic staff of Uniuyo and AKSU become aware of the emerging STI?
3. How do the academic staff of Uniuyo and AKSU perceive the emerging STI?
4. How much do academic staff of Uniuyo and AKSU trust the information about emerging STI?

**Theoretical Framework of the Study**

This study is framed around the Technological Determinism Theory coined by Thorsten Veblen (1857 – 1929) but its foundation was laid properly by Marshal McLuhan in 1965. The theory postulates that technology defines the nature of the society. It is viewed as the driving force of culture in the society and it determines its course of history. Ukonu, Ani, and Ndubisi (2013) note that McLuhan's famous dictum, "The Medium is the Message," captured the whole essence of the theory. Expounding on McLuhan's postulation, Griffin (2000) states that the new technologies… radically alter the entire way people use their five senses, the way they react to things, and therefore their entire lives and the entire society.

The basic tenets of the theory are that technologies create new environments and enable progress, leading to new ways of production in a society, thus ultimately influencing the cultural, political, and economic aspects of society, thereby inevitably changing the society. For example, a feudal society that used a hand mill could slowly change into an industrial capitalist society with the introduction of the steam mill.

Technological Determinism Theory shows up at various levels, starting with the introduction of newer technologies, introducing various changes that can also lead to a host of existing knowledge. For Asemah, Nwammuo, and Nkwam-Uwaoma (2017), technological determinism theory acknowledges that technology can drive human interaction and create social change. This concept focuses on the effects and/or impacts that STIs have on the public. Technology shapes how individuals in society think, feel, and act or how society operates as it moves from one technological era to another. Technological advancement has exerted enormous powers on the way people make their choices in sectors that satisfy their desires. For instance, the preponderance of social media today supports the assertion that one can be in a place and collect information from other countries within minutes. Ukonu *et al.*, (2013) insist that the level of awareness of new technologies by the public determines the level of influence the new technologies will have on the public since technology alters the perception of the audience.

**Emerging Science, Technology and Innovation (STI)**

Emerging science, technology, and innovation also referred to as frontier technologies, is a group of new technologies that take advantage of digitalisation and connectivity which enable them to combine and bring about multiple impacts as well as enable the achievement of a sustainable national development (UNCTAD, 2018). They include Artificial Intelligence (AI), Biotechnology, Nanotechnology, Big Data Analysis, Renewable Energy, and Internet of Things, 3D Printing, Drones, and Synthetic Biology.

**Artificial Intelligence (AI):** This includes capabilities in image recognition, language translation, voice translation through natural language processing, problem-solving, and logical reasoning that sometimes exceed those of humans. It has the potential to transform production processes and business, especially in manufacturing; and has proved more accurate than doctors at diagnosing some diseases, particularly cancers (STI Report, 2021).

**Biotechnology and health technology:** Refers to any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use (Gastrow, Roberts, Reddy, and Ismail, 2016). It involves technologies for manipulating DNA and allows gene editing for human medicine which makes personalised treatments possible for certain conditions as well as genetic modification of plants and animals (Nordic, 2016).

**Big Data Analysis:** This optimises business operations and facilitates the creation of new products, services, and industries; resolves critical global issues, creates new scientific breakthroughs, advances human health and improves decision-making, by providing real-time streams of information (e.g. on disease outbreaks or traffic conditions), monitors natural systems, improves the efficiency of resource use, and supports decision making by business people, policymakers and civil society (UNCTAD, 2018).

**3D Printing:** This is a platform technology that aids global manufacturers in producing critical parts for airplanes, wind turbines, automobiles, and other machines, and construction (e.g. printing houses and large buildings) due to huge reductions in its costs and complementary developments in computer-aided design (Campbell, Williams, Ivanova and Garrett, 2011; Garrett, 2015).

**Nanotechnology:** It is the manipulation of matter on an atomic, molecular, and supramolecular scale (Olaniyi, 2020). It creates many new materials and devices with a vast range of applications, such as nanomedicine, nanoelectronics, biomaterials energy production, and consumer products. It is a general-purpose technology with multiple applications such as: (a) water remediation and purification, for example through nanofiltration membranes used to treat wastewater in water-scarce countries; (b) increasing the heat resistance of materials and the flexibility and performance of electrodes in lithium-ion batteries; (c) precise control of the release of agrochemicals, improving seed germination and reducing toxicity in the agriculture process, increasing agricultural yields and reducing environmental impacts; (d) nanoelectronics include devices and materials that reduce weight and power consumption of electronic devices, for example, the production of small electronic circuits, enhanced memory storage and faster computer processors; and (e) medical applications such as the use of gold nanoparticles in the detection of targeted sequences of nucleic acids, and of nanoparticles as a delivery mechanism for medications (Leproust, 2015).

**The Internet of Things (IoT):** It allows the condition and actions of connected objects and machines to be monitored and managed, while connected sensors can monitor the natural world, animals, and people. Its applications cover health care, agriculture, energy and water management and quality, retailing, construction, and trade, addressing inefficiencies in manufacturing and related processes, as well as monitoring development indicators to assess progress toward sustainable national development (Manyika, Chui, Bisson, Woetzel, Dobbs, Bughin, and Aharon, 2015a). It includes devices to monitor eating, sleeping, or fitness habits using sensors; to control home appliances using mobile phones; and to monitor soil conditions to improve agricultural productivity using sensors (Dora, 2015a).

**Renewable Energy:** This technology provides electricity in remote and isolated rural areas inaccessible to centralised grid systems (UNCTAD, 2017c; Domiers, 2017).

**Drones:** They are technologies employed to perform many tasks, including commercial delivery of packages and high-value items such as vaccines to rural areas in developing countries; delivering supplies to conflict areas, refugee camps, and places with poor ground transportation networks (d'Onfro, 2014; Kolodney, 2017). Others include inspecting bridges, cell phone towers, and roofs, fighting wars, and fire-spotting in local areas, as well as providing new and cheap capabilities for precision agriculture, including monitoring the growth of weeds and crops, spraying insecticides, and monitoring soil hydration (UNCTAD, 2018).

**Synthetic Biology** is the design and construction of new biological systems and processes from standardised biological components, networks, and synthetic pathways, impactful in human health, the environment, biofuels, and chemical production with huge economic benefits (Mudziwapasi, Mufandaedza, Jomane, Songwe, Ndudzo, Nyamusamba, Takombwa, Mahla, Pullen, Mlambo, Mahuni, Mufandaedza and Shoko (2022).

**Perception of Emerging Science, Technology and Innovation**

Emerging science, technology, and innovation have elicited various perceptions from the public depending on their understanding of the emerging frontier technologies. For instance, biotechnology with a growing role, and enormous potential, in the development and production of new classes of medicine, food, energy, and industrial processes; offering great opportunities for sustainable human development and economic growth, faces several challenges in the public domain. The public has little understanding of what biotechnology is, how it is governed, how knowledge is produced, and how the benefits are distributed and accrued. As Gastrow et al., (2016) observe, this provides fertile ground for reservations about biotechnology's ethical, health, and environmental implications.

The public therefore has attitudes of both promise and reservation about biotechnology and other emerging frontier technologies. These are evident in surveys carried out, especially in Europe and the USA. Relatively, there is a smaller body of research on the public level of awareness, understanding, and perception of emerging STIs in Africa particularly in Nigeria. Literature is replete with emerging STI being a subject of conflict in society (Torgersen & Schmidt, 2013; Bogner & Torgersen, 2015), in which opposing visions, hopes, and fears collide. This is because technologies are open to various interpretations and interests (Bauer & Bogner, 2020).

The public often attach meaning to technology that is neither definite nor merely xrays an issue that is given ex ante (Bogner & Torgersen, 2015).

While STI can be expected to create new markets and jobs, Financial Times (2017a) and The Economist (2017b) argue that they will also break apart existing productive sectors and labour markets, with impacts that may particularly affect disadvantaged communities. The papers argue further that the relationship between technology and employment has historically been controversial. At least in theory, the main objectives of technological progress are productivity growth leading to economic growth, and improved living standards. UNCTAD (2018) reports that technologies have often been perceived as contributing to unemployment and inequality. For example, the Luddite movement in the United Kingdom emerged in response to the First Industrial Revolution, to protest against the use of machines that were destroying jobs in the textile industry. The debate about the impact of technology on employment has resurfaced in recent times, particularly in developed countries, by increasing inequality, high rates of unemployment, the rapid advance of artificial intelligence and robotics, and increasing digital automation of production processes – the so-called Fourth Industrial Revolution (UNCTAD, 2018).

UNCTAD (2016b) had reported that the increasing pace and widening scope of STI progress could lead to more job cuts than job creation, at least in the short and medium term. A polarisation of employment has been observed as jobs at medium skill levels have declined, while non-routine jobs, both manual (low-skilled) and cognitive (high-skilled) have increased. The report argues that while digital automation allows some countries and businesses to produce goods and services at an unprecedented scale, increasing labour productivity and expanding operations at marginal cost, this may eliminate the need for workers. Recent advances in STI thus have the potential to affect a radical reshaping of work.

Several studies have considered the impact of STI particularly automation and robotics on employment. According to the studies, robots may replace workers faster than the labour market and policies can adapt, resulting in a negative net impact on employment. The rising quest for digital automation could result in increasing productivity not being matched by higher wages and job growth (Frey and Osborne, 2013; Brynjolfsson and McAfee, 2014; Pew Research Center, 2014; World Economic Forum (WEF), 2016). Some of such studies also highlight the gender implications of automation and employment.

Empirical data suggest that a higher level of educational attainment or information does not generally lead to more positive attitudes to the role of STI in society. The traditional one-way approach to the science-society relationship still predominates in communication and outreach scenarios. However, many members of the public already understand basic scientific facts and concepts and therefore resist the presumption that they are not able to understand. Thus, "scientific education" alone may be insufficient for such citizens (Davies, 2008). Studies have also shown that there is a consistent group of people who are so highly interested in topics of science, technology, and innovation, but have scarce knowledge of these topics and access little scientific information. This group of persons has a real interest in STI. However, interest and attitude do not correlate with an active and concrete search for more information in the area (Castelfranchi, 2013). People are interested in science, regardless of their educational attainment. Yet, the interest is not followed by an action to get more knowledge, but a certain sympathy, which can be understood as an optimistic view of science, technology, and innovation.

**Methodology**

This study involved the use of a questionnaire–based quantitative survey of academic staff in three faculties comprising 14 departments in two universities – the University of Uyo and Akwa Ibom State University. The departments were selected purposively from the faculties of Education (Edu) and Social Sciences (SS), UniUyo, and Faculty of Arts, AKSU, based on their willingness to participate in the research provided different ranks/strata were represented. The study was a census survey because the population of academics in the selected departments was not as large as to warrant sampling. One hundred and fifty-five (155) academic staff partook in the survey. Those on sabbatical/medical study leave and leave of absence were not included. The rationale for the survey was to assess the level of awareness, understanding and perception of academics in emerging science, technology and innovation in Nigerian universities.

The accidental sampling technique (Asemah, 2012) was used in the administration of the questionnaire. This implies that copies of the questionnaire were administered (through the help of three trained research assistants) on the availability of respondents at the point of administration. One hundred and fifty-five (155) questionnaire copies were returned for analysis. Each questionnaire had 13 closed/semi-closed-ended questions. The items were concerned with the level of awareness, understanding, and perception of emerging science, technology, and innovation, as medium/media of awareness and trust about the information on STIs

**Results and Discussion**

**Table 1: Level of Awareness of Emerging Science, Technology and Innovation**

| Responses | Faculty | | | | Total | |
|---|---|---|---|---|---|---|
| | Edu/SS | | Arts | | | |
| | N | % | N % | | N | % |
| I am very aware of the listed STI | 8 | 10 | 7 | | 15 | 10 |
| I am moderately aware of the listed STI | 30 | 36 | 15 | 21 | 45 | 29 |
| I am somewhat aware of the listed STI | 10 | 11 | 20 | 28 | 30 | 19 |
| I am slightly aware of the listed STI | 30 | 36 | 25 | 35 | 55 | **35** |
| I am not sure of being aware of the listed STI | 6 | 7 | 4 | | 10 | 6 |
| **Total** | **84** | **100** | **71** | | **155** | **100** |

***Source: Field Survey, 2023***

The majority (35%) indicated that they were slightly aware of the emerging STI. This result suggests that among academics, awareness of the emerging STI is low.

**Commented [EB11]:** We are finding it difficult to reconcile these data on the table

**Table 2: The Medium/Media of Awareness of Emerging Science, Technology and Innovation**

| Responses | Faculty | | | | Total | |
|---|---|---|---|---|---|---|
| | Edu/SS | | Arts | | | |
| **Medium of Awareness** | N | % | N | % | N | % |
| Radio/TV (Broadcast) | 6 | 7 | 5 | 8 | 11 | 7 |
| Newspaper/Magazine( Print) | 9 | 10 | 6 | 8 | 15 | 10 |
| Seminar/Workshop | 20 | 24 | 15 | 21 | 35 | 23 |
| Social Media | 5 | 6 | 5 | 8 | 10 | 6 |
| Website | 14 | 17 | 15 | 21 | 29 | 19 |
| Book/Journal | 30 | 36 | 25 | 35 | 55 | **35** |
| **Total** | **84** | **100** | **71** | **100** | **155** | **100** |

**Source: Field Survey, 2023**

Data in Table 2 indicate that majority (35%) of the respondents indicated that their awareness came through reading books/journals. This implies that books/journals provided academics the opportunity to become aware of the emerging frontier technologies.

**Table 3: Perception about Emerging Science, Technology and Innovation**

| Responses | Faculty | | | | Total | |
|---|---|---|---|---|---|---|
| | Edu/SS | | Arts | | | |
| **Perception of STI** | N | % | N | % | N | % |
| Reliable | 7 | 8 | 4 | 6 | 11 | 7 |
| Credible | 10 | 12 | 8 | 11 | 18 | 12 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Efficient | 10 | 2 | 8 | 11 | 18 | 12 |
| Not trustworthy | 5 | 6 | 10 | 14 | 15 | 9 |
| Trustworthy | 15 | 18 | 7 | 10 | 22 | 14 |
| Improved Living Standard | 17 | 21 | 11 | 15 | 28 | 18 |
| Contribute to Unemployment and inequality | 20 | 23 | 23 | 32 | 43 | **28** |
| **Total** | **84** | **100** | **71** | **100** | **155** | **100** |

***Source: Field Survey, 2023***

Table 3 shows that 28% which represent majority of the respondents perceived the emerging STI as contributing to unemployment and inequality.

**Table 4: Extent of Trust on Information about Emerging Science, Technology and Innovation**

| **Ratings** | **Faculty** | | | | **Total** | |
|---|---|---|---|---|---|---|
| | **Edu/SS** | | **Arts** | | | |
| | **N** | **%** | **N** | **%** | **N** | **%** |
| 70-100 | 15 | 18 | 15 | 21 | 30 | 19 |
| 60-69 | 25 | 30 | 12 | 17 | 37 | 24 |
| 50-59 | 30 | 36 | 20 | 28 | 50 | 32 |
| 1-49 | 14 | 16 | 24 | 34 | 38 | 25 |
| **Total** | **84** | **100** | **71** | **100** | **155** | **100** |

***Source: Field Survey, 2023***

As shown in Table 4, the extent of trust in information that academic staff in the two universities have about emerging science, technology, and innovation is rated on a scale of 100 with four intervals arranged in descending order. The respondents in the majority (32%) rated their extent of trust on information about emerging STI on a scale of "50-59" which equates to "Average" and 25% rated it on the lowest scale "1-49". It could therefore be said that respondents average, trusted the information about emerging science, technology, and innovation.

**Discussion of Findings**

This study assessed the level of awareness, understanding, and perception university academic staff in Akwa Ibom State have about emerging science, technology, and innovation. A total of 155 respondents, from three faculties comprising 14 departments in two universities – University of Uyo and Akwa Ibom State University were studied. The departments were selected purposively from the faculties of Education and Social Sciences, UniUyo, and Faculty of Arts, AKSU, based on their willingness to participate in the research provided different ranks/strata were represented. The study lasted for 3 months. Our study revealed four major findings.

First, the respondents had a slight level of awareness about emerging science, technology, and innovation. This result suggests that awareness of the emerging frontier technologies is still at the lowest, supporting Akin *et al.*, (2017) report that the public does not generally feel informed about STI, especially synthetic biology, or believe it is personally important. The public has a limited understanding of what biotechnology is,

how it is governed, how knowledge is produced, and how the benefits are distributed and accrued (Gastrow *et al.*, 2016). Second, the little awareness of the respondents came via exposure to mainly books/journals and seminars/workshops. This result is expected because most information about emerging science, technology, and innovation is contained in books/journals. Furthermore, results of scientific outcomes technological innovations, and inventions are presented to the public in conferences, seminars, and workshops. These are common learning environments and reference points for academics.

Third, public perception of the reality of the emerging STI fall under seven thematic constructs. We categorised these constructs based on the frequency of their discourse. Seven percent of the respondents perceived the emerging STI as reliable, and 12% perceived the emerging STI as credible and efficient, respectively. Respondents who perceived the emerging STI as untrustworthy and trustworthy are 9% and 14%, respectively. Respondents who perceived the emerging STI as improving living standards are 18%. However, the respondents in the majority (28%) held the view that emerging STIs contributed to unemployment and inequality in society. The relationship between technology and employment has historically been controversial (Financial Times 2017a; The Economist, 2017b). Technologies have often been linked to unemployment and inequality (Frey and Osborne, 2013; Brynjolfsson and McAfee, 2014; Pew Research Center, 2014; World Economic Forum (WEF), 2016; UNCTAD, 2018). Emerging STIs have increasingly become the subject of societal conflicts (Torgersen & Schmidt, 2013; Bogner & Torgersen, 2015), in which opposing visions, hopes, and fears collide. The reason is that technologies are open to various interpretations and interests (Bauer and Bogner, 2020).

The public often gives technology a meaning that is neither random nor merely xrays an issue that is given ex-ante (Bogner & Torgersen, 2015). This provides fertile ground for reservations about STI and its environmental implications (Gastrow *et al*., 2016). Griffin (2000) while explaining further the TDT states that the new technologies… radically alter the entire way people use their five senses, the way they react to things, and therefore their entire lives and the entire society.

Fourth, related to the issue of perception is respondents' extent of trust in the information about the emerging STI. We rated the extent of trust on a scale of 100 with four intervals arranged in descending order. The result showed the extent of trust in information that academic staff have about emerging science, technology, and innovation. Nineteen percent of the respondents rated their extent of trust on information about emerging STIs on a scale of 70-100 which suggests "Excellent", 24% of the respondents rated their extent of trust on a scale of ''60-69'' which equates to "Good", 32% rated it on the "50-59" scale which equates to "Average" and 25% rated it on the lowest scale "1-49". It could therefore be said that only 25% of the respondents representing the average, trusted the information about emerging science, technology, and innovation. Unfortunately, a significant number of the respondents had a low level of trust regarding the information about emerging STIs. Technological Determinism Theory suggests that technology shapes how we, as individuals in society think, feel, and act or how society operates as it moves from one technological stage to another.

**Conclusion/Recommendations**

No doubt, science, technology, and innovation have brought remarkable changes in the development of the various sectors of the economy across the globe. Yet, most African nations including Nigeria have not taken advantage of the enormous potential of STI in fast-tracking sustainable national development. Our study revealed that awareness of STI amongst academics is low. Books, journals, seminars, conferences, and workshops were the communication channels through which academics became aware of the existence of the emerging STI. A significant number of the studied academics perceived STIs as creating unemployment and inequality in society and did not completely trust information about STIs. We conclude that the low level of awareness among academics on emerging STIs has resulted in poor research output, teaching, and learning on STIs (ACBF, 2017). Thus, we recommend that STI should be introduced into the academic curriculum of the two universities, particularly in the faculties that are not science-based. There should be seminars, workshops, and even conferences on STI in the universities. Nigerian scholars should delve into research in the emerging STI. Policymakers should initiate policies that would drive the adoption of STIs, especially as we move towards knowledge-based economy. Enlightenment through teaching on STIs would lead to trust in STIs.

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