

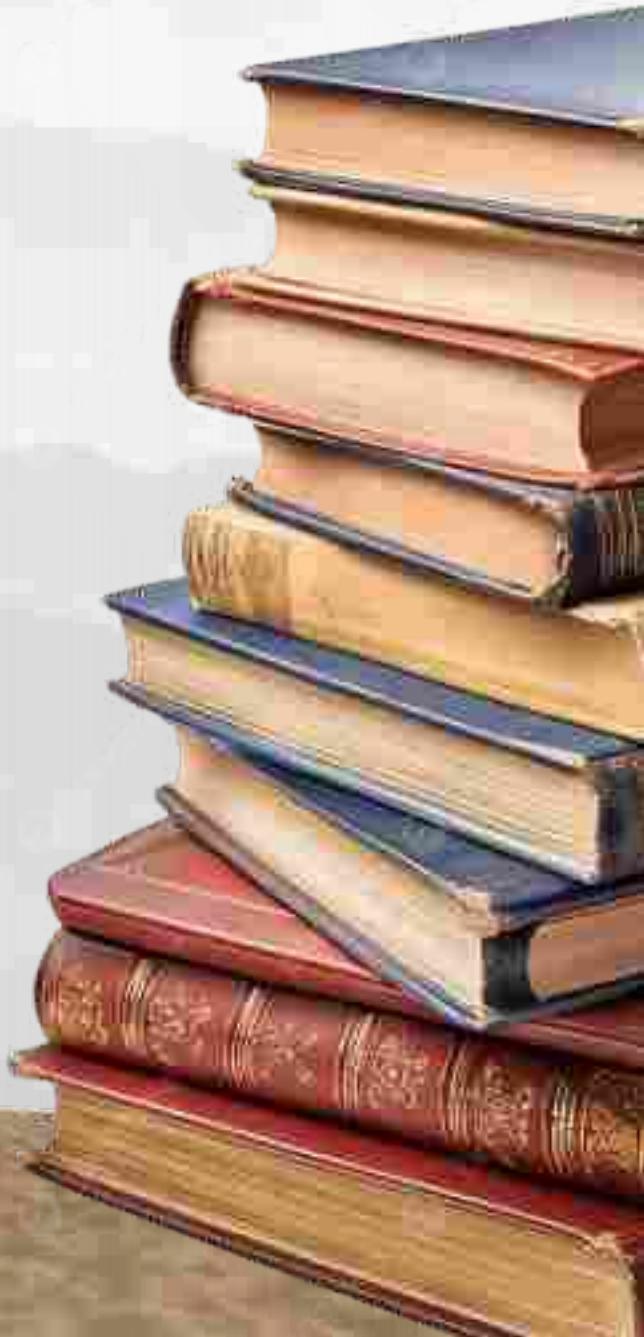


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PERSPECTIVE ON EDUCATION IN NIGERIA

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PERSPECTIVE ON EDUCATION IN NIGERIA

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CHAPTER FIFTEEN

SMART RESEARCH IN TERTIARY EDUCATION IN NIGERIA: PROBLEMS AND SOLUTION

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ABSTRACT

“Smart research” in tertiary education refers to using advanced digital tools, artificial intelligence, big data, cloud computing, and similar technologies to enhance efficiency, accuracy, collaboration, and accessibility in scholarly work. In Nigeria, adoption of these tools promises benefits such as faster data collection and analysis, automation of routine tasks (literature reviews, cleaning data), multidisciplinary collaboration across institutions, reduced costs for some stages of research, and broader access to research outputs. However, many challenges persist: underfunded institutions, unreliable power and internet, lack of digital skills among academic staff and students, brain drain of expert personnel, outdated or inadequate infrastructure, and weak institutional support. This chapter explores these problems and offers sustainable strategies: establish research-technology grants; set up institutional smart research labs; promote training and capacity building in digital tools; encourage partnerships between universities and the private sector; update infrastructure; and implement policies that support open access, data sharing, and research ethics. If these strategies are well implemented, smart research can help Nigeria’s tertiary institutions close the research gap, improve research quality, and contribute significantly to national and global knowledge.



Keywords: smart research; digital tools; big data; tertiary education; Nigeria; research infrastructure; challenges; capacity building

15.1. Introduction

Research is one of the core mandates of tertiary institutions, as it drives innovation, shapes policies, and provides solutions to societal challenges. With the advent of modern technologies, the concept of smart research—which emphasizes the use of digital tools, artificial intelligence, big data, cloud computing, and other advanced technologies—has become an essential component of higher education globally. Smart research promotes efficiency, accuracy, collaboration, and accessibility in scholarly work, making it a powerful tool for advancing knowledge and national development.

In Nigeria, tertiary institutions are beginning to embrace elements of smart research, recognizing its potential to transform traditional research practices. Through digital platforms, researchers can now access vast online libraries, collaborate with colleagues across the globe, and analyze complex data with greater precision. This has opened new opportunities for Nigerian scholars to contribute to global conversations and to address pressing national issues more effectively. However, despite its promise, the implementation of smart research in Nigeria faces numerous obstacles that hinder its full integration and sustainability.

Among the major challenges are poor digital infrastructure, unreliable internet connectivity, inadequate funding for research, and persistent electricity supply problems. Additionally, limited ICT literacy among some staff and students, lack of access to cutting-edge digital tools, and weak institutional support further restrict the adoption of smart research practices. These challenges not only slow down innovation but also widen the gap between Nigerian institutions and their global counterparts in terms of research output and impact.

This chapter explores the critical challenges facing the implementation of smart research in Nigerian tertiary institutions. The chapter is discussed under the following subhead: concept of smart research, benefits of smart research, challenges militating against implementation of smart research and sustainable strategies to aid implementation of smart research.

15.2. Clarification of concepts

Concept of Smart Research

Smart research refers to the use of advanced technology, such as artificial intelligence and machine learning, to enhance the process of conducting academic research. This includes the use of data mining, text analysis, and other techniques to collect, analyze, and interpret large amounts of data in a more efficient and accurate manner. By utilizing smart research methods, researchers are able to uncover new insights, identify trends, and make connections between different pieces of information, ultimately leading to more comprehensive and insightful academic abstracts.



Smart research is a term used to describe the use of advanced technology and innovative approaches in conducting academic research. It involves the use of AI tools, data analysis techniques, and other emerging technologies to gather, process, and analyze data in a more efficient and accurate manner. Smart research also focuses on finding creative and impactful ways to present and communicate research findings, as well as identifying new research areas and opportunities. By leveraging these tools and techniques, researchers can generate high-quality, insightful abstracts that summarize their research and contribute to the advancement of knowledge in their field (Ogunode, 2025).

Smart research refers to the process of conducting thorough and innovative studies to gain new insights and knowledge in a particular field of interest. It involves utilizing advanced techniques and technologies to analyze data and gather evidence, thereby creating a strong foundation for further research in the same topic. Smart research also emphasizes the importance of critical thinking and problem-solving skills to tackle complex issues and contribute to the academic community. By constantly pushing the boundaries of traditional research methods, smart research aims to advance our understanding and facilitate progress in various disciplines (Ogunode, 2025).

Smart Research plays a crucial role in supporting research development in tertiary institutions. By utilizing advanced technology and algorithms, it is able to collect, analyze and generate academic abstracts that are relevant and high quality. This not only saves researchers valuable time and effort, but also ensures that their work is at par with industry standards. With Smart Research, researchers can access a wide range of resources and collaborate with experts from different fields, leading to more innovative and impactful research. This ultimately contributes to the growth and advancement of the academic community as a whole (Ogunode, 2025).

15.3. Benefits of Smart Research

a) Increased Efficiency:

By using cutting-edge technology, smart research in tertiary institutions can greatly increase the efficiency of the research process. This can save researchers valuable time and resources, allowing them to focus on other important tasks. Smart research has greatly increased efficiency in the field of research in recent years. By utilizing advanced technology and data analysis techniques, researchers are now able to gather and analyze large amounts of data in a shorter amount of time (AFSA. 2022). This has allowed for faster identification of trends and patterns, leading to more accurate and insightful conclusions. One key factor in the increased efficiency of smart research is the use of artificial intelligence (AI) and machine learning algorithms. These technologies are able to analyze data at a much faster rate than traditional methods, which allows researchers to focus their time and efforts on interpreting the results and generating new ideas. Additionally, AI can also assist in the identification of potential research gaps and areas for further exploration, saving researchers time and resources (Ogunode, Edinoh, & Chinedu, (2023).. Another way in which smart research has improved efficiency is through the use of automation. With the help of

AI tools, tasks such as data entry, literature reviews, and data cleaning can now be automated, reducing the time and effort required by researchers. This not only frees up their time to focus on other aspects of their research, but also helps to reduce errors and increase the accuracy of the data. Moreover, smart research has also made collaboration and communication among researchers more efficient. With the use of online platforms and digital tools, researchers are now able to share and access data and findings in real-time, regardless of geographical location. This has greatly accelerated the pace of research as researchers can work together and build upon each other's work, leading to more impactful results (Borbajo, Malbas, & Dacanay, 2023)

b) Accurate and Reliable Results:

Smart research utilizes advanced algorithms and data analysis techniques to produce accurate and reliable results. This can greatly enhance the quality and credibility of research findings, making them more valuable to the academic community. Smart research methods are crucial for ensuring accurate and reliable results in research. By utilizing advanced technology and data analysis techniques, researchers can minimize human error and bias, leading to more accurate and trustworthy conclusions (Ogunode, Agbade, & Bassey, 2023).. Additionally, incorporating rigorous experimental design and methodology can further improve the reliability of research findings. This includes proper controls, sample sizes, and statistical analysis to reduce the likelihood of chance findings. Ultimately, the combination of smart research practices can help to ensure that results are accurate and reliable, providing a strong foundation for further investigation and advancement in the academic community (Bordia, D. (2023).

c) Multidisciplinary Collaboration:

With the help of AI, smart research allows for multidisciplinary collaboration among researchers from different fields. This can lead to a more holistic and comprehensive approach to research, resulting in more insightful and impactful findings. Multi-disciplinary collaboration is crucial for effective research in today's complex and interconnected world. By combining knowledge and expertise from multiple fields, researchers are able to gain a deeper understanding of various topics and find innovative solutions to complex problems. Smart research is something that ensures this collaboration by utilizing advanced technologies and methods. One way in which smart research ensures multidisciplinary collaboration is by facilitating communication and information-sharing between researchers from different fields (Chan, & Tsi, 2023).. Through the use of AI, researchers are able to easily connect with others who have relevant knowledge and expertise, allowing for effective collaboration across disciplines. This not only increases the speed and efficiency of research, but also leads to more diverse perspectives and ideas. Smart research tools assist in the organization and management of multidisciplinary research projects. By utilizing AI algorithms, researchers are able to identify potential overlaps and gaps in their research, leading to a more comprehensive and well-rounded approach. This also helps to avoid duplication of efforts and resources, saving both time and money (Ogunode & Olowonefa 2023). Smart research also



promotes a culture of collaboration by encouraging researchers to work together and share their findings. With the help of AI, academic abstracts can be generated quickly and accurately, allowing for timely dissemination of information and making it easier for researchers to stay up-to-date with the latest developments in their field.

d) Enhanced Data Collection and Analysis:

AI-powered tools can collect and analyze vast amounts of data in a fraction of the time it would take a human researcher. This can greatly expand the scope of research and provide a deeper understanding of complex phenomena. Smart Research Enhanced Data Collection and Analysis is a revolutionary tool that optimizes the research process by providing advanced data collection and analysis capabilities. It utilizes cutting-edge artificial intelligence algorithms to generate high-quality academic abstracts based on user input. By inputting the name "Smart Research Enhanced Data Collection and Analysis" into the tool, users can instantly access a comprehensive abstract that highlights the key research findings, methodologies, and conclusions of their project. This tool not only saves researchers time and effort but also enhances the quality and effectiveness of their research by providing accurate and insightful abstracts (Ogunode, & Ejike, 2023). With Smart Research Enhanced Data Collection and Analysis, researchers can confidently present their work to the academic community and make a significant impact in their field of study.

e) Cost Reduction:

Smart research can help reduce the cost of research by eliminating the need for expensive equipment, materials, and resources. This makes it more accessible for smaller institutions and researchers with limited budgets. Smart research in the field of cost reduction has become increasingly important in recent years. This is due to the ever-growing pressure on organizations to cut costs and improve efficiency. With the help of advanced technologies and techniques, researchers are now able to identify and implement cost-saving strategies that were previously thought to be impossible. One of the main ways in which smart research has impacted cost reduction is through the use of data analytics. By analyzing vast amounts of data, researchers are able to identify patterns and trends that can help organizations make informed decisions about where to cut costs. This includes identifying areas of the organization where costs can be reduced without sacrificing quality or productivity. Another key aspect of smart research in cost reduction is the use of innovative technologies. These can include artificial intelligence, machine learning, and automation (Ogunode, Agbade, & Bassey, 2023). By incorporating these technologies into their processes, researchers are able to streamline and automate tasks that were once labor-intensive and time-consuming. This not only saves time and resources, but it also reduces the risk of human error, leading to more accurate results. Furthermore, smart research has also enabled organizations to think outside the box when it comes to cost reduction strategies. By leveraging insights from different fields or industries, researchers are able to come up with creative solutions



that were previously overlooked. This has led to groundbreaking cost-saving methods that have revolutionized the way organizations approach cost reduction.

f) Improved Accessibility:

With the help of AI, smart research can make academic abstracts more accessible to a wider audience. This can help bridge the gap between academia and the general public, allowing for a better understanding and appreciation of research findings. Smart research has greatly improved accessibility in the world of academic research, allowing individuals from all backgrounds to access and contribute to valuable knowledge. By utilizing the latest technologies and data analysis techniques, smart research has revolutionized the way in which we conduct and share research. With its ability to quickly and accurately identify trends and insights, smart research allows for the creation of more comprehensive and impactful research abstracts. This not only makes it easier for researchers to understand and build upon existing studies, but also makes it easier for those outside of the academic world to access and benefit from this knowledge.

Increased efficiency in research processes, Access to a wider range of data and resources, Enhanced accuracy and reliability of research findings, Ability to identify patterns and connections among data sets, Facilitates interdisciplinary research collaborations and Supports evidence-based decision making in academic institutions

15.4. Problems militating against Smart Research in Tertiary Institutions in Nigeria

i. Insufficient Funding:

One of the main problems facing smart research in tertiary institutions in Nigeria is the lack of adequate funding. Most of these institutions do not receive enough financial support from the government, which limits their ability to invest in research and development. As a result, researchers are unable to access the necessary resources and equipment needed to conduct high-quality studies. Insufficient funding is a major problem that is hindering smart research in tertiary institutions in Nigeria. This issue has been a cause for concern as it directly impacts the quality and quantity of research being conducted in these institutions (Ogunode, 2025). The lack of adequate funding not only affects the infrastructure and resources available for research, but also limits the opportunities for students and faculty members to participate in research activities. One of the major consequences of insufficient funding for research is the limited access to state-of-the-art equipment and facilities. This impedes the ability of researchers to conduct cutting-edge experiments and studies, hindering their progress and limiting the scope of their research.

ii. Brain Drain:

Another major challenge facing smart research in Nigerian tertiary institutions is the brain drain phenomenon. Many talented researchers and professors often leave the country in search of better opportunities abroad, leaving a shortage of skilled personnel within the country. This leads to a lack of expertise and knowledge, hindering the progress of research in these institutions. The

phenomenon of brain drain is a major challenge facing the research landscape of Tertiary Institutions in Nigeria (Westagilelabs 2022; Ogunode 2023). The concept of brain drain refers to the migration of highly skilled and educated individuals from their home countries to other countries in search of better opportunities. This has led to a significant loss of intellectual and scientific expertise, thereby hindering the progress of smart research in Nigerian Tertiary Institutions. The lack of adequate funding, infrastructure, and resources in these institutions further exacerbates the problem of brain drain, as talented researchers are often forced to seek better opportunities abroad (Alagbe,, Awodele, & Ayorinde, 2021; Copeland,2022).. Additionally, the brain drain phenomenon has also resulted in a brain gain for other countries, as they benefit from the contributions of skilled Nigerian researchers. In conclusion, brain drain has become a critical issue that must be addressed to promote the growth and development of smart research in Nigerian Tertiary Institutions.

iii. Outdated Infrastructure:

Most tertiary institutions in Nigeria lack modern and updated infrastructure which poses a significant challenge to smart research. Without proper facilities, researchers are unable to perform experiments and studies effectively, leading to limited progress in research and development. This also affects the quality of academic publications from these institutions (Ogunode, & Ukozor, 2023). The outdated infrastructure in tertiary institutions in Nigeria is a major problem that hinders the progress of smart research. This is due to the fact that outdated infrastructure restricts the capabilities of researchers and limits the scope and quality of their work (Oztok & Zingaro,2021). Additionally, it also affects the data collection and analysis process, causing delays and errors in results. These issues ultimately hinder the advancement of research and knowledge in these institutions. This tool generates academic abstracts by highlighting the negative impact of outdated infrastructure on the research capabilities of tertiary institutions in Nigeria. With this information, researchers can better understand the importance of updating infrastructure and take steps towards improving their research processes (Ogunode, & Gregory, 2023; Igbokwe, 2023).

iv. Inadequate Technology Adoption:

The rapid growth of technology has significantly impacted every aspect of our lives, including academia. However, the adoption of technology in tertiary institutions in Nigeria has been inadequate, hindering smart research. This issue has raised concerns as it poses a significant problem for the growth and development of the country's education sector. Inadequate technology adoption hampers the efficiency and effectiveness of research in tertiary institutions, limiting their ability to produce relevant and impactful research. Inadequate technology adoption in Nigerian tertiary institutions is a multifaceted problem with numerous causes. Some of the primary reasons for low adoption rates include lack of funding, inadequate infrastructure, resistance to change, and inadequate training and support (Ogunode & Olowonefa 2023). These factors contribute to hindering the integration of technology into the research process in tertiary institutions. One of the



most significant consequences of inadequate technology adoption in Nigerian tertiary institutions is the limitation it poses to smart research. Without adequate technology, researchers are constrained in their abilities to collect, analyze, and interpret data. This limitation makes it difficult for them to produce high-quality and relevant research that can contribute to the advancement of knowledge in various fields (Smith, 2021; Singh, & Singh, 2021).. Moreover, inadequate technology adoption also affects the dissemination of research findings. With limited access to technology, researchers are unable to share their findings with a wider audience, hindering the growth and impact of their research. This lack of dissemination also restricts collaboration and knowledge exchange among researchers, further limiting the development of smart research in tertiary institutions. The use of advanced technology according Caleb, (2020) is crucial for smart research, but unfortunately, many tertiary institutions in Nigeria are slow to adopt new technologies. This is due to various reasons, such as lack of funding, limited access to technology, and inadequate training. As a result, researchers are restricted in their ability to conduct cutting-edge studies.

v. Lack of Government Support:

The lack of government support for smart research in Nigerian tertiary institutions is a significant constraint. While some funding is allocated to research, it is often inadequate and comes with many bureaucratic procedures. This hinders the progress of research and discourages researchers from pursuing innovative ideas and projects (Xiaolin, & Xiaojun, 2022; Frankenfield, 2023).. The lack of government support in Nigeria has been a major problem for smart research in tertiary institutions. This has greatly hindered the development of the academic community in the country. Despite various efforts made by these institutions to make meaningful contributions to the field of research, the lack of support from the government has been a major obstacle (Abubakar, 2022). One of the main issues with the lack of government support is the inadequate funding for research projects. Tertiary institutions in Nigeria heavily rely on external funding to carry out their research activities. However, due to the lack of support from the government, these institutions are often left with insufficient funds to conduct quality research. As a result, the research conducted by these institutions is often not up to par with international standards, hindering the progress of the academic community. Moreover, the lack of government support also leads to a shortage of resources and equipment needed for research (Oluyemisi, 2023; Zawacki-Richter, & Anderson, 2014). Tertiary institutions in Nigeria do not have the necessary resources to carry out their research effectively. This includes access to modern technology, scientific equipment, and databases. Without these resources, it becomes difficult for researchers to gather and analyze data, hindering the progress of their work.



15.5. Strategies to improve smart research in tertiary institutions in Nigeria

i. Implementing Research-Based Curriculum:

One of the most effective strategies for improving smart research in tertiary institutions in Nigeria is by implementing a research-based curriculum. This involves incorporating research-focused courses and activities into the existing curriculum, which will allow students to develop critical thinking skills and enhance their research capabilities.

ii. Encouraging Collaborative Research Projects:

Another effective strategy is to encourage collaborative research projects among students. This not only promotes teamwork and communication skills but also allows students to learn from each other's strengths and areas of expertise.

iii. Providing Adequate Resources:

In order to improve smart research, it is crucial to provide students with the necessary resources such as access to online databases, computer labs, and research funding. This will enable students to conduct thorough and in-depth research on their chosen topics.

iv. Promoting Research Culture:

It is important for tertiary institutions in Nigeria to promote a research culture among students. This can be achieved by organizing seminars, conferences, and workshops on research-related topics, as well as providing opportunities for students to present their research findings.

v. Encouraging Multidisciplinary Research:

Promoting multidisciplinary research can greatly benefit smart research in tertiary institutions in Nigeria. By encouraging students from different disciplines to work together on a research project, they can gain a broader perspective and develop a well-rounded understanding of their chosen topic. This can also lead to innovative and impactful research outcomes.

Conclusion

In conclusion, smart research in tertiary education in Nigeria is a vital instrument for transforming the nation's academic and developmental landscape. By leveraging advanced technologies such as artificial intelligence, big data analytics, cloud computing, and digital collaboration platforms, Nigerian tertiary institutions can move beyond traditional research practices to more dynamic, data-driven, and impactful approaches. Smart research not only accelerates the generation of knowledge but also ensures that research outputs are more relevant, innovative, and directly applicable to solving pressing societal and economic challenges.

The adoption of smart research in Nigeria holds significant potential benefits for improving the global visibility and competitiveness of Nigerian universities, increased efficiency, accurate and



reliable results, multidisciplinary collaboration, enhanced data collection and analysis, cost reduction and improved accessibility and ensure that research outcomes contribute meaningfully to national development goals such as poverty reduction, sustainable agriculture, healthcare improvement, technological advancement, and industrial growth.

However, realizing the full benefits of smart research requires overcoming several barriers, including insufficient funding, brain drain, outdated infrastructure, inadequate technology adoption, and lack of government support and the limited availability of reliable digital tools and platforms. Addressing these challenges demands a holistic approach involving robust government policies, increased investment in research and technology, capacity-building programs for researchers, and the promotion of collaborative networks at both national and international levels.

Ultimately, smart research has the capacity to redefine the role of tertiary institutions in Nigeria from being primarily centers of knowledge transmission to becoming active drivers of innovation and societal transformation. By embracing smart research practices, implementing research-based curriculum, encouraging collaborative research projects, providing adequate resources, promoting research culture and encouraging multidisciplinary research, Nigerian tertiary education can unlock new opportunities for discovery, enhance the quality and impact of academic outputs, and contribute significantly to positioning the country as a knowledge-driven economy in the global digital era.

Revise Questions

- 1) Define Smart Research
- 2) Discuss five Benefits of Smart Research in tertiary institutions
- 3) Highlight five problems militating against Smart Research in Tertiary Institutions in Nigeria
- 4) Discuss five strategies to improve smart research in tertiary institutions in Nigeria

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