School Library Support and Inquiry Based Approach as Determinants of Science Subject Content Delivery in Private Schools, Ekiti State, Nigeria

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Certification

This is to certify that Funmilola Adeola Ojo with matriculation Number **LCU/PG/001929** carried out this research work titled "**School Library Support and Inquiry Based Approach as Determinants of Science Subject Content Delivery in Private Schools Ekiti State, Nigeria**" in the Department of Information Management, Faculty of Communication and Information Science, Lead City University, Ibadan, Oyo State, Nigeria, for the Award of Master Degree in Library and Information Science (MLIS) and this has not been previously submitted.

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Dedication

This dissertation is dedicated to the glory of God the father, Son and Holy Spirit

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Abstract

To investigate school library support and inquiry based approach as determinants of science subject content delivery in private schools in Ekiti State, Nigeria is the purpose of this study. The importance of this study is centred on significance attached to science being an apparatus adopted for actualising national growth in Nigeria. This study addressed the following research questions: What is the level of science subject content delivery in private schools in Ekiti State? What is the level of school library support available to science teachers in private schools in Ekiti State? What are the inquiry based teaching methods adopted by private school teachers in Ekiti State? This study was underpinning with the theory of constructivist theories, while the study's population comprised science teachers in private schools in Ekiti State. The study employed both stratified and purposive samplings. The sample size for the study was 72. Questionnaires was the instruments of data collection. Response rates of 88.9% was obtained. The version 24 of Statistical Package for Social Sciences (SPSS) was used to analysed the questionnaire to generate descriptive statistics for the research questions and inferential statistics for the hypotheses. The findings revealed that inquiry based approach has a significant influence on content delivery of science subjects in private schools in Ekiti State, Nigeria ($R = 0.858$, $p<0.05$), and that the higher the level of inquiry based approach adopted, the more effective the content delivery for science subjects. Similarly, the test of hypothesis revealed that school library support has a significant influence on content delivery of science subjects in private schools in the state. Far reaching recommendations that could position school libraries for effective service delivery were offered by the study.

Keywords: Constructivism, Inquiry-based Approach, Science Teachers, School libraries, Science Subjects, Secondary Schools, Ekiti State, Nigeria

Word Count: 278

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Chapter One

Introduction

1.1 Background to the Study

Content is one of the most challenging as well as one of the most important aspects of developing subject among courses offer in academic institutions. Content is the heart of developing any course, so how content is presented to students strongly impacts student success and satisfaction. The best way to deliver content varies from course to course, but there are several best practices that can be used to ensure students' success which include learning the content they need to deliver that content[1].

The role of science content in guiding teaching and learning cannot be over emphasized in secondary schools. It ensures uniformity in the content students are exposed to as well as makes students become relevant and functional to the society after undergoing its contents. Content is the ground which learners and teachers cover in order to attain the goals of education[3]. It is also defined as the set of courses offered in an educational institution, and which constitute an area of specialization[4].

The content is therefore expected to develop the learners cognitively (head), affectively (mind) and in psychomotor domain (hand/skill) to enable them have desirable adaptations for functionality in the society. Science content was developed in order to prepare students to acquire adequate laboratory and field skills in science subjects; meaningful and relevant knowledge in science subjects; ability to apply scientific knowledge to everyday life in matters of personal, community health, technology and agriculture; as well as reasonable and functional scientific attitude[5]. In the dynamic world of today, the subject content is expected to inculcate in learners; life and career skills such as creativity skills, critical

thinking skills, problem-solving skills as well as ICT skills[6]. Delivery of subject content in classrooms cannot be effective and impactful without considering the process of impacting knowledge. The indicators for measuring science content delivery in this study are content knowledge, the pedagogical knowledge, the pedagogical content knowledge, the technological content knowledge and the technological pedagogical knowledge[7].

Content knowledge is the body of knowledge that is to be impacted by the teachers of private schools in Ekiti State which include facts, theories, principles, ideas, terms of the subject to be taught which the teacher must master effectively, a teacher must have a deep understanding of the content of their subject, but it has been observed that this is not the case of teachers of private schools in Ekiti State, Nigeria and it has led to private school students performing woefully and relying on exam malpractices while writing external examinations.

Pedagogical knowledge is the understanding of learning, human development, professional ethics, motivation techniques, cultural and individual differences, instructional strategies, classroom management and assessment strategies that have an impact on the learner which the teachers must have learnt whilst under training. It has been perceived that most of the teachers in private school in Ekiti State do not acquire necessary skill and knowledge for teaching. Pedagogical content knowledge is a form of knowledge that makes science teachers rather than scientists. It is the kind of knowledge required by teachers for the successful integration of technology in teaching. It suggests that teachers' need to know about the intersections of technology.

Technological content knowledge is the term that describes teachers' understanding of technology and content can both influence and push towards better and more robust understanding of the subject matter. "Technological pedagogical knowledge is the

effectiveness of the delivery of the lesson with technology integration. It is an ideal application in all aspects of learning which are all important in the teaching and learning process"[8]. Attempt to achieve success in providing more access to science education has brought about diminishing quality education[8]. At the World Education Forum held in Dakar, Senegal where standard learning was given adequate priority, proof over the years indicated that to increase enrolment, efforts have to be complemented with attempts to increase the learning quality if learners will be encouraged to enroll in schools, continue and achieve significant learning results[9].

Further, the recent assessments of learning achievements in some countries have shown that a sizeable percentage of children are acquiring only a fraction of the knowledge and skills they are expected to master especially in science subjects[10]. The strain between standard learning process and quantity of learners has categorized education in many developing nations of the world for about two decades till date, that learning process has become an issue so serious to the extent that it is not seen as a choice but as a necessecity[11]. The important thing that is worthy of note is that quality of content is diminishing in most countries of the world, though some of the global treaties, specified the necessity of providing education on the citizen's rights, gender awareness, sports and reproductive health, touched on educational quality as it is evident that learning process has continuously declined in most developing countries (Nigeria inclusive). Though different sectors in the society may have diverging views on the direction of education change or update, the use of library in supporting the students' knowledge acquisition has also been on the decline.

Important international bodies such as the International Federation of Library Associations (IFLA) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), have admitted the importance of libraries in schools, especially in developing countries such as Nigeria. It is in this view, the IFLA/UNESCO in 1999 published a School Library Manifesto, which stated that: the school library is essential to every long-term strategy for literacy, education, information provision and economic, social and cultural development. It has been demonstrated that, when school librarians and teachers collaborate, students achieve higher levels of literacy, reading, learning, problem-solving and information and communication technology (ICT) skills.

The school library could be described as the school's physical and digital learning space where inquiry, research, reading, thinking, imagination, and creativity are crucial to students' information-to- knowledge journey and to their personal, cultural and social growth[12]. This physical/digital space is known by numerous terms such as: documentation and information centre; school media centre, library learning commons and library resource centre. However, school library is the term generally applied and used for the facilities and functions. School library provides information and ideas that are necessary to the success of our educational achievements in the 21st century society. Libraries are expected to deliberately change the perception of themselves from spaces of collections of information to spaces of creation of information, since today's societies are characterized by their heavy dependence on information. The school library has an obligation to offer learning services, books and resources that enable entire members of the school community to become critical thinkers and effective users of information in all formats and media, with links to the wider library and information networks[13]. Therefore, available resources in the library both physical and online, library personnel and library services will be used in assessing this study.

Library resources are materials, both print and non-print found in the school libraries which support curricular/content and personal information needs. The print items include books, magazines, newspapers, pamphlets, microfiche or microfilm and so on. Most private schools in Ekiti state do not have a standard library while some that even have library do not equip their libraries with the necessary academic material for the students to compliment what they are taught in the classroom.

Library personnel are professionals that provide access to information, sometimes social or technical programming or instruction on information literacy to users (students). Most of these private schools do not employ professional librarians to monitor their library but rather give the office as duty to teachers generally where teachers will be schedule to monitor the library on a weekly basis.

Library services are services that provide reading materials, service to help provide users with library materials, educational and recreational audio-visual materials or a combination of these services. Most of these schools do not render the appropriate library services to the students due to not having the library in the first place, while the few that could boost of a library among them do not provide the necessary facilities so as to render good services to the students. To improve student performance in science subjects, it is important to transform the teaching approaches and the one way to do this is to use inquiry strategies in the teaching and learning process.

Libraries and education are partners in progress that should not be separated if any meaningful education is expected in the holistic development of a child. As such, a library is regarded as one of the agencies through which sources of information of accumulated knowledge and experiences are selected, acquired, organized, preserved and disseminated to the right people at the right time. Therefore, the provision of library resources and

services is crucial and indispensable to a secondary education system. The school library is the engine room of functional education without which academic excellence would be difficult to achieve. The school library is the nerve centre of the school for it is required to play a significant role in the school curriculum by providing unlimited access to knowledge[13]. Therefore, school library is required to be well equipped for it to be relevant for inquiry based approach.

Inquiry-based approach (IBA) is primarily a pedagogical method, which requires learners to experience the process of knowledge creation and/or acquisition and was developed in 1960s as an answer to traditional methods of instructional based learning led by the teachers in the classroom[14]. This means, students learn from situations in the world (families, friends, media and libraries) around them to construct knowledge via their interaction or exposure. Consequently, the knowledge base of students is enriched and expanded as their social and communication skills are improved by making a classroom environment that underscores collaboration and exchange of ideas[15]. The major priority of the Nigerian Government has been to reposition science education in the scheme of national education for optimal performance[16]. One of the aims of the Government is to make the school curriculum more relevant to the needs of the labour markets. Therefore, emphasis is being placed on science and ICT diffusion and targeted skills development. Therefore, the government's vision is to make a relevant curriculum that guarantees quality science education required to achieve the economic growth[17].

The Nigerian educational system is predominantly British oriented, and the 6-3-3-4 educational system was adopted, which makes provision for six years of primary education, three years of junior and three years of senior secondary school education and four years for tertiary education.

Secondary school education in Nigeria is the link between primary and tertiary education. It is the foundational basis of science. The government has placed emphasis on science and targeted skills development in science to achieve its economic growth[18]. It has been demonstrated by numerous international studies that there is a link between student performance and the presence of professionally trained staff and accessible school libraries. Extensive research reveals that a school that puts its trust in its school library to support student growth, precisely in the areas of literacy, Information Literacy (IL), and science and technological skills, have been seen to increase motivation, personal and interpersonal capabilities, higher assessment scores, and ultimately, greater graduation rates[19].

However, school library has the capability to encourage reading for enjoyment, which is an important factor in improving student performance not only in literacy skills, but also in science and mathematics[20]. The system of education in Nigeria has experienced many challenges in terms of inconsistency as a result of restructuring of the system from time to time[21]. The political turbulence has always generated a negative impact on the education system in Nigeria. The political instability plagued not just the education system but also the library system. These difficulties were more pronounced at the foundation levels of education where there is a shortfall of school librarians despite government policy on having librarians for all schools[22]. Students and teachers need library information resources and the expertise of professionally trained school librarians to succeed. Studies in Nigeria on the impact of the school library on students' achievement showed that school libraries significantly affect students' performance in senior secondary schools[23]. Planning, processing, creating, sharing, retrieving and evaluation of content delivered to the students will be used to measure Inquiry based approach which was derived from Alberta learning inquiry model.

Planning the content to be delivered to students will allow teachers to outline the content of the subject to be taught. Process is how students make sense of the content delivered to them by their teacher in the classroom. They need time to reflect on and digest the learning activities before moving on to the next segment of their subject. Creating subject matter and content to teach students is also a necessary aspect of developing subject content, it is another way to engage students in learning. Also, sharing is impacting information or knowledge within the curriculum of a subject to students and this is referred to as sharing of content to students. Retrieving contents that the students as been taught is also compulsory which should be done together by evaluating the students so as know if what they are taught has been retained by them and it is impactful. Based on this, the study tends to investigate how school library support and inquiry based approach serve as determinants for science subject content delivery in private schools in Ekiti State, Nigeria.

1.2 Statement of the Problem

The Nigeria National Policy on Education (NNPE) (2013) has placed major responsibility on the school library as one of the most important educational services. Science subject content has been difficult by teachers of private schools in Ekiti State, Nigeria which is due to non-availability of standard library and information inquiry center for the teachers. NNPE categorically states that all the proprietors of schools should make available well equipped libraries in all their schools in agreement with the laid down standards.

Secondary school education is the crucial link between basic education and the world of work, and tertiary education, as it serves as the foundation to equip students to effectively live in the modern age of science and technology[24]. Since the government has always emphasised science as a mechanism to achieve economic growth, then there is a need to investigate the efficacy of school library and inquiry based approach for science subject

teaching and learning in schools. Not much is known about school library support and inquiry based approach as determinants for science subject content delivery in private schools in Ekiti State, Nigeria. Therefore, it is against this background that the study intends to investigate school library support and inquiry based approach as determinants for science subject teaching and learning in private schools in Ekiti State, Nigeria.

1.3 Aim and Objectives of the Study

The aim of this study is to investigate school library support and inquiry based approach as determinants for science subject content delivery in private schools in m State, Nigeria. The specific objectives are to:

i. identify the level of science subject content delivery in private schools in Ekiti State
ii. ascertain the school library support available to science teachers in private schools in Ekiti state, and to
iii. examine the inquiry- based method of teaching adopted by private school teachers in Ekiti State.
iv. determine the influence of school library support on content delivery of science subjects in private schools in Ekiti State.
v. determine the influence of inquiry based approach on content delivery of science subjects in private schools in Ekiti State.
vi. determine the combined influence of school library support and inquiry based approach on content delivery of science subjects in private schools in Ekiti State.

1.4 Research Questions

The following research questions would guide in carrying out this study

i. What is the level of science subject content delivery in private schools in Ekiti State, Nigeria?

ii. What is the level of school library support available to science teachers in private schools in Ekiti State, Nigeria?

iii. What are the inquiry based teaching methods adopted by private school teachers in Ekiti State, Nigeria?

1.5 Hypotheses

The following hypotheses that would guide in carrying out this study have been formulated:

$H_0$1: There will be no significant influence of school library support on content delivery of science subjects in private schools in Ekiti State, Nigeria.

$H_0$2: There is no significant influence of inquiry based approach on content delivery of science subjects in private schools in Ekiti State, Nigeria

$H_0$3: There is no significant combine influence of school library support and inquiry based approach on content delivery of science subjects in private schools in Ekiti State, Nigeria.

1.6 Significance of the Study

The significance of this study revolves round the importance attached to science education being a mechanism employed for achieving national development in Nigeria. Although studies on school library support and inquiry based approach as determinants for science subject content delivery have been conducted nationally and internationally, however, no comprehensive studies have been conducted on school library support and inquiry based approach as determinants for science subject content delivery, specifically on private schools in Ekiti State, Nigeria. The results of this study will contribute to a better

understanding of the role of school libraries in inquiry based approach for science subject content delivery. The outcome of this research would encourage the government and education stakeholders such as; principals, science teachers and school librarians to consider the role school libraries should play in science subject content delivery.

1.7 Scope of the Study

Using the school library support indicators for measuring science content delivery, this research investigates the influence of school library support and inquiry based approach as determinants for science subject content delivery in private schools in Ekiti State, Nigeria. Science subject content delivery is measured by content knowledge, pedagogical knowledge, pedagogical content knowledge, technological content knowledge and pedagogical knowledge, the first independent variable is school library support which is measured by mentoring, technical assistance and financial assistance, while the second independent variable is inquiry based approach which is measured by planning, processing, creating sharing retrieving and evaluating. The geographical scope for the study will be private schools in in Ekiti State, Nigeria. This private schools will be chosen for the study because they all have school libraries.

1.8 Limitations of the Study

As this study investigated school library support and inquiry based approach as determinants of science subject content delivery in private schools in Ekiti State, Nigeria, some limitations were encountered. The major one was the assumption that all the private schools in the state would be covered, but as a result of shortage of finance and limited time for the research, only twenty-four (24) out of three hundred and forty-three (343) private schools in the state were covered.

1.9 Operational Definition of Terms

Definitions of some key *terms* used in the context of this study are as follow:

Science subject content Delivery: It is an intellectual and practical activity encompassing the systematic study of the structure and behaviours of the physical and natural world through observation and experiment by science teachers to science students of private secondary schools in Ekiti State, Nigeria. Among the list of science subjects in Nigeria secondary schools are: physics, chemistry and biology.

Content knowledge: It is the body of knowledge which include facts, theories, principles, ideas, vocabulary which teachers of private schools in Ekiti State must master to be effective while teaching.

Pedagogical Knowledge: It means understanding of learning, human development, professional ethics, motivational techniques, cultural and individual differences, instructional strategies, classroom management and assessment by teachers of private schools in Ekiti State, Nigeria.

Pedagogical Content Knowledge: It is the knowledge framework described the kinds of knowledge required by teachers of private schools in Ekiti State, Nigeria.

Technological Content Knowledge: This is the teacher's understanding of how technology and content can both influence and push the students in understanding them.

Technological Pedagogical Knowledge: It describes how private schools in Ekiti State teachers' understanding of how particular technologies can change both the teaching and delivery aspect of his/her subject content.

School Library Support: It is a school's physical or digital learning space where reading, inquiry, research, thinking, imagination, and creativity are central to private schools'

students in Ekiti State information-to-knowledge journey and to their personal, social, and cultural growth.

Library Resources: These are materials both print and non-print found in the school libraries which support curricular and personal information needs of students of private schools in Ekiti State, Nigeria.

Library Personnel: These are professional individuals that guide students on how to use the library for study and acquisition of information in private schools in Ekiti State, Nigeria.

Library Services: These are the services that provides reading materials for convention use, circulation of reading material, service to help provide users with library materials, educational and recreational audio-visual materials or a combination of these services

Inquiry based **approach** (IBA): It is learning in which private school students in Ekiti State actively engage in diverse information and ideas, to build new understandings, and to develop personal viewpoints and perspectives.

Planning: It is the determination of the content Ekiti State private school teachers hope to create and sets expectation for hoe it should be created.

Processing: It is the goal of adding value to science subject content by private school teachers in Ekiti State, Nigeria.

Creating: It is the process of identifying a new topic by private school teachers in Ekiti State so as to write about them.

Sharing: It is the process of disseminating knowledge or information to students of private schools in Ekiti State, Nigeria.

Retrieving and **Evaluating**: This is the process whereby private school teachers in Ekiti State evaluating and try to get back what they have taught the students in a long time.

Endnotes

1. S. O. Adeyegbe, M. Oke, & A. Tijani, "The feasibility of Teaching assessing STM with ICT in Nigeria". **Proceeding of the 44th Annual Conference of the Science Teachers Association of Nigeria (STAN)**, 2018. 119-123.

2. J. Akindele, "Availability and utilization of Information Communication Technology (ICT) for Spoken English Teaching and Learning in South-West Nigeria". **An International Journal of Arts and Humanities**. 4(2). 2013. 1 - 3.

3. J. S. Akingbade, "Students' Perception of the Availability and Utilization of Information and Communication Technology (ICT) in the Teaching and Learning of Science Subjects in Secondary Schools in Ekiti State, Nigeria". **International Journal of Education and Literary Studies.** 1(1). 2013. 5-8.

4. T. Anderson, & F. Elloumi, "*Theory and Practice of online learning*". Canada: **Athabasca University**, 2020.

5. W. Annie, W. Stoker and M. Mildred, "Achievement and Ability Tests - Definition of the Domain", Educational Measurement 2, **University Press of America,** 2018. 2–5,

6. K. O. Ezeoba, Instructional Media. "An Assessment of the Availability, Utilization and Production by Nursery School" Teachers. **Journal of Applied Literacy and Reading, 3(Special Edition)**, 2007. 33-38.

7. D. Fakeye, "Assessment of English Language Teachers' knowledge and use of Information Communication Technology (ICT) in Ibadan Southwest Local Government of Oyo State". **American-Eurasian Journal of Scientific Research,** 5(4): 2020. 270-276.

8. Federal Government of Nigeria, Universal Basic Education Act. **NERDC**, Lagos, 2018.

9. T. Goshit, Nigeria's need for ICT: SP. 259 "technology and policy in Africa". http://ocw.mit.edu

10. D. Gouch, "Investigating critical and contemporary issues in education/students' academic performance. A case study of senior secondary schools in Kassena-Nankana District". **Journal of Social Science,** 2019. 4(4).

11. P. M. Heathcote, A Level of ICT. Payne-Gallway publishers, West Midland, 2018.

12. S. Ibrahim, "Impact of Accounting Background, Gender and Motivation on Performance of Business Education in Introductory Accounting in Federal Universities Nigeria": **Unpublished Doctorate Dissertation Presented to the School of Post Graduate Studies, Ahmadu Bello University,** Zaria, 2018.

13. A. B. Cirfat, C. F. Zumuyil, and M. A. Ezema, "The Status of ICT in Colleges of Education". **Proceeding of the 44th Annual Conference of the Science Teachers Association of Nigeria**, 2018. 48- 52.

14. J. E. Orheruata, Abubakar, and Y. M. Aminu, "Assessment and Utilization of infrastructural materials in tertiary institutions in Borno State". **ABEN Conference Proceedings**, 1 (1), 2017. 73-77.

15. P. S. O. Udin, and V. O. "Uwaifo, Principles and practice if vocational and technical education in Nigeria". Benin City: **Ever Blessed Publishers.** 2015.

16. E. K. Umunadi, "Provision of equipment and facilities in vocation and technical education for improving carrying capacity of Nigeria's Tertiary Institutions". **African Society for Scientific Research (ASSR)**. Retrieved from http://www.hrmars.com/admin/pics/293pdf. 2018.

17. C. P. Uzuegbu, H. C. Mbadiwe and J. C. Anulobi. "Availability and utilization of instructional materials in teaching and learning of library education in tertiary institutions in Abia State". **Journal of Educational Research** 2(8), 2015. 111–120.

18. D. D. Zakka and M. W. Priscilla. "Critical issues in the teaching and learning of Office Technology and Management". **Journal for the Promotion/Advancement of Office Management/Secretarial Profession,** 4, 2018. 22-29.

19. M. O. Ugwuanyi, and M. E. Eze, "An assessment of the educational resources available for implementing the mandates of secretary studies programme in Nigerian Polytechnics". 2018.

20. K. Blyth, "Effectiveness of Using Inquiry-Based Instruction to Increase Students Performance in High School Biology as Bardwell Institute". **[OTS Master's Level** projects & papers, Old Dominion University]. https://digitalcommons.odu.edu/ots_masters_projects/46.

21. R. W. Bybee, "Scientific Inquiry and Science Teaching". In L. B. Flick & N. G. Lederman (Eds.), Scientific Inquiry and nature of science: Implication for Teaching, **Learning, and Teacher Education**, 2019, 1 - 10. Springer.

22. R. Chowdhury, "Inquiry-Based Learning as an Instructional Strategy to Increase Student Achievement in Math and Science". **Association of Educational Communications and Technology,** 2018. 177–188.

23. J. Cohen, "Statistical power analysis for behavioral sciences". **Lawrence Erlbaum Associates.** New York, 2013.

24. G. E. Deboer, “Historical perspectives on Inquiry Teaching in schools”. In L . Flick & N. . Lederman (Eds.), Scientific Inquiry and nature of science: Implication for Teaching, Learning, and Teacher Education, 2018

Chapter Two

Review of Related Literature

Introduction

The purpose of this chapter is to review the current literature on school library support and inquiry based approach as determinants for science subject content delivery in private schools in Ekiti State, Nigeria with an emphasis on areas of convergence and divergence. To review the literature, the following subheadings are used:

2.1 Conceptual Review

2.1.1 Concept of Science Subject Content Delivery

2.1.3 Concept of School Library Support

2.2 Concept of Inquiry Based Approach

2.3 Theoretical Review and Framework

2.2.1 Technological Pedagogical Content Knowledge (TPACK) Model

2.2.2 Sociocultural Theory of Teaching, Learning, and Development

2.2.3 Theory of constructivism and inquiry-based approach

2.3 Review of Empirical Studies

2.3.1 School Library Support and Science Subject Content Delivery

2.3.2 Inquiry Based Approach and Science Subject Content Delivery

2.4 Conceptual Framework

2.5 Summary of Literature Reviewed

2.1 Conceptual Review

2.1.1 Concept of Science Subject Content Delivery

Various studies have been carried out to investigate the factors contributing to poor performance in science subjects all over the globe. For instance, a study was carried out to investigate factors contributing to poor performance of science subjects in Kawe Division,

Tanzania. The study showed that the main reason for poor performance were methodology of science education subject among students, inadequate resources such as textbooks and well equipped laboratories. From the finding, students were passive learners. Physics is believed to be one of the oldest and probably the most developed of all the sciences[1]. It employs a systematic scientific methodology of study. Physics is highly regarded in science content since it enhances development of industries and help in achieving vision 2030. Research carried out revealed that most students perceived physics as a difficult subject and associated with failure[2]. Physics employs teacher and learner discussion, group and classroom experiments as a method of study. In physics, emphasis should be on fundamental scientific concepts and principles, experimental approaches of investigation, project and fieldwork to modernize the teaching and learning process. Therefore, the mode of content delivery is supposed to be more heuristic than expository[3].

Over the decades, information communication and technology (ICT) has become popular in learning institutions. Research has been carried out globally to explore the ways of integrating ICT in education. Information communication and technologies have wider field of application and will depend on the context in which they are spoken. For example, we talk of ICTs in education, ICT in banking, ICT in health, ICT in libraries and ICT in various ministries. Since we are living in a dynamic world and the world has been converted into a global village, our offices, schools, homes and basically everywhere is changing very fast due to technologies. Integrating ICT in teaching and learning is therefore critical for this change. By using ICT in learning, it will be observed that there will be higher students` engagement in higher order thinking[4]. Enrolment of physics in Nigeria and particularly in Ekiti state remains very low for years. As students graduated from SS3 two to SS three, they are expected to make choices between the three sciences; Chemistry, Biology and Physics. Since in most Schools chemistry is compulsory, then

there are two choices, Biology and Physics. Most students opt to do Biology. Enrolment of Physics in WASSCE is always less than that of other science subjects. Generally, the students who take physics in most schools are higher achievers hence the mean scores are expected to be higher than those of other sciences which are not the case. Despite the government heavily investment in mathematics and sciences, students' achievements in WASSCE examinations in mathematics and sciences over the year has been dismal[5]. At least 46% physics candidates in WASSCE score D+ and below. Learning physics require learners to be able to handle scientific equipment and apparatus appropriately and with confidence. For this to happen, learners must continuously carry out a variety of experiments in order to develop manipulative observation and recording skills. Where apparatus are not adequate, the teacher could use ICTs tools for simulations to promote these skills.

According to WASSCE report for year 2018 National examination revealed that candidates have difficulties answering an item that required them to determine pressure of air trapped by mercury column[6]. Most of them could not show the relationship between the atmospheric pressure and pressure due to the mercury column and gas. This is because learners were not adequately exposed to practical activities to enhance their manipulative observation and recording skills. According to the training needs assessment survey report the topic waves was rated as the second most challenging by learners[7]. Physics teachers also indicated that the topic was challenging to teach. Physics is critical in development of science technology and innovation (STI). However, the traditional teaching methods characterized by rote learning employed in the teaching of physics does not foster critical thinking, creativity problem solving skills and a holistic learning environment among learners.

Teaching methodology is an integral part of a school system and a veritable tool for students to question, select, analyze and synthesis information resources until they are able to discern paths to new understandings and knowledge construction for the purpose of achieving the educational goals or objectives[8]. This suggests that science teaching methods form a track to a pre-determined goal or objective. A teaching method is the way the facilitator (teacher) helps or guides learners (students) to establish a relationship between themselves and the learning activities. Learning and teaching styles in language, science and technology education in Nigeria was explored by a scholar[9]. They used the index of learning style questionnaire to show that learning styles are varied, while teaching styles are rigid and one-directional. The study recommended an adjustment in teaching styles so as to match teaching with learning styles.

In a study on teaching and learning in science education through ICT, a scholar reviewed various applications of ICT in teaching and learning of chemistry, biology and physics education[10]. The study highlighted problems affecting the full application of ICTs in these science subjects as inadequate funds, shortage of certificated computer teachers, corruption and insecurity. The scholar recommended that government should establish a well-equipped ICT centre in all secondary schools to equip teachers in effectively discharging their duty of teaching. Surprisingly, the study did not identify a school library (which ought to use ICTs) as one of the facilities required to equip the teachers in effectively discharging their duty of teaching. In a study on different learning styles and how teaching strategies need to accommodate these styles for achieving effective education in Nigeria, revealed that teachers do not usually understand the various learning styles of students that could be among teaching strategy[11]. The findings recommended collaborative, intuitive, visual, and independent learning styles to encourage learner-centred education.

In a study on learning styles and teaching in biology, using a biology achievement test and questionnaire to collect data, revealed that biology students taught with guided inquiry have high academic achievement[12]. Taking their learning styles into consideration, adopting inquiry-based approaches to teaching and learning science improves intellectual engagement and nurtures deep understanding through the development of its practical application and research based disposition towards teaching and learning. However, the complex nature of inquiry-based teaching techniques may have influenced its minimal use or acceptance[13]. A comparative study on chemistry students' learning styles in selected public and private schools in Lagos was investigated[14]. The visual-learning style was predominantly preferred among students in both school types. The recommendation was that chemistry teachers should use various teaching styles to accommodate their students' various learning styles. The findings encouraged alignment between teaching and learning styles which will greatly improve the teaching, learning as well as students' performance in chemistry.

In Abuja, Nigeria, a researcher conducted a study on assessment and evaluation of teaching methods used in basic education schools revealing that many schools poorly implemented assessment approaches like concept-mapping, individual projects, group works/assignments and guided discovery[15]. The study recommended a change of teaching method from the conventional lecture/discussion methods (traditional methods) to guided discovery (inquiry). The prevalence of the lecture method in Nigeria may be as a result of training acquired by teachers during their study at colleges of education. A scholar, however, described traditional teaching methods as not effective as they used to be due to the current advancement and evolving landscape in information technology[16].

A conducted research focussing on teaching strategies and its implications for curriculum implementation in science subjects and found that the lecture method of teaching is still predominant at all levels in most schools, and that ignorance is a major challenge to effective application of innovative strategies such as self-directed learning and higher cognitive skills, required for the 21st century education[17]. It was recommended that consistent refresher training for teachers in schools in order to enlighten and motivate them to integrate innovative teaching strategies into their teaching methods. It is on the basis of the weaknesses of the lecture pedagogy in science that several scholars advocate peer instruction as the better alternative to the lecture method[18]. Peer instruction is a research-based pedagogy created for teaching large introductory science class. This method was developed to assist in making lectures more interactive and equally gets students intellectually involved in what is being taught class[18].

It was observed that some "pedagogical practices employed by science teachers in Rivers State, Nigeria and compared science teachers' reports of their classroom practices with their observed classroom practices"[19]. Data collection instruments used were a classroom practice observation checklist and direct observations. The science teachers used various transmissions and constructivist motivated approaches in classroom instruction and there were significant differences in science teachers' reports of their classroom practices and their observed practices. The study recommended science teachers for workshops and seminars that will eventually improve their application of a student-centred teaching method.

Instructional strategies for effective teaching and learning in Nigerian secondary schools was conducted, and revealed that teachers' approaches to teaching do not promote effective teaching and learning[20]. They recommended the inclusion of teachers in

curriculum planning and implementation, to encourage them to bring in student-centered methods/strategies that will make their teaching more engaging and interesting as it is likely to produce more self-reliant students than the traditional teaching approach. Several researchers examined "science teachers' use of innovative strategies for teaching senior school science in Ilorin, Nigeria", with a sample of 256 science teachers[21]. The data collection instrument used was a questionnaire. The findings revealed that of the 36 selected innovative strategies, the majority of the science teachers frequently used only the laboratory and models as innovative strategies for teaching, while other innovative teaching strategies were hardly used. There was no significant difference in the level of science teachers' utilisation of the innovative teaching strategies, based on qualifications and experiences. The study recommended that science teachers should avail themselves of the opportunities embedded in these innovative teaching strategies to improve their students' performance. This topic (science teaching and learning methods in Nigeria) is pertinent to the study as it provides a general overview of various teaching and learning approaches (inclusive of inquiry based approaches) employed by science teachers in Nigeria which is the main thrust of the study.

When a person imparts science knowledge and skills to another, it is common to describe the action as teaching. Imparting may mean to share experiences or communicating information, for instance, lecture[22]. Teaching is regarded as both an art and science. As an art, it lays stress on the imaginative and artistic abilities of the teacher in creating a worthwhile situation in the classroom to enable students to learn. As a science, it sheds light on the logical, mechanical, or procedural steps to be followed to attain an effective achievement of goals. Different educationists hold different ideas regarding the concept of teaching[23]. "Teaching is intimate contact between a more mature personality and a less mature one which is designed to further the education of the latter". "Teaching is to

learning as selling is to buying"[24]. Teaching is arrangement and manipulation of a situation in which there are gaps or obstructions which an individual will seek to overcome and from which he will learn in the course of doing so[25]. Teaching is a system of actions intended to induce learning[26]. Teaching is a form interpersonal influence aimed at changing the behaviour potential another person[27]. Teaching is a system of actions involving an agent, an end in view and a situation including two sets of factors those over which the agent has no control (class size, characteristics of pupils, physical facilities, etc.) and those which he can modify (such as techniques and strategies of teaching[28].

Teaching (content delivery) is an interactive process, primarily involving classroom talk which takes place between teacher and pupil and occurs during certain definable activities[29]. Teaching is a scientific process, and its major components are content, communication and feedback[30]. The teaching strategy has a positive effect on student learning. It is always possible to modify, improve and develop. The new teaching-learning activities, and hence the flexibility is in-built into the system; and "The terminal behaviour of the learner in terms of learning structures can be established by appropriate teaching environments[31]. Teaching is a set of events, outside the learners which are designed to support internal process of learning[32]. Teaching (Instruction) is outside the learner. Learning is internal to learners. You cannot motivate others if you are not self-motivated. Motives are not seen, but, Behaviors are seen. Is learning a motive or behavior? Learning is both a motive and behavior but only behavior is seen, learning is internal, performance is external[33].

Generally, the role of teacher can be categorized into: Traditional Role - Teacher Centered, Modern Role - Facilitator (Student Centered). There has been a change from the Traditional role to the Modern role in the present context. The learning increases when

the teacher builds on the previous experience of the student. However, individual's learning differs and each individual learns at his or her own pace. Identifying the slow learners and individual attention of the teacher may be required. Thus, effective learning is to a great extent based on experiences. Direct experiences are student centered and participation in problem solving. While in indirect experience, the contents are carefully designed and organized by teacher[34]. Objectives are intended learning outcomes written down before the process of instruction. General Objectives - Statement of instructional intent - student ability in general terms. Specific objective statement of instructional intent- student ability in terms of specific and observable, Usefulness of objectives, Elements of objectives, Terminal behavior Condition, and Criterion / Criteria[35].

Writers tend to separate learning into three main groups or domains. These are the psychomotor, cognitive and affective domains. Those skills, which are concerned with physical dexterity, for example changing a wheel and giving an injection, fall into the psychomotor domain. Both of the tasks do need knowledge but, predominantly they are physical skills, which need practice. Knowledge and knowing the 'how' and the 'why', the thinking skills, fall into the cognitive domain. Examples include 'stating the names of the major bones in the body', 'explaining why we have tides'. Both of these require thought processes to be accomplished. The third domain, and one we often neglect, is the affective domain. This is concerned with attitudes. Examples in this domain include 'the need to eat a healthy, balanced diet', 'the need for equality of opportunity for all', and 'politeness'. These deal with feelings and emotions and are different from the examples in the other domains[36]. Effective Learning occurs when these three domains are seen as interdependent. Each of these domains should be developed as part of teaching/ learning session. Teachers should be able to define learning objectives in each of them[37].

Traditionally the role of the teacher has been as a purveyor of information: The teacher was the fount of all knowledge. This suggests a picture of students sitting in rows in front of the teacher who is talking and passing information to students with the aid of a blackboard, while the students either listen passively or, if the teacher is lucky, take their own notes. This, of course, is not true anymore. The modern teacher is a facilitator: a person who assists students to learn for themselves. Instead of having students sitting in rows, they are likely to be in groups, all doing something different; some doing practical tasks, some writing, some not even in the room but in another part of the building using specialist equipment or looking up something in the library. All of the students might well be at different stages in their learning and in consequence, the learning is individualized to suit individual requirements and abilities[38]. This change from the traditional model is the result of a number of factors. First, it is recognized that adults, unlike small children, have a wealth of experience and are able to plan their learning quite efficiently. Second, not all individuals learn in the same manner, so that if a teacher talks to students some might benefit, but others might not. Third, everyone learns at their own pace and not, of necessity, at the pace set by the teacher. Hence, the individualizing of learning has defined advantages. Research into the ways that people learn has not provided teachers with any specific answers. If it had, all teachers would be using the same techniques. However, researchers have identified that learning is generally more effective if it is based on experiences; either direct experiences or experiences that have been read about. Of the two types of experiences, the former is more likely to be effective than the latter. Thus concepts that are able to be practiced or seen are more likely to be learning. To apply this in a practical situation in post-16 education and training, learning is more likely to be effective when it is related to, and conducted in, the knowledge of a student's (work) experience[39].

We need, at this stage, to consider how we as teachers might best provide the experiences so as to make the learning as easy and quick as possible. We might consider two possible approaches to the design of a teaching programme; (i) A programme where the content is carefully derived from an analysis of the student's personal, social and/or vocational needs and which is implemented by you in such a controlled and organized manner that the student is almost certain to learn, and is aware when the learning has taken place. By this method motivation is generated by immediate success and the avoidance of failure. Unfortunately this rarely takes place because it has a fundamental drawback. Apart from the requirement for the students to place themselves in the hands of the teacher and thus tend to develop a relationship of dependency, it confirms to them that learning is a process which is organized by someone who knows better. It does not help students to learn on their own[40]. (ii) The other approach starts from the experience of the student, experience that has taken place as part of life or which has been organized as part of the programme.

It then depends upon the student identifying and accepting a need to learn. Such an approach has been described as 'problem solving', 'student-centered learning', 'participative learning', and so on[41]. The problem with this approach is to ensure that important areas of learning are not omitted and that the 'right' balance is struck between these areas, and that each area is learned as effectively as possible.

Teaching methods which allow this second approach to be implemented include: project work derived from students' current experiences; discussions which allow students to recognize and consolidate what the experience has taught them, and also lead them to identify what else they need to learn and practice; the learning of specific problem-solving techniques which can be applied to a range of situations; activities designed to provide opportunities for specific learning outcomes. Such a list of teaching approaches identifies a second problem associated with the approach; that of (over) concentrating upon the

activities – the practical work which tends to be more enjoyable, and neglecting to recognize the possible learning that can accrue from such activities. The entire structure of teaching has four steps 'Step-I: Planning of teaching which includes content analysis, identification and writing of objectives. Step-2: Organization of teaching which indicates the teaching strategies for achieving the objectives of teaching. Step-3: Identification of suitable teaching learning strategies for effective communication of content. Step-4: Managing teaching-learning, whereby the focus is on the assessment of the learning objectives in terms of student performance, and this forms the feedback to teacher and students[42]. Teaching is a generic term which denotes actions undertaken with the intention of bringing about learning in another[43]. The International Encyclopedia of Teaching and Teacher Education) have classified the concept of teaching into three categories: 1. Teaching as success signifies that learning is implicated in teaching. Teaching entails learning and can be defined as an activity which necessarily affects learning. 2. Teaching as an intentional activity means that teaching may not logically imply learning, but it can be anticipated that will result in learning. 3. Teaching as normative behaviour denotes action undertaken with the intention of bringing about learning. It designates a family of activities: such as training and instructing which are primary members and indoctrination[44]. Training consists of activities that shape skills and other behaviours while instruction and indoctrination go with activities which induce knowledge and beliefs. Teaching can be conceptualized as a form of problem-solving and decision - making which has many properties in common with the work of physicians. This conceptualization has led to a body of research which has investigated the decision - making of teaching focusing in particular on the information about pupils that teachers use to make decisions and the way they tailor instruction to individual pupil needs[45].

The characteristics of teaching are as follows: 1. Teaching is an effective interaction between teacher and students. 2. Teaching is both arts as well as science. Teaching is an art as it calls for the exercise of talent and creativity. Teaching as science involves a repertoire of techniques, procedures and skills, that can be systematically studied, described and improved. A good teacher is one who adds creativity and inspiration to the basic repertoire. 3. Teaching has various forms, like formal and informal training, conditioning or indoctrination, etc. 4. Teaching is dominated by the skill of communication. 5. Teaching is a tripolar process; the three poles are, educational objectives, learning experiences and change in behaviour. 6. Teaching should be well planned, and the teacher should decide the objectives, methods of teaching and evaluation techniques. 7. Teaching is suggesting and not dictating. 8. Good teaching is democratic, and teacher respects the students, encourages them to ask questions, answer questions and discuss things. 9. Teaching provides guidance, direction and encouragement to the students. 10. Teaching is a cooperative activity and teacher should involve students in different classroom activities, such as organization, management, discussion, recitation and evaluation of results. 11. Teaching is kind and sympathetic, and a good teacher develops emotional stability among children. 12. Teaching is remedial, and the teacher must solve the learning problems of students. 13. Teaching helps children to make adjustments in life. 14. Teaching is a professional activity that helps to bring about harmonious development of children. 15. Teaching stimulates students' power of thinking and directs them towards self-learning. 16. Teaching can be observed, analyzed and evaluated. 17. Teaching is a specialized task and may be taken as a set of component skills for the realization of a specified set of instructional objectives[46].

Exponents of Education have analyzed the concept of teaching and have assayed to differentiate teaching from related concepts such as training, conditioning and

indoctrination. Teaching denotes action undertaken with the intention of bringing about learning in another. In this way, teaching is distinguished from mere telling or showing. Teaching involves face to face encounter, and the teacher's actions are conducive to bringing about student's learning. Normally, teaching acts fall within a range of activities that covers explaining, describing, demonstration exemplifying, guiding, etc. By "education" in this context is meant specific information of thought, feeling and action distinct from mere socialization. And the goal of educations is the development of critical reflective agents. It is in this context that teaching is distinguished from related activities such as training, conditioning and indoctrination[47].

Training is used less frequently than either conditioning indoctrination. The focus of training is on the development of skill on knowing-how rather than knowing what. Sometimes training reserved for use in the context of the teaching of routine tasks which allow total mastery. Teaching someone a skill requires developing the learner's capacity to respond to the unexpected, to understand what he or she is doing and why to be intelligent and reflective in the exercise of his or her skill. Conditioning, when compared with teaching, is normally operant conditioning and not classical conditioning. Operant conditioning may seem to be simply a systematic form of training and hence teaching. Common school practices such as giving rewards for good behaviour can be described as setting up a situation in which a reinforcer depends upon the occurrence of a response, and that is the procedure for operant conditioning. Conditioning, in this sense, will have taken place if the probability of the desired response in the particular circumstances increases because of its association in the experience of the child with the positive reinforcer. A child's behaviour could be altered through conditioning without the child being aware of the change or having any notion of why behaving in this way might be appropriate? The particular circumstances. Processes which by-pass human rationality are generally held to

be unacceptable in a programme of education. Such processes seem less like a form of teaching and more like something resorted to when normal instruction fails. On the other hand, such rational processes as a person's learning some fact by reading or hearing statements in its favour and evaluating the evidence can be described as a process of operant conditioning. In this sense, teaching is not incompatible with conditioning students but only with some ways of doing so. Indoctrination, in its generic sense, is considered as synonymous with teaching. Etymologically, indoctrination is related to the teaching of doctrines. A doctrine is a system of beliefs that provide an explanation or interpretation of the world and indicates how humans ought morally to act in light of the general features of existence that the system has identified[48].

To conclude, it may be said that, teaching should not only aim at encouraging beliefs which are supported by the evidence but also at developing the power of students to gather the evidence; assess its adequacy for themselves. A programme of education may include the acquisition of the most reliable methods humans have developed for discovering the truth about themselves and the world. When teaching skills, the educator makes the students aware of reasons for what they are doing and encourages them to be intelligent and reflective in the exercise of their skills. And though the environment may shape the behaviour of students teachers expect students to act because of perceptions of what they ought to do. It is essential to prepare the students for life by developing their capacity, intelligent freedom of choice rather than simply acquiring thought, feeling and action possessed by the learners[49].

2.1.2 Concept of School Library Support

In the 21st century, students are required to possess skills for information literacy (IL) and inquiry, collaboration and curriculum integration to achieve exceptional performance. A

school library is the livewire of the school where curriculum development and other academic activities are supposed to revolve around[50]. "School libraries have mission to ensure that staff and students are effective users of information and ideas. The mission is the provision of intellectual and physical access such as providing as many collections (resources) in many different formats as possible, and being open for students during accessible hours[51].

As espoused by IFLA and institutions, the role of school library as related to information literacy, teaching and learning include: supporting and enhancing the goals and objectives of education as defined in the school's mission and curriculum; instilling the habit of using the libraries for independence lifelong reading and learning in children; provision of opportunities for experiences in creating and using different sources of information for knowledge and understanding; supporting all students with evaluation skills needed for using all formats of information, taking into consideration the medium of communication in the community; creating access to local and global resources and opportunities that expose learners (students) to different ideas, experiences and opinion; providing opportunities for students, teachers, administrators (principals), as well as parents in order to accomplish the mission of the school; advocating the idea that access to various sources of information is necessary to effective citizenship for participation in a democracy; provision of library resources and services to the entire school community and beyond[52].

The school library is a "learning laboratory where technology, information and inquiry come together in dynamic ways that reverberate with 21st century learners"[53]. All over the world school libraries exist as learning environments that provide both physical and digital spaces, access to resources, activities and services that inspire and support students and teachers as well as community learning[54]. Students are expected to use the school library

resources and services anytime. Therefore, the school library provides teachers and students access to various sources of information that support curriculum implementation and exposes learners (students) to diverse ideas, opinions and experiences that could inculcate the habit of reading for information and recreation. It also provides reliable information services to the youth, especially on health, careers, family related issues, violence and crime, finance and other cultural and socio political economic matters[55].

Further, a study was conducted on the role of the library in students' academic motivation in secondary schools in Osun State[56]. Using a questionnaire, they revealed many services rendered by the school library: provision of lending services, newspapers/magazines, arrangement for individual study, provision of computers and internet access, provision of application software on library computers (e.g. Word, Excel), among others. The major factors motivating students academically were relevant library resources and suitable place to study in school libraries. The findings recommended more funding for school libraries to be able to acquire various emerging ICTs for student use as a way of motivating them academically. Similarly, the significance of school libraries in the educational development of students was investigated and revealed that school libraries assist students to develop for themselves the habit of studying independently and learning how to ask questions (inquiry)[57]. The findings recommended the employment of a qualified librarian to provide effective services to users; acquisition of current and relevant information resources to arouse students' interest, proper orientation and, exhibitions and displays to create users awareness of the library service and equally provide adequate study space. Some of the important roles played by the libraries have been highlighted. The role of the school librarian is discussed in the next section.

A school library should be staffed with a full time professional librarian and assisted by library assistants. The library should have current resources; include supports for digital literacy skills development and regular collaboration between librarians and teachers in schools[58]. The major role of the school library is to provide students access to good reading resources that would improve their studies[59]. Moreover, there are different roles being played by different school libraries across the world and school librarians are not hesitating to share their ideas with others. In Indonesia, for instance, the roles of librarians in effectively teaching information literacy were delivered[60]. They state that, for teaching to be successful, school librarians should play some important roles such as: serving as role models for reading, being knowledgeable about book publishing and literary works, collaborating with teachers, being reading advocates and leaders in resource-based learning.

The study on the role of school librarians highlighted the main content specifically taught by librarians, which most subject teachers actually expected librarians to teach as the traditional information skills such as: locating information; using books; taking notes and referencing[61]. It was suggested that school librarians should reconsider their expertise in IL (education) and share more responsibility (collaborate) with teachers (as teachers have content knowledge of the curriculum) to improve student learning[62]. In a comparative study to explore library services in primary and secondary schools in Croatia and Hong Kong, libraries in the two countries offer programmes that assist students' reading and enhance their information literacy and research skills[63]. In addition, library programmes in both countries go beyond the school walls and school curriculum. The services of librarians in the two countries differ in a few cases. For example, while the school librarians in Croatia offer services that involve them in wider community engagement, the

school librarians in Hong Kong apply technology for collection development and library instruction.

One of the expected roles of a school librarian is to offer intellectual, physical and digital access to library resources in all formats – print, non-print and electronic such as; electronic databases, operating systems, storage devices, computer network resources, e-books and computer hardware platforms (American Association of School Librarians, 2016) for use (reading, study, research, consultation) students and teachers as well as the entire school community[63]. With collaboration and meaningful goals, librarians have assisted teachers in identifying invaluable library resources that support lesson development and curriculum implementation. The collaboration has helped in integrating research based assignments into teaching practice, which has ultimately resulted in high academic performance as revealed in several studies across the United States as well as European countries such as the United Kingdom (UK) and Netherlands[64].

New librarianship should be about creation of knowledge rather than storing and retrieving information only[65]. This is the reason some libraries keep their staff and reduce the acquisitions when forced to cut their budgets[66]. Knowledge creation pushes librarians into the role of mentor, coach and teacher in ways that underscore outcomes rather than inputs[67]. School librarians of the 21st century should be actively involved in school instructional programmes such as; curriculum development, information literacy instruction and collaborative teaching[68]. A school librarian helps students in acquiring ICT skills (which sometimes are not taught in the classroom) essential for students in the 21st century[69].

Today's school librarians should perform as collaborative instructional partners by evaluating, planning and teaching with fellow educators. School librarians should also

teach IL skills, that is, teaching of students about accessibility, evaluation, and utilisation of information in the context of their curriculum content. When a school librarian fulfils these roles - active involvement in their school's instruction, students' achievements increase academically[70]. Since school librarian is also anticipated to perform as a teacher. Therefore, they are expected to possess good teaching skills and a teaching qualification[71]. In addition, a school librarian should possess a first degree in librarianship or first degree in other disciplines with at least a postgraduate diploma in librarianship to be able to participate effectively in collaboration[72]. For instance, described the role of the school librarian as a teacher as: the teacher of IL who: selects the IL standards that will be addressed; teaches concepts of information access, evaluation and use; maintains long-term relationships with students from year to year; and fosters an inquiry-based learning (constructivist learning) environment[73]. Part of the role expected of school librarians is guided inquiry. Equally, school librarians are expected to formulate the policy for improving information literacy, which includes a well organised collection of current and relevant resources within the school; internet connectivity; incorporation of community members from the public library to expand resources and generate authentic experiences, and links to experts on different subjects[74].

In developing 21st century citizens who can to locate, evaluate and utilise information effectively required school libraries managed by fulltime qualified librarians. Studies from around the world confirm that a qualified school librarian improves learning outcomes of students regardless of their socioeconomic status. However, school librarians can only perform optimally if they are assisted by support staff library officers, library assistants, and library attendants. Equally, to achieve quality teaching across an entire school required effective school librarians. School librarians provide the resources and services that could impact on every teacher and student[75]. Librarians should be trained to become

school librarians, well versed in pedagogy and curricula. Only by developing an expertise in the educational arena will they be able to collaborate successfully with teachers, be valued as leaders in their schools and fulfil their potential to contribute to the academic success of their students. Teachers need training in IL skills and the techniques of effective inquiry-based learning where students are challenged to engage with the various sources available to them, and to question, select, analyse and synthesise until they are able to discern paths to new understandings and knowledge construction[76].

A school library enhances research, sharing of ideas for teaching and learning. Specifically, a student-centred school library helps students engage in their inquiry-based learning by being an inclusive and community space that enables a variety of learning and easy access to all kinds of resources, including ICTs. Besides, providing new technologies and services, school libraries are expected to offer users a welcoming, safe space to gather their information needs without the pressure to spend money. Therefore, school librarians should always make the school library a creative hotspot, just as it is presently practised in Australia where the *GiggleIT Project*'s free resources are being used to showcase students' writing for an international audience, introduce stories and poems written by children in other countries, and collaborating with teachers within existing curriculum frameworks to enhance global understanding at school. Students share their world with peers in other lands through their writing, photography, and art when school librarians use *GiggleIT Project* lesson plans to foster creativity and authentic learning while encouraging positive expressions of children's own personal knowledge and interests[77].

In Ohio, a study to examine ways in which school librarians and library programmes helped students learn was carried out. Statistically, more than 99% (13,050 sample students) of students confirm that the services provided by school libraries have actually

assisted them (students) in becoming better learners[78]. It was concluded that school librarians in Ohio are agents of; knowledge construction, resources, independent reading, individualized learning, information literacy development, academic achievement, personal development and technological literacy. Secondary school is a place expected to provide students more instruction to develop into independent learners and information-literate individuals, and the assistance provided by school librarians at this level is strong in instilling in students the interest of independent and long life leaning.

Through well-developed knowledge of pedagogy and curriculum, librarians advocate the 21st century learning goals and information expertise that support and implement the vision of the school communities through advocating and building effective library and information services and programmes that contribute to the development of lifelong learners[79]. The school librarian, as educator, provides the needed intellectual agency for developing student's thorough understanding and knowledge through multi-modal experimentation and investigation with information. School librarians assist students to scrutinize information via several ways in a school where appropriate instructions to effectively use the best technology tools that support their performance are provided[80]. Professionally certified full time librarians have prime influence when they: promote reading advocacy; teach IL skills; collaborate with teachers; maintain access to various relevant information resources either local or web-based[81].

In Hong Kong, a study on "the perception of the school administration and teachers about the role of school librarians" was conducted[82]. In the study, three practicing school librarians were interviewed to explore: the fast-evolving current trends in ICTs and the emphasis laid on inquiry-based learning which positive influence school curriculum implementation and the required library support. They found that the trending roles of

librarian include: championing library improvement projects; IL specialists, and offering collaboration and classroom teaching support. The study recommended that school librarians should develop promotional skills as that of marketing managers, self-confidence and self-motivation and not surrender to take up extra work. Further, school librarians should be innovative to relentlessly think outside the box; collaborate with other teachers in other disciplines, possess a self confidence that what they do as professionals would influence on students' academic performance[83].

There is no gainsaying the fact that the school principal's support is paramount to the establishment and maintenance of functional school libraries. The principal who is the instructional leader of the school must offer guidance in the developing library programme. Research has revealed that the leadership of the principal in the library programme is essential to its success. In the USA, focus was on "school principals' perceptions of school libraries and teacher-librarians"[84]. He found that the major problem of school administrators (principals) is their limited and inaccurate knowledge of the importance of school libraries and school librarians in curriculum implementation and academic performance. His findings recommended that school librarians should consistently consult with principals in multiple innovative ways to change their perceptions towards school libraries, since reforming perceptions takes more time, effort and commitment. Many principals do not value school librarians nor appreciate the potential of libraries in student academic performance, since they do not understand what librarians really do. This is due to the fact that many principals themselves seldom used libraries as children and were not exposed to the library's role in the curriculum implementation and academic performance in their professional training. In the professional literature read by some principals and teachers, libraries and librarians have not been given a high profile which does not help

them (principals and teachers) in changing their perceptions of what the library could actually offer them[85].

A study on the principals' perspectives of school librarians and revealed that principals supported the competencies of school librarians, and more than 82% of principals were very satisfied with their librarians[86]. A study about gaining respect and support of school administrators by school librarians, revealed that principal's consideration for the advancement of learners usually revolves around teaching and learning in class. However, this attitude does not take into cognizance that for any effective and quality teaching and learning to take place, library resources, that could assist teachers to present their lessons, must be provided. It is only the trained person who can rightly recommend teachers the relevant information resources for effective presentation of their lessons[87].

In a related study on the principals' perception of the school librarians' role in Australia[88].

The study revealed different ways in which the school librarian significantly contributes to the school development, such as; their role as teachers, providing the principal with advice and ideas with a broad viewpoint on the school library operations; and offering leadership in the use of ICT at the school. Similarly, the school librarian's role as neither a support nor a service but a partner role was captured, because "teaching partners share a stake in both the process and outcome of collaboration as it reflects school expectations and a beneficial practice for student learning"[89]. State of libraries in African secondary schools, especially Nigeria is discussed in the next section.

International studies have unequivocally provided evidence to support the positive impact of school libraries on learners' performance. For instance, a study on the influence of school libraries on academic achievement in Colorado revealed that library resources and staff size were the second best determinant of students' achievement on standardised tests

after poverty[90]. Furthermore, in more than 60 studies carried out in 19 states in the USA and a Canadian province, the major findings of these studies are that students with access to well-supported school libraries with a full-time certified librarian scored higher on reading assessments regardless of their socio-economic status[91]. A study on assessing student learning outcomes in high schools in USA also agreed that there is a significant relationship between libraries and academic performance[92]. All things being equal, in most of the international studies, researchers concluded that, students' performance increases when a school library is stocked, staffed and fully-funded[93].

In study carried out on seminal studies in Massachusetts and Texas respectively[94]. A study established that test scores were higher in schools with library programmes, and that 'the highest performing students were those who attended schools with adequate libraries'[95]. A researcher used more than 200 variables with a sample of more than 500 school libraries in Texas to analyse the relationship between students' performance and the existence of school libraries. She established that, while socio-economic variables explained most of the variance in performance at every level of education, library-related variables such as: collection sizes; staffing and technology all significantly contribute to the overall achievement of learners. The important findings in the study are: school library provision is a necessity and not a luxury; and for any school library to be at its most productive level, its information resources must be managed by a fulltime qualified librarian. However, in a critically reviewed study carried out to examine the copious literature concerning the impact of school libraries on students' academic performance, and implications this impact had on school library advocacy, evidence has not been persuasive to encourage the development of school libraries, because of the erroneous perceptions of administrators and educators who see school libraries as being peripheral to teaching and learning[96].

More recently, a study conducted on change in school librarian staffing associated with change in the Colorado Student Assessment Programme (CSAP) reading performance revealed that students at schools with a professional librarian manage\ing the library programme achieved higher scores in the CSAP reading scores and higher improvements in those scores over time than students at schools with library programmes being managed by non-professional librarians[97]. This shows that having somebody managing the school library is not enough but a fulltime professional librarian is what can actually impact positively students' academic performance.

In Scotland, a study carried out on the influence of school libraries on learning, revealed that school libraries had influence on exam scores resulting in academic attainment; effective curriculum implementation or learning outcomes (academic performance), including information literacy practice, good project work development, and positive attitudes towards learning[98]. Similarly, in a study carried out to compare students from schools with an enriched/equipped school library, that is, one with more up-to-date resources with students from schools with a typical (not well equipped) school library[99]. They verified impacts of an equipped school library on reading motivation and academic skills reading frequency. Students in schools with well-equipped libraries scored higher on a standardized reading comprehension test than students in control schools[100]. With the revelation of studies from several scholars, one can easily conclude that a well-resourced school library is one of the most important factors that determines students' performance in schools[101].

In contrast, in a study to determine whether facilities in schools have an impact on students' achievement, the Government of Pakistan's national assessment report, adopting a quantitative approach and using two instruments, 1) achievement tests in language and

mathematics, and 2) student, teacher and head teacher background questionnaires, revealed the mixed effects of facilities in school, and that the availability of libraries, did not affect students' achievement[102]. In a related development, a study conducted on the impact of school environment on academic performance of secondary school students in Punjab, Pakistan, the researchers did not consider school libraries as an important predictor of students' academic achievement[103]. This could be attributed to the poor condition of most school libraries in Pakistan. For instance, a study on school library development in Pakistan revealed that in primary and middle schools there was no idea of libraries. Only a very few books are kept in closed cupboards in one office, or in a multipurpose room. Students were rarely allowed to use or borrow library books. The period of the library is the same with that of the school period, so very little time is available for teachers and students to use the few available resources in libraries. The libraries were disorganised in the arrangement of space and stock, and managed by unqualified staff[104]. The study recommended, among others, professionals with a librarianship background to manage school libraries.

A study was investigated on the impact of school library services and library utilisation on student performance[105]. The study determined that school library utilisation does impact students' academic performance positively. He recommended broadening the range of information sources and services provided in school libraries through equipping them with enough current and relevant information sources and services in addition to employing adequate qualified library staff. A study carried out to determine the influence library services have on students' performance in the Certificate of Secondary Education Examination (CSEE) in Mtwara Mikindani Municipality[106]. The students from secondary schools with well-equipped libraries performed better in the CSEE than students from secondary schools without school libraries. The availability of well-equipped school

libraries encouraged learning habits and strengthened students' study skills which ultimately resulted in better performance of the students in the CSEE.

In Nigeria, as in other countries around the world, the dissenting opinions that the education standard has fallen has seriously brought about arguments of what could be responsible for the decline[107]. Various factors responsible for this decline in education standards have been debated by researchers and scholars. However, at the centre of these arguments, school libraries have not been recognised by researchers and scholars as one of the significant and viable educational vehicles for national development. Based on the importance of the library as highlighted by the NNPE, it is surprising that secondary schools are still being established without a functional library[108]. Good standard education cannot be achieved in isolation from school libraries[109].

A study on the school library and students' learning outcomes in secondary schools in Ekiti State, Nigeria employed an inventory as the instrument of data collection for the study, which contained information about the level of school library development and secondary school students' learning outcomes in the State[110]. The findings showed that the level of development of school libraries in the state was low, while school library conditions were poor. However, with just an inventory as the instrument of data collection, the findings of the study could not be subjected to the parameters of validity since there was no opportunity for data triangulation. In a study on school facilities and secondary school academic achievement in agriculture in Ekiti State, Nigeria, The study population was final year students, and the data collection method was the West African Senior School Certificate Examinations (WASSCE) results conducted between the years 1990 and 1997 in some secondary schools in the state[111]. In this study's findings there were no significant differences in the students' performance in agricultural science between rural

and urban schools in the state. Both these studies adopted a descriptive survey design. The current study (this dissertation) employs both qualitative and quantitative approaches to enable validity through triangulation of the results.

In a study on "school facilities as correlates of students' achievement in the affective and psychomotor domains of learning in Nigeria" used a study population consisting of all the public secondary school the teachers in South-West Nigeria[112]. The study revealed a positive relationship between the libraries and the students' achievement in the affective domain as well as a positive relationship between school libraries and students' achievement in the psychomotor domain of learning. The study recommended improvement of physical facilities such as classrooms, laboratories, and libraries to improve the students' achievement in these areas (affective and psychomotor domains) of learning.

In a study on the "influence of availability and teachers' utilization of library media resources on the cognitive achievement of secondary school students in social science subjects in Oyo State" reported that providing library resources in the required quantity and quality would influence the students cognitive achievement in social science subjects in senior secondary schools[113]. A researcher study on the "use of school libraries and students' academic performance in selected secondary schools in Ondo West Local Government Area of Ondo State", adopting descriptive survey research, found that students irregular utilisation of libraries as one of the factors responsible for poor academic performance, particularly in English language and mathematics[114]. The study, therefore, recommended a "library study hours" in schools to enable students have a definite time to use the library on a regular basis; and extension of library opening hours to afford the students the opportunity to study after school lecture period. Similarly, a study

examined the "influence of the school environment on secondary school students' academic achievement in Zone "A" senatorial district of Benue State, Nigeria". Their findings identified a conducive school environment, effective school discipline and adequate school physical facilities, such as libraries, as factors that positively influence the secondary schools' academic achievement in the state[115].

2.1.3 Concept of Inquiry Based Approach

Inquiry-based teaching (IBT) can be defined as a pedagogy in which the teacher delivers curricula content via inquiry-based activities and students develop an understanding of the content by participating in actual scientific inquiry[116]. It can also be defined as the teaching process that comprises the methods followed by scientists when doing their studies[117]. Inquiry-based learning is an approach in which students learn by discovery; hence facilitates a deep understanding of the biology concepts and enables students to engage actively in the learning process[118]. Furthermore, Inquiry was defined as the strategy of teaching in which learners seek information or knowledge of certain phenomena with minimal guidance from their teacher[119]. From these perspectives, it can be said that inquiry-based teaching is the way of teaching where students are actively engaged in the process of getting or searching certain planned knowledge or information through various ways used by scientists or inquiry-based activities. These ways include asking questions, formulating a hypothesis, making observations, collecting data, recording, and interpreting, and communicating the results[120].

In the inquiry-based method, teachers are guiders and not any more providers. Students construct knowledge rather than being receivers. The inquiry-based method allows

students to interact with their surroundings and make them able to see the abstract phenomenon in a real sense. So, it facilitates a deep understanding of the scientific content rather than rote learning or cramming. This also makes the learned information to be retained longer in memory hence improving performance[121]. Moreover, the method helps the preparation of future scientists because students normally experienced the usual but diverse ways scientists do to explore natural phenomena[122]. Furthermore, inquiry-based teaching develops among students 21stcentury skills like collaboration, communication, and presentation skills[123].

A scholar discussed how inquiry-support software, the Progress Portfolio, could assistance students to participate in contemplative inquiry[124]. They argued that self-regulation was one of the furthermost life-threatening components of thoughtful inquiry and presented an experiential case of how the Progress Portfolio tool was designed to permit students to develop self-regulated in their learning. Even though there was a rich literature on self-regulation, little had been written about group self-regulation in inquiry-based science. Preliminary results from a study with middle school students show that students did use the Progress Portfolio tool to occupy in self-regulating perceptive activities, such as setting goals, planning, and monitoring their work.

The effect of inquiry based teaching on 8th graders' observations about education atmospheres in the physical science classes was investigated[125]. There were 295 8th graders contributed in the study, in the experimental group included five classes (n=155) that taught with three units of inquiry-based teaching which last for three months. In the control group, teachers castoff the textbooks to clarify five classes of students (n=140). The "What Is Happening In this Class?" (WIHIC) questionnaire was applied in both groups beforehand and afterward eight months to gather students' perceptions about the

constructivist learning surroundings. Results presented both inquiry-based and textbook-based teaching, the inquiry-based instruction would meaningfully.

A scholar investigated the effect of inquiry-based mathematics teaching on extraordinary achievers' met cognitive capabilities[126]. The research subjects were 28 eleventh graders high performance in learning mathematics. An assorted methodology combing qualitative and quantitative approaches was used to examine students' metacognition in an inquiry-based classroom setting. The main research instrument for gathering quantitative data was the Metacognition Inventory questionnaire which was showed beforehand and afterward the inquiry-based teachings. Creation of a new introductory course in Physics to help counter attrition rates in major was described by a researcher. It included three components: research techniques, faculty discussions of their own research and completion of a research project[127]. It was noted importance of having students learning how to do science, not impartial learning about science.

A researcher validated superior enhancements in students' science literacy and research services using inquiry lab teaching[128]. We also originated that inquiry students gained self-assurance in scientific aptitudes, but traditional students' gain was superior prospective menstruating that the traditional curriculum promoted over-confidence. Inquiry lab students valued extra dependable science experience but recognized that undergoing the complication and preventions faced by enthusiastic scientists was stimulating, and explained the extensive reported student confrontation to inquiry prospectuses. A scholar quantified that the knowledge about IR within prescribed courses of study empowered users of search engines to use them additional intelligently and efficiently, while providing the preliminary point for the examinations of new researchers into original exploration technologies[129]. Although IR could be trained in an outmoded style of formal classroom

teaching with students being led through the details of the subject and predictable to replicate this in assessment, the nature of IR as a theme made it an perfect subject for inquiry-based learning methods to teaching. In an inquiry-based learning approach students were familiarized to the ideologies of a subject and then stimulated to develop their understanding by answering structured or open problems. Functioning through resolutions in following class discussions enabled students to escalate the obtainability of different solutions as planned by their classmates. Following this approach, students not only acquire the details of IR techniques, but meaningfully, obviously learnt to smear them in resolution of problems.

2.2 Theoretical Review & Framework

2.2.1 Technological Pedagogical Content Knowledge (TPACK) Theory

Mishra and Kohler came up with a model known as Technological Pedagogical Content Knowledge(TPACK) which is useful in integrating technology in learning process[130]. This model captures the knowledge and skills which the teacher need to integrate technology in teaching[131]. For effective technology integration, teachers need to understand and negotiate the relationship between three components namely: Technology, Pedagogy and Content. Archambault and Crippen[132], TPACK framework shows the relationship that exist between the three components which is a useful organization structure that teachers are supposed to know for effective content integration. There are seven areas considered in TPACK model: first type of knowledge is Content Knowledge (CK) which includes the knowledge and information teachers are required to effectively engage in order to teach and learners expected to learn. Content knowledge in science refers to facts, laws, principles, theories and concepts[133]. In other words, it is the knowledge that teachers have about subject matter students will learn. The second type of knowledge is Pedagogical

Knowledge (PK). According to Koehler and Mishra, these are specialized knowledge teachers have in order to have an effective teaching and learning environment for learners[134]. Teachers should understand learners and have in place all the strategies to use for evaluating them. Third type of knowledge is Technological Knowledge (TK). This is the understanding that the teachers have on how the ICT tools, resources and devices fit in the teaching of science subject.

Shulman argued that a teachers need to have both content knowledge and know how to teach that specific content[135]. This is referred to as Pedagogical Content Knowledge (PCK). The knowledge enables science classroom teachers to apply different strategies and best methods for teaching specific science content. Mishra and Koehler identified another type of knowledge known as Technological Content Knowledge (TCK). This skill will help the teachers to identify the best technologies which will support the students when learning a specific science content. Further they identified another skill which they called Technological Pedagogical Knowledge (TPK). This skill helps the teachers to identify the best technology to use when teaching in order to support the lesson. Finally, there is knowledge that teachers apply when integrating technology to teach specific content. This is known as Technological Pedagogical Content Knowledge (TPACK). This theory is relevant to teaching (delivering) science subject contents among private schools in Ekiti State due to the fact that it explains how a science teacher must have the knowledge of the subject to be taught (both practical and theory) and must know how it is demonstrated to the students for the students to have the required and expected knowledge as spelt out in the subject content.

2.2.2 Institutional Support Theory

This study is underpinned with the theory of institutional support. Institutional support theory was introduced in the late 1970 by John Meyer and Brian Rowan as a means to

explore further how organization's were related and shaped by their societal, state, national and global environment.

Institutional support refers to the part of economic environment of institutions and business (school libraries). It consists of authorities and institutions whose decisions and active support in form of laws, regulations, financial and non-financial assistance brings a lot of changes and development in functioning of any business (school libraries). Institutional support includes financial, emotional and technical supports. The table 1 summarizes the underlying concepts of the framework.

Table 2.1: Underlying concepts of the framework

ITEMS	**Descriptions**
Financial support	Loans, Grants for development
Mentoring	Teaching student library usage
Technical	Internet facilities, computer

Institutional support refers to the extent to which government and its agencies give supports to firms in order to decrease the negative effects of inadequate institutional infrastructure[136], institution and student performance is influenced by institutional support[137]. As depicted in the diagram below, institutional support means active organization (i.e. school libraries in this context) encouragement in form of policies, monetary and non-monetary aids that motivate teachers and students to effectively carry out their duties[138,139,140,141].

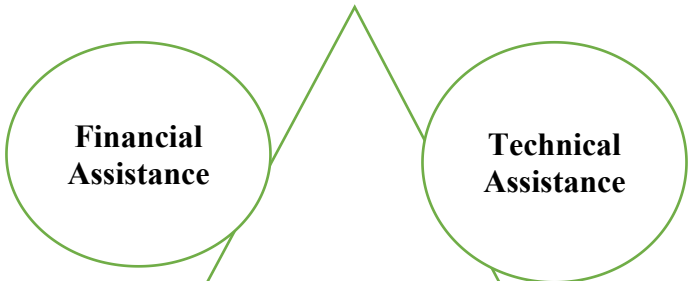


Figure 2.1: Ullah, Biswas & Miah (2021) adopted Institutional Support model

Source: Adapted: Ullah, Biswas and Miah (2021)

Institutional support is a general reflection of the supports, such as implemented policies, programs, financial support, technical support and other support (such as mentoring) from the government and its agencies. It is found that institutional support is often used as a moderation or mediation variable. These findings on the roles of institutional support are also inconsistent[136,142], which makes it hard to understand the effects of institutional support. One possible explanation may be the difference of research samples. For example, the study of [135] focused on new venture companies, while [143,144] explored the effects of institutional support in Chinese high technology companies. However, this study uniquely investigated school library support and inquiry based approach as determinants for science subject content delivery in private secondary schools in Ekiti State, Nigeria.

Institutional, according to the English Advanced Dictionary is defined as an organization similarly long established and respected, particularly one involved with education, public service, or charity work. Support is simply regarded as aid in any field, including

education. However, Institutional support is a functional category that includes day-to-day operational support of the different private secondary schools. Institutional support also includes the general administrative activities, executive activities, legal or fiscal activities and also educational board involvement in the general activities of the school, and likewise the teacher-student relationship in these various private secondary schools. Also, the institutional support includes information technology expenses. Every institution is expected to separate the estimated expenses for the information technology resource as it is believed to be associated with student performance and the general maintenance of every other academic resource.

The term institutional support refers to an essential part of the economic environment of the

academic institution. It is consisted of activities and academic bodies and organization whose decisions and active support in form of rules, regulation, financial and non-financial help, which is believed to effect a lot of positive changes in the functioning of the educational business in various private secondary schools. It has been established by academic researchers that institutional support is an essential factor for successful implementation of any educational innovation.

Assistance Institutional support however is coupled with several indicators that has contributed to its effect in the science subject content delivery outcome. These indicators include, Mentoring, Financial Assistance and Technical Assistance

MENTORING: Mentoring in this context is suitable in the sense that in a school library you have the school librarians, who are responsible for the tutelage of the users. (Users in this context are the private secondary school students) The School Librarians are solely

responsible for every activity carried out in the school library, from the sourcing for materials to weeding, organizing, recommending and even to answering user's queries. According to the five principles of a good library

by Raganathan, its states that;

• Book are for use

• Every user his/her book

• Every book, its user

• Do not waste the time of the user

• The Library is a growing Organism

The library's main aim, considering the above is to serve its users. However, according to certain researchers who doubles as librarians like Kenneth Dike, it has been established that majority of the target users have almost zero knowledge about the library, importance and purpose. However, the place of mentoring as a key factor is established as the Librarian and learned educationist educate target users of the purpose and importance of the library set in place to answer their various queries.

Under Mentoring, the Librarian in charge is responsible for Orientation and sensitization of secondary school students as regards the importance of library resources use, and also operations are put in place to answer their various users' queries. However, these librarians undergo training so as to carry out their responsibilities effectively. When, they get back from the several seminars and trainers, they transmit all they have learnt to these students and according to scholars; a situation whereby knowledge is being shared is regarded as Mentoring. However, in the situation described above mentoring is said to have taken place between the librarian and the user. It is pertinent to note that mentoring, contributes greatly to the positive output of science subject content delivery in private secondary schools.

FINANCIAL ASSISTANCE: Financial assistance is also known as institutional budget. This factor is categorized as the Budgeting phase. i.e. how much is the proposed amount to be put in place for operations, how much money is released to support the proposed operations which includes, building expenses, purchasing of books and even e-resources for the library users, the aesthetics, and even the salary of all the library workers. However, the financial supports that is expected and received form the management is considered and check in this phase. The finance and budget is one of the most important aspect of a project, it is a determinant of the failure or even success of a project, which in this case is centered on the operations of libraries in private secondary schools. The importance of financial assistance in the effective tool to gainfully effect the science subject content delivery in private schools.

TECHNICAL ASSISTANCE: Under this phase, the technical section of the library is responsible solely for operational activities of the libraries. However, the Librarian in charge is expected to be well trained, so as to carry out the expected activities. Some of the major functions of the libraries technical services include processes for acquiring, arranging, indexing, and storing the collection. The technical section plays a key role in the functioning of the library. It makes a bridge between the acquisitions of the documents to the circulation; the technical section in all libraries including the school libraries is solely responsible for the processing of new books to be added to the library collections. However, the efficiency of this phase and section is an important determinant of the expected outcome of the expected subject

content delivery in private secondary schools.

2.2.3. Sociocultural Theory of Teaching, Learning, and Development

Sociocultural theory of teaching, learning and development is the second theory that underpinning this study. Largely inspired by the seminal works of Lev Vygotsky, this theory assumes that human minds do not develop by virtue of some predetermined cognitive structures that unfold as one matures. Rather, this theory posits that human minds develop as a result of constant interactions with the social material world. According to Vygotsky, human mind develops through interaction with materials in the learning process where people learn from each other and use their experiences to successfully make sense of the materials they interact with. These experiences are crystallized in 'cultural tools', and the learners have to master such tools in order to develop specific knowledge and skills in solving specific problems and, in the process, become competent in specific profession. In the library, these tools can be a picture, a model, a pattern of solving a problem or ICT facilities. Most often however, such tools are combinations of elements of different orders, and human language is the multi-level tool par excellence, combining culturally evolved arrangements of meanings, sounds, melody, rules of communication, and so forth[136].

Learning by using such tools is not something that simply helps the mind to develop. Rather, this kind of learning leads to new, more elaborated forms of mental functioning. For example, when students master such a complex cultural tool as human language, this results not only in their ability to talk but leads to completely new levels of thinking, self-regulation and mentality in general. It is the specific organization of this tool that calls into being and in effect shapes and forms new facets of the students' mind. Importantly, cultural tools are not merely static 'things' but embodiments of certain ways of acting in human communities. In other words, they represent the functions and meanings of things, as discovered in cultural practices: they are "objects-that-can-be used- for-certain-purposes" in human societies. As such, they can be appropriated by a student only through

acting upon and with them, that is, only in the course of actively reconstructing their meaning and function. And such reconstruction of cultural tools is initially possible only in the process of cooperating and interacting with other people who already possess the knowledge (i.e. the meaning) of a given cultural tool.

This theory is applicable to school library support in such a way that it explains how available library facilities impact science students' knowledge and enhance their exposure practically due to it establishment on how human being learn by interacting with academic resources.

2.2.4 Theory of Constructivism and Inquiry-Based Approach

This study will be grounded in the theories of constructivism and inquiry-based approach such as the work of Piaget, Dewey, Vygotsky, which could be applied in secondary schools, particularly in science education. The theory of constructivism is the one upon which inquiry is based[137]. Inquiry-based approach (IBA) is primarily a pedagogical method, which requires learners to experience the process of knowledge creation and/or acquisition and was developed in 1960s as an answer to traditional methods of instructional based learning led by the teachers in the classroom[138]. This means, students learn from situations in the world (families, friends, media and libraries) around them to construct knowledge via their interaction or exposure. In so doing, the knowledge base of students is enriched and expanded as their social and communication skills are improved by making a classroom environment that underscores collaboration and exchange of ideas[139]. Further, constructivism is a theory of knowledge that argues that human knowledge and meaning are generated from their interaction between their ideas and experiences. Constructivism also refers to the idea that students created/generated

knowledge for themselves, (that is, applied to explain and understand how people know what they know), and each student whether individually and/or socially creates/generates meaning as they learn[140].

In constructivism, students develop competencies through a process of inquiry and discovery, as they would accept to learn how to think critically and creatively, which will result in discoveries through inquiry, reflection, exploration, experimentation, and trial and error. According to Alberta Learning, "reflecting on the process is integral to all phases in the Inquiry Model Planning, Retrieving, Processing, Creating, Sharing and Evaluating[141]. Reflection should address both the affective and cognitive elements associated with metacognition". These concepts are well illustrated in the diagram below (Figure 1):

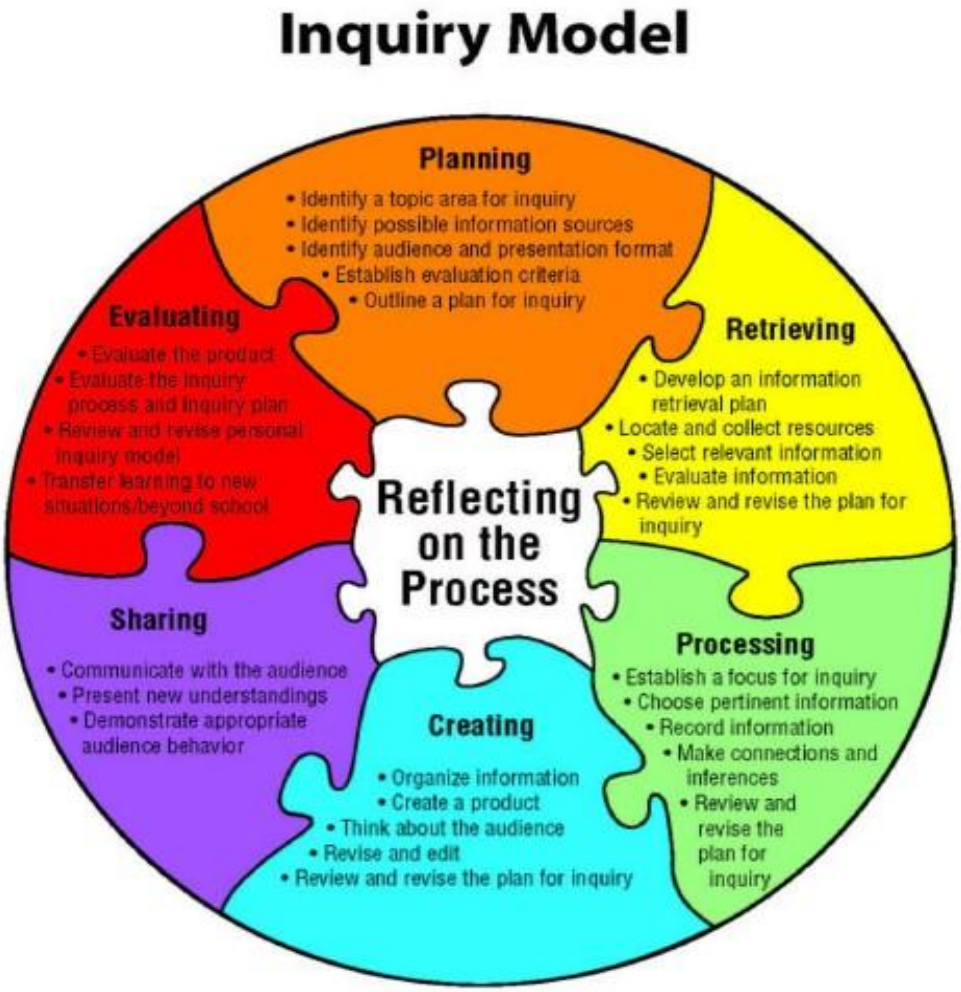


Figure 2.2: Alberta Learning Inquiry Model

Since the 1980s and 1990s school librarianship has passed through many phases from library skills, information skills to information literacy, and now to inquiry as a way of teaching and learning in the 21st century[142]. When guided through an inquiry process by school librarians and teachers, students gain proficiency at each grade level. Guided-inquiry instructional teams develop in students' subject knowledge, research competency and equally foster motivation, language development, cooperative learning, reading comprehension, writing ability and social skills. All these have been recognised for fruitful lifelong learning[143].

Kuhlthau have conducted several studies which provide the field of education with some of the invaluable research on the nature and dynamics of constructivism and inquiry-based learning. For example, he affirms that constructivism helps learners (students) through learning stages as they experience doubt and anxiety when they initiate a search process and begin to explore new information. Besides, the constructivist learning environment steered many librarians and teachers to reconsider approaches to library orientation and teaching methods respectively, as it uncovers the weakness of a teacher centred approach.

Research has shown a widespread application of constructivist principles in teaching and learning science. The theory of constructivism and inquiry-based learning approaches are connected with behavioural and cognitive theorists such as: Jean Piaget, Lev Vygotsky, Jerome Bruner and John Dewey[144]. Constructivism and the pedagogical method of inquiry-based learning has broad applications, particularly in the field of education. For instance, in Turkey, a scholar applied constructivist learning theory in a study: "comprehensive meta-analysis of learners' academic achievement, retention and attitudes"[145]. They concluded that the application of the theory of constructivism and

inquiry-based learning influenced positively learners' academic achievement and high level of retention. Similarly, a study on "the effect of a constructivist learning approach in the field of mathematics assessment", asserts that mathematics education based on constructivist and inquiry-based learning approaches significantly increases the mathematics achievement and academic self-perception[146].

In Korea, a study carried out on "the effects of a constructivist approach on academic achievement, self-concept and learning strategies", which investigated student preferences[147]. The elementary sixth graders were divided into two groups (experimental and control). The constructivist approach was used to teach the experimental group, while the traditional method was used to teach control group. A self-concept inventory, mathematics tests administered by the teacher, learning strategies inventory, and a classroom environment survey were the instruments used. The findings revealed a constructivist environment as learning strategy preferred by students to a traditional classroom setting, and constructivist teaching approach was more effective compared to traditional teaching method in terms of academic performance of students.

In India, in a study on "the effect of a constructivist approach on the achievement in mathematics of IX standard students" revealed that: 1) a constructivist learning approach improves student's achievement in mathematics than traditional teaching approach; 2) a constructivist learning approach was equally effective for both male and female in improving their performance in mathematics; and 3) Students taught in a constructivist learning environment have significant enhancement in their understanding and application abilities[149]. More recently, Pangat's study on constructivist pedagogy and secondary school mathematics students revealed that using a constructivist learning approach improved significantly students' achievement in mathematics in India, than using a

traditional teaching approach[150]. Besides, majority of students were showing amazing improvements in their abilities to understand and reflect.

2.3 Review of Empirical Studies

2.3.1 School Library Support and Science Subject Content Delivery

A survey carried out by Tomlinson showed that science classes should be made more colorful and interesting[151]. These will help the students to leave secondary schools with adequate knowledge and applicable skills in physics. Further, he noted that the use of ICT combined with project, experiments and demonstrations was a promising asset to modernizing the teaching of physics and making it more attractive. Good result in physics is enhanced by change teaching methods[152]. Teachers must spend a lot of time exploring more appropriate resources to teach physics. It was argued that any person preparing to become a teacher must be willing and ready to incorporate ICT into their class[153]. A scholar reiterated that the use of expository method of teaching physics has gone and that integration of ICT is inevitable in a physics class[154]. Information Communication Technology integration into teaching and learning has become the best solution for improving performance in physics. This is because ICT motivates the learners, promotes learner interaction in learning, increasing the effectiveness of teaching especially content delivery and improves the learners' achievements[155]. The purpose of ICT integration in physics teaching is to help in creating, displaying, storing, manipulation and exchanging information[156]. ICT was summarized in three categories namely; learning resources, instructional organization of learning and communication[157].

Research carried out showed that integrating ICT in physics teaching simplified abstract content, created interest in learners. The study also revealed that ICT integration in physics

instructions in secondary schools in Kenya was still very low[158]. ICT allows slide shows projection to make lesson explanation more attractive with many components such as videos, diagrams, photographs, animations and sounds. The instructions can be seen by the students during the experiments, exercises or activities and interactive whiteboard gives them an opportunity to interact. Students can also learn how to perform some activities through observations from video tapes and imitating the same[159]. Electronics, welding and soldering can easily be taught using video clips. These community resources are good learning resources that a teacher can use in teaching physics. It was reported that topics like waves, electrostatics and electromagnetic induction are abstract to both teachers and learners. Materials available like text books, journals, research publication and newspapers are written in an abstract language. This makes the concepts difficult for learners to comprehend.

A scholar's findings showed that internet contains valuable information for students who are willing and ready to get ideas for their projects and assignments[160]. Secondary school learners who used video during physics instructions produced good results compared to those taught using the conventional method only[161]. Some researchers found a significant effect of PowerPoint presentations on prospective Biology teachers' achievement and attitude towards Biology[162]. PowerPoints presentation has significant impact on Biology students' learning outcomes and modes of instruction and thus, recommended that Multimedia Assisted Instruction should be used in the teaching of Biology at secondary schools to improve students' learning outcomes in the subject[163]. It was also stated that teaching based on the use of technology such as PowerPoint presentations had a significant positive effect on learners' scores and their motivation towards learning[164]. Although the use of PowerPoint presentation has been found to be efficacious in enhancing students' learning outcomes in Biology, there is need to carry out studies to

determine the extent of its usage in delivering Biology curriculum contents to secondary school students.

Some studies have been conducted to determine the extent of use of ICT facilities generally in teaching and learning. For examples, some researchers studied the extent of the use of ICT facilities in teaching of Oral English in secondary schools and discovered that teachers use laptop computers, audio-tape recorders, DVD recorders, handset, Desktop computers, internet services, e-mail and MP3 to a very high extent in teaching Oral English, while PowerPoint, digital camera, scanner and television were used to a less extent[165]. This study though in Oral English reported that the extent of use of PowerPoint presentation is low. In a related development, a scholar conducted a study on integrating ICT into teaching and learning Biology, and discovered that most teachers did not use computer technology for instructional purposes[166]. Teachers' inability to integrate computer technology for instructional purposes may be as a result of some challenges.

2.3.2 Inquiry Based Approach and Science Subject Content Delivery

In Jordan, a scholar carried out research on the "effect of using the constructivist learning model in teaching science and scientific thinking of 8th grade students"[167]. The findings revealed "that there is a statistically significant difference at (α= 0.05) for the effect of the constructivist learning model on the achievement and scientific thinking in favour of the experimental group". The study therefore recommends paying more attention to adopting of constructivist learning approach for teaching science courses. In Orlando, United States, some researchers study on "implementing participatory, constructivist learning experiences through best practices in live interactive performance" equally affirmed that constructivist and inquiry-based learning approaches greatly influence high academic

performance, since it creates room for non-threatening situations which are relevant for academic performance in science[168].

A scholar conducted a study on "teachers and librarians collaborating on inquiry-based science instruction"[169]. The study suggests how teachers and librarians learn to collaborate on inquiry-based science lessons that connect science, information literacy, and structured English immersion standards for Latino elementary students. Findings show that considerable time and experience are required to prepare teachers and librarians to collaborate on instruction. Also revealed in the study is apparent lack of experience with inquiry-based science, particularly in schools with a culture of direct instruction. Also, the study reveals the teachers' lack of awareness of librarians' role as instructional partners. The study recommended smooth communication between the professions (librarianship and teaching) for successful implementation of teacher and librarian collaboration which could boost student achievement in science.

A scholar examined "the effects of inquiry-based learning on the academic achievement, attitudes, and engagement of fifth-grade science students"[170]. Respondents were from two science classes (N = 42). The experimental group received IBL instruction, while the control group received traditional instruction. Pre-tests and post-tests were used to measure academic achievement of students during the 6-week study. The science attitudes survey was administered to students' pre-intervention and post-intervention to assess overall attitudes of students about science. Students in the IBL group scored higher than students in the traditional group on the academic achievement post-test, although not statistically significant. Students who received IBL instruction showed a slight statistically insignificant decrease in their positive attitudes towards science but higher engagement as compared to students who received traditional instruction[171].

In Ghana, a scholar investigated "the role of the school library in teaching and learning"[172]. The study which is underpinned by the theory of constructivist learning, found that strong teacher and librarian collaboration provides significant mediation opportunities for students to build their own meanings and understanding from the library resources accessed. The two studies however, affirmed the strength of constructivism in the process of librarian and teacher collaboration as well i and learning science[173].

In Nigeria, a researcher studied the "effect of a constructivist instructional approach in biology", and revealed that the approach was more active in facilitating the students' achievement in ecological concepts[174]. Similarly, "constructivist teaching strategies in integrated science at secondary school level in Ogun State, Nigeria" was studied[174]. They revealed that the students being taught with a constructivist approach scored higher marks on the post-test and the delayed post-test compared to students taught with traditional method (lecture) of teaching. The findings recommended incorporation of constructivist-based approach into teacher's methods of teaching.

In a study, it was revealed that there is a strong positive link between teaching method and subject content delivery[175]. Schools that possess more different teaching methods in learning better than schools that don't have diverse method of teaching. This finding supported the study that private schools performed better than public schools because of the availability and adequacy of teaching and learning resources[176]. There was a low level of instructional resources available in public schools and hence commented that public schools had acute shortages of both teaching and learning resources. He further commented that effective teaching and learning cannot occur in the classroom environment if essential instructional resources are not available.

The quality of instructional processes experienced by a learner determines quality of education[177]. In their view they suggest that quality instructional materials create into the learners quality learning experience. It was also supported by another scholar that students' performance is affected by the quality and quantity of teaching and learning resources[178]. This implies that the schools that possess adequate teaching and learning materials such as textbooks, charts, pictures, real objects for students to see, hear and experiment with, stand a better chance of performing well in examination than poorly equipped ones. A study on the physical facilities and teaching learning materials in schools in Tanzania supports the above views[179]. Teachers and students were interviewed on the role of instructional materials on effective learning. From his study he learned that performance could be attributed to adequate teaching and learning materials and equipment that are in a school. He recommended that in order to provide quality education the availability of sufficient quality facilities is very important. In another study which directly linked the role of physical facilities with students' academic learning in schools, only physical facilities were focused on, leaving out instructional materials[152]. To me, physical facilities such as buildings including classrooms, chairs and desks are not enough to provide quality teaching and learning. Instructional materials are also necessary. A study agreed on my ideas that, in order for a school to have a good performance it must be well equipped with relevant and adequate text books and other teaching and learning resources[180].

A research study tilted: "The availability and utilization of instructional materials in the teaching of agricultural science in selected secondary schools in Lagos State" was carried out[181]. The target population was two hundred and fifty (250) secondary schools out of which, twenty-five (25) secondary schools were selected as the samples using systematic sampling. The instrument used in collecting the data was questionnaire. Five (5) null

hypotheses were stated which were tested using the Average Weighted Response (AWR) test statistics at 1.00 level of significance. All the five (5) null hypotheses were accepted. The results showed that the teaching of agricultural science in selected secondary schools depended on the availability and utilization of instructional materials which had negative relationship in the teaching of agricultural science in selected secondary schools in Lagos State[182].

A research study tilted: "Utilization of teaching aids in the teaching of vocational agricultural science in secondary schools in Osun State" was carried out[156]. The target population was two hundred and thirty-one (231) secondary schools out of which fifteen (15) secondary schools were selected as the sample by simple randomization. Five (5) null hypotheses were stated which were tested using correlation coefficient test statistics at 0.68 level of significance, and all the five (5) null hypotheses were rejected. The result showed that about 60% of the respondents made use of the teaching aids effectively which had positive relationship in the teaching of vocational agricultural science in secondary schools in Osun State.

A research study titled: "Effects of Instructional Materials on Students' Performance in Geography in selected Secondary Schools in Ilorin South LGA of Kwara State" was carried out[183]. The target population was fourteen (14) secondary schools out of which eight (8) secondary schools were selected as the sample by simple random sampling. Three (3) null hypotheses were stated which were tested using correlation coefficient test statistics at 0.8 level of significance, and all the three (3) null hypotheses were accepted. The results showed that about 80% of the respondents did not make use of the instructional materials appropriately which had negative effects on the performance of students in Geography in Secondary Schools in Ilorin South LGA in Kwara State.

A research study titled: “Effects of Instructional Materials’ Usage and Teachers’ Quality on Students’ Academic Performance in Science in Senior Secondary Schools in Zaria LGA in Kaduna State” was carried out[184]. The target population was fifteen thousand four hundred and thirty (15,430) senior secondary school students from twenty-four (24) secondary schools in Zaria LGA and one thousand and thirty-three (1,033) teachers. Sample of eighty (80) students were randomly selected with nine (9) teachers. Three (3) null hypotheses and three (3) research questions were formulated to guide the study. T-test statistical tool was used in testing the null hypotheses at 0.05 level of significance. The findings revealed that students performed better when appropriate and improvised materials were made available and utilized in teaching science and teachers possessing good qualifications enhanced students’ performance in science.

The factors affecting the instructional materials usage were discussed. Among which included number of learners or students involved, the space of time available, facilities and materials available, interest and ability of agricultural science teachers and effectiveness of instructional materials. Also, the problems militating against effective use of agricultural instructional materials were equally treated which included emotion and feelings, self-concepts or personal or audience perception, educational level of the learners or students’ cultural background, motivation, etc. Some of the criteria for selecting and evaluating instructional materials were treated as seen or observed in our secondary schools or as related to the materials which included purpose, availability and durability, appropriateness and cost effectiveness[185].

In a researcher’s study it was revealed that a strong positive link between instructional resources and academic performance[186]. According to the researcher, schools that possess more instructional resources performed better than schools that have less instructional

resources. This finding supported the study by a scholar that private schools performed better than public schools because of the availability and adequacy of teaching and learning resources[187]. The researcher noted that there was a low level of instructional resources available in public schools and hence commented that public schools had acute shortages of both teaching and learning resources. He further commented that effective teaching and learning cannot occur in the classroom environment if essential instructional resources are not available. Another scholar suggested that the quality of instructional processes experienced by a learner determines quality of education[188]. In their view they suggest that quality instructional materials create into the learners' quality learning experience. A scholar also supports that students' performance is affected by the quality and quantity of teaching and learning resources[189]. This implies that the schools that possess adequate teaching and learning materials such as textbooks, charts, pictures, real objects for students to see, hear and experiment with, stand a better chance of performing well in examination than poorly equipped ones.

A study on the physical facilities and teaching learning materials in Primary schools in Tanzania supports the above views[190]. Chonjo interviewed teachers and students on the role of instructional materials on effective learning. From is his study he learned that performance could be attributed to adequate teaching and learning materials and equipment that are in a school. He recommended that in order to provide quality education the availability of sufficient quality facilities is very important. His study was one of its kinds in Tanzania which directly linked the role of physical facilities with students' academic performance in primary schools. However, he focused only on physical facilities, leaving out instructional materials. To me, physical facilities such as buildings including classrooms, chairs and desks are not enough to provide quality teaching and learning. Instructional 20 materials are also necessary. Another study also agreed with my ideas that,

in order for a school to have a good performance it must be well equipped with relevant and adequate text books and other teaching and learning resources[191].

Teachers in community secondary schools most especially in rural community schools face some challenges in accessing instructional materials. One of the big challenges that teachers in community secondary schools face in accessing instructional materials is meagre funds provided by the government to community secondary schools for purchasing instructional materials. Community secondary schools depend to the large extent on the government for funding. Very little support is received from local government and communities around the schools most especially in rural areas due to poverty. The funds are provided in form of capitation grants. The capitation grant is aimed at improving the quality of education by making sure that sufficient leaching and learning material are found at school level. In particular, the capitation grant is meant to finance the purchase of textbooks and other teaching and learning materials as well as to fund repairs, administration materials, and examination expenses[192]. However, while the number of students who are enrolled in schools has been increasing each year, education capitation grant has been dropping. Even without adjusting for inflation, the actual amount of money reaching schools for capitation grants is clearly much less today compared to what it was between 2002 and 2003.

According to the Education Public Expenditure Tracking Survey of 2004, in the period 2002-2003 schools received an average of 5,400 shillings per pupil. In 21 2007/08 however, the money actually reaching the schools had declined to 4,189 shillings per pupil[193]. This amount of money is grossly insufficient to purchase a minimum set of textbooks apart from other instructional materials which are highly needed by the teachers. According to a researcher, government's Policy towards efficient provision of these

aspects of educational resources has not been encouraging and has always not been well planned, monitored, supervised and evaluated with rural schools as the back bench of implication of these policies[194]. Another challenge that teachers face is the lack of exposure and limited accessibility to modern instructional facilities. Most community secondary schools especially in rural areas do not have access to information communication technology (ICT) which could alleviate shortage of instructional materials. As we are in a new millennium, there is an increased awareness of the need to use modern scientific approach in teaching and learning processes in our schools.

At present, there is a universal recognition of information and communication technology as a major force in the dissemination of knowledge[195]. Majority of teachers who were trained early 1990's and backward do not have skills in the field of Information and Communication Technology. Where there are skilled teachers, other problems naturally include problem of installation, maintenance, operation, network administration and local technicians to service or repair these equipment and the other facilities. In most of the rural secondary schools, most of the facilities are non-existent, hence the traditional chalk and duster approach still dominates in secondary school pedagogy[196]. 22 Poor salary is also another challenge that teachers face. Teachers like most civil servants in Tanzania are poorly paid. This becomes a hindrance for them to purchase their own teaching materials or acquisition of new ideas, skills and knowledge by failure in enrolling for further educational programmes including Information and Communication Technology (ICT). With this, the academic and intellectual capacities of teachers and learners are bound to be affected substantially during classroom interaction[197]. Lack of sufficient skills and creativity may hinder teachers to improvise their own instructional materials. Local governments and communities around community secondary schools are supposed to provide resources most especially funds to these schools so that teachers can use them to

access instructional materials. But very often this is not the case due to number of reasons. Some local communities have very narrow tax base.

Also the performance of local councils in the collection of their own revenue have been recorded very poor. According to a researcher there are few types of councils in Tanzania, which can manage to collect government grants[198]. Many local authorities however have found themselves unable to deal with such a rapid increase in expenditure and their budget deficit increase. Education is one of the sectors, which are mostly affected by this situation. Poverty is another reason, which may hinder members of the community in supporting teachers and schools financially so that they can access instructional materials. According to another study, Parents and community's participation differ from rural to urban communities and from one mode of economy to another[199]. Parents who are involved in cash crops economy have economic ability to 23 finance education compared to parents who are not involved in cash crop economy. For example, pastoral communities such as Masai have displayed poor financing strand for their children. Teachers who work in such areas have more challenges in accessing instructional materials. Another challenge that teachers face in accessing instructional materials is lack of clear policy and monitoring mechanisms to ensure that enough funds are provided to community secondary schools for purchasing instructional materials and also these funds are used for the intended purpose.

According to the comments of a scholar, government's Policy towards efficient provision of these aspects of educational resources has not been encouraging and has always not been well planned, monitored, supervised and evaluated with rural schools as the back bench of implication of these policies. There are a number of strategies, which can be used in order to minimize the challenges of attaining and using quality instructional materials[200]. According to studies done in different parts of the world including Africa, one of the

strategies is improvisation of instructional materials. A scholar states that improvisation involves sourcing, selection and deployment of relevant instructional materials into the teaching-learning focus in the absence or shortage of standard materials for a meaningful realization of specified educational goals and objectives[201]. According to some studies, creation of improvised media of low technological 24 materials and resource-centred learning can enlarge the limited knowledge base of any course of study and enrich instruction to a guaranteed quality[202]. It can also promote strategies that ensure the integration of technology in the teaching and learning process of basic science education. Their findings are in agreement with the findings of another scholar who observed that using technologies like simulation devices open new horizons for individual learning tools, the environment resources and services[203]. The use of ICT can also minimize some of the challenges in accessing instructional materials.

According to UNESCO (2004), the use and rapid spread of electronic communications has the capacity to affect the quality and efficiency of basic education throughout the world[204]. The ease with which teachers and students can gather information over the Internet on virtually any topic has the potential to transform instructional content and pedagogical practice. Moreover, courses developed by the best teachers in one country can be made available to students across many countries. Newer technology-based instructional strategies, incorporating the Internet and the World Wide Web (WWW), can therefore be used more to expand communication and increase access to resources. A scholar points out that ICT has potentials in increasing access and improving relevance and quality of education in developing countries[205]. He further states the potentials of ICT as follows: ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems.

A study surveyed support the hypothesis that student academic performance depends on a number of factors. Findings from studies identify students' effort/persistence, academic ambition, previous grades, parents' education, parents academic ambition for their wards, sex of the child, age of student, peer influence, and personal effort, academic ambition as factors that have a significant influence on the students' academic performance[206].

The Organization for Economic Cooperation and Development (OECD) has published the results of the international PISA 2012 with the participation of Peru among other 65 countries or territories. PISA (acronym for Program for International Student Assessment) is held every three years. It tests 15-year-old's competencies in mathematics, reading and science. PISA 2012 focused on mathematics, that is, the assessment presented more questions in this area, along with Reading and Science questions. In Peru, a nationally representative sample was assessed. This sample included 6035 15-year-old students, from 240 secondary schools or similar institutions in all regions of the country. Public, private, urban and rural institutions were included. While it is true that international comparisons make a significant contribution to the debate on quality of education, they should not be considered only as the final study on educational accomplishments. The results achieved by Peru in PISA 2012 in Mathematics are low. Peru's average score was 368 points. According to performance levels, PISA places students in 6 levels. On average, the assessed Peruvian students are located at Level 1, although a significant percentage (47%) is below level 1. In Science, the situation of Peruvian students is similar to that in mathematics. A score of 373 was obtained and, on average, students are also at Level 1[207].

Regarding reading competencies, while our students showed low results in PISA 2012 compared to other Latin American countries participating in PISA, a steadily progress

over the last 11 years is reported in this area. Between 2001 and 2012 the Peruvian average has increased from 327 to 384 points. In the previous cycle, PISA 2009, we have increased in 14 points which is the highest progress among Latin American countries participating in PISA[208].

We share a findings formulated in PISA School failure and educational reforms. He states that it is a falsehood that the PISA report evaluates competencies. The truth is that this assessment does not evaluate, but it examines based on a competency-based model which is no longer reduced to three subjects, but to certain aspects of these three subjects. For instance: language tests do not imply that the student writes a minimum text at any time. Students only have to choose between options, that is: objective tests of text type, which can often be guessed by chance. These are a tests taken out of context that do not even measure what they say they measure, and these tests are performed in samples of population that are not representative of the group, since there is no group as such. The diversity of students, teachers, families, educational centers, autonomous communities and countries is so large that it invalidates these types of very standardized tests that do not really say anything, no matter how many experts persist in using them to explain the same thing that they could argue without them. Actually, they do not contribute to education and its improvement, especially when what is published in the media is entirely superficial and it lacks intellectual rigor[209].

In this vein, points out, referring to SIMCE (System for Measuring the Quality of Education, Mexico), that this type of tests "don't not measure the complexity of human learning, but the behaviors of training in issues that become the foundation of the curriculum content. This creed which involves tests like SIMCE do nothing but accept a poor and distorted understanding of students' progress." "School failure" is not tackled with exams and school systems do not improve by taking tests nonstop. Failure and

success are market concepts which have never been considered in the educational world and we have to avoid the strong negative component they both imply. We observed a positivist bias that a scholar describes with these words: "It is studied what fits best in the method, which is best measured, while what it is not so easily quantifiable is invisible." In this case, PISA has the positive aspect of explicitly stating its approach, and thus it doesn't intend to evaluate education as a whole, it doesn't even intend to make of it assessment the most important fact in education[210].

Teaching methods are the means or procedures that teachers use to aid students in having an experience, mastering a skill or process, or in acquiring an area of knowledge[211]. In addition, methodological competencies could further be characterized based on their functional elements: to adapt to effective work methods; to analyze the task to be performed; to begin the process; to perform the task and to analyze one's procedures[212].

Different pedagogies could be used for lesson presentations in public senior secondary schools. Some of such methods include classroom discussion, discovery/inquiry, lecture/exposition, demonstration, collaboration, critical thinking, problem solving techniques, role play method, individual/group project, simulation and games, instructional scaffolding and excursions. The discussion/question and answer method employs the art of seeking information and stimulating thinking and elaboration at all levels of human reasoning to achieve given objective. The demonstration method requires teaching by displaying the instructional situation with an audio-visual explanation of an idea, process or product. It involves showing, doing and telling the students the point of emphasis and performing an activity so that students can observe how things are done in order to help prepare them to transfer theory to practical application[213].

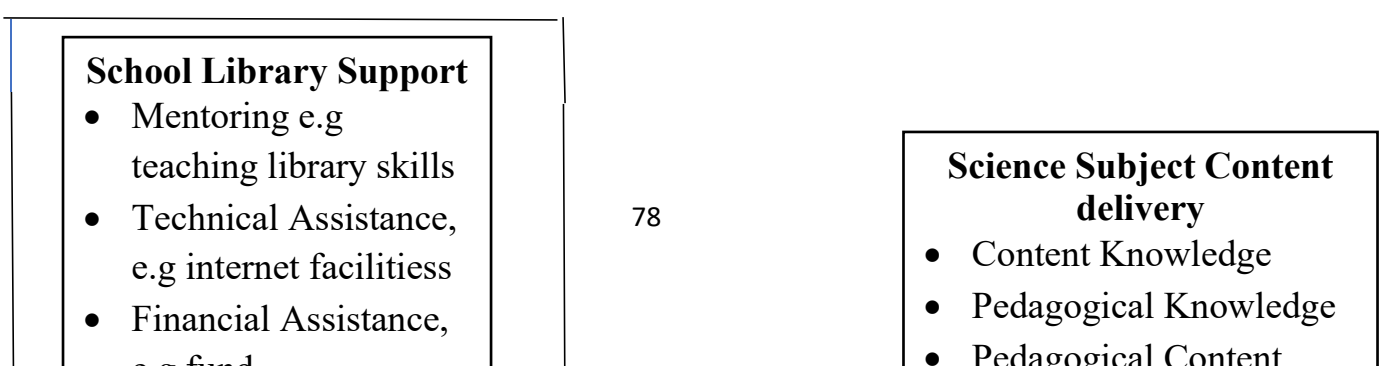
Most studies use the distinction between declarative (knowing that) and procedural knowledge (knowing how)[214]. This approach is relevant as it focuses on understanding how knowledge is related to behaviour, or in other words, the quality of teaching performance. An investigation into the knowledge of teachers as 'learning specialists' involves understanding how this knowledge functions in the teaching-learning process; more specifically, how teachers' apply their knowledge in making decisions, for example, about lesson design or making on-the-spot judgments in the classroom. A set of research studies conceptualizes the teaching profession as a 'clinical practice profession' and compares it to the medical profession. Some argue that decision-making is actually a basic teaching skill as decisions are made regularly by teachers while processing cognitively complex information about the student in order to decide alternatives for increasing their understanding, thus, making good pedagogical decisions hinges on the quality of the pedagogical knowledge held by the teacher. Therefore, there is no doubt whatsoever that a

teacher with the right skills for teaching should be able to manage his time and classroom effectively and efficiently using the appropriate teaching techniques. The problem solving method can easily be compared to the questioning/development method, because both methods use questions to get answers from students[215]. The problem solving method presents a problem first through formulating hypotheses, exploring mechanisms, developing and researching learning issues, and applying new information to the case.

Again, they learn by trying different approaches to solving problems such as the role play method. One or more students adopt a specified role and try to play the role. The method according to the University of New Mexico School of Medicine (2015) develops problem solving and verbal expression skills of students, provides practice to build skills before real-world application and when real experiences are not readily available, can provide an entirely new perspective on a situation and develop insights about feelings and

relationships and improves the likelihood of transfer by learning from the classroom to the real world[216]. However, most scholars have argued that most classroom instructional delivery in most subjects are dominated with the traditional teacher-centered approach which is the lecture or expository method of teaching[217]. The aforementioned scholars are of the view that it does not give students the opportunity to generate their own ideas and test hypotheses. It was therefore concluded that this form of instruction and learning hampers creativity and does little to foster innate abilities for problem solving and decision making[218]. Another scholar revealed that the in-depth pedagogical knowledge of teachers make them able to use various methodologies suited to deliver a lesson[219]. The full understanding of content makes them confident about selection of teaching strategies and skills which are best for student understanding. Furthermore, teachers are expected also to demonstrate a thorough understanding of the content of their curricular areas. They should be able to communicate this content material to students using methodologies that are appropriate for the age and abilities of the learners[220]. In the same vein, a scholar in an empirical study found that pedagogical skills to a high extent influence students' academic performance as well as no significant difference between the mean responses of male and female SS2 students on the extent teachers' pedagogical skills influence students' performance in public senior secondary schools in Port Harcourt Metropolis of Rivers State[221]. This was translated to mean that pedagogical skills of the teacher enhance students' academic performance.

2.4 Conceptual Framework



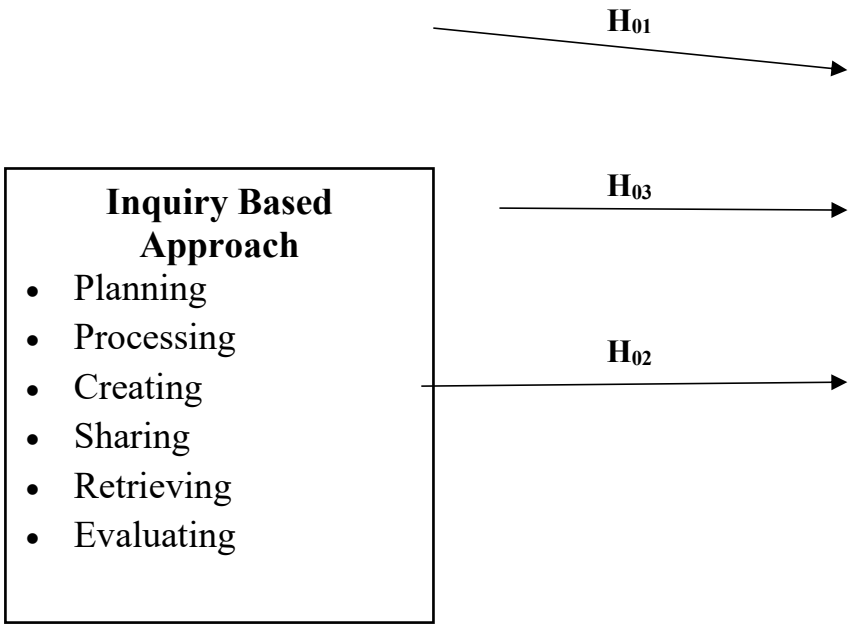


Figure 2.3: Conceptual Framework of Institutional Support

Source: Researcher, 2022

As conceptualized diagrammatically above, the dependent variable is Science subject content delivery with five measures which are content knowledge, pedagogical knowledge, pedagogical content knowledge, technological content knowledge and technological pedagogical knowledge; these five measures were adapted[132]. The first independent variable is school library support which is measured with library resources, library personnel and library services while the second independent variable is inquiry based approach measured with communication, evaluation and demonstration. In the first hypothesis, the measures of school library support which were adapted[136] will be tested on the measures of Science subject content delivery in private schools in Ekiti State, in the second hypothesis, it indicates that measures of inquiry based approach which are planning, processing, creating, sharing, retrieving, and evaluating[142] will be tested on the measures of science subject content delivery while the third hypothesis indicates the combine influence of the two independent variables (school library support and inquiry based

approach) will be tested on the measures of science subject content delivery in private schools in Ekiti State, Nigeria.

2.5 Summary of Literature Reviewed

This chapter has reviewed related literature relevant to this research work. The reviewed literature on concept of school library support and inquiry based approach as determinants for science subject content delivery in private schools in Ekiti State, Nigeria, explores empirical findings and discusses different context and criteria of science subject content delivery. The literature review reveals that learning and teaching paradigm in the educational sector as core component of content delivery which determines the performance and or otherwise of education received by the science students.

Literature is replete with various meaning of content delivery sector with increased clamour for use of library and inquiry based approach for teaching science students. The extent to which the content or the results of the education provided (learning acquired by the science students) meet the standards stipulated in the system's educational objectives; and the extent to which the contents acquired are relevant to human and environmental conditions and needs. Further, the notion of content delivery should also consider such determinants as provision of teachers, buildings, curriculum, equipment, textbooks, and the teaching process. This view of content delivery by teachers implies that quality cannot be measured by looking only at the outcome which is examination results. Rather it should consider the analysis of the internal efficiency of the school system, which enables control for wastages that come in the form of school dropouts, repetition rates, poor examination results, low survival rates, average study time per student, and wastage ratios. It was submitted that content in science subjects is dwindling or continuously decreasing among

private schools in Ekiti state due to decline investment in library, provision of adequate equipment and recruitment of substandard teachers. Review of literature on content delivery in this study has revealed paucity studies on core variables influencing continuous retrogression of academic performance of science students in Nigeria especially among private secondary schools in Ekiti State, Nigeria.

A study responds to the recent calls for more quality in science subject content delivery on issue like learning and acquiring the right knowledge through both theory and practical relationships with other types of learning synchronous patterns of adoption of technological and non-technological learning, and effects of their joint adoption on inquiry based approach to teaching science subject. More generally, it tackles the gap identified by the researcher in the lack of a comprehensive study of science subject content delivery in the literature. A step was taken in the direction by developing a conceptual model of school library support and inquiry based approach as determinants for science subject content delivery in private schools in Ekiti State, Nigeria of students to advance a more nuanced understanding of the antecedents, synchronous patterns and effects of library support on quality content. In doing so, we argue and confirm the dual role of internal and external knowledge in the generation of quality science subject content, the cumulative nature of the generation of content delivery, complementarity between school library support and inquiry based approach.

Endnotes

1. A. A. Adeogun, “The principal and the financial management of public secondary schools in Osun State.” **Journal of Educational System and Development.** 5(1), 2020 1-10.

2. J. S. Akingbade, “Students’ Perception of the Availability and Utilization of Information and Communication Technology (ICT) in the Teaching and Learning of Science Subjects in Secondary Schools in Ekiti State, Nigeria”. **International Journal of Education and Literary Studies.** 1(1). 2013. 5-8.

3. T. Anderson, and F. Elloumi, “Theory and Practice of online learning”. Canada: Athabasca University, 2008.

4. W. Annie, W. Stoker and M. Mildred, "Achievement and Ability Tests - Definition of the Domain", Educational Measurement 2, **University Press of America,** 2018.2–5,

5. K. O. Ezeoba, “Instructional Media. An Assessment of the Availability, Utilization and Production by Nursery School Teachers”. **Journal of Applied Literacy and Reading, 3(Special Edition)**, 2007. 33-38.

6. D. Fakeye, “Assessment of English language teachers’ knowledge and use of Information Communication Technology (ICT) in Ibadan Southwest Local Government of Oyo State”. **American-Eurasian Journal of Scientific Research,** 5(4): 2020. 270-276.

7. Federal Government of Nigeria, Universal Basic Education Act. NERDC, Lagos, 2018.

8. T. Goshit, Nigeria's need for ICT: SP. 259 “technology and policy in Africa”. http://ocw.mit.edu

9. D. Gouch. “Investigating critical and contemporary issues in education/students’ academic performance. A case study of senior secondary schools in Kassena-Nankana District”. **Journal of Social Science**, 2019. 4(4).

10. P. M. Heathcote, A Level of ICT. **Payne-Gallway publishers,** West Midland, 2018.

11. S. Ibrahim. “Impact of Accounting Background, Gender and Motivation on Performance of Business Education in Introductory Accounting in Federal Universities Nigeria” **Unpublished Doctorate Dissertation** Presented to the School of Post Graduate Studies, Ahmadu Bello University, Zaria, 2018.

12. R. Colom, and R. Lynn. “Testing the developmental theory of sex differences in intelligence on 12-18 year olds”. Personality and Individual Differences, 36, 2018. 75-82.

13. G. Considine, and G. Zappala, “Influence of social and economic disadvantage in the academic performance of school students in Australia”. **Journal of Sociology**, 38, 2020. 129-148.

14. R. Crosnoe, & G. H. Elder, “From childhood to the later years”. Pathways of human development. **Research on Aging,** 26, 2018. 623-654.

15. L. Darling-Hammond, Teacher quality and student achievement: A review of state policy evidence. **Educational Policy Analysis Archives**, 8 (1), 2018. 67-93.

16. T. Dembo, Der arger als dynamisches problem. Psychol. Forsch., 15, 2019. 1- 144.

17. M. De Paola, "The determinants of risk aversion: the role of intergenerational transmission", **German Economic Review**, 64, 2019. 193–209.

18. C. Desforges, and A. Abouchaar, The impact of parent involvement, parent support and family education on pupil achievement and adjustment: A literature review. Department of Education and Skill: **Queen's Printe**r. 2020.

19. A. L. Diaz, Personal, family academic factors affecting low achievement in secondary school. **Electronic Journal of Research in Educational Psychology and Psychopedagogy,** 1 (1), 2019. 43-66.
20. K. A. Dills, Trends in the relationship between socioeconomic status and academic achievement. Retrieved September 30, 2013 from http://papers.ssrn.com/ 2017.

21. T. Dohmen, Are risk aversion and impatience related to cognitive ability? **American Economic Review**, 100, 2020. 1238-1260.

22. M. K. Eamon, Social-demographic, school, neighbourhood and parenting influence on academic achievement of Latino young adolescents. **Journal of youth and adolescence**, 34 (2), 2018. 163-175.

23. P. U. Ekeh, Gender bias and achievement in science and mathematics among school pupils. Implications for human resource development. **Journal of Curriculum Organization of Nigeria,** 10 (1), 2017. 30-33.

24. A. Elliot, A conceptual history of the achievement goal constructs. 2017.

25. A. Elliot and C. Dweck (Eds.), Handbook of competence and motivation (pp.52-72). New York: **Guilford Press.** Engelmann, 2020.

26. S. Carnine, Theory of instruction: Principles and applications (Ed.). Eugene, OR: ADI Press. 2011.

27. A. Goodman, and P. Gregg, 'Poorer children's educational attainment: how important are attitudes and behaviour?' York: **Joseph Rowntree Foundation**. 2020.

28. R. H. Grissmer, Beyond helping with homework: Parents and children doing mathematics at home. Teaching Children Mathematics, 14, 2020. 120- 131.

29. L. Gutman, and R. Akerman, Determinants of aspirations. Centre for Research on the Wider Benefits of Learning Research Project 27. London: **Institute of Education.** 2018.

30. N. M. Hansen, and A. Mastekaasa, Social origins and academic performance at university. USA: **Oxford University Press.** 2016.

31. S. T. Hijazi, and S. M. Naqvi, 'Factors affecting students' performance: A case of private colleges'. **Bangladesh E-Journal of Sociology,** 3 (1), 2019. 65-99.

32. E. D. Hirsch, The schools we need and why we don't have them. New York, NY: 2019.

33. M. O. Mgbor, and A. Anyanjor, The development of physical education in Nigeria: Issues and future directions. **Journal of Nigerian Association for Physical Health Education Sports and Dance**, 2 (1), 2019. 172-178.

34. M. O. Mgbor, The implementation of school sports in the UBE programme: challenges and implications. **Journal of Nigeria Association for Physical, Health Education, Recreation, Sports and Dance**, 2(1), 2020. 146-152.

35. National commission for colleges of education. Minimum standards for NCE (2012 ed). Abuja: NCCE. 2012.

36. E. O. Ntikudem, Constraints to effective instructional standards in programmes of business education in tertiary institutions. **Business Education Journal.** 4(2), 2018. 177-186.

37. A. O. Ojoawo, An empirical study of factors responsible for poor academic performance in secondary schools in Oyo State. **AJEM,** 4 (1&2), 2018. 140-148.

38. J. Okoro, and P.O. Iyeke, An appraisal of instructional facilities for business studies in secondary schools in Delta State. **African Journal of Education and Development Studies**. 4(2), 2019. 34-40.

39. S. I. Okwuanaso, Improving standard in business education in Nigeria. **Business Education Journal**, 4(2), 2018. 12- 23.

40. M A. Owuamanam, Quality assurance in business teacher education colleges of education in Nigeria. **Academic leadership Journal**. 10(4): Retrieved on the 14th September 2014, from http://www.aljrss. 2014.

41. M. O. Ugwuanyi, and M. E. Eze, An assessment of the educational resources available for implementing the mandates of secretary studies programme in Nigerian Polytechnics.2018.

42. A. A. Adeogum, The principal and the financial management of public secondary schools in Osu State. **Journal of Educational System and Development.** 5(1), 2001. 1 – 10.

43. L.O. Aina, Information, knowledge and the gatekeepers. The One Hundred and Thirty-Second Inaugural Lecture delivered at the University of Ilorin, Nigeria. 2013.

44. O.M. Akande, Hints on Teaching Practice and General Principles of Education. Lagos: **OSKO Associates**. 1985.

45. R. K. Atkinson, Learning from Examples: Instructional principles from the worked Examples Research. Mississippi: **Mississippi State University.** 2000.

46. A. A. Babayomi Comparative study of the Teaching and Learning Resources in Private and Public Secondary Schools in Logos State. **Master's Thesis, Department of Educational Administration,** University of Lagos, Nigeria. 2019.

47. BEMC, Long-Range Educational Facilities Planning. Board of Education of Montgomery County. http://www.montgomeryschoolsmd.org.faa.pdf Retrieved on 11 December 2014.

48. P. Benell, and F. Mukyanuzi, Is there teacher motivation crisis in Tanzania? A report commissioned by DFID. Dar es Salaam, Tanzania. 2017.

49. L. Blair, Constructing knowledge by design. Southwest Educational Development **Laboratory News**, 10(4), 2008. 3-8.

50. B. S. Bloom, A Primer for Parents, Teachers and other Educators: All Our Children Learning. New York: **Mcgraw-Hill.** 1999.

51. Cambridge University Reporter. Indicators of academic performance. Retrieved on June 13, 2016

52. P. N. Chonjo, The quality of Education in Tanzania primary schools: an assessment of physical facilities and teaching learning materials. **UTAFITI (new series)** l(1), 2018. 36 – 47.

53. Collins English Dictionary, Complete and unabridged. Paris: **Harper Collins Publishers**. 2016.

54. K. Dodge, Socialization mediators of the relation between socio-economic status and child conduct problems. **Child development,** 65(2): 649-665. 2017.

55. G. L. Earthman, 'Prioritization of 31 Criteria for School Building Adequacy', **American Civil Liberties Union Foundation of Maryland**. 2014.

56. M. M. Edwards, Building Conditions, Parental Involvement and Student Achievement in the D.C. Public School System. **Unpublished Master Degree Thesis, Georgetown University**, Washington, D.C., USA. 2018.

57. I. T. Eshiet, Improvisation in science teaching. Abak: **Belpot (Nig) Co**. 2017.

58. J. S. Farrant, Principles And Practices In Education. Singapore: **Longman Publishers Limited.** 2019.

59. FEMSA, Resources and facilities for Teaching and Learning of Mathematics and Science School. 2015.

60. R. M. Gagne', W. W. Wager, K. C. Golas, and J.L. Keller, Principles of Instructional Design. **Belmost, CA: Thompson.** 2015.

61. B. Fuller, and P. Clark, Raising School Effects While Ignoring Culture? Local Conditions and the Influence of Classroom Tools, Rules, and Pedagogy. **Review of Educational Research.** 64(2): 2019. 119 – 157.

62. J. Hallack, Investing in the Future: Setting Educational Priorities in the Developing World. Paris: **1 TEP and Pergonion Press.** 2010.

63. S. Higgins, E. Hall, K. Wall, P. Woolner, and C. McCaughey, 'The Impact of School Environments: A literature review', The Centre for Learning and Teaching, School of Education, Communication and Language Science. 2017.

64. G. Anthony "A Matter of Style: The Teacher as Expert, Formal Authority, Personal Model, Facilitator, and Delegator, College Teaching". 42: 1994. 142-149.

65. J., Savignon, Sandra. Communicative competence: theory and classroom practice: texts and contexts in second language learning. **McGraw-Hill.** ISBN9780070837362. OCLC 476481905**.** 2018.

66. K. Bolak, D. Bialach, and M. Dunphy, Standards-based, thematic units integrate the arts and energize students and teachers. **Middle School Journal**, 31(2), 2005. 57-60.

67. K. C. Barton, and L.A. Smith, Themes or motifs? Aiming for coherence through interdisciplinary outlines. **The Reading Teacher**, 54(1), 2010. 54 – 63.

68. T. Gatewood, How valid is integrated curriculum in today's middle school? **Middle School Journal**, 29(4), 2018. 38 – 41.

69. C. L. Harold, Of Philosophers and Kings: Political Philosophy in Shakespeare's Macbeth and King Lear. Toronto: **University of Toronto Press**. ISBN 978-0-8020-8605-1 2018.

70. G. L. Evan, Jewish and Islamic Philosophy: Crosspollinations in the Classic Age. **Edinburgh University Press.** 2019. pp. 25–6.

71. G. E. Bentley, Shakespeare: A Biographical Handbook. New Haven: **Yale University Press**. ISBN 978-0-313-25042-2. OCLC 356416. 1961.

72. L. Levenson, Romeo and Juliet. Oxford: **Oxford University Press**. ISBN 9780-19-281496-8. Park, Katherine; Daston, Lorraine, eds. 2000.

73. B. William John, An Inquiry into the Philosophy and Religion of Shakspere. London: **C Mitchell**. OCLC 162952347. 1978.

74. C. Ava, Death by philosophy: the biographical tradition in the life and death of the archaic philosophers Empedocles, Heraclitus, and Democritus. Ann Arbor: **University of Michigan Press**. p. 80. ISBN 0472113887. OCLC 54988783. 2017.

75. T.V. Rao, Human Resource Development - **Tata McGraw Hill Publication**, 1998.

76. I. Reece and S. Walker, Teaching, Training and Learning - **Business Education Publishers**, 2012.

77. R. H. Dave Developing and Writing Behavioral Objectives - **Educational Innovators Press**, 1999.

78. S. A. Adeyemo, 'The relationship between students' participation in school based extracurricular activities and their achievement in physics.' 2010.

79. J. K. Aina. Teaching aids improvisation in the teaching and learning of Physics in secondary schools. 2013. **American Journal of Educational Research,** 2013, 1(7), 225-229

80. A. O. Akanbi, An investigation into Students' Performance in Senior Secondary School Physics. **Journals of Teachers Education Trends** (1)1, 2009. 58-60.

81. O. A. Askhia, Students and Teachers' Perception of the Causes of Poor Academic Performance in Ogun State Secondary Schools. 2010.

82. **European Scientific Journal** February edition Vol.14, No.4 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431. 2018.

83. A. A. Balogun, "The use of Audio-Visual Materials in Geography teaching in Post Primary Schools in Nigeria". **West African Journal of Education.** Vol. No. 3, 2011. pp. 211-212. 7.

84. T. Y. Daniel, 'Improvisation and the Use of Instructional Materials in Teaching Science. A paper presented at **NCCE/UNESCO workshop**.' 2018.

85. O. U. Egbugara, Poor Performance in Physics: Implication for National Development. 2012.

86. P. A. Eniayeju, Raising the Standard of Performance in Public Examination in Science, Technology and Mathematics. 2019.

87. G. O. Esiobu, Gender Issues in Science and Technology Education Development. In: Science and Technology Education for Development Uwowi, U.M.O. (Ed). **NERD Press**, Lagos, 2019. pages: 137156.

88. M. A. Fakomogbon, and M. V. Adegbija, Instructional Media and Their Sources for Teaching and Learning Tertiary Institution, A Nigeria perspective. **African Journal of Educational Studies**.4 (2), 2016. 128.

89. Isola, O. M. "The Effects of Standardized and Improvised Instructional Materials on students' Academic Achievements in Secondary School Physics". 2010.

90. S. A. Jegede, and J. O. Adedajo, Enriching physics education in Nigeria and enhancing a sustainable Technological Development. **Greener Journal of Research**, 3(2), 2015. 80-84.

91. A. A. Jekayinfa, 'Effects of Instructional Resources on the Academic Performance of Students in History in Nigeria.' 2018.

92. Lederman. Science Education in America. 2000.

93. Marzano. 'Examining the Role of Teacher Evaluation in student Achievement.' 2017.

94. M. Marland, 'The craft of the Classroom' 2019.
95. Morakinwa. Attitude and Academic performance in study of physics. 2018.

96. B. Moronfola, "Effects of Instructional Resources on the Academic Achievements of Secondary school Students in Ilorin Local Government of Kwara State. **Unpublished M.Ed Research Thesis**. 1982.

97. NERDC, Workshop on difficult concepts Physics group report. Nigerian Educational Research and Development Council, Lagos. European Scientific Journal February 2018 edition Vol.14, No.4 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431. 2018.

98. Nikky . Teaching aids , Types and importance 2020

99. A. O. Odeniyi, 'Teacher-Student Relationship as facilitator of Academic and Moral Excellence in schools.' 2016.

100. C. A. Ogunlade, Media in Education. Ile-Ife, **University of Ile ife, press Ltd**. 2009.

101. S. O. Okeke, and N. E. Okoye, Effective resource utilization. A better Approach to Teaching and learning of physics. **Academic Journal of Interdisciplinary Studies**, 2 (6), 2015. 35 – 39.

102. Okoronka and Wada. Effect of Teaching Method on Academic Performance. 2018.

103. M. A. Oladejo, G. R. Olosande, A. O. Ojebisi, and O. Isola Instructional materials and students' academic achievement in physics: Some policy implications. 2019.

104. S. A. Onasanya, and E. O. Omosewo, Effect of Improvised and Standard Instructional Materials on secondary school students' Academic performance in physics in Ilorin, Nigeria. **Singapore Journal of Scientific Research**, 1(1), 2015. 68 – 76.

105. S. Abubakar Department of Physics Federal College of Education, Katsina Nigeria 32. Schmoker, M. (2011). 'Three foundational elements are keys to improve Students achievement.' 2019.

106. E. Hoyle, Policies of School Management, Suffolk. **The press ltd**. 1986.

107. G. S. Ibe-Bassey, Educational technology: The teaching learning process and the falling standard of education in Nigeria. 35th Inaugural lecture series of the University of Uyo, Uyo. Nigeria. 2017.

108. D. Kerr, Citizen education in England: The making of a new subject. Online journal for social science education. Retrieved on 7th January, 2003 from **www.sowi-online.de/journal/2003/england_kerr.htm.** 2017.

109. H. R. Kimago, Study Guide for Med APPS Course. Dar es Salaam: **University of Dar es**
110. **Salaam.** 2019.

111. P.K. Kimalu, A. S. Bedi, and N. N. Nafula, The Decline in Primary School Enrolment in Kenya. Nairobi: **Kenya Institute for Public Policy Research and Analysis**. 2018.

112. C. R. Kothari, Research Methodology. New Delhi: **Wishwa Prakashan**. 2019.

113. I. A. Makombe, A. R. Kihombo, J. B. Sesabo, A. Hodgson, and K. Spours, Building partnership for poverty reduction in Tanzania: Improving successful completion and progress from secondary education into further studies and working file. **Morogoro: Mzumbe University**. 2018.

114. J. Maundu, Family background and student achievement in Kenya National Examinations. **Unpublished M.Ed. Thesis**, Nairobi, Kenyatta University. 2000.

115. A. Mbelle, and J. Katabaro, School Enrolment, Performance and Access to Education in Tanzania. Research on Poverty Alleviation Dar es Salaam, **(REPOA)/Mkuki na Nyota Publishers.** 2019.

116. D. T. Msabila, Human and economic Geography. Dar es Salaam: **Tanzania Publishing House LTD.** 2016.

117. O. M. Mugenda, and A. G. Mugenda, Research methods. Nairobi: **African Centre for Technology Studies (ACT).** 2019.

118. K. Mwiria, Issues in Educational Research in Africa. Nairobi: **East African Educational Publishing Limited.** 2018.

119. NBS, 2012 Population and housing census. Retrieved on 20th January 2012 from http://www.nbs.go.tz/2012populationandhousingcensus. 2017.

120. E. Obasi, Challenges for secondary education in the culturally diverse Nigerian society. Being text of lead paper at the National Association of Sociologists of Education (NASE) conference holding at the University of Nigeria. Nnsuka, Nigeria. 2008.

121. OCM, Classroom Utilization report summary. Retrieved on 6th April 2015 from http://www.classroom.umn.edu/scheduling/utilization/fall01-spring02/ summary.html. 2020.

122. A. Onche, Meeting the Challenge of Accessibility and Utilization of Modern Instructional Materials in Rural Secondary Schools in Nigeria. **International Journal of Multidisciplinary Studies.** 1 (2): 2018. 1 – 13.

123. J.O. Oni, Resource and Resource Utilization as Correlates of School Academic Performance. **Unpublished Ph.D Thesis, University of Ibadan**, Ibadan, Nigeria. 2018.

124. J. S. Owoeye, School Facilities and Academic Achievement of Secondary School Agricultural Science in Ekiti State, Nigeria. Kampala: Kampala International University. 2018.

125. B. Pachai, Malawi: The History of the Nation, London: **Longman Group Limited.** 2000.

126. PEFA, Impact of Population Growth on School Facilities. Retrieved on 1st December, 2012 from http://www.archive.knoxmpc.org/capacities.pdf. 2011.

127. G. I. Earthman, and L. K. Lemaster, Review on the research on the relationship between school buildings, student achievement, and student behaviour. Paper presented in the annual meeting of the Council of Educational Facilities Planners, **International, Tarpon Springs**, Florida, USA. 2018.

128. Policy brief, Challenges of Education Sector Budget "A missed Opportunity to Transform Education Sector Retrieved on 23rd August, 2014 from http://www.policyforumtz.org/sites/default/files/Educationbrief.pdf. 2013.

129. N. Postlewaithe, The conditions of primary schools in least-developed countries. International Review of Education, 44(4): 289-317. 2013.

130. Random House Karnerman Webster's College Dictionary 2010K Dictionaries Ltd, Retrieved on 9th July, 2015 from http://www.thefreedictionary.com/ population. 2014.

131. S. Sumra. and R. Rajani, Secondary Education in Tanzania: Key Policy Change, Hakielimu, Dar es Salaam, Tanzania. Samuel, T. (1997). An Investigation between Instructional Resources and Academic Performance. **Unpublished M.ED Project,** University of Ilorin, Nigeria. 2016.

132. The American Heritage Dictionary, The American Heritage Dictionary of the English language 4th edition Washington DC: **Houghton Mifflin Publishing Company**. 2019.

133. V. L. Tinio, ICT in Education: UN Development Programme. (Retrieved on April 2016 from http:www.eprmers.org). 2019.

134. Mishra and Koehler, Technological Pedagogical Content Knowledge **Theory (TPACK) Framework,** 2006.

135. I. N. Udosen, Instructional media: An assessment of the availability and frequency of use by social studies teachers in Akwa Ibom State. **Journal of Educational Media & Technology (JEMT)**, 15(2), 2018. 141 – 160. 2018.

136. UNESCO, Adapting technology for school Improvement: A global perspective, Washington DC: **International Institute for Educational Planning.** 2014.

137. URT, Education and Training Policy (ETP). Dar es Salaam: **Ministry of Education and Culture.** 2015.

138. L. S. Vygotsky, Mind in Society. Cambridge: **Harvard University press**. 1978.

139. URT, Education Sector Development Programme: Secondary Education Development Plan 2004 – 2009, Dar es Salaam: **Ministry of Education and Culture.** 2003.

140. J, D. Willms, Standards of care: Investments to improve children's educational outcomes in Latin America. Paper presented at the "Conference of Early Childhood Development" Washington, **D.C., World Bank.** 2018.

141. E. Young, H. A. Green, L. Roehrich-Patrick, L. Joseph, and T. Gibson, Do K-12 School Facilities Affect Education Outcomes? Tennessee: Tennessee Advisory commission on Intergovernmental Relations. 2018.

142. F. T. Acharu, and E. Solomon, Influence of infrastructure on the teaching and learning of office education in Polytechnics. **ABEN Conference Proceedings** 1 (1) 78-82 2014.

143. O. Aina, Future directions in business education.Business. **Education Journal**, 3 (3) 259-266 . 2013.

144. Alberta Learning. Focus on Inquiry: A teacher's guide to implementing inquiry-base learning. 2004.

145. O. I. Ayelotan, and F. A. Sholagbade, Infrastructural facilities and business education: Office technology and management perspective. **ABEN Conference Proceedings** 1 (1) 88-97. 2014.

146. O. Y. Bongotons, and B. O. Onyenwe, Availability and adequacy of ICT resources in business education programme in Nigeria. **Business Education Journal**, 7 (2) 200-215 2010.

147. N. O. Emesini, Electronic-Learning as an innovation in teaching and learning in Nigerian Universities. A paper presented at the 22nd annual conference of the curriculum organization of Nigeria held at Cairo on September, 2018. 2-4.

148. T. Goshit, Nigeria's need for ICT: Technology and Policy in Africa. Retrieved from http://ocw.mit.edu/nr/rdonlyres/specialprogrammes. 2017.

149. O. Miller, and B. C. Akume, The state of equipment provision and maintenance for the teaching of business studies at the Junior Secondary School level in Delta State. **Business Education Journal,** 7 (1), 2019. 212-220.

150. F. O. Nnaji, & I. A. Bagudu. Critical issues in office technology and management and their emerging challenges. **ABEN Book of readings.** 2(1), 2019. 23-28.

151. C. I. Nwachukwu, Administration and supervision in business education: challenges and way forward. **ABEN Book of readings**. 2(1), 2018. 66-73.

152. S. C. E. Obasi, Student's living environment and the menace of cultism in Nigeria Universities. **AARCHES Journals,** 4 (1), 2015. 42-47.

153. N. Onah, and F. Okoro, Strategies for enhancing the accessibility and use of information and communication technology in the colleges of education in Enugu State of Nigeria, **Nigerian vocational journal** 14(2), 2018. 104-114.

154. M. Onyesom, Assessment of instructional resources for teaching business education at the colleges of education in Edo and Delta States of Nigeria. **(Unpublished Thesis)** Nnamdi Azikiwe University, Awka. 2018.

155. J. E. Orheruata, I. M. Abubakar, and Y. M. Aminu, Assessment and Utilization of infrastructural materials in tertiary institutions in Borno State. **ABEN Conference Proceedings,** 1 (1), 2019. 73-77.

156. J. F. Oyedele. Facilities for business education for self-reliance. **Business Education Journal,** 2 (4), 2016. 136-143.

157. O. T. Oyinloye, and F. K. Oluwalola, Modern office instructional facilities in office technology and management in Polytechnics: a means to insecurity management in Nigeria. **ABEN Conference Proceedings** 1 (1), 2019. 125-133.

158. S. T. Priye, The corrosive effect of corruption on Nigeria educational system. Retrieved from www.gamji.com/article6000/news7987.htm. 2017.

159. A. E. Robert, Office tech. & mgt. curriculum and new technologies: The challenges for office educators in polytechnic in south-south of Nigeria. **Nigeria Journal of Business Education:** 1(3), 2016. 122-137.

160. P. S.O. Udin, and V. O. Uwaifo, Principles and practice if vocational and technical education in Nigeria. Benin City: **Ever Blessed Publishers**. 2015.

161. E. K. Umunadi, Provision of equipment and facilities in vocation and technical education for improving carrying capacity of Nigeria's Tertiary Institutions. **African Society for Scientific Research (ASSR)** Retrieved from http://www.hrmars.com/admin/pics/293pdf. 2017.

162. C. P. Uzuegbu, H. Mbadiwe and J. C. Anulobi, Availability and utilization of instructional materials in teaching and learning of library education in tertiary institutions in Abia state. **Journal of Educational Research** 2(8), 2018. 111–120.

163. D. D. Zakka and M. W. Priscilla, Critical issues in the teaching and learning of office technology and management. **Journal for the Promotion/Advancement of Office Management/Secretarial Profession,** 4, 2019. 22-29.

164. C. R. Chaimany, Introduction to Teachers Education in Nigeria: Enugu, **TTC publisher,** 2019.

165. A. E. Ejili, and N. O. Anyanwu, Teacher Education in Nigeria; An Introduction. Enugu: **HRV Publishers**. 2016.

166. G.B. and Co.Ltd. A. B. Fafunwa, History of Education in Nigeria, Ibadan, **NPS Educational Publishers Ltd.** 2015.

167. K. Singh, "Education for the Global Society", in Learning: The Treasure Within, The Report to UNESCO of the International Commission on Education for the Twenty First Century, Paris: **UNESCO.** 2016.

168. R. E. Slavin, Educational Psychology: Theory and Practice. 7th ed. New York: **Ablongman.** 2017.

169. J. Taskinsoy, Leap into Student –Centered Learning (SCL) Paradigm: Students" Attitudes Towards SCL. **Insight @Unimas Teaching & Learning Bulletin** 17, 2018. 15-20.

170. A. W. Tyma, Pushing past the walls: Media literacy, the "emancipated" classroom, and a really severe learning curve. **International Journal of Communication,** 3, 2019. 891-900.

171. S. Tobias, and T. M. Duffy, Constructivist instruction: Success or failure? New York: **Taylor & Francis**. 2019.

172. L. S. Vygotsky, Learning and mental development at school age. Cambridge, MA: **MIT Press.** 1963.

173. F. E. Weinert, Concept of competence: A conceptual clarification. In D. S. Rychen & L. H. Salganik (Eds.), Defining and selecting key competencies, 2011. (pp. 45-65).

174. O. H. Ashland, US: Hogrefe & Huber Publishers, Student-centered teaching: Five key changes to practice. San Francisco, **CA: Jossey-Bass**. 2012.

175. G. F. Davis, 'Editorial essay: What is organisational research for?' **Administrative Science Quarterly,** 60(2), pp.179-188. 2015.

176. D. R. Denison, and G. M. Spreitzer, Organisational culture and organisational development: a competing values approach. **Research in organisational change and development**, 5(1), pp.1-21. 2009.

177. N. K. Denzin, The research act: a theoretical orientation to sociological methods, 2nded, New York, **McGraw-Hill.** 1978.

178. Department of Arts and Culture. The Bill and Melinda Gates Foundation supports the National Library of South Africa with a grant of R32 million, Accessed December, 2018,

179. P. Deshwal, Green HRM: An organisational strategy of greening people, **International Journal of Applied Research,** 1(13), pp.176-181. 2015.

180. B. I. Dewey, 'The embedded librarian: strategic campus collaborations', **Resource Sharing and Information Networks**, 17 (1-2), pp.5-17. 2017.

181. O. Dibu, Eroding the university culture. **Inaugural lecture at Federal University of Technology**, Akure, Ondo State, 26 April. 2012.

182. W. V. Dole, K. Dabbour, and K. Kott, 'Dialogic approaches to strategic planning in academic libraries: an appreciative inquiry case study at Oviatt Library". **Journal of Library Administration**, 57(4), pp.468-480. 2017.

183. P. A. Donwa, Funding of academic research in Nigeria universities, Accessed 18 May 2018,

184. D. G. Dorner, and J. Revell, 'Subject librarians' perceptions of institutional repositories as an information resource', **Online Information Review**, 36 (2), pp.261277. 2017.

185. R. Dougherty, 'Reference around the clock: is it in your future?' American Libraries, 33 (5), pp.44-46. 2012.

186. N. Duxbury & M. S. Jeannotte. "Culture, sustainability and communities: exploring the myths", Paper presented at the 6th International Conference on Cultural Policy Research, Jyvaskyla, Finland, 24-27 August. 2019.

187. J. W. Creswell. "Research Design: Qualitative. Quantitative, and mixed methods". Los Angeles, **Sage Publications.** 2018.

188. J. W. Creswell. "Qualitative, quantitative, and mixed methods approach". Thousand Oaks, CA: **Sage.** 2019.

189. J. W. Creswell, and C. Plano. "Designing and conducting mixed methods research". Thousand Oaks, CA, **Sage**. 2018

190. J. W. Creswell "Research design: qualitative, quantitative and mixed methods approaches", ed., Los Angeles, **Sage Publications.** 2015.

191. J. W. Creswell. "Educational research: planning, conducting and evaluating quantitative and qualitative research", 4th ed, Boston, MA, **Pearson Education, Inc.** 2019.

192. J. W. Creswell, Research design: qualitative, quantitative and mixed methods approaches, 4th ed, Los Angeles, **Sage Publications**. 2014.

193. J. W. Creswell, and N. P. Cheryl, Qualitative Inquiry and Research Design: Choosing among Five Approaches, Boston, MA, **Pearson Education, Inc**. 2018.

194. J. W. Creswell, and V. L. Clark, Designing and Conducting Mixed Methods Research, 2nd ed, **Sage,** Thousand Oaks, CA. 2021.

195. C. Cuillier, and C. J. Stoffle, 'Finding alternative sources of revenue". **Journal of Library Administration,** 51(7-8), pp.777-809. 2011.

196. R. Cullen, and B. Chawner. "Institutional repositories, open access, and scholarly communication: a study of conflicting paradigms". **The Journal of Academic Librarianship,** 37(6), pp.460-470. 2017.

197. P. S. Dadzie, 'Electronic resources: access and usage at Ashesi University College,' **Campus-Wide Information Systems,** 22 (5), pp.20–28. 2015.

198. L. Dai, L. Chen, and H. Zhang, 'China Academic Library and Information System: an academic library consortium in China', **Information Technology and Libraries,** 19(2), pp.66-70, Accessed 12 February 2018,

199. K. P, N. Damayanthi. "An assessment of electronic information resources usage and management: a case study at University of Peradeniya", **Master's thesis from faculty of graduate studies, University of Columbo,** Sri Lanka. 2016.

200. E. Chiware, and Z. Mathe. "Academic libraries' role in research data management services: a South African perspective". **South African Journal of Libraries and Information Science**, 81(2), 1-10. 2015.

201. G. Chowdhury. "Sustainability of digital information services" **Journal of Documentation,** 69 (5), 602-622. 2015.

202. G. Chowdhury, and K. Koya, 'Information practices for sustainability: Role of iSchools in achieving the UN sustainable development goals (SDGs)', **Journal of the Association for Information Science and Technology**, 68(9), 2128-2138. 2017.

203. G. Chowdhury. "Sustainability of digital libraries: a conceptual model and a research framework". **International Journal on Digital Libraries,** 14(3-4), 181-195. 2014.

204. G. G. Chowdhury, "How to improve the sustainability of digital libraries and information Services". **Journal of the Association for Information Science and Technology**, 67 (10), 2379-2391. 2017.

205. W. Chunsheng, "The phenomenon of foreign libraries opting out of big deals". **Journal of Academic Libraries,** 4, 1-12. 2014.

206. CILIP, A changing landscape: a survey of public library authorities in England, Wales and Northern Ireland 2012-2013, London, **Chartered Institute of Library and Information Professionals Survey Report.** 2012.

207. Cline Library Strategic Plan 2019- 2025 2019. Norther: **Arizona University**. Accessed 7 July 2019.

208. L. Cohen, L. Manion, and K. Morrison, 'Observation', **Research methods in Education,** 6, 396-412. 2017.

209. G. R. Conway. "Agroecosystem analysis". **Agricultural Administration,** 20 (1), pp.31-55. 1985.

210. S. Cooper. "Corporate social performance: a stakeholder approach". London, **Routledge**. 2017.

211. D. M. Coughlin, M. C. Campbell, and B. J. Jansen, "A web analytics approach for appraising electronic resources in academic libraries", **Journal of the Association for Information Science and Technology,** 67(3), 518 – 534. 2016.

212. P.L Carr, and M. Collins. "Acquiring articles through unmediated, user-initiated pay-per-view transactions: An assessment of current practice". **Serials Review**, 35(4), pp.272–277. 2017.

213. L. Carstens, "Defining, inspiring and implementing sustainability", **National Civic 1Review,** 99 (3), 11-16. 2020.

214. A. M. Casey. "Strategic priorities: a roadmap through change for library leaders". **Library Leadership and Management,** 29(2), 1-17. 2015.

215. C. Chamberlain, and B. MacAlpine. "Pay-per-view article access: a viable replacement for subscriptions?" **Serials**, 21(1),.30-34. 2018.

216. A. S. Chandel, and M. Saikia "Challenges and opportunities of e-resources". **Annals of Library and Information Studies (ALIS),** 59 (3), 148-154. 2018.

217. C. M. Chao, 'Factors determining the behavioural intention to use mobile learning: an application and extension of the UTAUT model', **Frontiers in Psychology**, (10), 1652- 1662. 2019.

218. A. Chaputula, and B. Y. Boadi, 'Funding for collection development activities at Chancellor College Library, University of Malawi', **Collection Building,** 29 (4), 142-147. 2018.

219. A. H. Chaputula, and A. J. Kanyundo, 'Collection development policy: how its absence has affected collection development practices at Mzuzu University Library', **Journal of librarianship and information science**, 46(4), 317-325. 2019.

220. Y. Charalabidis, A. Zuiderwijk, C. Alexopoulos, M. Janssen, T. Lampoltshammer, and E. Ferro. “Open data evaluation models: theory and practice”. In The World of Open Data (pp. 137-172). **Springer**, Cham. 2018.

Chapter Three

Methodology

This Chapter three focused on the methodology, which is about research design, population, sample and sampling technique, validation of research instrument, reliability of the research instrument, distribution of the research instrument and method of data analysis. school library support and inquiry based approach as determinants of science subject content delivery in private schools in Ekiti State, Nigeria.

3.2. Research Design

This study will adopt cross – sectional survey research design using descriptive approach as it attempts to tudy a subset of population at a point in time and to investigate school library support and inquiry based approach as determinants of science subject content delivery in private schools in Ekiti State, Nigeria. The advantage of the design is its robustness with respect to distribution of data is easy to compute the detailed information that can be derived from the test; it is used in studies for which parametric assumptions cannot be met, and its flexibility in handling data.

3.3 Population of the Study

The population of this study consists of three hundred and forty-three (343) private schools, with total of 1,029 science teachers in Ekiti State. The study will employ total enumeration.

Table 3.1: Population

S/N	Local Govt Areas	Total No of Schools	No of Science teachers
Ekiti North Senatoria District			
1	Ido/Osi	24	3
2	Ikole	19	3
3	Ilejemeje	1	3
4	Moba	13	3
5	Oye	7	3
Ekiti Central Senatoria District			
6	Ado	122	366
7	Efon	5	14
8	Ekiti West	16	48
9	Ijero	15	45
10	Irepodun/Ifelodun	13	39
Ekiti South Senatoria District			
11	Ekiti East	26	78
12	Emure	13	39
13	Ekiti South West	10	30
14	Gboyin	20	60
15	Ikere	21	63
16	Ise/Orun	18	54
	Total	**343**	**1,029**

Source: Department of Evaluation and Standard (2021), Ministry of Education, Science & Technology, Ado-Ekiti

3.3 Sample and Sampling Technique

The sample size of this study is 72. The study employed stratified sampling and purposive sampling. Stratified sampling involves separating the population into mutually exclusive

sets (homogeneous non- over lapping groups) or strata, while purposive sampling belongs to the category of non- probability sampling techniques . There are 343 private secondary schools scattered across the three senatorial districts in Ekiti State (see the Table 3.1). In this study, each senatorial district forms a stratum where one local government each (i.e Ado, Ikere and Ido/osi) was selected from each district with simple random sampling so as to have state coverage.

Further, purposive sampling techniques involve selecting certain units or cases based on a specific purpose rather than randomly . Therefore, 24 private senior schools (i.e, eight schools each in urban areas of Ado, Ikere and Ido/Osi local government areas) were selected for the study. That is, three participants (science teachers) from each of 24 private schools selected across the 16 local government areas in the three senatorial districts responded to the questionnaire. These schools were purposively selected because they have functional libraries .

3.4 Description of Research Instrument

The instrument to be used is tagged School Library Support, Inquiry based approach and science subject content delivery (SLSIBASSCD Scale). Structured questionnaire will be used to gather data from the respondents because it will be used to analyze the structured questions and responses easily to achieve the study's objective. The study adopted like scale design which allowed the researcher in listing options where respondents will choose from. The instrument is made up of four sections.

Section A: This section was developed by the researcher to collect demographic information of respondents and this contain Bio-data of Respondents measured through

four factors; gender, age, qualification and number of years of the science teachers and librarians.

Section B: Science Subject Content Delivery scale consists of five dimensions; Content Knowledge, Pedagogical Knowledge, Pedagogical Content Knowledge, Technological Content Knowledge and Technological Pedagogical Knowledge which is aimed at examining the students' learning ability in the selected private schools with 12 items. The items were adapted from existing literature as a guide in formulating the questions[1,2,3] (Cronbach alpha will be tested). The scale will use a four-point response format of Very High (VH) =4, High (H) = 3, Low (L) = 2, Very Low (VL) = 1.

Section C: School Library Support scale which consists of three sub-variables of library resources, library personnel and library services with 12 items. The items were adapted from existing literatures on instructional resources. The scale will use a four-point response format of 4=Strongly Agree, 3=Agree, 2= Disagree and 1=Strongly Disagree. This section of the questionnaire will be answered by the teachers.

section D: Inquiry Based Approach scale which consists of six sub-variables of Planning, Processing, Creating, Sharing, Retrieving and Evaluating with 12 items. The items were adapted from existing literatures on teaching. The scale will use a four-point response format of 4=Strongly Agree, 3=Agree, 2= Disagree and 1=Strongly Disagree. The research instrument will be divided into various sections which will be design to elicit responses on the topic under investigation.

3.5 Validation of the Research Instrument

To validate this study, instrument was gathered through related literature review and adaptation from questionnaires that have been used by other researchers. Content and construct validity will be done. Content validity will be used to assess the internal validity

of the research instruments which will be ascertain through the supervisor and other experts in information management field**.** Corrections made will be incorporated in constructing the final questionnaire which will be given out to the respondents for the study.

3.6 Reliability of the Research Instrument

In ensuring validity of the data, questionnaire will be tested by subjecting it to the inspection of principals of the private schools under study who will give his/her opinions as to whether the hypotheses used to measure the concepts were valid so as to ensure it covers all variables under study. The researcher will subject the questionnaire to a reliability test to check the internal consistency of all items measuring each variable in the study. The reliability of the instrument was done through a pilot study using thirty (30) copies of the questionnaire that was administered to the teachers and librarians of a private school at Ado local government area which is not part of the study. Data obtained was subjected to Cronbach's alpha reliability test to establish internal consistency of the items. The reliability coefficient (r) was 0.7.

3.7 Distribution of the Research Instrument

A primary data will be collected to address the objectives of the study through a structured questionnaire in line with existing literature. This instrument works well with a cross-section survey design mainly because it supports the collection of data regarding opinion and perception of respondents at a point in time on current issues.

A letter of introduction will be obtained from the Department of Information Management, Lead City University which will be used to gain permission to conduct the survey from the management of the selected private schools in Ekiti State, Nigeria. Due to number of respondents, a three (3) day training will be conducted for four (4) research assistants to

ease the administration, retrieval and initial sorting of copies of the questionnaires. In all, 72 copies of questionnaires were administered to the science teachers of the selected private schools in Ekiti State, Nigeria, of which 64 were filled and returned, representing 88.9% response rate.

3.8 Method of Data Analysis

The researcher analysed the data using the descriptive statistics for the research questions and inferential statistics for the hypotheses. The use of the descriptive statistics is appropriate because it helps to describe and summarize data in terms of frequency distribution, mean, standard deviation, and percentage of response about variables under study, thereby answering the research questions. To test the hypotheses formulated, the inferential statistics through regression analyses was used mainly to test the hypotheses. The data collected for the study was analysed using Statistical Package for Social Sciences (SPSS), version 24. All hypotheses in the study are tested at level of 0.05 significance.

Endnotes

1. J. S. Akingbade, "Students' Perception of the Availability and Utilization of Information and Communication Technology (ICT) in the Teaching and Learning of Science Subjects in Secondary Schools in Ekiti State, Nigeria". **International Journal of Education and Literary Studies.** 1(1). 2013. 5-8.

2. T. Anderson, and F. Elloumi, Theory and Practice of online learning. Canada: Athabasca University, 2020.

3. C. Teddies & F. YU. "Mixed methods sampling. A typoloy with examples". **Journal of mixed methods Research,** (l), (2007) 77- 100

4. C. P. Uzuegbu, H. C. Mbadiwe and J. C. Anulobi. "Availability and utilization of instructional materials in teaching and learning of library education in tertiary institutions in Abia State". **Journal of Educational Research** 2(8), 2015. 111–120.

5. Cozby P.C. "Methods in behaveoural Research" 10th Edition New York; **MC Graw Hill.** (2009).

6. K. Blyth. "Effectiveness of Using Inquiry-Based Instruction to Increase Students Performance in High School Biology as Bardwell Institute". **[OTS Master's Level projects & papers, Old Dominion University]**. https://digitalcommons.odu.edu/ots_masters_projects/46.

Chapter Four

Results and Discussion of Findings

4.1 Introduction

This chapter presents the result of the empirical data collected to achieve the research objectives. The analysis focuses on answering the research questions and test the study hypotheses.

4.2 Demographic Information

Table 0.1: Demographic Information of the Respondents

Items	Frequency	Percentage
AGE		
20 – 25	6	8.3
26 – 30	36	50.0
31 – 35	12	16.7
36 – 40	9	12.5
41-45	6	8.3
46 and above	3	4.2
Total	**72**	**100.0**
Gender		
Male	38	52.8
Female	34	47.2
Total	**72**	**100.0**
Educational Level		
NCE	17	23.6
Bachelor's degree	42	58.3
Master's degree	13	18.1
Total	72	100.0

Years of experience		
5 – 10	12	16.7
11 – 15	34	47.2
16 – 20	20	27.8
21 – 25	6	8.3
Total	72	100.0
Designation		
Science teacher	68	94.4
Librarian	4	5.6
Total	72	100.0

Source: Fieldworks, 2022.

Table 4.1 presents the demographic information about the study respondents. The demographic data collected in the study include age, gender, educational level, years of experience, and job designation. The analysis of the age distribution of the respondents shows that 6 (8.3%) of the respondents are between 20-25 years of age; those who are in the 41-45 age bracket are also the same. In addition,36 (50%) of the respondents are between 26 – 30 years; 12 (16.7%) are between 31-35 years of age; 9 (12.5%) are between 36-40 years of age; while only 3(4.2%) are aged above 45 years.

In term of gender, 38 (52.8%) of the respondents are male while 34 (47.2%) are female, indicating that there may be more male science teachers than females. Also, the analysis of the education level of the respondents shows that 17 (23.6%) of the respondents have NCE certificates, 42 (58.3%) are educated up to the university as the have a Bachelor's Degree and 13 (18.1%) of the respondents have at least, a Master's degree. The distribution according to the year of experience also showed that 12 (16.7%) of the respondents have been employed for between 5 – 10 years; 34 (47.2%) have experience of between 11 – 15 years; 20 (27.8%) has experience of between 16 – 20 years while 6 (8.3%) of the

respondents have up to 21 – 25 years of experience showing that the sample is a good blend of experienced educators. The job description of the respondents was also identified. The data showed that 68 (94.4%) were Science teachers while the 4 (5.6%) remaining of the respondents were school Librarians.

4.3: Presentation of Research Questions

4.3.1 Research Question One: What is the level of Science Subject Content Delivery in Private Schools in Ekiti State, Nigeria?

Table 4.2: Science Subject Content Delivery in Private Schools in Ekiti State, Nigeria

	SA	A	D	SD	Mean
Technological Knowledge (TK)					
I have the technical skills I need to use	35 (48.7%)	32 (44.4%)	5 (6.9%)	-	3.42
I keep up with important new technologies	21 (29.2%)	34 (47.2%)	14 (19.4%)	3 (4.2%)	3.01
I can learn technology easily	31 (43.1%)	23 (31.9%)	4 (5.6%)	14 (19.4%)	2.99
Average Mean					**3.14**
Pedagogical Knowledge (PK)					
I can adapt my teaching styles to different learners	15 (20.8%)	48 (66.7%)	5 (6.9%)	4 (5.6%)	3.03
I know how to assess students' performance in a classroom	30 (41.7%)	28 (38.9%)	9 (12.5%)	3 (4.2%)	3.26
I am familiar with common student understandings and misconceptions	14 (19.4%)	34 (47.2%)	17 (23.6%)	7 (9.7%)	2.76
Average mean					**3.01**
Content Knowledge (CK)					
I have sufficient knowledge about my teaching subject	25 (34.7%)	30 (41.7%)	15 (20.8%)	2 (2.8%)	3.08
I can think about the content of my teaching subject like a subject matter expert	20 (27.8%)	24 (33.3%)	24 (33.3%)	4 (5.6%)	2.83
I have various ways and strategies of developing understanding of my teaching subject	31 (43.1%)	26 (36.1%)	13 (18.1%)	2 (2.8%)	3.19
Average					**3.03**

Technological Pedagogical Knowledge (TPK)	**SA**	**A**	**D**	**SD**	**Mean**

I am able to use technology to introduce my students to real world scenarios	28 (38.9%)	31 (43.1%)	12 (16.6%)	1 (1.4%)	3.19
I am able to facilitate my students to use technology to find more information on their own	38 (52.8%)	21 (29.2%)	9 (12.4%)	4 (5.6%)	3.29
I can adapt the use of the technology that I am learning about to teach my students different subjects	21 (29.2%)	21 (29.2%)	26 (36.1%)	4 (5.6%)	2.82
Average mean					**3.10**
Technological Content Knowledge (TCK)					
I can use appropriate technologies e.g. multimedia resources, simulations to represent the content of my teaching subject	25 (34.7%)	25 (34.7%)	21 (29.2%)	1 (1.4%)	3.03
I know about the technologies that I have for the research of content of my teaching subject	18 (25.0%)	33 (45.8%)	18 (25.0%)	3 (4.2%)	2.92
I know about technologies that I can use for enhancing my teaching in my subject	29 (40.3%)	18 (25.0%)	16 (22.2%)	9 (12.5%)	2.93
Average mean					**2.96**
Pedagogical Content Knowledge (CK)					
Without using technology, I know how to select effective teaching approaches to guide students thinking and learning in my teaching subject	42 (58.3%)	20 (27.8%)	8 (11.1%)	2 (2.8%)	3.42
Without using technology, I can help my students to understand the content knowledge of my first teaching subject through various ways	24 (33.3%)	36 (50.0%)	11 (15.3%)	1 (1.4%)	3.15
Without technology, I can help my students to understand approaches	24 (33.3%)	30 (41.7%)	11 (15.3%)	7 (9.7%)	2.99
Average Means					**3.19**
Technological Pedagogical Content Knowledge (TPACK)	**SA**	**A**	**D**	**SD**	**Mean**
I can teach lessons that appropriately combine my first teaching subject, technologies and teaching approaches	32 (44.4%)	19 (26.4%)	11 (15.3%)	10 (13.9%)	3.01
I can provide leadership in helping others to coordinate the use of content, technology and teaching approaches at my school	36 (50.0%)	24 (33.3%)	9 (12.5%)	23 (4.2%)	3.29
I can select technologies to use in my classroom that enhance what I teach and what students learn	14 (19.4%)	37 (51.4%)	16 (22.2%)	5 (6.9%)	2.83
Average Mean					**3.04**
Overall Mean	**3.08**				

Decision rule: low mean is < 2.5, moderate mean is = 2.5 and high mean is > 2.5
Source: Field work, 2022.

Table 4.2 present the analysis of the data collected to identify the level of science subject content delivery in private schools in Ekiti State, Nigeria. The science subject content delivery was discussed under seven dimensions including; Technological Knowledge (TK), Pedagogical Knowledge (PK), Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), Pedagogical Content Knowledge (CK), and Technological Pedagogical Content Knowledge (TPACK).

For Technological Knowledge, the responses showed that 93.1% of the respondent agreed that they have the technical skills I need to use in teaching science subjects. The mean score of 3.42 for this item indicate that this is highly common among the respondents. Also, 76.4% of the respondents agreed that they keep up with important new technologies relevant to the teaching of science subjects. This item also has a mean score of 3.01 indicating a high prevalence among the teachers. Furthermore, 72.9% of the respondents agreed that they can learn technology easily. This item also has a high mean score of 2.99. In all, the average mean score for technological knowledge is 3.14 indicating a high level of technological knowledge among the respondents.

The second dimension is pedagogical knowledge. The responses here show that 87.5% of the respondents agreed that they can adapt their teaching styles to different learners. This item has a mean score of 3.03 which indicates a high prevalence of pedagogical knowledge among the respondents. Similarly, 80.6% of the respondents indicated that they know how to assess students' performance in a classroom. With a mean score of 3.26, it can be deduced that this is highly common among the respondents. In addition, 66% of the respondents are familiar with common student understandings and misconceptions. While it is not as high as other items in the same category, this item has a mean score of 2.76

which is also considered as high. Overall, the average mean for pedagogical knowledge is 3.01 which indicate high level of pedagogical knowledge among the respondents.

For the items measuring content knowledge, 76.4% of the respondents agreed that have sufficient knowledge about their teaching subject. This high prevalence of this is shown in the mean score of 3.08 for the item. Also, 61.1% of the respondents agreed that they can think about the content of their teaching subject like a subject matter expert. This is further supported by a mean score of 2.83 which is regarded as high in this study. in addition, 79.2% of the respondents agreed that they have various ways and strategies of developing understanding of their teaching subject. This item is highly prevalent as shown by the mean score of 3.19. Overall, the average mean score for content knowledge is 3.03 which is within the designation of 'high'. The next dimension considered is Technological Pedagogical Knowledge (TPK). For the items under Technological Pedagogical Knowledge (TPK), 82% of the respondents agreed that they are able to use technology to introduce students to real world scenarios. This item has a mean score of 3.19 which is considered high. In the same vein, 83% of the respondents agreed that they are able to facilitate students' use technology to find more information on their own. With a mean score of 3.26, this it is judged that this is highly prevalent among the respondents. In addition, 58.2% of the respondents agreed that they can adapt the use of the technology they are learning about to teach students different subjects. This item has a mean score of 2.82 which means that the respondents are highly able to adapt technology for teaching. All said, the average mean for the dimension of Technological Pedagogical Knowledge (TPK) is 3.10 which indicate a high level of this knowledge.

Another dimension of content delivery is Technological Content Knowledge (TCK). From the items under this, 69.4% of the respondents agreed that they are able to use appropriate technologies to represent subject content. This item has a mean score of 3.03. Similarly, 70.8% of the respondents agreed that they know about the technologies available for the research of teaching content. This item also has a high mean score of 2.92. Also, 65.3% of the respondents agreed that they know about technologies they can use for enhancing teaching of science subjects. This is supported by a mean score of 2.93. Overall, the average mean for the dimension of Technological Content Knowledge (TCK) is 2.96.

The study also examined the Pedagogical Content Knowledge (CK) of the respondents. The results showed that 86.1% of the respondents agreed that they can select effective teaching approaches without using technology. This has a mean score of 3.42. In the same vein, 83.3% of the respondents agreed that they can help students to understand subjects content without using technology. This item has a mean score of 3.15. Also, 75% of the respondents agreed that they can help students to understand learning approaches without the help of technology. This item has also a mean score of 2.99. Overall, the average mean score for this dimension is 3.19 which is high according to the decision rule.

Another dimension of service delivery is the Technological Pedagogical Content Knowledge (TPACK). The responses to the items under this dimension showed that 70.8% agreed that they can teach lessons that appropriately combine their teaching subject, technologies and teaching approaches. This item has a mean score of 3.01 which also indicated a high prevalence. Also, 83.3% of the respondents agreed that they can provide leadership to coordinate the use of content, technology and teaching approaches in their schools with the item having a mean score of 3.29 and finally, 70.8% of the respondents

agreed that they have the ability to select technologies to enhance classroom teaching. The item also has a high mean score of 2.83. Overall, the dimension of TPACK has an average mean score of 3.04 which is considered high.

In order to obtain the level of content delivery practice in the schools, the aggregate mean of all the dimensions is obtained. That is, Technological Knowledge (TK) (3.14); Pedagogical Knowledge (PK) (3.01); Content Knowledge (CK) (3.03); Technological Pedagogical Knowledge (TPK) (3.10); Technological Content Knowledge (TCK) (2.96) Pedagogical Content Knowledge (CK) (3.19) Technological Pedagogical Content Knowledge (TPACK) (3.04)

The aggregate mean for all the items is 3.07. the implication of this mean score is that the level science subject content delivery in Private Schools in Ekiti State, Nigeria is high.

4.3.2: Research Question Two: What is the Level of School Library Support Available to Science Teachers in Private Schools in Ekiti State, Nigeria?

Table 4.3: School Library Support Available to Science Teachers in Private Schools in Ekiti State, Nigeria

	SA	A	D	SD	Mean
Mentoring Support					
My school has mentoring programmes to support students and teachers in science subjects contents delivery	34 (47.2%)	29 (40.3%)	4 (5.6%)	5 (6.9%)	3.28
The management of my school do encourage me to go for workshops/training and seminars	24 (33.3%)	35 (48.6%)	12 (16.7%)	1 (1.4%)	3.14
The school management provide electronic materials e.g. tablets for easy learning.	25 (34.7%)	22 (30.6%)	17 (23.6%)	8 (11.1%)	2.89
Textbooks are available in the library to compliment what is taught in the classroom.	27 (37.5%)	21 (29.2)	14 (19.4%)	10 (13.9%)	2.90
Average Mean					**3.05**
Financial Support					
The school management provide adequate fund to support school library services	27 (37.5%)	29 (40.3%)	16 (22.2%)		3.15

The school management always provide enough funds for training and development of science teachers to guide the students on how to use the library	30 (41.7%)	26 (36.1%)	13 (18.1%)	3 (4.2%)	3.15
The school management do provide financial supports to acquire necessary science subjects resources.	26 (36.1%)	27 (37.5%)	10 (13.9%)	9 (12.5%)	2.97
The available librarians work throughout the school hours	18 (25.0%)	35 (48.6%)	15 (20.8%)	4 (5.6%)	2.93
Average Mean					**3.05**
Technical Support	**SA**	**A**	**D**	**SD**	**Mean**
Reading materials on the Internet Web pages are encouraged	26 (36.1%)	27 (37.5%)	16 (22.2%)	3 (4.2%)	3.06
Encouragement of use of computer software for reading instruction	17 (23.6%)	33 (45.8%)	16 (22.2%)	6 (8.3%)	2.85
The school management encourages online learning library.	30 (41.7%)	24 (33.3%)	15 (20.8%)	3 (4.2%)	3.13
Use of required learning materials for reading in the library is encouraged.	21 (29.2%)	26 (36.1%)	15 (20.8%)	10 (13.9%)	2.81
Average Mean					**2.96**
Overall Mean	**3.02**				

Decision rule: low mean is < 2.5, moderate mean is = 2.5 and high mean is > 2.5

Source: Field work, 2022.

Table 4.3 presents the analysis of the responses to the level of school library support available to science teachers in private schools in Ekiti State, Nigeria. The school library support is measured with three namely, mentoring, financial and technical support. The responses under mentoring support shows that 87.5% agreed that their school has mentoring programmes to support students and teachers in science subject contents delivery. This item has a mean score of 3.28 indicating that this items. Also, 81.9% of the respondents agreed that the management of their schools encourage them to go for workshops/training and seminars. This item has a mean score of 3.14 which indicates that it is highly practiced. Furthermore, 65.3% of the respondents agreed that their school management provide electronic devices for easy learning. The item has a mean score of 2.89 which also indicate high prevalence. Similarly, 66.7% of the respondents agreed that

textbooks are available in the library to compliment what is taught in the classroom. The mean score of 2.90 also shows that textbooks are highly available. Overall the mean score for mentoring support is 3.05 which indicates a high level of mentoring support.

On the aspect of financial support, 77.8% of the respondents agreed that their school management provide adequate fund to support school library services which gave the statement a high mean score of 3.15. In the same vein, 77.8% of the respondents agreed that school management always provide enough funds for training and development of science teachers which also gave the statement a high mean score of 3.15. furthermore, 73.6% of the respondents agreed that school management do provide financial supports to acquire necessary science subject resources. This item has a mean score of 2.97 which is also high. Also, 73.6% of the respondents agreed that librarians work throughout the school hours which gave the statement a mean score of 2.93. Overall financial support has a mean score of 3.05 indicating that the level of financial support in the schools is high.

The third aspect of school library support is technical support. The responses to items in this section shows that 63.6% of the respondents agreed that reading materials on the Internet Web pages are encouraged in their schools. With the mean score of 3.06, this practice is regarded as high. Also, 69.4% of the respondents agreed that their schools provide encouragement of use of computer software for reading instruction which is high as indicated by the mean score of 2.85. Similarly, 75% of the respondents agreed that their school management encourages online learning library. This is also shown to be high according to the mean score of 3.13. Also, 65.3% of the respondents agreed that the use of required learning materials for reading in the library is encouraged. This item also has a mean score of 2.81. Overall, the average mean score for technical support is 2.96 which

translates to a high level of technical support for the schools. The combination of the average mean score of the three aspect of school library support, namely mentoring support (3.05), financial support (3.05), and technical support (2.96), is 3.02. So, the means score for school library support is 3.02 which translates to a high level of school library support.

4.3.3 Research Question Three: What are the Inquiry Based Teaching Methods Adopted by Private School Teachers in Ekiti State, Nigeria?

Table 4.4: Inquiry Based Teaching Methods Adopted by Private School Teachers in Ekiti State, Nigeria

	SA	A	D	SD	Mean
Communication					
Provision of basic amenities for effective teaching	39 (54.2%)	25 (34.7%)	5 (6.9%)	3 (4.2%)	3.39
Knowledge is impacted through teaching by my teachers.	19 (26.4%)	35 (48.6%)	13 (18.1%)	5 (6.9%)	2.94
Class discussion is organized for teaching	34 (47.2%)	19 (26.4%)	10 (13.9%)	9 (12.5%)	3.08
Subject syllabus are followed while teaching	24 (33.3%)	37 (51.4%)	6 (8.3%)	5 (6.9%)	3.11
Average Mean					**3.13**
Evaluation					
Students engage in assignments and classwork for teachers to ascertain the level of understanding.	33 (45.8%)	28 (38.9%)	10 (13.9%)	1 (1.4%)	3.29
Teachers test the students on topic taught at the end of each lesson.	18 (25.0%)	38 (52.8%)	10 (13.9%)	6 (8.3%)	2.94
Teachers support students to sort out the difficult aspect of our lesson.	32 (44.4%)	23 (31.9%)	16 (22.2%)	1 (1.4%)	3.19
Average Mean					**3.14**
Demonstration					
Teachers demonstrate what is being taught during practical class.	27 (37.5%)	31 (43.1%)	10 (13.9%)	4 (5.6%)	3.12
Libraries are well equipped for understandable learning.	29 (40.3%)	32 (44.4%)	9 (12.5%)	2 (2.8%)	3.22
Quality learning is taken into consideration while teaching.	30 (41.7%)	26 (36.1%)			3.18
Average Mean					**3.17**
Overall Mean					**3.14**

Decision rule: low mean is < 2.5, moderate mean is = 2.5 and high mean is > 2.5
Source: Field work, 2022.

Table 4.4 presents the responses on the inquiry based teaching methods adopted by private school teachers in Ekiti State, Nigeria. Inquiry based teaching methods are measured by Communication, evaluation, and demonstration. Under communication, the responses show that 88.9% of the respondents agreed that there is provision of basic amenities for effective teaching in their schools which is further confirmed by a mean score of 3.39. Also, 75% of the respondents agreed that knowledge is impacted through teaching by teachers. this item has a mean score of 2.94 which is considered as high in this study. furthermore, 73.6% of the respondents agreed that Class discussion is organized for teaching in their schools. This item is also regraded as high because of the mean score which is 3.08. in the same vein, 84.7% of the respondents agreed that Subject syllabus are followed while teaching. This item has a mean score of 3.11 which is regarded as a high mean score in this study Overall the average mean of communication as an aspect inquiry based teaching method is 3.13 which a high.

The second aspect of inquiry based teaching method is evaluation. Under this section, it can be seen that 84% of the respondents agreed that teachers often used assignments and classwork fo students in order to evaluate their performance. This aspect has a mean score of 3.29 which is considered high. Also, 77.8% of the respondents agreed that teachers usually test the students on topic taught at the end of each lesson. This item has a mean score of 2.94. furthermore, 76.3%of the respondents agreed that. teachers support students to sort out the difficult aspect of our lesson this is further supported by a mean score of 3.19. Overall, the average mean score for evaluation is 3.14 which means that the practice of evaluation is very high.

The third aspect of Inquiry Based Teaching Methods is demonstrator. The analyses of the responses here show that 80.6% of the respondents agreed that teachers demonstrate what is being taught during practical class. This has a mean score of 3.12 which is considered as high. Also, according to 84.7% of the respondents agreed that Libraries are well equipped for understandable learning. This item has a mean score of 3.22. In the same vein, 77% of the respondents agreed that Quality learning is taken into consideration while teaching. This item also has a meal store 3.18 which is considered high. The combination of all the item yielded and average mean of 3.17 which translates to a high level of demonstration as a mode of inquiry based teaching.

To identify the level of the Inquiry Based Teaching Methods Adopted by Private School Teachers in Ekiti State, Nigeria, the means scores of all the dimensions are considered. This is done by getting the average of communication (3.13), evaluation (3.14). and demonstration (3.17). the aggregate mean for all the aspect is 3.14 which means that the inquiry based teaching method is highly embraced in the schools. In addition, it can be seen that all types of inquiry based teaching method are adopted in the schools.

4.4 Presentation of Hypotheses

4.4.1 H_{01}: There will be no significant Influence of School Library Support On Content Delivery of Science Subjects in Private Schools in Ekiti State, Nigeria.

Table 4.5 (a-c): Influence of School Library Support On Content Delivery Of Science Subjects In Private Schools In Ekiti State, Nigeria.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.858[a]	.736	.732	.24570

a. Predictors: (Constant), School library support

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.756	1	11.756	194.743	.000[b]
	Residual	4.226	70	.060		
	Total	15.982	71			

a. Dependent Variable: Condev
b. Predictors: (Constant), Support

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.820	.164		5.009	.000
	Support	.745	.053	.858	13.955	.000

a. Dependent Variable: Condev

Table 4.5a-c presents the results of the linear regression analysis for the Influence of school library support on content delivery of science subjects in private schools in Ekiti State, Nigeria.

From the results in table 4.5a, school library support has a positive and significant relationship with content delivery of science subjects in private schools in Ekiti State, Nigeria. ($R = 0.858$, $p<0.05$). The coefficient of determination (Adj. R^2) of 0.732 shows that school library support predicts 73.2% of the changes in content delivery of science subjects in private schools in Ekiti State, Nigeria, while the remaining 26.8% changes in content delivery of science subjects in private schools in Ekiti State, Nigeria is explained by other variables not included in this study.

Furthermore, table 4.5b presents the results of ANOVA of regression test which revealed that school library support has a significant effect on content delivery of science subjects in private schools in Ekiti State, Nigeria. This is exhibited in the F-value (194.743) and low p-value (0.000) which is statistically significant at 95% confidence interval. Hence, the result indicates that school library support has a positive and significant relationship with content delivery method of science subjects in private schools in Ekiti State, Nigeria.

In addition, the results of regression coefficients in Table 4.5c, revealed that at 95% confidence level, a unit change in school library support will lead to a 0. 745 change in the content delivery method of science subjects in private schools in Ekiti State, Nigeria given that all other factors are held constant. It is on the strength of this result (Adj. $R^2 = 0.732$, F (1,70)= 194.743, p= 0.000), that this study rejects the null hypothesis one ($H_0 1$) which states that there will be no significant influence of school library support on content delivery of science subjects in private schools in Ekiti State, Nigeria.

4.3.2 H_{02}: There will be no Significant Influence of Inquiry Based Approach on Content Delivery of Science Subjects in Private Schools in Ekiti State, Nigeria

Table 4.6 (a-c): Influence of Inquiry Based Approach on Content Delivery Of Science Subjects In Private Schools in Ekiti State, Nigeria

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.668[a]	.446	.438	.35559

Predictors: (Constant), Inquiry Based Approach

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	7.130	1	7.130	56.390	.000[b]
Residual	8.851	70	.126		
Total	15.982	71			

a. Dependent Variable: Content Delivery Method

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.043	.273		3.821	.000
Content Delivery Method	.643	.086	.668	7.509	.000

a. Dependent Variable: Content Delivery Method

Table 4.6a-c presents the results of the linear regression analysis for the influence of inquiry based approach on content delivery method of science subjects in private schools in Ekiti State, Nigeria. From the results in table 4.5a, inquiry based approach has a positive and significant relationship with content delivery of science subjects in private schools in Ekiti State, Nigeria. ($R = 0.668$, $p<0.05$). The coefficient of determination (Adj. R^2) of 0.438 shows that inquiry based approach predicts 43.8% of the changes in content delivery method of science subjects in private schools in Ekiti State, Nigeria, while the remaining 56.2% changes in content delivery of science subjects in private schools in Ekiti State, Nigeria is explained by other variables not included in this study.

Furthermore, table 4.6b presents the results of ANOVA of regression test which revealed that inquiry based approach has a significant effect on content delivery of science subjects in private schools in Ekiti State, Nigeria. This is exhibited in the F-value (56.390) and low p-value (0.000) which is statistically significant at 95% confidence interval. Hence, the result indicates that inquiry based approach has a positive and significant relationship with content delivery method of science subjects in private schools in Ekiti State, Nigeria.

In addition, the results of regression coefficients in Table 4.6c, revealed that at 95% confidence level, a unit change in inquiry based approach will lead to a 0.643 change in the content delivery method of science subjects in private schools in Ekiti State, Nigeria given that all other factors are held constant. It is on the strength of this result (Adj. $R^2 = 0.438$, F (1,70)= 56.390, p= 0.000), that this study rejects the null hypothesis one ($H_0 2$) which states that there will be no significant influence of inquiry based approach on content delivery of science subjects in private schools in Ekiti State, Nigeria.

4.4.2 H_{03}: There will be no Significant Combined Influence of School Library Support and Inquiry Based Approach on Content Delivery Method of Science Subjects in Private Schools in Ekiti State, Nigeria.

Table 4.7 (a-c): Combined Influence of School Library Support and Inquiry Based Approach on Content Delivery Method of Science Subjects in Private Schools in Ekiti State, Nigeria

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.869[a]	.755	.748	.23813

Predictors: (Constant), Inquiry Based Approach, School Library Support

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	12.069	2	6.035	106.421	.000b
Residual	3.913	69	.057		
Total	15.982	71			

a. Dependent Variable: Content Delivery Method

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.577	.190		3.042	.000
Inquiry Based Approach	.179	.076	.185	2.350	.022
School Library Support	.639	.068	.736	9.333	.000

a. Dependent Variable: Content Delivery Method

Source: Field Survey Results (2022)

Table 4.7a-c presents the results of the multiple regression analysis for the combined influence of school library support and inquiry based approach on content delivery method of science subjects in private schools in Ekiti State, Nigeria. From the results in Table 4.7a, the combination of school library support and inquiry based approach has a positive significant relationship with content delivery method of science subjects in private schools

in Ekiti State, Nigeria, Nigeria (R = 0.869, p<0.05). The coefficient of determination (Adj. R^2) of 0.748 shows that the combination of school library support and inquiry based approach predicts 74.8% of the changes in content delivery method of science subjects in private schools in Ekiti State, Nigeria, while the remaining 25.2% changes in content delivery method of science subjects in private schools in Ekiti State, Nigeria.is explained by external variables not included in this study.

Table 4.7b presents the results of ANOVA (overall model significance) of regression test which revealed that the combination of school library support and inquiry based has a significant effect on content delivery method of science subjects in private schools in Ekiti State Nigeria. This can be explained by the F-value (106.421) and low p-value (0.000) which is statistically significant at 95% confidence interval. Hence, the result posited that information behaviours significantly influenced the combined influence of school library support and inquiry based approach on content delivery method of science subjects in private schools in Ekiti State, Nigeria.

In addition, the results of regression coefficients in table 4.7c, revealed that at 95% confidence level, a unit change in Inquiry Based Approach will lead to a 0.179 change in the content delivery method of science subjects in private schools in Ekiti State, Nigeria given that all other factors are held constant. Also, at 95% confidence level, a unit change in lead to a 0.015 while a unit change in the school library support will lead to a 0.464 increase in the perceived academic performance of students in Federal Cooperative College, Ibadan, Oyo State, Nigeria given that all other factors are held constant. It is on the strength of this result (Adj. R^2 = 0.748, $F(2,69)$= 106.421, p= 0.000), this study rejects the null hypothesis one ($H_0$3) which states that there will be no significant combined

influence of inquiry based approach on content delivery method of science subjects in private schools in Ekiti State, Nigeria. However, it is only school library support that individually predict the content delivery method of science subjects in private schools.

4.5 Discussion of Findings

The study examined the influence of school library support and inquiry based approach as determinants of science subject content delivery in private schools in Ekiti State, Nigeria. Data was collected and analysed in line with the research questions and hypotheses.

The first research question identified the level of science subject content delivery in private schools in Ekiti State, Nigeria. The study found that all seven dimensions of science subject content delivery examined in the study were highly delivery with all of them converging to result in high level of science subject content delivery in private schools in Ekiti State, Nigeria. This finding runs contrary to what has been reported in other studies conducted by researchers in Nigeria.

In a study conducted in Abuja, Nigeria, to assess and evaluate the teaching methods used in basic education schools, it was found that many schools poorly implemented assessment approaches like concept-mapping, individual projects, group works/assignments and guided discovery[1]. The study recommended a change of teaching method from the conventional lecture/discussion methods (traditional methods) to guided discovery (inquiry) method. Also, in another study conducted to evaluate teaching strategies and its implications for curriculum implementation in science subjects, it was found that the lecture method of teaching is still predominant at all levels in most schools, and that ignorance is a major challenge to effective application of innovative strategies such as self-directed learning and higher cognitive skills, required for the 21st century

education[17]. In schools where teachers make attempt to adopt innovative strategies, the majority of the science teachers frequently used only the laboratory and models as innovative strategies for teaching, while other innovative teaching strategies were hardly used.

This non-application of the inquiry based method was attributed to the fact that the training acquired by teachers during their study at colleges of education did not prepare them for modern ways of content delivery. A scholar, however, described traditional teaching methods as not effective as they used to be due to the current advancement and evolving landscape in information technology[2]. It was recommended that consistent refresher training for teachers in schools in order to enlighten and motivate them to integrate innovative teaching strategies into their teaching methods. It is on the basis of the weaknesses of the lecture pedagogy in science that several scholars advocate peer instruction as the better alternative to the lecture method[3]. Peer instruction is a research-based pedagogy created for teaching large introductory science class. This method was developed to assist in making lectures more interactive and equally gets students intellectually involved in what is being taught class[4].

The second research question focus on the level of school library support available to science teachers in private schools in Ekiti State, Nigeria. The finding showed that all of the three dimensions of school library support, that is; mentoring support, financial support and technical support were highly available. These came together to form a high level of library support for science subject content delivery in the schools. The finding on library support shows that private schools in Ekiti state are among the few that enjoy

decent level of library support. The available research in Nigeria indicates that while some schools enjoy proper library services, others do not.

Researchers in Osun State have linked the many services rendered by the school library such as the provision of lending services, newspapers/magazines, arrangement for individual study, provision of computers and internet access, provision of application software on library computers (e.g. Word, Excel), among others. The researcher submitted that these services motivate students academically and lead to better academic performance. The scholars however observed that these services are large unavailable and recommended more funding for school libraries to be able to acquire various emerging ICTs for student use as a way of motivating them academically[5]. Similarly, another group of researchers highlighted the significance of school libraries in the educational development of students and reported that the lack of professional school librarians is a minus for school libraries. The scholars recommended the employment of a qualified librarian to provide effective services to users; acquisition of current and relevant information resources to arouse students' interest, proper orientation and, exhibitions and displays to create users awareness of the library service and equally provide adequate study space[6].

Studies conducted in Croatia and Hong Kong, as wells as USA and UK indicate that school libraries in these are important support for effective content delivery in science and other subjects. countries offer programmes that assist students' reading and enhance learning. The studies highlighted the main content specifically taught by librarians, which most subject teachers actually expected librarians to teach as the traditional information skills such as: locating information; using books; taking notes and referencing[8.] The libraries also have current resources and offer supports for digital literacy skills development and regular collaboration between librarians and teachers in schools[7]. The

collaboration has helped in integrating research based assignments into teaching practice, which has ultimately resulted in high academic performance as revealed in several studies across the United States as well as European countries such as the United Kingdom (UK) and Netherlands[9].

The major role of the school library is to provide students access to good reading resources that would improve their studies[10]. In Indonesia, for instance, the roles of librarians in effectively teaching information literacy were delivered[11]. School librarians of the 21st century should be actively involved in school instructional programmes such as; curriculum development, information literacy instruction and collaborative teaching[68]. A school librarian helps students in acquiring ICT skills (which sometimes are not taught in the classroom) essential for students in the 21st century[69].

The third research question is focused on the inquiry based teaching methods adopted by private school teachers in Ekiti State, Nigeria. The dimensions of inquiry based teaching methods examined include communication, evaluation, and demonstration. The study found that all these dimensions were highly practiced by the teachers in Ekiti state. The finding therefore indicates a high level of use of inquiry based teaching methods among the teachers. Previous studies by Nigerians have also explored the adoption of inquiry based teaching methods by educators in the country.

One of such study looks at how IBP is perceived and implemented by secondary school science educators in Nigeria. The study also identified various method which can be categorised as communication, demonstration and evaluation. However, the study also found a fourth method which is investigation. However, the study reported irregular application of the methods due to factors such as lack of time, classroom overcrowding,

personal beliefs, inadequate access to and use of technology, and insufficient professional development for inquiry-based pedagogy[12]. To find out why the application of inquiry based teaching method was so important, the study tested some hypotheses.

The first hypothesis evaluated the influence of school library support on content delivery of science subjects in private schools in Ekiti State, Nigeria. The test of hypothesis revealed that school library support has a significant influence on content delivery of science subjects in private schools in Ekiti State, Nigeria. The finding shows that school library support plays a great role in effective content delivery of science subjects in private schools in Ekiti State, Nigeria. This finding has a lot of support in literature. Available literature has reported that contemporary school librarians operate as collaborative instructional partners by evaluating, planning and teaching with fellow educators. School librarians also teach information literacy skills, that is, teaching of students about accessibility, evaluation, and utilisation of information in the context of their curriculum content. When a school librarian fulfils these roles, they help teacher in delivering understandable content to students[13]

Since school librarian is also anticipated to perform as a teacher they are expected to possess good teaching skills and a teaching qualification[1]. In addition, a school librarian should possess a first degree in librarianship or first degree in other disciplines with at least a postgraduate diploma in librarianship to be able to participate effectively in collaboration. The involvement of the school librarians in through the creation of information access, evaluation and use; maintains long-term relationships with students from year to year; and fosters an inquiry-based learning (constructivist learning) environment[14]. Equally, school librarians are expected to formulate the policy for

improving information literacy, which includes a well organised collection of current and relevant resources within the school; internet connectivity; incorporation of community members from the public library to expand resources and generate authentic experiences, and links to experts on different subjects[14] In developing 21st century citizens who can to locate, evaluate and utilise information effectively required school libraries managed by fulltime qualified librarians. Studies from around the world confirm that a qualified school librarian improves learning outcomes of students regardless of their socioeconomic status. However, school librarians can only perform optimally if they are assisted by support staff library officers, library assistants, and library attendants. Equally, to achieve quality teaching across an entire school required effective school librarians. School librarians provide the resources and services that could impact on every teacher and student[15].

The second hypothesis focused on the influence of inquiry based approach on content delivery of science subjects in private schools in Ekiti State, Nigeria. The study found that inquiry based approach has a significant influence on content delivery of science subjects in private schools in Ekiti State, Nigeria. It was found that the higher the level of inquiry based approach adopted, the more effective the content delivery for science subjects. This is supported by the finding of previous studies. For example, a previous study revealed that the Inquiry-Based Science Teaching Approach is more effective than the Lecture Method of teaching, with a considerable accomplishment gap between the experimental and control groups. Furthermore, the Inquiry-Based Science Teaching Method significantly benefits male students' achievement over female students'. For a third, the effects of Inquiry-Based Science Teaching on students' attitudes and performance in science are not distinguishable from those of traditional science education[16].

In Orlando, United States, researchers affirmed that constructivist and inquiry-based learning approaches greatly influence high academic performance, since it creates room for non-threatening situations which are relevant for academic performance in science[17.] Similarly, a scholar from Latin advocated that teachers and librarians should learn to collaborate on inquiry-based science lessons that connect science, information literacy, and structured English immersion standards for students[18.]

A scholar who conducted an experimental study also reported that Students in the IBL group scored higher than students in the traditional group on the academic achievement post-test, although not statistically significant. Students who received IBL instruction showed a slight statistically insignificant decrease in their positive attitudes towards science but higher engagement as compared to students who received traditional instruction[19]. The inquiry based teaching method has also been found useful in Africa. For example, in Ghana, a scholar found that strong teacher and librarian collaboration provides significant mediation opportunities for students to build their own meanings and understanding from the library resources accessed[19.] Similarly, in Nigeria, a researcher revealed that the approach was more active in facilitating the students' achievement in ecological concepts[20].

Similarly, a study which focused on constructivist teaching strategies in integrated science at secondary school level in Ogun State, Nigeria found that the students being taught with a constructivist approach scored higher marks on the post-test and the delayed post-test compared to students taught with traditional method (lecture) of teaching. The findings recommended incorporation of constructivist-based approach into teacher's methods of teaching[21]. In a study, it was revealed that there is a strong positive link between teaching method and subject content delivery. Schools that possess more different teaching

methods in learning better than schools that do not have diverse method of teaching. This finding supported the study that private schools performed better than public schools because of the availability and adequacy of teaching and learning resources[21, 22].

The third hypothesis examined the combined influence of school library support and inquiry based approach on content delivery method of science subjects in private schools in Ekiti State, Nigeria. The finding showed that both there is a combined influence of school library support and inquiry based approach on content delivery method of science subjects in private schools in Ekiti State, Nigeria. However, it was found that only school library support individually predict the content delivery method of science subjects in private schools. This indicates that school library is not only important to content delivery, it is also the bedrock of inquiry based teaching method. This is support by the findings of a study which showed that the teaching of agricultural science in selected secondary schools in Nigeria depended on the availability and utilization of instructional materials which had negative relationship in the teaching of agricultural science in selected secondary schools in Lagos State[23]

Similarly, a related study on the role of library services in science education revealed that students performed better when appropriate and improvised materials were made available and utilized in teaching science and teachers possessing good qualifications enhanced students' performance in science. In a researcher's study it was revealed that a strong positive link between instructional resources and academic performance[24] According to the researcher, schools that possess more instructional resources performed better than schools that have less instructional resources. This finding supported the study by a scholar that private schools performed better than public schools because of the availability and adequacy of teaching and learning resources[24] What all these study imply

is that library services is indispensable to modern educations Studies imply is that effective science teaching depends largely on the provision of library support is non-negotiable for effective content delivery. While the use of inquiry based teaching method is highly desirable and has been found to be effective, without library support, the desired result may not be achieved.

Endnotes

1. S. G., Isa, M. A., Mammam, Y. Badar & T. Bala. "The impact of teaching methods on academic performance of secondary school students in Nigeria". **International Journal of Development Research**, 10(6), 2020, 37382-37385.

2. De Paola, "The determinants of risk aversion: the role of intergenerational transmission", **German Economic Review**, 64, 2019. 193–209.

3. A. L. Diaz. "Personal, family academic factors affecting low achievement in secondary school". **Electronic Journal of Research in Educational Psychology and Psychopedagogy**, 1 (1), 2019. 43-66

4. R. H. Grissmer. "Beyond helping with homework: Parents and children doing mathematics at home". **Teaching Children Mathematics**, 14, 2020. 120- 131.

5. I. T. Eshiet, "Improvisation in science teaching". **Abak: Belpot (Nig) Co**. 2017.

6. Aslam, R. & Awan, A.G., "Perception of primary school teachers about teaching strategies and their impact on student learning". **Global Journal of Management, Social Sciences and Humanities**, 5(1), 2019. pp.36-59.

7. M. J. de Dieu & D. J. de Dieu. "The relationship between smart classroom and learners' academic performance in public boarding schools of Gicumbi District, Rwanda". **Inkanyiso: Journal of Humanities and Social Sciences**, 13(2), 2021, 228-241.

8. E. V. Malicoban, J. S. Omra, N. M. Guinar, K. A. L. Acma, G. P. Go & I. C. V. Mordeno. "Qualitative study on difficulties of non-physics majors teaching physics: basis for competency enhancement for teaching STEM". **Journal of Physics: Conference Series. IOP Publishing**. Vol. 1835, No. 1, 2021, p. 012066

9. L.D.A.M., Antunes. "Speaking skills and communicative competence in EFL: relating theory to teachers' and learners' perceptions" **(Doctoral dissertation).** 2022.

10. R. Dubovi, I., "Designing for online computer-based clinical simulations: Evaluation of instructional approaches". **Nurse Education Today**, 69, 2018. pp.67-73.

11. M. A. Buba, I. A. Gana, & M. W. Bularafa. "Influence of Instructional Materials and school location on Academic Achievement of Senior Secondary School Students in Biology in Maiduguri Metropolis, Nigeria". **Rivers State University Journal of Education,** 22(1&2), 2019. 156-164.\

12. A. A. Ogegbo, "Relationships between High School Teachers' Understanding and their Reported Practices of Inquiry-based Pedagogy in Science Classrooms in Nigeria". **African Journal of Research in Mathematics, Science and Technology Education**, 25(2), 2021. pp.125-136.

13. M. P. Osiesi, "Assessment of Teachers' Perception of the Provision, Use, and Maintenance of Information and Communication Technology Facilities (ICT) in Ekiti State Primary School Libraries in Nigeria". **Assessment,** 2022**.**

14. C. Margaret, A. F., Emeka, A. H., & O. N. Jacob. "Science Education in Primary School Education in Nigeria: Problems and the way Forward". **International Journal of Development and Public Policy**, 1(5), 2021, 18-23

15. R. Eichie & R. Strachan. "The use of interactive screencasts to promote active and engaged learning in the Further Education mathematics classroom: A descriptive case study from North East England". **In 2021 IEEE Frontiers in Education Conference (FIE**) 2021, pp. 1-5

16. N. Srisawasdi & P. Panjaburee. "Implementation of game-transformed inquiry-based learning to promote the understanding of and motivation to learn chemistry". **Journal of Science Education and Technology**, 28(2), 2019. 152-164.

17. Liou, P.Y., "Students' attitudes toward science and science achievement: An analysis of the differential effects of science instructional practices". **Journal of Research in Science Teaching,** 58(3), 2021. pp.310-334.

18. N. M. Nor, R. Embong, H. Muda, K. Yunus & J. M. Nor. "Effects of teachers' teaching competencies on students' academic performance mediated by holistic centered learning style based on SUMUR Program at Secondary Religious Schools". **International Journal of Academic Research in Progressive Education and Development**, 8(2), 2019, 25-38

19. W. N. Nasution. "The effects of inquiry-based learning approach and emotional intelligence on students' science achievement levels". **Journal of Turkish Science Education**, 15(4), 2018. pp.104-115.

20. T. G. Olatunde-Aiyedun & N. J. Ogunode. "School administration and effective teaching methods in science education in north central Nigeria". **International Journal on Integrated Education**, *4*(2), 2020, 145-161.

21. C. Chukwueke & J, Onuoha. “Effect of library services on the educational development of secondary school students in Abia State: A study of Igbere Secondary School Igbere”. **Library Philosophy and Practice**, 1. 2018.

22. T. S. Ternenge & O. L. Agipu. “Availability and utilization of school library resources in selected secondary schools in Makurdi Metropolis”. **Library Philosophy and Practice (e-journal),** 2019, 2542

23. . W. V. Dole, K. Dabbour, and K. Kott, “Dialogic approaches to strategic planning in academic libraries: an appreciative inquiry case study at Oviatt Library”, **Journal of Library Administration**, 57(4), pp.468-480. 2017.

24. A. Kangas, N. Duxbury & C. De Beukelaer (Eds.). “Cultural policies for sustainable development”. **Routledge**.2019.

25. O. N. N. “Charlotte, Sustainability Strategies for Electronic Information Resource (EIR) Services in University Libraries (UL) of North Central Nigeria”. **Bull. IEEE Tech. Comm. Digit. Libr**., *14*(1).2018

Chapter Five

Summary, Conclusion and Recommendations

Introduction

In this chapter, the summary of the research findings is presented, followed by the conclusion. The last sections present the study's recommendations and contribution to the body of knowledge, as well as suggestions for further research.

5.1 Summary of Findings

The findings of this study can be summarised as follows:

The study found that all seven dimensions of science subject content delivery examined in the study were highly observed with all of them converging to result in high level of science subject content delivery in private schools in Ekiti State, Nigeria. This means that private school teachers in Ekiti State are delivering quality science subject contents to their students.

The finding on library support shows that private schools in Ekiti state are among the few that enjoy decent level of library support. The study also found that all of the three dimensions of school library support, that is; mentoring support, financial support and technical support were highly available. These came together to form a high level of library support for science subject content delivery in the schools.

Furthermore, the findings of the study indicate a high level of use of inquiry based teaching methods among the teachers. The dimensions of inquiry based teaching methods examined include communication, evaluation, and demonstration. The study found that all these dimensions were highly practiced by the teachers in Ekiti state.

The test of hypothesis one revealed that school library support has a significant influence on content delivery of science subjects in private schools in Ekiti State, Nigeria. It was found that the higher the level of school library support, the more effective the content delivery for science subjects.

The study also found, through the test of hypothesis two that inquiry based approach has a significant influence on content delivery of science subjects in private schools in Ekiti State, Nigeria. It was found that the higher the level of inquiry based approach adopted, the more effective the content delivery for science subjects.

Furthermore, testing of the third hypothesis showed that both there is a combined influence of school library support and inquiry based approach on content delivery method of science subjects in private schools in Ekiti State, Nigeria. However, it was found that only school library support individually predict the content delivery method of science subjects in private schools. This indicates that school library is not only important to content delivery, it is also the bedrock of inquiry based teaching method.

5.2 Conclusion

Science education has been recognised as one of the effective strategies to drive development in developing countries such as Nigeria. However, if science is to be used to solve societal problems and drive development, it must be well taught. Old, archaic and unimaginative approach to science content delivery would therefore be a disservice to the individual students and the nation at large. The adoption of inquiry based method of delivering science content to student as exhibited by teachers in this study is commendable. However, the effect may not be significant enough unless it becomes institutionalised and

widespread in Nigerian schools. Also, the study has provided further evidence to support the importance of library support to educations.

It has been shown that dynamic, self-direct and purposeful learning would only be possible in an environment where the required library support is available. Not only this, professional librarians have been shown in this study to be indispensable in the modern learning environment.

5.3 Recommendations

The researcher considered the findings reported in this study and the following recommendations are made:

i. There is a need for educational authorities to provide a framework for science content delivery in the state so that all students, irrespective of whether they attend public or private schools will have access to quality science education.

ii. A functional school library should be a key part of the criteria for registering a private school. The policy should also be extended to cover public schools.

iii. There should be regular capacity development for science teachers in order for them to properly master the inquiry based method for science education.

iv. There should be more collaboration between teacher librarians and science teachers to ensure the effective use of available information resources by students in a way that improve their performance in science and science-related subjects.

v. Self –driven learning supported by a well-resourced library should be encourage among students. School librarians should create interesting programmes to attract students to use library resources.

5.4 Contributions to Knowledge

The study has significantly contributed to knowledge by revealing that school library is not only important to content delivery but also the bedrock of inquiry based teaching method.

The findings of this study may be useful to education stakeholders such as government, principals, and sciences teachers to adequately equip school library so as to be able help in the area adopting inquiry based approach for teaching science. Also, the study made theoretical contributions by applying various constructivist theories such as: technological Pedagogical Content Knowledge (TPACK) Model; sociocultural Theory of Teaching, Learning, and Development; and theory of constructivism and inquiry-based approach to underpin the various constructs of the study.

Empirically, the study has collected raw data that was previously not in existence. This data is available for future researchers, who might find any aspect useful either for comparison or adaptation.

5.5 Suggestions for further Study

Initially, this study sought to cover the entire private schools in the state. As a result of shortage of finance and limited time, this could not be achieved. Therefore, it is suggested that:

i. Similar study be conducted in other local govern areas in the state. This will give more general views of the study.
ii. A comparative study of both public and private schools in the State be conducted. This will provide more understandings of the efficacy of school library and inquiry based approach for science subject content delivery.

iii. In the study, it is only teachers that served as respondents, therefore, similar study where other education stakeholders, such as: librarians, students, principals as respondents be conducted. This will make the study to be more comprehensive and robust.

Bibliography

Books

Abubakar, S. “Department of Physics Federal College of Education”, **Katsina**, Nigeria 32

Adeyemo, S. A. “The relationship between students’ participation in school based extracurricular activities and their achievement in physics”. 2010.

Aina, J. K. “Teaching aids improvisation in the teaching and learning of Physics in secondary schools”. 2018.

Aina, L.O. “Information, knowledge and the gatekeepers.” The One Hundred and Thirty-Second Inaugural Lecture delivered at the University of Ilorin, Nigeria. 2013.

Akande, O.M. “Hints on Teaching Practice and General Principles of Education.” Lagos: OSKO Associates. 1985.

Alberta Learning. “Focus on Inquiry: A teacher’s guide to implementing inquiry-based learning”. 2004.

American Heritage Dictionary, “The American Heritage Dictionary of the English language” 4th edition Washington DC: Houghton Mifflin Publishing Company. 2019.

Anderson, T. & Elloumi, F. “Theory and Practice of online learning”. Canada: Athabasca University, 2008.

Annie, W. Stoker, W & Mildred, M. "Achievement and Ability Tests - Definition of the Domain", Educational Measurement 2. University Press of America, 1996. 2–5,

Ashland, O. H. US: Hogrefe & Huber Publishers, “Student-centered teaching: Five key changes to practice”. San Francisco, CA: Jossey-Bass. 2012.

Askhia, O. A. “Students and Teachers’ Perception of the Causes of Poor Academic Performance in Ogun State Secondary Schools”. 2010.

Atkinson, R. K. “Learning from Examples: Instructional principles from the worked Examples Research.” Mississippi: Mississippi State University. 2000.

Ava, C. “Death by philosophy: the biographical tradition in the life and death of the archaic
philosophers Empedocles”, Heraclitus, and Democritus. Ann Arbor: University of Michigan Press. p. 80. ISBN 0472113887. OCLC 54988783. 2017.

Benell, P. & Mukyanuzi, F. “Is there teacher motivation crisis in Tanzania?” A report commissioned by DFID. Dar es Salaam, Tanzania. 2017.

Bentley, G. E. “Shakespeare: A Biographical Handbook”. New Haven: Yale University **Press.** 1961.

Bloom, B. S. “A Primer for Parents, Teachers and other Educators: All Our Children Learning.” New York: **Mcgraw-Hill.** 1999.

Bybee, R. W. “Scientific Inquiry and Science Teaching”. In Flick, L. B. & Lederman (Eds.),

N. G. Scientific Inquiry and nature of science: Implication for Teaching, Learning, and Teacher Education, 2019, 1 - 10. **Springer.**

Carnine, S. “Theory of instruction: Principles and applications (Ed.).” Eugene, OR: **ADI**

Press. 2011.

Chaimany, C. R. “Introduction to Teachers Education in Nigeria”: TTC publisher No. 42 Edinburgh Road, Enugu. 2019.

Charalabidis, Y. Zuiderwijk, A. Alexopoulos, C. Janssen, M. Lampoltshammer, T. & Ferro,

E. “Open data evaluation models: theory and practice”, In The World of Open Data (pp. 137-172). **Springer,** Cham. 2018.

Cline Library Strategic Plan 2019- 2025 2019. Norther Arizona University. Accessed 7 July

2019.

Cohen, L. Manion, L. & Morrison, K. “‘Observation, Research methods in education”, 6, pp.396-412. 2017.

Cohen, J. “Statistical power analysis for behavioral sciences”. **Lawrence Erlbaum Associates.** New York, 2013.

Collins English Dictionary, Complete and unabridged. Paris: Harper Collins Publishers.

2016.

Colom, R. & Lynn, R. Testing the developmental theory of sex differences in intelligence

on 12-18 year olds. **Personality and Individual Differences,**” 36, 2018. 75-82.

Cooper, S. “Corporate social performance: a stakeholder approach”. London, **Routledge.** 2017.

Cozby P.C. “Methods in behavioural Research” 10th Edition New York: **MC Graw Hill**.

2009

Creswell, J. W. & Clark, V. L. "Designing and Conducting Mixed Methods Research", 2nd Ed, **Sage,** Thousand Oaks, CA. 2021.

Creswell, J. W. "Research design: qualitative, quantitative and mixed methods approaches", 4th ed, Los Angeles, **Sage Publications**. 2014.

Creswell, J. W. "Research Design: Qualitative. Quantitative, and mixed methods," Los Angeles, **Sage Publications.** 2018.

Creswell, J. W. & Cheryl, N. P. "Qualitative Inquiry and Research Design: Choosing among Five Approaches", Boston, MA, **Pearson Education, Inc.** 2018.

Creswell, J. W. & Plano, C. "Designing and conducting mixed methods research", Thousand Oaks, CA, **Sage**. 2018

Creswell, J. W. "Educational research: planning, conducting and evaluating quantitative and qualitative research," 4th ed, Boston, MA, **Pearson Education, Inc.** 2019.

Creswell, J. W. "Qualitative, quantitative, and mixed methods approach." Thousand Oaks, CA: **Sage.** 2019.

Creswell, J. W. "Research design: qualitative, quantitative and mixed methods approaches", ed., Los Angeles, **Sage Publications.** 2015.

Dave, R. H. "Developing and Writing Behavioural Objectives" - **Educational Innovators Press,** 1999.

Deboer, G. E. "Historical perspectives on Inquiry Teaching in schools. In Flick, L. B. & Lederman (Eds.), N. G. Scientific Inquiry and nature of science: *Implication for Teaching, Learning, and Teacher Education*," 2018.

Denzin, N. K. "The research act: a theoretical orientation to sociological methods", 2nd ed, New York, **McGraw-Hill.** 1978.

Desforges, C. & Abouchaar, C. "The impact of parent involvement, parent support and family education on pupil achievement and adjustment: A literature review. Department of Education and Skill:" **Queen's Printer.** 2020.

Donwa, P. A. "Funding of academic research in Nigeria universities", Accessed 18 May 2018,

Earthman, G. L. "Prioritization of 31 Criteria for School Building Adequacy" **American**

Civil Liberties Union Foundation of Maryland. 2014.

Eniayeju, P. A. "Raising the Standard of Performance in Public Examination in Science, Technology and Mathematics". 2019.

Esiobu, G. O. "Gender Issues in Science and Technology Education Development". In: Science and Technology Education for Development Uwowi, U.M.O. (Ed). **NERD Press,** Lagos, 2019. pages: 137156.

Evan, G. L. "Jewish and Islamic Philosophy: Crosspollinations in the Classic Age". **Edinburgh University Press.** 2019. pp. 25–6.

Eze, H. O. "Understanding Human Learning." Enugu. -(2nded); 2019.

Elliot, A. & Dweck (Eds.), C. "Handbook of competence and motivation" (pp.52-72). New

York: **Guilford Press. Engelmann,** 2020.

Elliot, A. "A conceptual history of the achievement goal constructs." 2017.

Eshiet, I. T. "Improvisation in science teaching." Abak: **Belpot (Nig) Co.** 2017.

Fafunwa, A. B. "History of Education in Nigeria," **Ibadan NPS Educational Publishers Ltd**. 2015.

Farrant, J. S. "Principles and Practices in Education." Singapore: **Longman Publishers Limited**. 2019.

Federal Government of Nigeria, Universal Basic Education Act. **NERDC,** Lagos, 2018.

Federal Government of Nigeria, Universal Basic Education Act. **NERDC,** Lagos, 2018.

FEMSA, Resources and facilities for Teaching and Learning of Mathematics and Science School. 2015.

Gagne', R. M. Wager, W. W. Golas, K. C. & Keller, J.L. "Principles of Instructional Design." Belmost, CA: **Thompson**. 2017.

Goodman, A. & Gregg, P. "Poorer children's educational attainment: how important are attitudes and behaviour?" York: **Joseph Rowntree Foundation.** 2020.

Gutman, L. & Akerman, R. "Determinants of aspirations." Centre for Research on the Wider Benefits of Learning Research Project 27. London: **Institute of Education.** 2018.

Hallack, J. "Investing in the Future: Setting Educational Priorities in the Developing

World". Paris: **1 TEP and Pergonion Press.** 2010.

Hansen, N. M. & Mastekaasa, A. "Social origins and academic performance at university."

USA: **Oxford University Press.** 2016.

Harold, C. L. Of Philosophers and Kings: Political Philosophy in Shakespeare's Macbeth and King Lear. Toronto: **University of Toronto Press.** 2018.

Heathcote, P.M. "A Level of ICT". **Payne-Gallway publishers,** West Midland, 2018.

Higgins, S. Hall, E. Wall, K. Woolner, P. & McCaughey, C. 'The Impact of School Environments: A literature review', **The Centre for Learning and Teaching, School of Education, Communication and Language Science.** 2017.

Hirsch, E. D. "The schools we need and why we don't have them." New York, NY: 2019.

Makombe, I. A. Kihombo, A. R. Sesabo, J. B. Hodgson, A. & Spours, K. "Building partnership for poverty reduction in Tanzania: Improving successful completion and progress from secondary education into further studies and working file". Morogoro: **Mzumbe University**. 2018.

Hoyle, E. "Policies of School Management", Suffolk. **The press Ltd.** 1986.

Isola, O. M. "The Effects of Standardized and Improvised Instructional Materials on students' Academic Achievements in Secondary School Physics". 2010.

Jekayinfa, A. A. "Effects of Instructional Resources on the Academic Performance of Students in History in Nigeria". 2018.

Kimago, H. R. "Study Guide for Med APPS Course". Dar es Salaam: **University of Dar es Salaam**. 2019.

Kothari, C. R. "Research Methodology". New Delhi: Wishwa Prakashan. 2019. Lederman. **Science Education in America**. 2000.

Levenson, L. "Romeo and Juliet". Oxford: **Oxford University Press.** Park, Katherine; Daston, Lorraine, eds. 2000.

Marland, M. "The craft of the Classroom"2019.

Marzano. "Examining the Role of Teacher Evaluation in student Achievement". 2017.

Mbelle, A. & Katabaro, J. "School Enrolment, Performance and Access to Education in

Tanzania. Research on Poverty Alleviation" Dar es Salaam. **(REPOA)/Mkuki na Nyota Publishers**. 2019.

Mishra and Koehler, "Technological Pedagogical Content Knowledge Theory (TPACK) Framework," 2006.

Morakinwa. "Attitude and Academic performance in study of physics". 2018.

Msabila, D. T. "Human and economic Geography". Dar es Salaam: **Tanzania Publishing House LTD.** 2016.

National commission for colleges of education. Minimum standards for NCE (2012 ed). Abuja: **NCCE.** 2012.

Odeniyi, A. O. "Teacher-Student Relationship as facilitator of Academic and Moral Excellence in schools". 2016.

Ogunlade, C. A. "Media in Education". Ile-Ife. **University of Ile-Ife, press Ltd.** 2009.

Okoronka and Wada. "Effect of Teaching Method on Academic Performance". 2018.

Oladejo, M. A. Olosande, G. R. Ojebisi, A. O. & Isola, O. "Instructional materials and students' academic achievement in physics: Some policy implications". 2019.

Rao, T.V. "Human Resource Development" - **Tata McGraw Hill Publication**, 1998.

Reece, I. & Walker, S. "Teaching, Training and Learning" - **Business Education Publishers,** 2012.

Savignon, J. Sandra. Communicative competence: theory and classroom practice: texts and contexts in second language learning. McGraw-Hill. ISBN9780070837362. OCLC 476481905. 2018.

Schmoker, M. (2011). "Three foundational elements are keys to improve Students achievement". 2019.

Singh, K. "Education for the Global Society", in Learning: The Treasure Within, The Report
to UNESCO of the International Commission on Education for the Twenty First Century, *Paris:* **UNESCO.** 2016.

Slavin, R. E. "Educational Psychology: Theory and Practice." 7th ed. New York: **Ablongman.** 2017.

Stanson-Salazar, R. D (2011). A social Capital Framework for the study of Institutional agents and their role in the empowerment of low-status students and youth. NewYork: **SAGE Publication.**

Tobias, S. & Duffy, T. M. "Constructivist instruction: Success or failure?" New York: **Taylor & Francis.** 2019.

Udin, P. S. O.& Uwaifo, V. O. "Principles and practice if vocational and technical education
in Nigeria". Benin City: **Ever Blessed Publishers.** 2015.

Ugwuanyi, M. O. &. Eze, M. E. "An assessment of the educational resources available for
implementing the mandates of secretary studies programme in Nigerian Polytechnics.2018."

Vygotsky, L. S. "Learning and mental development at school age." Cambridge, MA: **MIT Press**. 1963.

URT, Education and Training Policy (ETP). **Dar es Salaam: Ministry of Education and Culture.** 2015.

URT, Education Sector Development Programme: Secondary Education Development Plan
2004 – 2009, **Dar es Salaam: Ministry of Education and Culture.** 2003.

Vygotsky, L. S. "Mind in Society." Cambridge: **Harvard University press**. 1978.

Weinert, F. E. "Concept of competence: A conceptual clarification." In Rychen, D. S. & Salganik (Eds.), L. H. "Defining and selecting key competencies", 2011. (pp. 45-65).

William John, B. "An Inquiry into the Philosophy and Religion of Shakspere". London: **Mitchell. C.** 1978.

Willms, J, D. "Standards of care: Investments to improve children's educational outcomes in Latin America." Paper presented at the "Conference of Early Childhood Development" Washington, D.C., **World Bank.** 2018.

Young, E. Green, H. A. Roehrich-Patrick, L. Joseph, L. & Gibson, T. "Do K-12 School Facilities Affect Education Outcomes?" Tennessee: Tennessee Advisory commission on Intergovernmental Relations. 2018.

Conference Proceedings

Acharu, F. T. & Solomon, E. "Influence of infrastructure on the teaching and learning of office education in Polytechnics." **ABEN Conference Proceedings** 1 (1) 78-82, 2014.

Adeyegbe, S. O., Oke, M. & Tijani, A. "The feasibility of teaching assessing STM with ICT in Nigeria". Proceeding of the **44th Annual Conference of the Science Teachers Association of Nigeria (STAN),** 2003. 119-123.

Ayelotan, O. I. & Sholagbade, F. A. "Infrastructural facilities and business education: Office technology and management perspective." **ABEN Conference Proceedings** 1 (1) 88-97. 2014.

Cirfat, A.B. Zumuyil, C. F. & Ezema, M. A. "The Status of ICT in Colleges of Education". Proceeding of the **44th Annual Conference of the Science Teachers Association of Nigeria**, 2018. 48- 52.

CILIP, A changing landscape: a survey of public library authorities in England, Wales and Northern Ireland 2012-2013, London, Chartered Institute of Library and Information Professionals Survey Report. 2012.

Daniel, T. Y. "Improvisation and the Use of Instructional Materials in Teaching Science". A paper presented at **NCCE/UNESCO workshop**.' 2018.

Dibu, O. "Eroding the university culture". **Inaugural lecture at Federal University of Technology**, Akure, Ondo State, 26 April. 2012.

Duxbury, N. & Jeannotte, M. S. "Culture, sustainability and communities: exploring the myths", Paper presented at the **6th International Conference on Cultural Policy Research,** Jyvaskyla, Finland, 24-27 August. 2019.

Eichie. R. & Strachan, R. The use of interactive screencasts to promote active and engaged learning in the Further Education mathematics classroom: A descriptive case study from North East England. **In 2021 IEEE Frontiers in Education Conference (FIE**) 2021, pp. 1-5

Emesini, N. O. "Electronic-Learning as an innovation in teaching and learning in Nigerian Universities." A paper presented at the 22nd annual conference of the curriculum organization of Nigeria held at Cairo on September, 2018. 2-4.

Ibe-Bassey, G. S. "Educational technology: The teaching learning process and the falling standard of education in Nigeria". **35th Inaugural lecture series of the University of Uyo,** Uyo. Nigeria. 2017.

Obasi, E. "Challenges for secondary education in the culturally diverse Nigerian society". Being text of lead paper at the National Association of Sociologists of Education (NASE) conference holding at the **University of Nigeria,** Nnsuka, Nigeria. 2008.

Orheruata, J. E., Abubakar, and Aminu, Y. M. "Assessment and Utilization of infrastructural materials in tertiary institutions in Borno State". **ABEN Conference Proceedings,** 1 (1), 2017. 73-77.

Chowdhury, R. "Inquiry-Based Learning as an Instructional Strategy to Increase Student Achievement in Math and Science. **Association of Educational Communications and Technology,** "2018. 177–188.

Orheruata, J. E. Abubakar, I. M. & Aminu, Y. M. "Assessment and Utilization of infrastructural materials in tertiary institutions in Borno State." **ABEN Conference Proceedings,** 1 (1), 2019. 73-77.

Oyinloye, O. T. & Oluwalola, F. K. "Modern office instructional facilities in office technology and management in Polytechnics: a means to insecurity management in Nigeria." **ABEN Conference Proceedings** 1 (1), 2019. 125-133.

Internet Sources

BEMC, "Long-Range Educational Facilities Planning." Board of Education of Montgomery County. http://www.montgomeryschoolsmd.org.faa.pdf Retrieved on 11 December 2014.

Blyth, K. "Effectiveness of Using Inquiry-Based Instruction to Increase Students Performance in High School Biology as Bardwell Institute". **[OTS Master's Level projects & papers,** Old Dominion University]. www.digitalcommons.odu.edu/ots_masters_projects/46.

Cambridge University Reporter. "Indicators of academic performance." Retrieved on June 13, 2016.

Department of Arts and Culture. The Bill and Melinda Gates Foundation supports the National Library of South Africa with a grant of R32 million, Accessed December, 2018,

Dills, K. A. "Trends in the relationship between socioeconomic status and academic achievement." Retrieved September 30, 2013 from http://papers.ssrn.com/ 2017.

Goshit, T. Nigeria's need for ICT: SP. 259 technology and policy in Africa. http://ocw.mit.edu

Goshit, T. "Nigeria's need for ICT: SP. 259 technology and policy in Africa." http://ocw.mit.edu

NBS, 2012 Population and housing census. Retrieved on 20th January 2012 from http://www.nbs.go.tz/2012populationandhousingcensus. 2017.

Pachai, B. Malawi: "The History of the Nation," London: **Longman Group Limited.** 2000.
PEFA, Impact of Population Growth on School Facilities. Retrieved on 1st December, 2012 from http://www.archive.knoxmpc.org/capacities.pdf. 2011.

Policy brief, Challenges of Education Sector Budget "A missed Opportunity to Transform Education Sector Retrieved on 23rd August, 2014 from http://www.policyforumtz.org/sites/default/files/Educationbrief.pdf. 2013.

Priye, S. T. "The corrosive effect of corruption on Nigeria educational system." Retrieved from www.gamji.com/article6000/news7987.htm. 2017.

Random House Karnerman Webster's College Dictionary 2010K Dictionaries Ltd, Retrieved on 9th July, 2015 from/www.thefreedictionary.com/population. 2014.

Tinio, V. L. "ICT in Education: UN Development Programme." (Retrieved on April 2016 from www.eprmers.org. 2019.

Ullah1, M. N., Biswas, B. Miah, M. Assessing Institutional Support to Online Education at Tertiary Level in Bangladesh Coping with Covid-19 Pandemic: An Empirical Study. (2021). Retrieved from doi:10.20944/preprints202104.0001

Umunadi, E. K. "Provision of equipment and facilities in vocation and technical education for improving carrying capacity of Nigeria's Tertiary Institutions". **African Society for Scientific Research (ASSR)**. Retrieved from http://www.hrmars.com/admin/pics/293pdf. 2018.

Journal Articles

Adeogun, A. A. "The principal and the financial management of public secondary schools in Osun State." **Journal of Educational System and Development.** 5(1), 2011. 1 – 10.

Aina, O. "Future directions in business Education Business". **Education Journal**, 3 (3) 259-266. 2013.

Akanbi, A. O. "An investigation into Students' Performance in Senior Secondary School Physics". **Journals of Teachers Education Trends** (1)1, 2009. 58-60.

Akindele, J. "Availability and utilization of Information Communication Technology (ICT) for Spoken English Teaching and Learning in South-West Nigeria". **An International Journal of Arts and Humanities**. 4(2). 2013. 1 - 3.

Akingbade, J. S. "Students' Perception of the Availability and Utilization of Information and Communication Technology (ICT) in the Teaching and Learning of Science Subjects in Secondary Schools in Ekiti State, Nigeria". **International Journal of Education and Literary Studies.** 1(1). 2013. 5-8.

Aslam, R. & Awan, A.G., "Perception of primary school teachers about teaching strategies and their impact on student learning". **Global Journal of Management, Social Sciences and Humanities**, 5(1), 2019. 36-59.

Anthony, V. "A Matter of Style: The Teacher as Expert, Formal Authority, Personal Model, Facilitator, and Delegator". **College Teaching**. 42: 1994. 142-149.

Balogun, A. A. "The use of Audio-Visual Materials in Geography teaching in Post Primary Schools in Nigeria". **West African Journal of Education.** 3, 2011. 211-212. 7.

Barton, K. C. & Smith, L.A. "Themes or motifs? Aiming for coherence through interdisciplinary outlines". **The Reading Teacher,** 54(1), 2010. 54 – 63.

Battistich, V., Solomon, D., & Kim, D. (1995), "Schools as communities, poverty levels of student populations, and students' attitudes, motives, and performance", **American Educational Research Journal**, 32, 627-658

Blair, L. "Constructing knowledge by design." **Southwest Educational Development Laboratory News**, 10(4), 2008. 3-8.

Bolak, K. Bialach, D. & Dunphy, M. "Standards-based, thematic units integrate the arts and energize students and teachers". **Middle School Journal**, 31(2), 2005. 57-60.

Bongotons, O. Y.& Onyenwe, B. O. "Availability and adequacy of ICT resources in business education programme in Nigeria." **Business Education Journal** 7 (2) 200-215 2010.

Buba, M. A. Gana, I. A. & Bularafa, M. W. "Influence of Instructional Materials and school location on Academic Achievement of Senior Secondary School Students in Biology in Maiduguri Metropolis, Nigeria". **Rivers State University Journal of Education,** 22(1&2), 2019. 156-164.\

Carr, P.L & Collins, M. "Acquiring articles through unmediated, user-initiated pay-per-view transactions: An assessment of current practices", **Serials Review**, 35(4), .272–277. 2017.

Carstens, L. "Defining, inspiring and implementing sustainability", **National Civic Review**, 99 (3), 11-16. 2010.

Casey, A. M. "Strategic priorities: a roadmap through change for library leaders", **Library Leadership and Management,** 29(2), 1-17. 2015.

Chamberlain, C. & MacAlpine, B. "Pay-per-view article access: a viable replacement for subscriptions?" **Serials**, 21(1), 30-34. 2018.

Chandel, A. S. & Saikia, M. "Challenges and opportunities of e-resources", **Annals of Library and Information Studies (ALIS)**, 59 (3), 148-154. 2018.

Chao, C. M. "Factors determining the behavioural intention to use mobile learning: an application and extension of the UTAUT model", **Frontiers in Psychology**, 10, 1652-1662. 2019.

Chaputula, A. & Boadi, B. Y. "Funding for collection development activities at Chancellor College Library, University of Malawi", **Collection Building**, 29 (4), 142-147. 2018.

Charlotte, O. N. N. "Sustainability Strategies for Electronic Information Resource (EIR) Services in University Libraries (UL) of North Central Nigeria". **Bull. IEEE Tech. Comm. Digit. Libr**., *14*(1).2018.

Chaputula, A. H. & Kanyundo, A. J. "Collection development policy: how its absence has affected collection development practices at Mzuzu University Library", **Journal of librarianship and information science***,* 46(4), 317-325. 2019.

Chiware, E. & Mathe, Z. "Academic libraries' role in research data management services: a South African perspective", **South African Journal of Libraries and Information Science***,* 81(2), 1-10. 2015.

Chonjo, P. N. "The quality of Education in Tanzania primary schools: an assessment of physical facilities and teaching learning materials". **UTAFITI (new series)** l (1), 2018. 36 – 47.

Chowdhury, G. & Koya, K. "Information practices for sustainability: Role of iSchools in achieving the UN sustainable development goals (SDGs)", **Journal of the Association for Information Science and Technology**, 68(9) 2128-2138. 2017.

Chowdhury, G. "Sustainability of digital information services", **Journal of Documentation**, 69 (5), 602-622. 2015.

Chowdhury, G. "Sustainability of digital libraries: a conceptual model and a research framework", **International Journal on Digital Libraries**, 14(3-4), 181-195. 2014.

Chowdhury, G. G. "How to improve the sustainability of digital libraries and information Services", **Journal of the Association for Information Science and Technology**, 67 (10), 2379-2391. 2017.

Chukwueke, C. & Onuoha. J. Effect of library services on the educational development of secondary school students in Abia State: A study of Igbere Secondary School Igbere. **Library Philosophy and Practice**, 1. 2018.

Chunsheng, W. "The phenomenon of foreign libraries opting out of big deals", **Journal of Academic Libraries**, 4, 1-12. 2014.

Considine, G. & Zappala, G. "Influence of social and economic disadvantage in the academic performance of school students in Australia." **Journal of Sociology**, 38, 2020. 129-148.

Conway, G. R. "Agroecosystem analysis, Agricultural Administration", 20 (1),.31-55. 1985.

Coughlin, D. M. Campbell, M. C. & Jansen, B. J. "A web analytics approach for appraising electronic resources in academic libraries", **Journal of the Association for Information Science and Technology**, 67(3), 518 – 534. 2016.

Crosnoe, R. & Elder, G. H. "From childhood to the later years: Pathways of human development". **Research on Aging**, 26, 2018. 623-654.

Cuillier, C. & Stoffle, C. J. "Finding alternative sources of revenue", **Journal of Library Administration**, 51(7-8), 777-809. 2011.

Cullen, R. & Chawner, B. "Institutional repositories, open access, and scholarly communication: a study of conflicting paradigms", **The Journal of Academic Librarianship**, 37(6), 460-470. 2017.

Dadzie, P. S. "Electronic resources: access and usage at Ashesi University College", **Campus-Wide Information Systems**, 22 (5), 20–28. 2015.

Dai, L. Chen, L. & Zhang, H. "China Academic Library and Information System: an academic library consortium in China", **Information Technology and Libraries**, 19(2), 66-70, Accessed 12 February 2018,

Darling-Hammond, L. "Teacher quality and student achievement: A review of state policy evidence. **Educational Policy Analysis Archives,**" 8 (1), 2018. 67-93.

Davis, G. F. "Editorial essay: What is organisational research for?" **Administrative Science Quarterly**, 60(2), 179-188. 2015.

De Dieu, M. J. & De Dieu, D. J. The relationship between smart classroom and learners' academic performance in public boarding schools of Gicumbi District, Rwanda. **Inkanyiso: Journal of Humanities and Social Sciences**, 13(2), 2021, 228-241.

De Paola, M. "The determinants of risk aversion: the role of intergenerational transmission", **German Economic Review**, 64, 2019. 193–209.

Dembo, T. "Der arger als dynamisches problem". **Psychol. Forsch.** 15, 2019. 1- 144.

Denison, D. R. & Spreitzer, G. M. "Organisational culture and organisational development: a competing values approach". **Research in organisational change and development**, 5(1), 1-21. 2009.

Deshwal, P. "Green HRM: An organisational strategy of greening people", **International Journal of Applied Research,** 1(13), 176-181. 2015.

Dewey, B. I. "The embedded librarian: strategic campus collaborations", **Resource Sharing and Information Network**s, 17 (1-2), 5-17. 2017.

Diaz, A. L. "Personal, family academic factors affecting low achievement in secondary school." **Electronic Journal of Research in Educational Psychology and Psych pedagogy,** 1 (1), 2019. 43-66.

Dodge, K. "Socialization mediators of the relation between socio-economic status and child conduct problems." **Child development**, 65(2): 649-665. 2017.

Dohmen, T. "Are risk aversion and impatience related to cognitive ability?" **American Economic Review,** 100, 2020. 1238-1260.

Dole, W. V. Dabbour, K. & Kott, K. "Dialogic approaches to strategic planning in academic libraries: an appreciative inquiry case study at Oviatt Library", **Journal of Library Administration,** 57(4), 468-480. 2017.

Dorner, D. G. & Revell, J. "Subject librarians' perceptions of institutional repositories as an information resource", **Online Information Review**, 36 (2), 261277. 2017.

Dougherty, R. "Reference around the clock: is it in your future?" **American Libraries**, 33 (5), 44-46. 2012.

Dubovi, R. Designing for online computer-based clinical simulations: Evaluation of instructional approaches. **Nurse Education Today**, 69, 2018. 67-73.

Eamon, M. K. "Social-demographic, school, neighbourhood and parenting influence on academic achievement of Latino young adolescents." **Journal of youth and adolescence,** 34 (2), 2018. 163-175.

Earthman, G. I. & Lemaster, L. K. “Review on the research on the relationship between school buildings, student achievement, and student behaviour.” Paper presented in the annual meeting of the Council of Educational Facilities Planners, International, Tarpon Springs, Florida, USA. 2018.

Echezona, R. I. Okafor, V. N. & Ukwoma, S. C. “Information sources used by postgraduate students in library and information science: a citation analysis of dissertations”, Accessed 11 April 2017.

Egbugara, O. U. “Poor Performance in Physics: Implication for National Development”. 2012.

Ejili, A. E. & Anyanwu, N. O. “Teacher Education in Nigeria; An Introduction.” Enugu: HRV Publishers. 2016.

Ekeh, P. U. “Gender bias and achievement in science and mathematics among school pupils. Implications for human resource development.” **Journal of Curriculum Organization of Nigeria,** 10 (1), 2017. 30-33.

Ezeoba, K. O. “Instructional Media. An Assessment of the Availability, Utilization and Production by Nursery School Teachers.” **Journal of Applied Literacy and Reading, 3(Special Edition),** 2007. 33-38.

Fakeye, D. “Assessment of English language teachers’ knowledge and use of Information Communication Technology (ICT) in Ibadan Southwest Local Government of Oyo State”. **American-Eurasian Journal of Scientific Research,** 5(4): 2020. 270-276.

Fakeye, D. “Assessment of English language teachers’ knowledge and use of Information Communication Technology (ICT) in Ibadan Southwest Local Government of Oyo State. **American-Eurasian Journal of Scientific Research,** 5(4): 2020. 270-276.

Fakomogbon, M. A. & Adegbija, M. V. “Instructional Media and Their Sources for Teaching and Learning Tertiary Institution”, A Nigeria perspective. **African Journal of Educational Studies**.4 (2), 2016. 128.

Fuller, B. & Clark, P. “Raising School Effects While Ignoring Culture?” Local Conditions and the Influence of Classroom Tools, Rules, and Pedagogy. **Review of Educational Research**. 64(2): 2019. 119 – 157.

Gatewood, T. “How valid is integrated curriculum in today’s middle school?” **Middle School Journal**, 29(4), 2018. 38 – 41.

Gouch, D. “Investigating critical and contemporary issues in education/students’ academic performance. A case study of senior secondary schools in Kassena-Nankana District”. **Journal of Social Science**, 2019. 4(4).

Grissmer, R. H. “Beyond helping with homework: Parents and children doing mathematics at home.” **Teaching Children Mathematics,** 14, 2020. 120- 131.

Hijazi, S. T. & Naqvi, S. M. “Factors affecting students” performance: A case of private colleges”. **Bangladesh E-Journal of Sociology**, 3 (1), 2019. 65-99.

Isa, S. G., Mammam, M. A., Badar, Y. & Bala. T. The impact of teaching methods on academic performance of secondary school students in Nigeria. **International Journal of Development Research**, 10(6), 2020, 37382-37385.

Jegede, S. A. & Adedajo, J. O. “Enriching physics education in Nigeria and enhancing a sustainable Technological Development”. **Greener Journal of Research**, 3(2), 2015. 80-84.

Kangas, A. Duxbury, N. & De Beukelaer, C. (Eds.). Cultural policies for sustainable development. **Routledge**.2019.

Kerr, D. “Citizen education in England: The making of a new subject”. **Online journal for social science education**. Retrieved on 7th January, 2003 from www.sowi-online.de/journal/2003/england_kerr.htm. 2017.

Kimalu, P. K. Bedi, A. S. & Nafula, N. N. “The Decline in Primary School Enrolment in Kenya”. Nairobi: **Kenya Institute for Public Policy Research and Analysis**. 2018.

Li, H., and Atuahene-Gima, K. (2001), “Product innovation strategy and the performance of new technology ventures in China”, **Academy of Management Journal**, 44 (6), 1123-1134.

Liou, P.Y., “Students' attitudes toward science and science achievement: An analysis of the differential effects of science instructional practices”. **Journal of Research in Science Teaching,** 58(3), 2021. pp.310-334.

Margaret, C. Emeka, A. F. & Jacob, O. N. “Science Education in Primary School Education in Nigeria: Problems and the way Forward”. **International Journal of Development and Public Policy**, 1(5), 2021, 18-23

Malicoban, E. V. Omra, J. S. Guinar, N. M. Acma, K. A. L. Go, G. P. & Mordeno. I. C. V. “Qualitative study on difficulties of non-physics majors teaching physics: basis for competency enhancement for teaching STEM”. **Journal of Physics: Conference Series. IOP Publishing**. Vol. 1835, No. 1, 2021, p. 012066

Mgbor, M. O. & Anyanjor, A. “The development of physical education in Nigeria: Issues and future directions.” **Journal of Nigerian Association for Physical Health Education Sports and Dance,** 2 (1), 2019. 172-178.

Mgbor, M. O. “The implementation of school sports in the UBE programme: challenges and implications.” **Journal of Nigeria Association for Physical, Health Education, Recreation, Sports and Dance,** 2(1), 2020. 146-152.

Miller, O. & Akume, B. C. “The state of equipment provision and maintenance for the teaching of business studies at the Junior Secondary School level in Delta State.” **Business Education Journal,** 7 (1), 2019. 212-220.

NERDC, "Workshop on difficult concepts Physics group report. Nigerian Educational Research and Development Council, Lagos". **European Scientific Journal** 14 (4), 1857 – 7881. 2018.

Nasution, W. N. "The effects of inquiry-based learning approach and emotional intelligence on students' science achievement levels". **Journal of Turkish Science Education**, 15(4), 2018. pp.104-115.

Nikky, Teaching aids, Types and Importance. 2020.

Nnaji, F. O. & Bagudu, I. A. "Critical issues in office technology and management and their emerging challenges". **ABEN Book of readings**. 2(1), 2019. 23-28.

Nor, N. M. Embong, R. Muda, H. Yunus, K. & Nor, J. M. "Effects of teachers' teaching competencies on students' academic performance mediated by holistic centered learning style based on SUMUR Program at Secondary Religious Schools". **International Journal of Academic Research in Progressive Education and Development**, 8(2), 2019, 25-38

Ntikudem, E. O. "Constraints to effective instructional standards in programmes of business education in tertiary institutions." **Business Education Journal.** 4(2), 2018. 177-186.

Nwachukwu, C. I. "Administration and supervision in business education: challenges and way forward." **ABEN Book of readings**. 2(1), 2018. 66-73.

Obasi, S. C. E. "Student's living environment and the menace of cultism in Nigeria Universities." **AARCHES Journals**, 4 (1), 2015. 42-47.
OCM, Classroom Utilization report summary. Retrieved on 6th April 2015 from http://www.classroom.umn.edu/scheduling/utilization/fall01-spring02/ summary.html. 2020.

Ogegbo, A. A. "Relationships between High School Teachers' Understanding and their Reported Practices of Inquiry-based Pedagogy in Science Classrooms in Nigeria". **African Journal of Research in Mathematics, Science and Technology Education**, 25(2), 2021. pp.125-136.

Ojoawo, A. O. "An empirical study of factors responsible for poor academic performance in secondary schools in Oyo State". **AJEM**, 4 (1&2), 2018. 140-148.

Okeke, S. O. & Okoye, N. E. "Effective resource utilization". A better Approach to Teaching and learning of physics. **Academic Journal of Interdisciplinary Studies**, 2 (6), 2015. 35 – 39.

Okoro, J. & Iyeke, P.O. "An appraisal of instructional facilities for business studies in secondary schools in Delta State". **African Journal of Education and Development Studies.** 4(2), 2019. 34-40.

Okwuanaso, S. I. "Improving standard in business education in Nigeria." **Business Education Journal,** 4(2), 2018. 12- 23.

Olatunde-Aiyedun T. G. & Ogunode., N. J. "School administration and effective teaching methods in science education in north central Nigeria". **International Journal on Integrated Education**, 4(2), 2020, 145-161.

Onah, N. & Okoro, F. "Strategies for enhancing the accessibility and use of information and communication technology in the colleges of education in Enugu State of Nigeria," **Nigerian vocational journal** 14(2), 2018. 104-114.

Onasanya, S. A. & Omosewo, E. O. "Effect of Improvised and Standard Instructional Materials on secondary school students' Academic performance in physics in Ilorin, Nigeria". **Singapore Journal of Scientific Research**, 1(1), 2015. 68 – 76.

Onche, A. "Meeting the Challenge of Accessibility and Utilization of Modern Instructional Materials in Rural Secondary Schools in Nigeria". **International Journal of Multidisciplinary Studies**. 1 (2): 2018. 1 – 13.

Osiesi, M. P. "Assessment of Teachers' Perception of the Provision, Use, and Maintenance of Information and Communication Technology Facilities (ICT) in Ekiti State Primary School Libraries in Nigeria". **Assessment,** 2022**.**

Owoeye, J. S. "School Facilities and Academic Achievement of Secondary School Agricultural Science in Ekiti State, Nigeria". Kampala: **Kampala International University**. 2018.

Owuamanam, M A. "Quality assurance in business teacher education colleges of education in Nigeria." **Academic leadership Journal.** 10(4): Retrieved on the 14th September 2014, from http://www.aljrss. 2014.

Oyedele, J. F. "Facilities for business education for self-reliance." **Business Education Journal,** 2 (4), 2016. 136-143.

Postlewaithe, N. "The conditions of primary schools in least-developed countries. **International Review of Education,**" 44(4): 289-317. 2013.

Qian, C., Cao, Q., and Takeuchi, R. (2013), "Top management team functional diversity and organizational innovation in China: The moderating effects of environment", **Strategic Management Journal**, 34 No. 1, pp. 110-120.

Robert, A. E. "Office tech. & mgt. curriculum and new technologies: The challenges for office educators in polytechnic in south-south of Nigeria." **Nigeria Journal of Business Education:** 1(3), 2016. 122-137.

Saint, W., Harnett, T., A., and Strassner, E., 'Higher education in Nigeria: a status report', **High Educ. Pol**., 16 (2003), pp. 259-281.

Sheng, S., Zhou, K. Z., and Lessassy, L. "NPD speed vs. innovativeness: The contingent impact of institutional and market environments", **Journal of Business Research**, Vol. 66 No. 11, pp. 2355-2362.

Shu, C., Wang, Q., Gao, S., and Liu, C. (2015), "Firm Patenting, Innovations, and Government Institutional Support as a Double-Edged Sword", **Journal of Product Innovation Management**, Vol. 32 No. 2, pp. 290-305.

Srisawasdi. N. & Panjaburee, P. "Implementation of game-transformed inquiry-based learning to promote the understanding of and motivation to learn chemistry". **Journal of Science Education and Technology**, 28(2), 2019. 152-164.

Taskinsoy, J. "Leap into Student –Centered Learning (SCL) Paradigm: Students" Attitudes Towards SCL." **Insight @Unimas Teaching & Learning Bulletin** 17, 2018. 15-20.

Teddies C, and Yu, F. "Mixed methods sampling. A typology with examples of mixed methods". **Research** (l) 77- 100, 2007

Ternenge, T. S. & Agipu O. L. "Availability and utilization of school library resources in selected secondary schools in Makurdi Metropolis". **Library Philosophy and Practice (e-journal),** 2019, 2542

Tyma, A. W. "Pushing past the walls: Media literacy, the "emancipated" classroom, and a really severe learning curve". **International Journal of Communication,** 3, 2019. 891-900.

Udosen, I. N. "Instructional media: An assessment of the availability and frequency of use by social studies teachers in Akwa Ibom State." **Journal of Educational Media & Technology (JEMT),** 15(2), 2018. 141 –160. 2018.

Ugwuanyi, M. O. & Eze, M. E. "An assessment of the educational resources available for implementing the mandates of secretary studies programme in Nigerian Polytechnics."2018.

Umunadi, E. K. "Provision of equipment and facilities in vocation and technical education for improving carrying capacity of Nigeria's Tertiary Institutions." **African Society for Scientific Research (ASSR)**. Retrieved from http://www.hrmars.com/admin/pics/293pdf. 2017.

UNESCO, "Adapting technology for school Improvement: A global perspective," Washington DC: **International Institute for Educational Planning**. 2014.

Uzuegbu, C. P. Mbadiwe, H. C. & Anulobi, J. C. "Availability and utilization of instructional materials in teaching and learning of library education in tertiary institutions in Abia state. **Journal of Educational Research** 2(8), 2015. 111–120.

Uzuegbu, C. P. Mbadiwe, H. & Anulobi, J. C. "Availability and utilization of instructional materials in teaching and learning of library education in tertiary institutions in Abia state." **Journal of Educational Research** 2(8), 2018. 111–120.

Zakka D. D. and Priscilla, M. W. "Critical issues in the teaching and learning of office technology and management." **Journal for the Promotion/Advancement of Office Management/Secretarial Profession**, 4, 2018. 22-29.

Zakka, D. D. & Priscilla, M. W. "Critical issues in the teaching and learning of office technology and management." **Journal for the Promotion/Advancement of Office Management/Secretarial Profession,** 4, 2019. 22-29.

Theses

Antunes, L.D.A.M. "Speaking skills and communicative competence in EFL: relating theory to teachers' and learners' perceptions" **(Doctoral dissertation).** 2022.

Babayomi A. A. "Comparative study of the Teaching and Learning Resources in Private and Public Secondary Schools in Lagos State." **Master's Thesis, Department of Educational Administration, University of Lagos,** Nigeria. 2019.

Damayanthi, K. P, N. "An assessment of electronic information resources usage and management: a case study at University of Peradeniya", **Master's thesis from faculty of graduate studies**, University of Columbo, Sri Lanka. 2016.

Edwards, M. M." Building Conditions, Parental Involvement and Student Achievement in the D.C. Public School System." Unpublished Master Degree Thesis, Georgetown University, Washington, D.C., USA. 2018.

Ibrahim, S. "Impact of Accounting Background, Gender and Motivation on Performance of Business Education in Introductory Accounting in Federal Universities Nigeria": *Unpublished Doctorate Dissertation Presented to the School of Post Graduate Studies, Ahmadu Bello University, Zaria,* 2018.

Maundu, J. "Family background and student achievement in Kenya National Examinations". **Unpublished M.Ed. Thesis,** Nairobi, Kenyatta University. 2000.

Moronfola, B. "Effects of Instructional Resources on the Academic Achievements of Secondary school Students in Ilorin Local Government of Kwara State". **Unpublished M.Ed Research Thesis.** 1982.

Oni, J.O. "Resource and Resource Utilization as Correlates of School Academic Performance". **Unpublished Ph.D Thesis,** University of Ibadan, Ibadan, Nigeria. 2018.

Onyesom, M. "Assessment of instructional resources for teaching business education at the colleges of education in Edo and Delta States of Nigeria." **Unpublished Thesis.** Nnamdi Azikiwe University, Awka. 2018.

Sumra. S. & Rajani, R. "Secondary Education in Tanzania: Key Policy Change," Hakielimu, Dar es Salaam, Tanzania. Samuel, T. (1997). An Investigation between Instructional Resources and Academic Performance. **Unpublished M.ED Project, University of Ilorin***, Nigeria*. 2016.

Appendix 1: Questionnaire

Lead City University
Faculty of Communication and Information Sciences (FCIS)
Department of Information Management

Dear Respondent,

I am a Master's student of the above-named institution gathering data for the purpose of academic research on the topic "school library support and inquiry based approach as determinants of science subject content delivery in private schools in Ekiti State, Nigeria. To achieve this, your optimum cooperation is needed; there are no right or wrong answers. All your responses will be kept confidential and used for research purpose only.
Thank you.

Section A: Demographic Information
Gender: Male ( ), Female ( )

Age: 20 – 25 ( ), 26 – 30 ( ), 31 – 35 ( ), 36 – 40 ( ), 41-45 ( ), 46 and above ( )

Educational Level: SSCE ( ) NCE ( ) Bachelor's degree ( ) Master's degree ( ) Ph. D ( )

Years of experience: 5 – 10 ( ), 11 – 15 ( ), 16 – 20 ( ), 21 – 25 ( ), 26 - 30 ( )

Science teacher ( ) librarian ( )

Section B: Science Subject Content Delivery as Observed In Your School
The statement in this section concern content delivery of private as observed by the selected private schools. Using the four-point Likert scale provided below. Please tick the appropriate choice that indicates your opinion on level of the content delivery of your students.

Strongly Agree (SA) =4, Agree (A) = 3, Strongly Disagree (SD) = 2, Disagree(D) = 1

S/N	Kindly rate the extent to which your schools do the following.	SA 4	A 3	SD 2	D 1
	Technological Knowledge (TK)				
1	I have the technical skills I need to use				
2	I keep up with important new technologies				

3	I can learn technology easily				
	Pedagogical Knowledge (PK)				
4	I can adapt my teaching styles to different learners				
5	I know how to access students performance in a classroom				
6	I am familiar with common student understandings and misconceptions				
	Content Knowledge (CK)				
7	I have sufficient knowledge about my teaching subject				
8	I can think about the content of my teaching subject like a subject matter expert				
9	I have various ways and strategies of developing understanding of my teaching subject				
	Technological Pedagogical Knowledge (TPK)				
10	I am able to use technology to introduce my students to real world senarious				
11	I am able to facilitate my students to use technology to find more information on their own				
12	I can adapt the use of the technology that I am learning about to teach my students different subjects				
	Technological Content Knowledge (TCK)				
13	I can use appropriate technologies (e.g. multimedia resources, simulations) to represent the content of my teaching subject				
14	I know about the technologies that I have for the research of content				

	of my teaching subject				
15	I know about technologies that I can use for enhancing my teaching in my subject				
	Pedagogical Content Knowledge (PCK)				
16	Without using technology, I know how to select effective teaching approaches to guide students thinking and learning in my teaching subject				
17	Without using technology, I can help my students to understand the content knowledge of my first teaching subject through various ways				
18	Without technology, I can help my students to understand approaches				
	Technological Pedagogical Content Knowledge (TPACK)				
19	I can teach lessons that appropriately combine my first teaching subject, technologies and teaching approaches				
20	I can select technologies to use in my classroom that enhance what I teach and what students learn				
21	I can provide leadership in helping others to coordinate the use of content, technology and teaching approaches at my school				

Section C: School Library Support

The statement in this section concerns school library support which serves relive as observed by the selected school. Using the four-point Likert scale provided below. Please tick the appropriate choice that indicates your opinion on the use of School library.

Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1.

S/N	Kindly rate the extent to which your school do the following.	SA 4	A 3	D 2	SD 1
	Mentoring Support				
1.	My school has mentoring programmes to support students and teachers in science subjects contents delivery				

2.	The management of my school do encourage me to go for workshops /training and seminars				
3.	The school management provide electronic materials (e.g. tablets) for easy learning.				
4.	Textbooks are available in the library to compliment what is taught in the classroom.				
	Financial Support				
5.	The school management provide adequate fund to support school library services				
6.	The school mangement always provide enough funds for training and development of science teachers to guide the students on how to use the library				
7.	The school management do provide financial supports to acquire necessary science subjects resources.				
8.	The available librarians work through during the school hours				
	Technical Support				
9.	Reading materials on the Internet (Web pages) are encouraged				
10.	Encouragement of use of computer software for reading instruction				
11.	The school management encourages online learning library.				
12.	Use of required learning materials for reading in the library is encouraged.				

Section D: Inquiry Based Approach

The statement in this section concern teaching as observed by the selected private schools. Using the four-point Likert scale provided below. Please tick the appropriate choice that indicates your opinion on the best method to teach science students among private schools.

Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1.

S/N	Kindly rate the extent to which your school do the following.	SA 4	A 3	D 2	SD 1
	Communication				
1.	Provision of basic amenities for effective teaching				
2.	Knowledge is impacted through teaching by my teachers.				
3.	Class discussion is organized for teaching				
4.	Subject syllabus are followed while teaching				
	Evaluation				
5.	Students engage in assignments and classwork for teachers to ascertain the level of understanding.				
6.	Teachers test the students on topic taught at the end of each lesson.				
7.	Teachers support students to sort out the difficult aspect of our lesson.				
	Demonstration				
9.	Teachers demonstrate what is being taught during practical class.				
10.	Libraries are well equipped for understandable learning.				
11.	Quality learning is taken into consideration while teaching.				

Bio -data

(i) Personal Data

1 **Full Name**: Funmilola Adeola **OJO**
2 **Date and Place of Birth**: 20th March, 1990, Ikere-Ekiti
3 **State of Origin and local Government**: Ekiti, Oye
4 **Nationality:** Nigerian
5 **Marital Status:** Married
6 **Current Postal Address**: federal university library Oye Ekiti

a. **Telephone Number**: 08063188508
b. **E- Mail Address:** funmilola.ojo@fuoye.edu.ng
a. **Permanent Address**: Road 4, Deeper Life Camp Ground Ajebamidele

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(ii) Educational Institutions Attended with Dates

1 Lead City University, Ibadan 2020-Till Date
2 Ekiti State University, Ado-Ekiti 2008-2012
3 African Church Comprehensive High School, Ikere-Ekiti 2001-2006
4 College of Education Staff School, Ikere 1995-2000

(iii) Academic Qualifications with Date

1. M.L.IS. (Library and Information Science) In view
2. B.A. (History and International Studies) 2012
3. Senior Secondary School Certificate (SSCE) 2006
4. First School Leaving Certificate 2000

(iv) Work Experience Posts

1. Higher Library Officer, Main Library, Federal University, Oye-Ekiti. Jan., 2018 till date

(v) Community Development Services

1. R.A. Collation Officer, Kogi State Governorship election held 2019

(vi) Extra Curricular Activities: Reading

University Compliance Certificate

This is to certify that **OJO Funmilola Adeola** with matriculation Number **LCU/PG/001929** of Department of Information Management Lead City University, Ibadan, is in FULL compliance with approved university format and style.

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Signature **Date**