

**PERCEPTION OF PHYSICS TEACHERS' ON CONTINUOUS
PROFESSIONAL CAREER DEVELOPMENT AND CURRICULUM
IMPLEMENTATION PRACTICES IN NIGER EAST SENATORIAL ZONE OF
NIGER STATE**

BY

SULEIMAN, Abdullahi
MTech/SSTE/2017/7557

**DEPARTMENT OF SCIENCE EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA**

OCTOBER, 2021

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**A THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF
MASTER OF TECHNOLOGY (MTech) IN PHISICS EDUCATION**

OCTOBER, 2021

ABSTRACT

The study investigated the “Perception of Physics Teachers on Continuous Professional Career Development and Curriculum Implementation in Niger East Senatorial Zone of Niger State” Survey research design was employed for the research work. A total of 76 Physics teachers from Niger East Senatorial Zone of Niger State made up the population of the study. There was no sample for the study because the population was small and manageable. The researcher designed questionnaire which was validated by experts in field of Physics and staff development was used for data collection. Pilot test of the instrument was conducted and reliability of 0.73 was obtained using Crombach Alpha. Six research questions guided the study. Questionnaires were administered to the sampled teachers using research assistants and were immediately collected after they responded to it. The data collected was analyse using mean and standard deviation. From the findings, it revealed that teachers’ qualification and teaching experience play a significant role in implementing Physics curriculum as perceived by Physics teachers in Niger East Senatorial Zone of Niger State, there are no motivations received by Physics teachers towards effective Physics Curriculum implementation in Niger East Senatorial Zone of Niger State and the findings also indicates that, there are many challenges faced by Physics teachers which are militating against effective Physics curriculum implementation by Physics teachers in Niger East Senatorial Zone of Niger State. On the basis of these findings, recommendations were made that Government should employ only the qualified Physics teachers to teach at secondary levels of educations. Government should also provide training and retraining opportunities periodically through seminars, conferences or workshops for all teachers at secondary schools level. This will improve teachers’ Continuous Professional Career Development. Non-Governmental Organizations and other stakeholders should be encouraged to contribute in providing Continuous Professional Career Development to teachers. This will help motivate the teachers hence, resulting to effective implementation of their respective curriculum.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Science has been of great importance globally for sustainable and socio-economic development and technological advancement of nations. This is because knowledge of science is a requirement for individual and national development as it provides a solution to challenges faced by humanity. These challenges include the emergence of new drug resistance disease, the effect of genetic experimentation and the engineering ecological impact of modern technology, dangers of nuclear war, explosions, and global warming. Effective application of science knowledge resulted in rapid changes in medicine, industry, communication, and agriculture (Arthur, 2010). As an agent of development, science plays a vital role in bringing about these changes through technological advancement, national wealth enhancement, health improvement, and industrialization. This is why scientific and technological breakthrough is usually the goal of any developing nation like Nigeria (Nwagbo & Uzoma, 2014).

Science as a broad area of discipline consists of many branches, and the significant branches include Biology, Chemistry, Mathematics and Physics. Physics, one of the major branches of science, is seen by Arthur (2010) as the fundamental branch of science because; Physics is generally regarded as the nucleus of all technology. This means that physics controls all forms of technology. It has also been affirmed that behind every technology, there is physics (Omosewo, 2011). At the senior secondary school level in Nigeria, Physics can be described as the branch of science that deals with the study of matter and energy, the relationships between matter and energy, and the study of measurements between matter and energy.

The importance of the knowledge of physics to man and society cannot be over emphasised. Physics serves as an intellectual adventure that inspires scientists to further research and expands our understanding of nature. Also, knowledge is needed for further technological advances that will continue to drive the world's economic engine (Ghirmai, 2010). Therefore, physics is an essential requirement for obtaining University admission to read courses like medicine, pharmacists, engineering, computer sciences, environmental sciences and astronomy, to mention just a few. Knowledge of physics is also necessary for developing new instruments and techniques for applying computer tomography, magnetic resonance imaging, positron emission tomography, ultrasonic imaging, and laser surgery (Wu *et al.*, 2020). Therefore, physics is an essential subject in science education that must be given adequate attention right from the secondary school level of the educational system by the government and all the stakeholders in the Nigerian education system.

Despite the above and much other importance of the knowledge of physics, it is disheartening to observe that secondary school students have been exhibiting dwindling interest in science subjects generally and in physics, particularly over the past few years (Nwagbo & Uzoma, 2014). This, among other reasons, explains the reported low enrolment of students into science classes and consistent poor learning outcomes in Physics by Secondary School Students (Omosewo, 2011). The reason for the dwindling interest of physics students towards the subject, which results in corresponding students' poor learning outcomes, may not be unconnected with the teaching style adopted by the teachers. Most physics teachers adapt teaching techniques that often encourage rote learning and memorization of formulas instead of the more effective practical and hands-on approach. This ineffective approach is often blamed on the paucity of equipment (Nwagbo & Uzoma, 2014).

This negative trend spells doom for National Development as physics is the bedrock of Scientific and Technological development of any Nation. To further compound the problem, Physics is one of the Science Subjects that remains the most challenging subject in the school curriculum according to the Nigeria Educational Research and Development Council (NERDC), as explained by (Isola, 2010). Therefore, practical teaching and learning of physics and students' poor learning outcomes have become a significant concern to all stakeholders in the educational sector. The only remedy to this National embarrassment and way out of this predicament may be for teachers to be exposed to continuous professional career development programmes through workshops, seminars, conferences or further studies.

Continuous Professional Career Development (CPCD) is a process by which teachers are continually trained in subject content mastery, updated in classroom instructional strategies (pedagogical knowledge), classroom management, infrastructural and resource management, as well as maintaining good cultural value orientation with the community where the teachers teaches (NGSMOE, 2016). This implies that Continuous Professional Career Development (CPCD) is a process that teachers are trained to acquire conceptual content knowledge and pedagogical skills necessary for effective teaching. On the other hand, a teacher is seen as a person who influences the learner by what the teacher says, what the teacher does, and how the teacher does it (Ghirmai, 2010). This is because teachers have direct contact with the students in the classroom. Therefore, it is necessary to look into physics teachers' Continuous Professional Career Development (CPCD) to improve the teachers' instructional strategy to bring about effective physics teaching and adequate curriculum implementation. This will bring about meaningful learning of physics concepts among physics students in secondary schools in Nigeria. This can only be achieved if the physics teachers are continually exposed to adequate Continuous

Professional Career Development (CPCD) like seminars, conferences, workshops, refresher courses and even study leave. However, researchers reveal that professional development facilities are not available to most teachers at the secondary school level and where they are available (Aliyu *et al.*, 2019). Factors responsible for this include; budgetary constraints, lack of qualified facilitators, volatile nature of some equipment and logistic challenges. In addition to the preceding, most policy makers and donor agencies in education always misconceive who a teacher is and the primary role of a teacher (Ogunu, 2011). As a result of this and many other reasons, teachers are seen as second-class citizens and relegated below the expected level of a classroom teacher.

To address this challenge, the Federal Government established the Teachers Registration Council of Nigeria (TRCN) in 1993, but this has not adequately addressed teachers' professional career development in Nigeria. This is because most teachers with TRCN certificates are not well equipped either in terms of subject content knowledge or pedagogical content knowledge. In addition to the failure of the established TRCN to address these challenges, government, school administrators and professional bodies in the education sector were expected to address the challenges of teachers' professionalism. Teachers' challenges were expected to be addressed by promoting capacity development of teachers through intensive and regular seminars or workshops. Such capacity development should be based on a needs assessment of professional practices of teachers to improve teachers' knowledge, pedagogical skills and competence in various subjects to enhance the quality of teaching and learning processes in secondary schools (Ayeni, 2010).

Niger State Government also established teachers' Continuous Professional Career Development (CPCD) centres in 2016 with the sole aim of training teachers to acquire

both conceptual content knowledge and pedagogical knowledge necessary for effective teaching and learning process in the state. But, it is too early for the established centres to have any noticeable effect on secondary schools teachers in the state. This study, therefore, considers the above efforts of both Federal and State Governments on teachers' professionalism as one of the significant reasons for finding out or determining the influence of teachers' Professional Career Development on Physics Curriculum Implementation among Physics Teachers in Niger East Senatorial Zone of Niger State.

A curriculum is defined in many ways by many experts. According to Ayeni (2010), a curriculum is defined as an academic document that explains what learners are to learn, simplified ways to learn and understand it and take action due to the learning. This implies that every subject must have a definite document describing what to learn and how to learn it for the benefit of the learner and society.

Therefore, the curriculum should be developed dynamically to be subjected to changes due to the nation's socio-economic and political changes. It should be changed when it is no longer consistent with the national goals of education (Umar, 2011). A well-planned and developed curriculum will never be helpful unless teachers effectively teach various subjects at the secondary school level of education. This implies that teachers must be qualitative both in terms of subject content knowledge and pedagogical content knowledge.

Effective curriculum implementation depends on the quality of the teachers responsible for the performance of such a curriculum. In-service education ensures that teachers are updated and adequately empowered for effective curriculum implementation. Pre-service training might not, in reality, perfectly prepare physics teachers for effective curriculum implementation. Therefore, many teachers sought the opportunity for in-service

education as a means of further professional development. In Nigeria, the central in-service education for secondary school teachers is the sandwich program offered by the faculties of education in Nigerian universities (NGSG, 2016). One would expect this in-service program to influence the recipients' knowledge about the secondary school curriculum and instruction, but a significant influence has not been witnessed. Based on this, this study aims to determine the effect of in-service training on secondary school physics teachers' curriculum implementation.

Chief examiners' report on Senior School Certificate Examination (SSCE) conducted by National Examination Council (NECO, 2014) observed that poor performance of physics students at Senior Secondary School level is due to lack of qualified physics teachers to handle physics curriculum. The report further asserted that most unqualified physics teachers employ poor instructional strategies. In addition, most physics teachers are inadequate in terms of physics content mastery. In line with the above observation, Umar (2011) reported that the lack of qualified physics teachers to teach at the secondary school level had forced the available ones to adopt poor instructional strategies during classroom instruction. This, therefore, calls for Continuous Professional Career Development (CPCD) of teachers, most especially the physics teachers.

In addition, most physics teachers use the traditional chalk and talk or conventional teaching strategy, a teacher-centred instructional strategy. This strategy emphasizes learning through the teacher's guidance at all times. Students are expected to listen to lectures and, therefore, learn little from the course. The teachers mostly talk to the students instead of encouraging students to interact and improve students' level of understanding the physics concepts, most significantly, in too large classes. Most classes involve rote learning, where students depend on memorization without adequately understanding the concepts taught by physics teachers (Adegoke, 2011). All these are

taking place at the secondary school level because most physics teachers are not adequately trained. Therefore, there is the need for proper and adequate Continuous Professional Career Development (CPCD) of physics teachers for effective physics curriculum implementation Niger State Ministry of Education (NGSMOE, 2016). This can be done either by Government, Non-governmental organizations or school management. However, to be able to come up with a proper instructional strategy that will promote and enhance effective teaching of physics concepts by physics teachers, increase and speed up the conceptual understanding of physics students and enhance physics teachers' job performance, physics teachers' Continuous Professional Career Development (CPCD) is one of the areas that Government and Non- Governmental Organizations (NGOs) must pay attention to with a view of improving physics teachers' instructional strategies and proper physics curriculum implementation.

Additionally, some physics teachers teaching in secondary schools are not trained teachers as such cannot correctly impart physics concepts to physics students. Amakiri (2012) asserted that quality science teaching must be linked to the teacher's content and pedagogical knowledge. The quality of scientific knowledge acquired by students is directly dependent on the quality of its science teachers because teachers are the agents that transmit knowledge to the students, evaluate the students' learning outcomes, and help the students overcome misconceptions and learning difficulties during classroom instruction. Hence, the need for Continuous Professional Career Development (CPCD) of physics teachers is paramount.

Continuous Professional Career Development (CPCD) is how teachers are continually trained in subject content mastery, updated pedagogical skills and classroom management strategies. In other words, Continuous Professional Career Development (CPCD) can be referred to as the process by which teachers are trained to acquire both conceptual content

knowledge and pedagogical skills necessary for effective curriculum implementation or classroom teaching and learning process Niger State Ministry of Education (NGSMOE, 2016). Ofojebe and Ezugoh, (2010) opined that teachers' training and retraining is necessary because a teacher is a person who influences the learner by what they say, what they do and how they do it. This is because teachers have direct contact with the students in the classroom. Therefore, it is necessary to look into the physics teachers' Continuous Professional Career Development (CPCD) to improve physics teachers' instructional strategy, leading to effective teaching and proper physics curriculum implementation by physics teachers.

This objective can bring about meaningful learning of physics concepts among physics students at secondary school levels of education. This can only be achieved if the physics teachers are continually exposed to Continuous Professional Career Development (CPCD). Exposure to CPCD will enable physics teachers to develop the ability and willingness to reflect on practice and learn from students' prior experiences. The government at both Federal and State levels must be proactive in providing physics teachers with facilities that would enable them to undergo periodic but continuous training or retraining programmes such as workshops, seminars, conferences and refresher courses to keep them updated in physics curriculum implementation.

The effectiveness of physics teachers' exposure to Continuous Professional Career Development (CPCD) depends on physics teachers' perception of the curriculum implementation processes. The physics curriculum may be implemented appropriately or not, depending upon physics teachers' perception of the teacher's strategies for the implementation. This is why physics teachers' perception of physics curriculum implementation is essential to implementing the curriculum effectively. Perception is defined as an individual's teachers' view on using a particular strategy to improve

curriculum implementation (Isiyaku *et al.*, 2018). In the context of this study, therefore, perception is the extent to which a teacher sees a particular method of curriculum implementation practices.

There are many types of curriculum implementation practices or models, which include the Overcoming Resistance to Change (ORC) model and Leadership-Obstacle course model (LOC) model, Linkage model, Rand Change Agent model (RCA), CIPP Model and many other types. This study, therefore, is aimed at finding out if Niger State Government and other stakeholders in education in the state are proactive in providing physics teachers with facilities that expose teachers to continuous training to keep physics teachers updated for effective implementation of physics curriculum in Niger East Senatorial Zone of Niger State.

1.2 Statement of the Research Problem

Physics is one of the most challenging but essential secondary school science subjects. This makes it compulsory for science students at the senior secondary school level, but students' learning outcomes in physics have been inferior. Researchers have shown that most physics teachers lack adequate subject content knowledge and instructional strategy content mastery ability to impart physics knowledge effectively to secondary school students (Ogunu, 2011). Because of the considerable importance of physics knowledge, there is an urgent need for students to understand the difficulty in physics concepts that are not well taught because of many reasons associated with teachers' subject content knowledge and pedagogical content knowledge.

The chief examiners' report reports on Senior School Certificate Examination (SSCE) conducted by the National Examination Council (NECO, 2012, 2014 & 2017) that, Physics students' learning outcomes are poor mainly because most of the physics teachers

have poor physics content knowledge as well as poor instructional strategies. Physics teachers' ineffective teaching strategy is one of the significant problems facing Physics teaching in Nigeria. This is mainly because physics teachers' content and instructional knowledge are not linked together during physics instruction. Physics teachers, therefore, cannot in whatever way teach and improve physics students' learning outcomes effectively. This can only be done if physics teachers are well trained in physics mastery and instructional content mastering abilities. This calls for a general overhaul of the physics teachers' training programmes to be well-equipped to properly implement the physics curriculum at the secondary school level of the Nigerian education system.

Therefore, this research focuses on the Perceptions of Physics Teachers' Continuous Professional Career Development (CPCD) and Curriculum Implementation Practices in Niger East Senatorial Zone of Niger State.

1.3 Aim and Objectives of the Study

This study aims to determine the Perceptions of Physics Teachers' on Continuous Professional Career Development and Curriculum Implementation Practices in Niger East Senatorial Zone of Niger State. Specifically, the study strived to achieve the following objectives:

1. Determine the perception of physics teachers on Continuous Professional Career Development and implementation of physics curriculum in Niger East Senatorial of Niger State.
2. Examine the perception of physic teacher Continuous Professional Career Development on teaching experience and Implementation of Physics Curriculum among Physics Teachers in Niger East Senatorial Zone of Niger State

3. Investigate whether Physics teachers in Niger East Senatorial Zone of Niger State undertake professional career development training during curriculum implementation practice.
4. Find out whether Physic teachers receive motivation towards curriculum implementation practices in Niger East Senatorial Zone of Niger State.
5. Examine whether challenges are militating Physics teachers' professional career development in Niger East Senatorial Zone of Niger State
6. Ascertain whether school supervision is adequate towards implementation of physics curriculum in Niger East Senatorial Zone of Niger State

1.4 Research Questions

The following research questions were raised in the study:

1. What is the perception of Physic Teacher on Continuous Professional Career Development on teachers' qualification and Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State?
2. What is the perception of Physic Teacher on Continuous Professional Career Development on teaching experience and Implementation of the Physics Curriculum in Niger East Senatorial Zone of Niger State?
3. Do physics teachers undertake Continuous Professional Career Development for curriculum implementation practices in Niger East Senatorial Zone of Niger State?
4. Does motivation enhance physics curriculum implementation practice in Niger East Senatorial Zone of Niger State?
5. What are the challenges faced by Physics teachers towards physics curricula implementation practices in Niger East Senatorial Zone of Niger State?
6. Is there effective schools' supervision towards physic curricula implementation in Niger East Senatorial Zone of Niger State?

1.5 Scope of the Study

The geographical scope is Niger East Senatorial Zone of Niger State. Two independent variables (continuous professional career development and curriculum implementation practices), one dependent variable (perception) were investigated in this study. The study is restricted to secondary school physics teachers of the zone. The instrument to be used for data collection is the researcher's designed questionnaire on the perception of Physics teachers on CPCD and Curriculum implementation in Niger East Senatorial zone of Niger State. The study lasted for 5 weeks.

1.6 Significance of the Study

The findings of this study would be significant to physics students, physics teachers, school administrators, Government, curriculum planners, non-governmental organizations and Researchers.

The findings would be of extra significance to physics study because the school physics teachers will be exposed adequately to periodic and effective professional career development programmes. This will help train the physics teachers to be well-equipped in physics content knowledge and physics pedagogical skills. After that, physics teachers will impart physics knowledge to the students effectively during physics curriculum implementation (physics classroom instruction). This will improve students' understanding of physics concepts and hence, progress in physics learning outcomes at final Senior School Certificate Examinations.

Physics teachers will benefit from this study. They will be well equipped in terms of both physics content knowledge and physics pedagogical skills. After that, physics teachers will impart physics knowledge to the students effectively during physics curriculum implementation (physics classroom instruction).

School administrators would find it easier to control and coordinate the activities of both teachers and students in the school. This is because the administrators' role in teachers' professional training and retraining will be effectively discharged, promoting love between the school administrators and teachers and between the school administrators and students.

The government would be encouraged to allocate sufficient funds to schools and release these funds when due. This, on the other hand provides room for proper coordination of school activities by the school administrators.

Curriculum planners can easily change the curriculum contents to meet the teachers' needs in terms of classroom instruction. This will, in turn, make teaching and learning so easy and effective in the schools.

1.7 Operational Definition of Terms

The following terms are operationally defined as used in the study:

Curriculum: In this study, curriculum refers to a physics document that describes what to learn and how to learn physics for the benefit of the learner and society.

Development: It refers to the act of training and retraining physics teachers to be appropriately and adequately equip for imparting physics knowledge to secondary school students effectively.

Implementation: It refers to teaching and learning the physics curriculum under the guidance of a physics teacher.

Learning outcomes: This study refers to secondary school physics students' performance at final Senior School Certificate Examinations.

Professional Career: Area or field of specialization. In this study, it refers to physics teaching

Physics students: Secondary school students that are exposed to teaching and learning physics as a primary subject.

Physics teachers: This refers to science teachers responsible for teaching physics as a primary subject at the secondary school level.

Perception: is “awareness of something which related to previous knowledge”. Through the perception process produce the meaningful experiences of the world which basis of the reality and attitude.

Continuous Profession Career: refers to the process of training and developing professional knowledge and skills through independent, participation-based or interactive learning

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Concept of Physics

Physics is the bedrock of science and technology because many of the equipment on which scientific and technological advancement depends are the direct products of physics (Nwagbo & Uzoma, 2014). Physics is a core subject in science and technology since it stands the essence of natural phenomena and helps people understand a technological changing society readily. The principle of physics has been widely used for various economic, scientific and technological advancements such as information technology, which has reduced the world into a global village through satellites and computers. Also, the knowledge of physics had led to sustainable development in industrialization for the improvement of materials useful to the well-being of the human race. Furthermore, Physics education enables learners to acquire problem-solving and decision-making skills that pave the way for critical thinking and inquiry that could help them respond to widespread and radical changes in all life factors.

Despite the importance of physics to our nation's scientific and technological development, understanding of the subjects had dwindled over the year, and the performance of the enrolled students had not been encouraging. Ho and Boo (2011) discussed that there had been a decline in the number of students wishing to continue with physics in many countries. Umar (2011); Arthur (2010) and Nneji (2011) were all of opinions that students' performance in the science subjects like biology, chemistry, mathematics and physics were poor. Also, previous studies had shown that students who hold negative stereotyped images of scientists, science and technology in society are easily discouraged from pursuing scientific discipline and usually performed poorly in

science subjects (Omosewo, 2011). This situation does not favour Nigerian's move towards developing a scientific and technological nation. Furthermore, male students shun science subjects, particularly physics, when given an option, which applies to girls. Arthur (2010) reported that if students are given a choice to choose a favourite subject from biology, chemistry and physics, the majority of them would instead drop physics in favour of other science subjects.

Improving physics and achievement required many imputing from the teachers because teachers are responsible for effective curriculum implementation. The teaching approach that a teacher adopts and the available materials they use for teaching can affect students' achievement and the implementation of physics curriculum (Isola, 2010). Therefore the use of appropriate teaching equipment and teaching method is critical to successfully implementing the physics curriculum. Many studies have been conducted to examine different teaching methods adopted in physics classrooms for curriculum implementation. For example, Bello (2011) found out that using the small group cooperative teaching method with the aid of laboratory equipment facilitated students learning in physics hence, effective physics curriculum implementation. This method also increased students' motivation to learn. Also, below-average students were found to improve on their achievement than in regular teaching method classes. The cooperative concept mapping approach teaching method enhances the teaching of secondary school science. Wachanga *et al.* (2012) in NGS (2016); Kibett and Kathuri also in NGS (2016) found out that students who are taught using project-based learning outperform their counterparts in the traditional teaching approach. There are still much to be done in the area of effective utilization of available teaching equipment for effective physics curriculum implementation

Unavailability or inadequacy of suitable teaching facilities is blamed for the poor physics curriculum implementation, among other factors such as teacher competency, teaching methodology, and student's attitude towards the subject. Using adequate and suitable laboratory equipment to teach physics in secondary schools will help improve learners' academic achievement with corresponding effective physics curriculum implementation. Unfortunately, the available research in literature does not indicate much research on the effectiveness of physics curriculum implementation in senior secondary school physics in Nigeria. This research study is therefore intended to fill this gap in the body of knowledge. In addition, the study is expected to provide empirical evidence on the physics curriculum implementation.

2.1.2 Importance of Physics to Society

Physics is an international enterprise, which plays a vital role in the future progress of humankind. The support of physics education and research in all countries is essential because: Physics is an exciting intellectual adventure that inspires young people and expands the frontiers of our knowledge about nature. Also, generating basic knowledge needed for future technological advances will continue to drive the world's economic engine. It also contributes to technology infrastructure and offers trained personnel required to take advantage of scientific advances and discoveries. Physics is an essential element in chemists, engineering and computer scientists, and other physical and biomedical sciences practitioners. Physics extends and enhances our understanding of different disciplines, such as the earth, agricultural, chemical, biological, and environmental sciences, including astronomy and cosmology subjects of substantial importance to all world peoples. Furthermore, physics improves our quality of life by providing the basic understanding necessary for developing new instrumentation and techniques for medical applications, such as computer tomography, magnetic resonance

imaging, positron emission tomography, ultrasonic imaging, and laser surgery. Therefore, physics is an essential part of the educational system and an advanced society.

2.1.3 Concept and Meaning of Curriculum

A curriculum is defined as an academic document that explains what learners should learn, how to learn it to understand it and take action as the learning (Ayeni & Akinola, 2013). Curriculum development must therefore be a dynamic and continuous process. It must be subjected to changes as a result of the changing socio-economic and political scenario of the nation. It should change when it is not consistent with the national goals of education or loses balance, integration and relationship within and among different disciplines (Aliyu *et al.*, 2019; Afolabi & Joshua, 2019).

Curriculum has various definitions among scholars, however the term is used here to refer to the knowledge that a society selects from the total available reservoir of knowledge and deems as valued and essential for students to learn in schools. In this context can be defined as all the learning activities which are planned and guided by the school, whether it is carried on in groups or individually, inside or outside the school, it comprises the totality of the experiences of children for which schools are responsible. Grundy (2000) defined curriculum as a programme of activities (by teachers and pupils) designed so that pupils will attain certain educational and other schooling ends or objectives. The definition sees curriculum from the angle of what is done in schools under the guardians of teachers. Jurie and Gideon (2006) viewed curriculum as a composite whole including the learner, the teacher, teaching and learning methodologies, anticipated and unanticipated experiences, outputs and outcomes possible within a learning institution. This definition considered curriculum from the angle of what is happening during teaching and learning exercise.

In another related definition, Tricia (2010) viewed curriculum as an intentions about opportunities for engagement of persons to be educated with other persons and things (all bearers of information, processes, techniques and values) in certain arrangements of times and space. Buttressing this definition, Mohamed *et al.* (2006) maintained that curriculum is all experiences that individual learners have in a programme of education whose purpose is to achieve broad goals and related specific objectives, which is planned in terms of a framework of theory and research in past and present professional practice. The definition considered curriculum as the aspect of deliberate actions or intention made teaching and learning. Mohamed *et al.* emphasized on educational experiences of the learners during their schooling period. In another related definition, Emmanuel (2008) defined curriculum as a plan that consists of learning opportunities for a specific time frame and place, a tool that aims to bring about behaviour changes in students as a result of planned activities, these include all learning experiences received by students with the guidance of the school. The definition unlike others stressed on time frame, place and materials used in bring desirable change on the learners.

Curriculum is a connective link between teacher and student, organized in such a way to achieve goals previously set by the teacher, the learning organization or by the curriculum specialists (Vuca, 2006). The author centered on relationship that exists between teachers and students geared towards achieving educational goals. Tricia (2010) defined curriculum as the contents of a subject, concepts and tasks to be acquired, planned activities, the desired learning outcomes and experiences, product of culture and an agenda to reform society. From the definitions reviewed so far, curriculum can be defined as the sum of all the activities, experiences and learning opportunities for which an institution or a teacher takes responsibility either deliberately or by default. This includes in such a broad concept of curriculum the formal and the informal, the overt and the covert, the recognised and the overlooked, the intentional and the unintentional actions.

Curriculum is the sum total of all learning experiences and the intended learning outcomes that are offered to the learners in an auspices of a school. Curriculum is also the vehicle through which educational goals/objectives/aims are being achieved. A countries hopes and aspiration Academic Excellences are expected to be attained through the use of the school curriculum while also modifying and educating their youths. In view of the above explanations, school curriculum must be creatively and painstakingly incorporated or integrated (Ugwu, 2013), considering the identified needs of the industry and the globe at large.

It is the teacher that executes these curriculum activities/curriculum actions/documents and so the teacher and the curriculum moves side by side. This implies that one cannot discuss elaborately on curriculum without the mention of the teacher who is the curriculum implementer. As a curriculum implementer it means that the teacher is the one who brings the curriculum documents to limelight and to reality.

2.1.4 Curriculum development in Nigeria

The curriculum is referred to as the external manifestation of an underlying conceptual system about the followings:

- i. The nature and structure of subject matter that is being taught,
- ii. Children's conceptions or misconceptions about the subject matter, and
- iii. Mechanisms of cognitive change, for instance, learning and development.

As for the mechanisms of cognitive change, buried in curricula are assumptions curriculum writers have about how learning and development occur in children's minds. Generally, these assumptions are uninspected. They are implicit and between the lines. But investigators can unearth these assumptions through hermeneutic text interpretation. A simple example here might be helpful to illustrate the point. Often one sees in mathematics curricula the following: a problem type is presented; solutions to two

problems are demonstrated, and the children who are studying from the curriculum are presented 15 similar problems for solution. From this somewhat familiar description, one could surmise that the curriculum developer believes that children learn through demonstration and practice. I do not quibble with that implicit description of the nature of the mechanism that leads to learning. This example of how one could analyze a curriculum section to determine the heart of the curriculum developer's implicit model of children's learning and development.

Child Cognitive Development and Learning One purpose of the present chapter is to elaborate on different kinds of theories of learning and development cognitive development psychologists have constructed and then to show their potential influence on curriculum development. Then, in the discussion section, I return to curriculum development in light of the exposition of these theories.

2.1.5 Model of curriculum development

To ensure the quality of education, schools should be actively involved in curriculum development and implementation. Curriculum development involves the following steps:

- (1) Identifying the learning needs of the children;
- (2) Setting priorities in these learning needs for curriculum development;
- (3) Searching and retrieving resources from within and outside the school;
- (4) Designing curriculum programmes;
- (5) Implementing curriculum programmes;
- (6) Evaluating the effectiveness of curriculum programmes;

(7) Making adaptations to curriculum programmes.

To meet the needs of an increasingly globalized world, educators, politicians, parents, and corporations across the globe have called for significant school reforms by restructuring the curriculum.

Roehrig *et al.* (2013) noted the quality of a curriculum could only be as good as the quality of the curriculum process; the word (curriculum) itself is used in many different contexts, by principals in schools, by teachers, by curriculum writers in education systems, and increasingly by politicians. It can mean other things in each of these contexts. When a new curriculum has been developed, the people affected by it must have some stakes in it to understand its relative merit over the previous one. This is to ensure their support for the new curriculum and contributions are enlisted. Such people include teachers, educational officers from the Ministry of Education headquarters, field officers, parents, religious leaders, politicians, professional bodies, and the general public. Through their effort, they will enhance the success of the entire curriculum process and forestall any resistance, sabotage or indifference to it.

2.1.6 Concepts of curriculum implementation

Umar (2011) describes the concept of curriculum implementation as the actual engagement of learners with planned learning opportunities. Marsh and Stafford (2010) also highlight three dimensions of curriculum concept. First, they explicit that curriculum includes syllabi or listing of contents and a detailed analysis of other elements such as aims and objectives, learning experiences and evaluation, and recommendations for interrelating them for optimal effect. Second, the curriculum comprises planned or intended learning, calling attention to unexpected situations in the classroom practices. Thirdly, curriculum and instruction are inextricable. Hondrich *et al.* (2016) rightly contend that curriculum is part of teaching, not separate from it. Therefore, the most

agreed basic notion of the curriculum is that it refers to a plan for learning (Budak, 2015; Isola, 2010 & Hondrich *et al.*, 2016). This concept of curriculum as (Akker, 2006), limits itself to the core of all definitions, permitting all sorts of elaborations for specific educational levels, contexts, and representations. In discussing this curriculum concept, Marsh and Stafford (2010) argue that curriculum is an interrelated set of plans and experiences that a student completes under the school's guidance.

Stages in the curriculum process when during learning activities, the teacher and learners are involved in a negotiation aimed at promoting learning. This is the interactive stage of the curriculum process. This takes place in the classroom through the effort of the teachers, learners, school administrators and parents. It also integrates the application of physical facilities and the adoption of appropriate pedagogical strategies and methods. Any society's quality of curriculum implementation is the bedrock of its political, economic, scientific, and technological well-being. Therefore, another name for the teacher is curriculum implementer. The teacher is the one who translates the curriculum document into operating curriculum through a joint effort of their learners and other interest groups, as viewed by Mkpá and Izuagba (2009). This implies that the task of implementing the curriculum lies with the teacher. The teacher does not just implement the content but instead breaks the content into teachable units.

Curriculum conceptualized broadly as culture. Su (2012) expound this notion of curriculum as a culture link. Using a cultural lens, we can begin to regard curriculum not just as an object (content) but as a series of interwoven dynamics. Curriculum conceptualized as culture educates us to pay attention to belief systems, values, behaviours, language, artistic expression, the environment in which education takes place, power relationships, and most importantly, the norms that affect our sense of correct or

appropriate. Chen (2013) states it functions as a mirror that reflects cultural beliefs, social and political values and the organization.

The hidden curriculum contains underestimated importance of the dynamics of human interactions in organizational behaviour, which are imperceptible but have a powerful influence on institutional culture/climate (Amah, 2011). In this sense, culture refers to the values and symbols that affect the organizational environment. This implies that the symbolic aspects of school activities, for instance, traditions, rites, and rituals, are subsumed, for these are the values transmitted literally from one generation of the organization to another.

2.1.7 Models of curriculum implementation

There are several models of curriculum implementation, but for this work, only the selected ones that are applicable in implementing curriculum in our various institutions are discussed below:

ORC model (Overcoming Resistance to Change)

The letters 'ORC' stands for 'Overcoming Resistance to Change. This model assumes that the success or otherwise of curriculum implementation primarily depends on the developer's impact on the curriculum users such as teachers, students and society in general. Therefore, we must address people's misgivings, apprehensions, or other related factors if we desire change. We must point out that what the curriculum incorporates, wherever possible and appropriate, their values, assumptions and beliefs. And while addressing the persons within the system, we should remember that to get the desired result; the subordinates should be motivated rather than ordered. Therefore, curriculum developers should identify and deal with the concerns of the staff in various educational

institutions when implementing the new curriculum. We can group the problems into the following four broad developmental stages:

Developmental stage: they are the following

1. Unrelated Concerns: At this stage, teachers do not perceive a relationship between themselves and the suggested changes. For example, if a new programme is being developed, a teacher at this stage may or may not be aware of this effort. If they are aware of it, they may not consider it something that concerns them. The teacher would not resist the change because they do not perceive the change as something that influences their own personal or professional domain.

2. Personal Concerns: At this stage, the teacher will react to the innovation about their situation. They are concerned with how the new programme compares to the one already in use.

3. Task-related Concerns: This stage relates to the actual use of the innovation. The teacher at this stage will be concerned with the time required for teaching the new programme, availability of materials, strategies to be adopted, etc.

4. Impact-related Concerns: The teacher at this stage will be concerned with how the innovation will influence others. When working with the ORC model, we must deal directly with the concerns at stages 2, 3 and 4 to serve the purpose for which the change is affected.

LOC model (Leadership-Obstacle course model): LOC is the acronym for the 'Leadership-Obstacle Course' model. This model treats staff resistance to change as problematic and proposes collecting data to determine the extent and nature of the opposition in implementing the curriculum. This can be carried out by the following:

i) the organisational members must have a clear understanding of the proposed innovation;

- ii) individuals within the organisation must be given relevant skills so that they possess the capabilities requisite for carrying out the innovation;
- iii) the necessary materials and equipment for the innovation must be furnished;
- iv) if need be, the organisational structure must be modified so that it is compatible with the innovation being suggested;
- v) the participants in the innovation must be motivated to spend the required time and effort to make the innovation successful.

The LOC model considers educational change as a sequence of three stages:

- i) initiation;
- ii) attempted implementation; and
- iii) incorporation.

We should note here that implementation obstacles solved at one point using this model may arise again at another point. This model, therefore, has a feedback and monitoring mechanism to determine if problems, once solved, keep reappearing and so on.

Linkage model: The 'linkage' model recognises innovators in research and development centres such as universities. However, educators in the field find some innovative and inappropriate attempts for solving the problems. Therefore, what is needed is a match between the problems and innovations to establish linkages with the established research centres. This model envisages two systems: user system and resource system. There has to be a link between these two systems. The resource system should have a clear picture of the curriculum user's problems to retrieve or create appropriate educational packages. A successful resource system must proceed through a cycle of diagnosis, search, retrieval, solution fabrication, dissemination, and evaluation to test its product. Thus, in the linkage model, the basic process is the transfer of knowledge.

RCA (Rand Change Agent model): The Rand Change Agent (RCA) model suggests that organizational dynamics seem to be the chief barrier to change. As in ORC and LOC models, it puts forward the following three stages in the change process:

i) Initiation: At this stage, the curriculum developers work to secure the support for the anticipated change. To support a change, such as a new programme, people must understand and agree that it is legitimate. Thus, curriculum implementation activity requires the personal backing of the individuals involved. For example, we should inform the teachers about the need for change and how it might occur at this stage.

ii) Implementation: At this stage, the proposed change, that is the new programme and the organisational structure, are adjusted to operationalize the change.

iii) Incorporation: During this stage, the changes implemented become part of the established programme. The assumption behind this is that the success of the implementation is a function of:

- i) the characteristics of the proposed change;
- ii) the abilities of the academic and administrative staff;
- iii) the readiness of the local community; and
- iv) the organisational structure.

During the incorporation stage, the changes implemented become part of the established programme. At this stage, the programme implemented is provided with the necessary personnel and financial support. The present study felt to assessed perceptions of physics teachers' on continuous professional career development and curriculum implementation practices in Niger East Senatorial Zone of Niger State.

2.1.8 History of curriculum development in Nigeria

Elsewhere, Ojediran *et al.* (2014) defined curriculum as the external manifestation of an underlying conceptual system about:

- (1) The nature and structure of subject matter that is being taught,
- (2) Children's conceptions or misconceptions about the subject matter, and
- (3) Mechanisms of cognitive change, that is learning and development.

As for the mechanisms of cognitive change, buried in curricula are assumptions curriculum writers have about how learning and development occur in children's minds. Generally, these assumptions are uninspected. They are implicit and between the lines. But investigators can unearth these assumptions through hermeneutic text interpretation. A simple example here might be helpful to illustrate the point. Often one sees in mathematics curricula the following: a problem type is presented; solutions to two problems are demonstrated, and the children who are studying from the curriculum are presented 15 similar problems for solution. From this somewhat familiar description, one could surmise that the curriculum developer believes that children learn through demonstration and practice. I do not quibble with that implicit description of the nature of the mechanism that leads to learning. This example of how one could analyze a curriculum section to determine the heart of the curriculum developer's implicit model of children's learning and development.

Child Cognitive Development and Learning are one of the purposes of the present chapter. It is to elaborate on different kinds of theories of learning and development cognitive development psychologists have constructed and then show their potential influence on curriculum development. In the discussion section, the researcher sees the need to return to curriculum development in light of the exposition of these theories.

The goal of a successful educational program and thus effective curriculum development should be to meet the needs and current demands of the culture, the society, and the expectations of the population being served. Therefore curriculum development and the educational reform process continually under goes review, revision and constant change

(Johnson, 2011). Curriculum development can be challenging, therefore the involvement of all stakeholders, especially individuals who are directly involved in student instruction, are a vital piece in successful curriculum development and revision (Johnson, 2011).

Education, as earlier noted, is the transmission of the cultural heritage of a people. The objective of education in any country is derived from the culture of that society education is to serve. Those cultural aspects to be taught, and learned by learners in schools, are enunciated in the objectives of education and reflected in the philosophy of life of the nation. A reflection on the philosophy of life of a nation demands that the life of the nation in the past should be considered before the new curriculum emerges. Since history enriches humanity in its bid at unfolding the ethical values of society in the past, as earlier noted, it is necessary to consider the relationship between history and curriculum development.

Borrowing-from Abelson (1982), history is a part of philosophy. This is because history offers us an idea of the ideals and values of our society in the past as we relate it to present so as to build a future brighter society. Acting in its function as a road map into the ideals and values of our society, history automatically blends with curriculum development in the effort of transmitting the desirable content of the culture derived from the national philosophy of education.

Curriculum development is intricately related to history in the sense that any consideration of its relevance borders on its sensitivity to the values, beliefs, norms, tradition, aesthetic, science and technology, art, religion, and customs of the people. Curriculum's sensitivity to the totality of the ways of life of a people signifies that no curriculum can be considered relevant to the development of a people unless it is deeply

rooted in their cultural milieu. Be that as it may, one may infer that curriculum, which is the transmission of the cultural heritage, derives its inspiration from history.

For instance, it is held that modern civilization with all its splendour has its roots in ancient cultural and traditional practices of the Greeks, Romans, Egyptians, (Africans) and the Babylonians (Maduewesi, 2005). To amplify this point, culture is viewed as the way of life of a people exemplifying their accumulated wisdom, knowledge and skills which are passed from one generation to another (Fafunwa, 1974). Education which aims at perpetuating the culture of the society from which it emanates, mandates a thorough knowledge of its rooting. Against this backdrop, history comes in closely with curriculum development. Both history and curriculum development meets at this point, since the perpetuation of the culture of a people from generation to generation is an integral part of what is imbibed by the learner, through the curriculum.

Those cultural aspects that are considered unworthy of preservation and to be discarded for their failure to rhyme with the needs of the contemporary society, through curriculum development are only understood through the knowledge of their history. Therefore, the important relationship between history and curriculum development is that of connecting what has gone in the curriculum past to the reconstruction of the curriculum present.

Since curriculum development has become a vital educational enterprise in most parts of the world today, it is pertinent to look at it from the historical standpoint. This is necessary, because 'many curriculum development efforts in recent years have deep historical rooting (Tanner & Tanner, 1975). Because most recent curriculum reforms are focused on pervading social problems that have their genesis on past curricula according to Tanner and fanner, one can suppose that efforts at improving quality of education, as well as attaining the goals of education in any particular country are not new. They have

benefited from the lessons that might have been learnt from the perspective of historical experience. The points made so far in the preceding paragraphs does not however, suggest that contemporary problems in the curriculum field can only be solved by simply turning to the past. The argument here is that history as it relate to curriculum is a big prop in curriculum development.

2.1.9 Nature and scope of Nigerian senior secondary school physics curriculum

The school educational program of any country is attracted to attain the satisfaction of the theory of instruction of that nation. This reasoning is straightforwardly connected with the needs of the government. For the reason to be in accordance with Nigeria's national objectives, training needs to apparatus towards self-acknowledgement, better human relationship, individual and national productivity, full citizenship, national awareness, national solidarity, and also to social, social, financial, political, experimental and innovative progress (FRN, 2013). Nigeria is a creating country with a dream to be one of the twenty most significant matters in profit-making countries on the planet by the year 2020 (Ibrahim, 2012). Physical science is a science subject taught at the senior optional school level of the Nigerian instructive framework. The national approach to training expresses that physical science can be taken as one of the "centres" among science subjects (i.e. one science, science, and material science or wellbeing science) with one other professional elective and two non-electives subjects (FRN, 2013).

Physic instruction prepares the understudies to get a proper understanding of fundamental guidelines and their applications. Likewise, it is gone to create in the learners fitting exploratory disposition as an issue for future investigative exercises. To accomplish these goals, dynamic support and community learning exercises get to be essential, which need working instructional media to make material science direction effective (Ojediran *et al.*, 2014).

Jandrić *et al.* (2020) opined that physical science instruction has been and will continue to be of enormous vitality to humanity for its capacity to clarify common phenomena and commonplace events and its focal part on the planet's present mechanical improvement. Presumably, it is on this ground that physical science is given a position of conspicuousness in the Nigerian school's educational program. Jandrić *et al.* (2020) expresses that the educational module is an academic attempt that needs constant modification. He underscores that all encounters that are liable to impact the general advancement of the learner ought to be considered while creating an educational program. Ojediran *et al.* (2014) opined that such correction ought to include constantly reviewing the goals to guarantee that gender fits the learner's needs and aligns with changing instructive strategies. Furthermore, it should have persistent conformity of substance, materials, instructional and assessment techniques, and learning knowledge to address the changing needs of the learners, society, and time.

The new auxiliary school physical science educational program as per the CESAC, science and innovation in conjunction with agreeable instruction study and adjustment focus (CESAC 1983) has the accompanying destination;

- a. To give fundamental writing proficiency in material science to helpful living in the general public;
- b. To obtain essential ideas and standards of material science as readiness for further studies;
- c. To get crucial exploratory aptitudes and mentality for the innovative application of material science;
- d. To fortify and improve innovativeness keeping in mind the end goal to attain the targets of material science training at the SSS level, the guided-disclosure strategy for instructing has been suggested.

Along these lines, educators are firmly urged to utilize the understudy action-based and request situated education. A great open door for research centre action dialogue has been given in every unit of the course. The three spaces of instructive targets have been secured. These are cognitive, full of feeling and psychomotor areas. Taking interest aptitudes will give opportunity and capacity to the learner to work in an extensive and little gathering, to impart thoughts, materials, to work in board of trustees, to take part in part taking exercises, to appreciate others and their perspectives in talk or maintain bunch 'choice'. Most field studies and lab investigations of the accomplishment of Jigsaw learning have occurred in every significant subject at all evaluation levels.

The showing and learning of physical science have some significant setbacks because of educators' pedagogical information. It is just as of late when substantive advancement has been made in understanding physical science educators' learning, how it plays out in practice, and how it can be produced. (Ofojebe & Ezugoh, 2010) have organized two influential works that grow the field's origination of the nature and unpredictability of the educator's information to educate the understudies. Ofojebe and Ezugoh (2010) further unveiled two levels of educators' information:

- The pedagogical level-the disclosure technique and the spontaneous dialogue in the middle of understudies and educators; and,
- The substance authority/the unprecedented dominance of the topic.

Omosewo (2011) offered a definite observational and hypothetical clarification of the different levels of learning, arranging, and choice-making involved in instructing material science and how it pays to be capable in pedagogical information. The studies further depict the educators' expert vision as a vital element as well. All this help material science information an educator must-have for powerful showing and learning furthermore demonstrate the degree of the character of learning that empowers instructors to associate

adequately with understudies over-generous physical science ideas in the classroom. The investigation of educators' knowledge was revitalized in the mid-1980s when pedagogical substance information was presented. Pedagogical substance information is a sort of information known to envision particular understudy understanding and misjudging in particular instructional connections and demonstrating methodologies (technique) prepared to utilize when understudies exhibit misconstruing or comprehension. The idea is vital and found to assume a focal part in classroom/research facility educating practices. This focuses on information that an instructor must have to be viewed as skilful in their education.

Omosewo (2011) had the solid conviction that what is required for skilled instructing in any space is a mix of sound topic learning and general pedagogical preparing that an instructor must-have for successful showing and figuring out how to happen. This conviction is a piece of the help structure for many software engineers in higher establishments. They took material science and science educators in different physical science and logical fields and got them into the classroom quickly. Educators hold interpretive lenses through which they channel encounters in their classrooms that educate the way they instruct in the classroom environment. Research has secured that educator convictions about showing material science are connected to their pedagogical learning and, therefore, understudy adapting in the classroom (Ayeni, 2010; Ogunu, 2011; & Isola, 2010). Generally, material science tells or gives clear, regulated strategies, while understudies learn by listening and rehearsing these methods. Umar (2011) remarkable that this conventional methodology lacks the complexity of the pedagogical learning change (NCTM, 2010) bolstered in a constructivist perspective of showing and realizing, which accentuates understudies' calculated comprehension talk in the material science classroom. Inside this setting of change in content science training, a test for educator

planning regarding pedagogical information arrangement projects is the constrained measure of time used to affect the encounters that poke instructor's physical science pedagogical learning and expand their viability for educating material science. What instructors may have learnt will suffice to set them up for the difficulties in educating in the classroom. Henceforth, understanding the simple premise of pedagogical competency learning is fundamental as a counteracting to such fast fixes for reinforcing instructor information all the more enough.

2.1.10 Teacher professional career development in Nigeria

Teacher Professional Career Development (CPCD) is a process by which teachers are continuously and appropriately trained in subject content mastery, updated effective pedagogy, classroom management efficiency and cultural values orientation of the local community where they are expected to teach. Furthermore, Continuous Professional Career Development (CPCD) can be referred to as how teachers are trained to acquire conceptual content knowledge and pedagogical skills necessary for effective teaching (Niger State Ministry of Education, 2016). This can easily be achieved if the teachers are willing to reflect on practice and learn from students' prior experiences. Therefore, the government at both Federal State levels must be proactive in providing teachers with facilities that would enable them to undergo periodic but continuous training or retraining programmes, workshops, seminars, conferences, and refresher courses to keep them updated in their various subject matter.

Teacher Professional Career Development includes formal experience (such as attending workshops and professional meetings, mentoring and others.) and informal experiences (such as reading professional publications, watching television documentaries related to academic discipline and others) (Celik, 2017). A teacher is conceived of as a reflective practitioner who enters the profession with a specific knowledge base and will acquire

new knowledge and experience based on prior knowledge (Celik, 2017). In so doing, the role of professional development is to aid teachers in building new pedagogical theories and practices and help them develop their expertise in the field (Celik, 2017).

Teachers' professional development has two main phases: the early or initial preparation and later or continuing professional development. Initial teacher training most often takes full-time residential pre-service programmes in teachers' colleges or universities.

Thus, continuing professional development may be regarded as all forms of 'in service', 'continuing education, 'on- the job training, 'workshop', 'post-qualification courses' etc. whether formal or informal, structured or unstructured, teacher-initiated or system-initiated, accredited or not (Muhammed, 2013).

Teachers need new skills, knowledge and new roles which they can get through Continuous Professional Development Programmes (CPDP).

One of the key elements of teacher quality is providing adequate opportunities for personal growth and professional development. Indeed, the continuing professional development of teachers ought to be an issue of central concern to all those who care about the quality of tuition in schools. Research on teacher education has consistently stressed the need to regularly provide opportunities for teachers to improve their knowledge of the subject matter they teach and the teaching skills they learned in the pre-service courses they attended. This is based on the recognition that we live in a rapidly changing world. Therefore, whatever knowledge and skills teachers acquire in their pre-service training becomes stale quickly as new challenges and realities emerge in socio-economic and political environments (Aliyu *et al.*, 2019).

Research has indicated some identifiable stages in the process of becoming a teacher. For example, there is the five-stage model of a novice, advanced beginner, competent performer, proficient performer, and expert teacher. The journey from being a novice teacher to becoming an expert will be facilitated, quickened and made less stressful by planned continuing professional development programs (Afolabi & Joshua, 2019). There is a shifting global paradigm in the concept of teaching. The emphasis is on students-as-learners in the classroom as learning places, where learning requires the active participation of the learners, taps into individual and social processes, assume students to be constructors (as well as recipients) of knowledge, and ultimately views teachers as curriculum-makers (Afolabi & Joshua, 2019).

These pedagogical changes demand new roles for the teachers in the field. It is continuing professional development programmes that can take the new skills to the teacher. Opportunities for continuing professional development must be created to re-skill the potential teachers, re-motivate, and encourage the old teachers. The present study felt to assessed perceptions of physics teachers' on continuous professional career development and curriculum implementation practices in Niger East Senatorial Zone of Niger State.

2.1.11 Teachers registration Council of Nigeria

The TRCN is an agency under the federal ministry of education that was established to regulate and control the teaching profession in all ramifications. This, as already noted, was established by Act 31 of 1993. The council came into full operation in June 2000 with a Registrar/Chief Executive appointment by the then-president Olusegun Obasanjo (GCFR). This development was a booster to the fulfilment of the teaching profession in Nigeria. It serves similar functions as those performed by the Nigerian Medical Council for medical doctors and the Nigerian Bar Association for lawyers in Nigeria. This was with particular reference to teacher education programmes, registration and teacher

licensing, mandatory continuing professional development, professional conduct and over all social status of teachers at all levels of the education system. However, this transformation cannot work unless there is a noticeable change in teachers' attitudes, orientations, and overall behaviour towards greater values, ideals, and practices as is the case in other noble professions. Since its establishment, the TRCN has been working tirelessly to uphold the teaching profession in Nigeria by launching campaigns, initiating awareness and professional development programmes. They have also been organizing workshops and conferences. To avoid excuses and claim of ignorance by teachers, TRCN distributed their pamphlets, handbills, statistical digest, teachers' code of conduct, teachers' handbook among others free. In a broader spectrum, the TRCN was meant to enunciate tremendous transformation in the teaching profession with particular attention to the quality of teacher education programmes, registration and licensing, mandatory continuing professional development, professional conduct and overall social status of teachers at 6 all strata of the education system.

Nevertheless, the workability of this transformation will deeply depend on the remarkable change in the attitudes, orientations, and behaviour of teachers in achieving greater values, ideals and practices as found in other noble professions. It was hoped that through the tireless efforts of the council, sanity will be restored in teaching. Teachers can start to enjoy the overwhelming standards of theory and practice, rights, privileges, opportunities, dignity and good life that are being enjoyed in other noble professions (TRCN, 2005).

TRCN Relationship with International Organizations: The quest to professionalize teaching has brought the entire nations of the world under one umbrella for the sole aim of regulating the teaching profession globally. TRCN in its twelve years of full operation, has made remarkable achievements in Nigeria and internationally such that distinguished it among the best leading agencies in Nigeria and a notable organization in the world,

especially with its membership and activities in Africa Forums of Teaching Regulatory Authorities (AFTRA) and International Forum of Teaching Regulatory Authorities (IFTRA), (Wokocha, 2014). The entire countries of the world came together under the umbrella of IFTRA with headquarters at the General Teaching Councils for Wales in the United Kingdom. Its aim was geared towards regulating the teaching profession in the whole world. This international body (IFTRA) has by 2009 taken a decision authorizing teachers who are willing to teach in any country outside theirs to apply for a letter of professional standing. With this letter, they can apply for licenses to teach comfortably in such countries.

TRCN attests that it has been receiving letters all over the world requesting for a confidential report of Nigerians who have applied to teach in different countries of the world to enable the processing of their application for a teaching license abroad. Such letters were expeditiously treated, bearing in mind the standard procedure laid down for Nigerian teachers in writing such reports. 7 Equally, the international labour organization (ILO) and UNESCO by 1984 had issued more than one hundred and forty-two recommendations on the status of the teacher. This document borders on issues covering guiding principles, educational objectives and policies preparation for the profession and further education for teachers. Other issues raised in the document are teachers' employment and careers, rights and responsibilities, conditions for effective teaching, teachers' salaries, and social security. This document clearly affirmed that teaching should be regarded as a profession because it is a form of public service which places premium on teachers' expert knowledge and specialized skills acquired and maintained through rigorous and continuing education programmes (TRCN, 2013). Indeed, TRCN has really been collaborating with the teaching councils of the world. In Africa, TRCN is an active member of Africa Forum of Teaching Regulatory Authorities (AFTRA) and as

a matter of fact remains its headquarters. By this position, the council plays a significant role in guiding other African nations in the development and professionalization of teaching. Given this position, TRCN has continuously been making tremendous efforts to position the teaching profession in Nigeria on the international threshold.

The Regulation of Teaching Profession in Nigeria: Mandate of TRCN: In section 1 (1) of TRCN Act 31 of 1993, the council was charged with the following responsibilities;

- i. Determine who are teachers for the purpose of the Act.
- ii. Determine what standards of knowledge and skills are to be attained by persons seeking to become registered as teachers under this Act and raising those standards from time to time as circumstances may permit.
- iii. Securing in accordance with the provisions of this Act the establishment and maintenance of a register of teachers and the publication from time to time of the list of those persons.
- iv. Regulating and controlling the teaching profession in all its aspects and ramifications.
- v. Classifying members of the teaching profession according to their level of training and qualification from time to time.
- iv. Performing through the council established under this Act the functions conferred on it by this Act.

The implication of this mandate is that the content of the TRCN Act is the same as the contents of the Acts establishing the council for regulating and controlling the noble profession of medicine, Engineering, Architecture, Pharmacy, and Law among other professions in Nigeria. The stand now is that teachers will henceforth undergo all those required intellectual, professional, moral, social and even psychological rigors inherent in the other professions and which has distinctively distanced them from quacks and lay people. Furthermore, it is well known fact that members of the noble professions compulsorily submit themselves to the requirements of their respective Acts regulating

their professions. In the same vein, teachers in Nigeria are bound by the dictates of the TRCN Acts, and they must be trained teachers, registered and regulated. It is clearly stated in section (2) of the Act that it is a criminal offence to find anyone answering a teacher or doing a work of teaching as well as earning the reward associated with teaching without first registering with TRCN. Anybody convicted of this offence is liable to a fine of five thousand naira (N5,000.00) or two years imprisonment or both as the law court may decide (TRCN, 2010). It further opined that the Act's provisions are very serious even though it has noted some obvious violations by both individuals and employers of teachers. However, the body asserts to have set machinery in power to enforce the provisions of the Acts and bring offenders to book.

Programmes of TRCN for Teacher Professionalism: In fulfilling the legal provisions required of every noble profession, the TRCN has set out to implement the under mentioned programmes and activities as outlined by TRCN (2010).

- i. Registration and licensing of qualified teachers
- ii. Accreditation, monitoring and supervision of the courses and programmes of teacher training institutions in Nigeria to ensure that they meet national and international standards. The institutions include the colleges of Education, Faculties and institute of Education in Nigerian Universities, Schools of Education in the Polytechnics and the National Teachers Institute.
- iii. Organization of internship schemes and induction programmes for fresh Education graduates to equip them with the necessary professional skills before licensing them for full professional practice.
- iv. Conduct of professional examinations and interviews to determine teachers suitable for registration.

- v. Establishment of national minimum standards for and execution of mandatory continuing professional development (MCPD) to guarantee that teachers keep abreast of developments in the theory and practice of the profession.
- vi. Organized annual conference for registered teachers
- vii. Publication of a register of qualified and licensed teachers in Nigeria in hard copies and available through the World Wide Web.
- viii. Enforcement of professional ethics among teachers using the teachers investigating panel (TIP) and the teachers' tribunal.
- ix. Prosecution in the law court of unqualified persons performing the job of teachers in contravention of the TRCN Act section 17 (2).
- x. Acting as the voice of the voiceless teachers and continuously initiating/driving public policies and practices that could reposition the 10 teaching professions in Nigeria to compete favourably in the global world. It however suffices to observe that these laudable programmes and activities are still to be fully implemented in Nigerian educational system. A clarion call is therefore made here requesting the TRCN to intensify effort in realizing the achievement of these programmes and activities to give teachers their full professional colour.

Legal Requirement for Registration of Teachers in Nigeria: Teaching in Nigeria has been fully accorded a legal recognition. Consequently, FRN (2013) states that (i) Nigeria's teachers' registration council has been established to register teachers and regulate teaching profession and practice. In this regard, for one to be legally recognized as a teacher in Nigeria, he/she must register with TRCN. The TRCN Act 31 of 1993, section 6 (1) states that to be registered, an individual must;

- i. Pass a qualifying examination accepted by the council and complete the practical teaching prescribed by the council under the Act or

ii. not being a Nigerian hold a qualification granted outside Nigeria which for the time being is recognized by the council and by law entitled to practice the profession in the country in which the qualification was granted provided that the other country accords Nigerian professional teachers the same reciprocal treatment and that he satisfies the council that he has had sufficient practical experience as a teacher. iii. be of good character iv. have attained the age of twenty-one years v. not have been convicted in Nigeria or elsewhere of an offence involving fraud or dishonesty. Also to be registered and retain one's name on the teachers register, a teacher shall comply with TRCN provisions in respect of;

- i. Induction at point of graduation,
- ii. Payment of registration fees and annual dues.
- iii. Professional qualifying examinations.
- iv. Internship after graduation from teacher education institution.
- v. Continuing professional development
- vi. Any other requirements that may be made by TRCN from time to time.

Rights and Privileges of Registered Teachers in Nigeria: Since a profession grants its members a strong measure of autonomy and self-governing status, TRCN has gone a long way to grant registered teachers:

- i. Legal status as teachers,
- ii. Freedom to add certain designations before or after their names as may be determined by TRCN for the identification of registered teachers in Nigeria, such as MTRCN (Member TRCN), FTRCN (fellow TRCN).
- iii. Freedom to impart their professional skills, knowledge and values within the education system subject to regulation by TRCN.
- iv. Participation in all TRCN activities, that is open to members.

v. Letters of credence from TRCN when required by foreign teaching councils or other relevant bodies around the world.

vi. Professional salary scales, allowances and other benefits that may be secured by profession, TRCN for registered teachers.

Categorization of Teachers in Nigeria: In conformity to one of the criteria for a profession in demanding professional knowledge and high level of training, the teachers registration council of Nigeria categorized teachers into four groups as provided by Act 31 of 1993 section 2. Category A (Doctoral Teachers) Holders of Ph.D in Education or Ph.D in other field plus teaching qualification e.g. post graduate diploma in Education (PGDE); Professional Diploma in Education (PDE); Nigeria certificate in Education (NCE) 12 Category B (Master Teachers) Holders of Masters Degree in Education or Masters Degree in other fields plus a teaching qualification, e.g. PGDE, PDE, NCE Category C (Graduate Teachers) Holders of Bachelors Degree in Education or Bachelors Degree in other field plus a teaching qualification, e.g. PGDE, PDE, NCE. Category D (NCE Teachers) Holders of the Nigerian certificate in Education which is the national minimum teaching qualification. In deed this classification/categorization is a legal requirement for professionalism and therefore places demands on teachers to constantly update themselves in academic qualifications as indispensable instrument for professional growth and development.

Professional Values, Attitudes and Conducts: The need to maintain and restore the teacher's enviable status and qualities has led the TRCN to enact a code of conduct to help define the minimum standards expected of professional teachers in areas of thoughts, values, attitudes and actions. This code of conduct clearly defined the teacher's relationship with the learners, colleagues, parents, guardians, and employers. It also

emphasized teachers' relationship with the society as well as administrative and academic leadership (TRCN, 2013).

Relationship with the Learners: The major obligation of the teaching profession in Nigeria is to guide the learners, youths and adults in the pursuit of knowledge and skill, to develop healthy attitudes that enable them become happy, useful and responsible citizens. The TRCN in accomplishing this stressed that the teacher in his relationship with the learner should;

- i. Honour learners right
- ii. Have responsibility for educational programmes
- iii. Have empathy for learners
- iv. Maintain confidentiality of learners information
- v. Seek fair remuneration
- vi. Show social and related abuse of office
- vii. Vanguard against examination misconduct.
- viii. Abhor illegal learner groups.
- ix. Serve as role model.
- x. Should be corruption free
- xi. Do not administer corporal punishment on learners
- xii. Inspire discipline among learners
- xiii. Put their ideological beliefs and influence under guard when dealing with learners.

Teachers Disciplinary Committee (TDC): A provision for the establishment of TDC was made in section 9 of the TRCN Act. It stipulates that the committee shall comprise the chairman of the governing council and ten other members appointed by the council. The major responsibility of TDC is to consider the cases referred to it by the teachers' investigation panel. In accordance with section 10 (1) of the TRCN Act, grounds that will

make a professional teacher liable for prosecution are where; a) The tribunal judges a teacher to be guilty of infamous conduct in any professional respect or

b) A teacher is convicted, by a court or committee in Nigeria or elsewhere having power to award imprisonment of an offence (whether or not punishable with imprisonment which in the opinion of the tribunal is incompatible with the status of a teacher, or

c) The tribunal is satisfied that the name of any person has been fraudulently registered or a member has made false claims in his registration documents. If a teacher is convicted on any of the offences stated, the committee reserves the right to direct as here under,

i. Advice

ii. Reprimand

iii. Suspension of registration

iv. Cancellation of registration

v. Criminal prosecution in accordance with the relevant laws of the country.

However, convicted teachers who are aggrieved are empowered by section 10 (4) of the Act to make appeal within twenty eight days of conviction to the High Court of Appeal against the decision taken by TDC. Here, TDC stands as respondent to the appeal thereby sharing the same power as a high court. By all standards therefore, the committee according to the Act is a tribunal or jury whose rights and teachers should not trifle upon privileges. It shares the same formation as the medical tribunal set up by the medical and dental council of Nigeria to try erring doctors same with legal council of Nigeria set up to try erring lawyers.

2.1.12 Gender, school attendance and learning outcomes: Women roles in social and economic development seem to be culturally determined in traditional societies. Hence, their potentials are seriously constrained and taken for granted (Morenikeji, 2010). This resulted in women being subjected to considerable industrial and occupational

segregation. As a result, they are mainly concentrated in semi and unskilled employment in retailing, the clothing industry, catering and cleaning. In addition, women are primarily employed to the lower-grade clerical and sartorial posts.

In contrast, the relatively small portion of professional women employees is concentrated in the caring profession, notably education, welfare and health (Morenikeji, 2010). The federal office of statistics in Morenikeji reported that one of the causes of low status accorded women in several societies is the discrimination against them in education.

Akinbi (2015) said that there is a significant disparity in male-female school enrolment favouring males. This disparity in school enrolment in favour of males was attributed to the desire of some parents to educate male children rather than female children partly because they believe that the male child has better employment opportunities than the female child (World Bank, 1993). Even before the Beijing Conference in 1995, the attention of the whole world has been directed at gender issues in developmental efforts, especially in developing countries like Nigeria. Many researchers have shown much interest in studying the relationship between gender and differential effectiveness of schooling by gender both in Nigeria and the world over (Morenikeji, 2010). His findings are in line with the report by Akinbi (2015) as they all reported that more males are found in schools than females. They further asserted that female participation in science and education, in general, has been observed to decline drastically. Aramide *et al.* (2010) have opined that factors responsible for this decline include early maturation and early marriage of the females, which leads to their removal from schools, particularly in northern Nigeria. Aramide *et al.* (2010) also reported that both the attendance rate and the quality of female education differ from region to region. More girls attend school in the southern and western parts of the country, although the rate is still lower than males'. Studies by Peter and Adewale (2018) also showed differences in the performance of boys

and girls in science class. NGS (2016) reported that there was a significant superior achievement of boys over girls in integrated science in Junior Secondary Schools. In Peter and Adewale (2018), Tobin reported that male students respond to teachers' questions by raising their hands and manipulating equipment to a greater extent than female students in classroom and laboratory activities. The studies above examined the gender difference in different areas of research. The present study has included gender variables hoping that further confirmation of gender differences in performance would be made through analogies in classroom instruction.

2.2 Theoretical Framework

2.2.1 Learning Theories

Learning theories are intangible frameworks describing how information is engrossed, processed, and hold on to all through education. Emotional, Cognitive, and ecological pressures and previous experiences all contribute a piece in the way thoughtful, or the globe observation, is obtain or altered, and so is the knowledge and skills. Learning theories encompass two principal standards, as made mention by Brown *et al.* (1989). Firstly is given us terminology and a theoretical scaffold for reading between the learning lines that we examine. The supplementary is portentous somewhere to gaze for answers to convenient tribulations. The theories do not provide solutions, but the theories provide refined concentration towards most of the variables vital in discovering answers. There are three major classes or idealistic frameworks beneath which learning theories drop into behaviourism, cognitivism, and constructivism.

2.2.2 Behaviourism Learning Theory

The word "behaviourism" was drafted by John (1959). Watson supposed to hypothesize opinions, objectives otherwise supplementary prejudiced familiarity was unempirical and be adamant that psychology obligatory focal point of quantifiable behaviours (Brophesy,

2007). For behaviourism, acquisition of knowledge is the attainment of fresh manners in the course of conditioning. The categories of conditioning are of two types:

- I. Classical conditioning, where the manners turn out into a reaction answer to incentive.
- II. Operant conditioning, where strengthening of the manners by a prize or penalty.

Classical conditioning becomes aware of Ivan Pavlov. When his adage with the aim dogs appears to link the coming of provisions using a white lab cover or a buzzing signal, the dogs resolve to fabricate saliva. Yet, there is no display of odour or food. Classical conditioning looks upon these sorts of cultures to be identical, whether in dogs or persons David (2002). On the other hand, Operant conditioning, or fundamental behaviourism, strengthens these manners by means of prize or penalty. Prize boosts the possibility of the manners persistent; penalty diminishes its possibility (David, 2002).

Behaviourists outlook the knowledge progression as an alteration in manners. Therefore, they will assemble the surroundings to bring out preferred reactions throughout such strategies as behavioural objectives, Competency-based education, with the ability to improve and train (Smith, 2003). Educational advancement like functional behaviour analysis, curriculum-based measurement, and direct instruction has come into view from this model (Smith, 2003). The preceding basis will focus on teachers' Continuous Professional Career Development (CPCD) on Physics Curriculum Implementation among Physics Teachers in Niger East Senatorial Zone of Niger State.

2.2.3 Cognitivism Learning Theory

Cognitive theories cultivated elsewhere of Gestalt psychology, developed in Germany in the near the beginning 1900s and convey to America in the 1920s. The German expression gestalt corresponds to the English configuration or pattern and stresses individual understanding (Ertmer & Newby, 2013). Over the years, the Gestalt psychologists make

available revelation and portrayed ideologies to clarify how we systematize our feelings into awareness (Smith, 2003).

Gestalt psychologists condemn behaviourists for being too reliant on unconcealed behaviour to elucidate knowledge. Gestalt psychologists recommend gazing at the model moderately than remote actions (James & Laura, 2010). Gestalt outlook of knowledge encompasses been integrated into what includes a move toward to be cognitive ticket theories. Two key suppositions motivate this cognitive approach: that the reminiscence coordination is a vigorous prearranged mainframe of information and that preceding information plays an imperative responsibility in knowledge. Cognitive theories gaze further than behaviour to believe how individual reminiscence works to endorse knowledge. An indulgence of diminutive time reminiscence and extensive-term memory is significant to instructors prejudiced by cognitive theory (James & Laura, 2010). They vision knowledge as an interior psychological course (including insight, information processing, memory and perception) where the instructor focuses on edifice intellect and cognitive improvement (Smith, 2003). The personage student is more essential than the surroundings.

On one occasion, reminiscence theories like the Atkinson-Shiffrin memory model Atkinson and Shiffrin (1968) and Baddeley's working memory model Baddeley's were famous as a theoretical structure in cognitive psychology, innovative mental frameworks of knowledge initiated to come into view for the duration of the 1970s, 80s, and 90s. Nowadays, researchers are focused on topics like cognitive consignment and information dispensation theory. These theories of knowledge participate in a task in manipulating instructional propose (Jong, 2010). Cognitive theory clarifies such topics as societal responsibility achievement, aptitude and reminiscence as linked to time. The researcher believes that if physics teachers are effectively subjected to training and retraining

programmes, they will be able to efficiently implement the physics curriculum at the secondary schools level of the Nigerian educational system.

2.2.4 Perception Theory of Education

The Gestalt Theory looks at the concept of visual perception. It was founded by three German psychologists. The word Gestalt means ‘pattern’ or ‘shape’ however the word configuration comes closer to the terms of the theory. Many people will recognise the Gestalt theory to be one of images. These include the vase or face image and the triangle or three pacmen illustration. It focuses on how we perceive the things we see.

Focusing on education the Gestalt Theory goes against the Behaviourist movement such as Edward L. Thorndike’s experiment, where he put a cat in a cage with a piece of string that could be pulled so the cat could escape. The cat tried the escape and in the process accidentally pulled the string which let him out. When the cat was placed back in the cage, after a few times, had worked out that by pulling the string could get out the cage. Thorndike concluded that this was done through trial and error, not intelligence (Rock & Palmer, 1990). The article goes on to say that Gestalt theorist objected that this was a display of intelligence as the cat could hardly understand the ‘hidden mechanism’. Köhler conducted experiments with chimps, the findings conflicted with those of Thorndike’s in two ways.

1. ‘The chimps arrived at the solution suddenly’
2. ‘The errors made by the chimps were not random’

Rock and Palmer (1990) state that ‘those who understand one topic can apply this knowledge elsewhere through analogy.’ They talk about ‘achieving insight through explanation’ being a good way to ‘grasp the solution’ rather than ‘rote memorization’.

Atherton (2011) suggests that Gestalts theory ‘concentrates on the way in which the mind insists on finding patterns in things’ also how it ‘contributes to learning, especially the development of “insight”.’ Harris (1998) in his work, points out that ‘people learn more when they take responsibility for their own learning.’ This view highlights to ‘autonomy of learning’ and connects to the ‘student-centred approach’ from Carl Rogers.

It is clear that the Gestalt theory about perception influences education due to the fact that we do not like to randomly come to the answers; we like to find patterns and sequences to help understand meaning so we can relate our finding to questions asked. The present study felt to assessed perceptions of physics teachers’ on continuous professional career development and curriculum implementation practices in Niger East Senatorial Zone of Niger State.

2.3 Review of Related Empirical Studies

Isaac *et al.* (2020) assessed the impact of professional development on physics tutors’ knowledge about the national teachers standard and the new teacher educational curriculum framework in Ghana. The study employed descriptive cross sectional survey using an online survey. The population for the study comprised all colleges of education tutors who teach physics. In all 85 tutors took part in the online survey. The data collected was analysed using means, standard deviations and ANOVA. The results indicated that the professional development has had great impact on teacher’s knowledge about the national teachers’ standard, the national teacher education curriculum framework and the 4-year Bachelor of Education curriculum. It was also found that there was no statistically significant difference in the impact of the professional development based on tutors’ qualifications. Implications of the study for practice are drawn.

Isaac (2015) carried a study on teaching and learning of physics in New Zealand. The convergent parallel design of this study used mixed methods, including a national survey of physics teachers throughout New Zealand, a student survey, as well as classroom observations and interviews with high school physics teachers, high school students and initial teacher educators who were coordinating the physics education programmes. The sample size for the study comprised 104 high school physics teachers across New Zealand; 85 high school physics students from selected schools in Christchurch; and three physics teacher educators in three selected universities. Data from teachers and students' survey questionnaires were analysed using descriptive statistical methods (including percentages, means, standard deviations and graphs where appropriate) and inferential statistics – independent samples test and multivariate analysis of variance (MANOVA). Audio recordings from interviews were transcribed and coded into nodes which provided easy retrieval of the themes that emerged. Detailed descriptions of classroom observations/practices were also recorded as a reference for indicating what actually occurred. The cases were compared for similarities and differences.

The research findings indicate that generally, physics classroom dialogue tended not to support constructivist epistemology or inquiry based teaching and learning. Student-centred instructional approaches were not common in many physics classes. The use of more traditional teaching approaches for physics contributed to students thinking that physics is a difficult subject and not something they want to participate in further. Some students in this study took physics because it is a requirement for future qualifications such as for engineering or medicine. The findings of the study also indicated that there was a lack of alignment between the aspirations of the New Zealand Curriculum (NZC), which promotes inquiry-based approaches to teaching and learning, and how physics is actually being taught. The teachers who participated in the research however, believed

that several factors hindered the quality teaching and learning of physics at high school. The teachers believed that physics teaching in New Zealand is driven by assessment, not by student interests, and that schools place too much emphasis on performance and grades. The teachers felt that their ability to focus on improving teaching and learning was compromised by the time spent addressing assessment requirements. Findings from the study also provided insight about physics teachers' preparation and indicated that the physics education programmes for would-be physics teachers generally do not cover content knowledge for the subject. That is, the would-be physics teacher education programmes are primarily about pedagogical content knowledge (PCK). The teachers perceived that their initial teacher qualification did not adequately prepare them to teach some of the content areas now in the curriculum. Also, there is no national teacher education curriculum and teacher education providers have the freedom to design their own courses.

Among other things, the findings from the research lead to a conclusion that the emphasis on high stakes assessment has led teachers to concentrate more on the assessment tasks for senior physics students rather than on preparing inquiry-based lessons that would facilitate conceptual change and stimulate students' interest in the subject. The teachers considered that limited time to work with students and assessment demands, with its heavy workload, had worsened the problem of finding time to prepare interesting physics lessons. Based on the findings from the research, seven recommendations were made. Teachers' ability to focus on improving teaching and learning, through innovative approaches, was compromised by the time spent addressing assessment requirements. Current assessment practices and high teacher workloads need to change so that teachers can spend more time to prepare interesting lessons and to explore topics in greater depth, thereby, helping to develop students' interest to learn physics more. The subject could be

made less demanding by reducing the number of topics/concepts covered in the senior levels. After all, the NZC stresses that schools should keep assessment to levels that are manageable for both students and teachers.

Adeyanju (2015) perceived the effect of Teachers' Preparation and Professional Development on Students' Academic Achievement in Ogun State Secondary Schools. The design used for this study is purely descriptive with the aim of assessing the effect of Teacher Preparation and Professional Development on students' academic performance. The major instrument used is questionnaire tagged: 'Teachers Professional Development and Students' Performance Questionnaire' (TPDSPQ) while NECO and WAEC SSCE results in the last five years were used to measure the Performance of both teachers and students. The population of the study consists of nineteen thousand, one hundred and forty six teachers in Ogun State public schools. Stratified random sampling was used to group Ogun State which was selected for the study into zones while random sampling technique was used to select 200 teachers from the stratified zones (ten teachers were selected from each zone) and NECO and WAEC results (2008 - 2013) from randomly selected schools from the zones were used respectively. The questionnaire was distributed to teachers in the sampled areas with the permission of the school authority in each case through research assistants who assisted the respondents on the modalities for filling it after which the questionnaire copies were collected within two weeks. The instrument was subjected to face and content validity through corrections and criticism from experts in the field. To ensure the instrument's reliability coefficient determined. The data collected were subjected to Cronbach Alpha Reliability test and a coefficient of 0.78 was obtained. The data collected was subjected to t-test and Analysis of Variance (ANOVA) statistical methods. From the findings, it reveals the significant effect of teachers' professional development on teachers' effectiveness as well as improved students'

achievement. It was recommended among other things that multidimensional in-service programmes be developed for every teacher, only well trained and qualified teachers should be recruited as full time staff and government should constitute Teachers' Professional Development Fund in form of corporate social responsibilities of companies operating within to boost in-service training for teachers for enhanced students' academic performance. From the findings, the study therefore recommends that government should engage in close monitoring of the activities of Teacher Education Institutions in Nigeria especially with regard to strict adherence to Teaching Practice Exercise and government should also make policy statement available stating years of experience and level of training acquired accordingly.

Eboatu and Ozigbo (2015) designed to determine the problems that militate against proper admission, recruitment, training and retention of qualified teachers and the prospects for improved teacher performance in Aguata Local Government Area of Anambra State, Nigeria. The study adopted the descriptive survey design. The total population of this study consisted of seventy-two (72) educational administrators. There was no sample for the study because the population was small and manageable. A structured questionnaire was used for data collection, while the mean statistical analysis was employed to answer the research questions. The result showed that entry into Teacher Education Institutions and recruitment into the Teaching Service were not regulated and that retraining of teachers for continuing development was not undertaken. Based on the findings, the researchers recommended amongst other things, that entry into the profession be regulated, the curricula of Teacher Education Institutions be reviewed and upgraded and that teacher's Mandatory Continuing Professional Development be institutionalized. Based on the findings, the following recommendations were made; the mode of entry into the teaching service and admission into Teacher Training Institutes should be reviewed

to ensure that only people with requisite qualifications and calling are admitted into the teaching profession among others.

Telima (2015) investigated the low popularity of physics among secondary school students in Rivers State, Nigeria. One outcome of this situation is concern and interest in effective teaching and learning in the subject in Nigeria. A mixed methods research design was adopted for the study. The study found that teachers' qualities and resource availability and utilization significantly influence students' physics enrolment. Also, there was no significant difference in the correlations of teacher and resource factors with enrolment by gender. To boost students' interest in physics, the study recommended amongst others, that teachers present content in ways that connect physics ideas to the everyday experiences of students and that, policy makers should consider making the study of science compulsory in all classes in secondary schools with the introduction of 'science for arts' for the non-science oriented students. From the foregoing, it is therefore important to identify policies and strategies to popularize physics and secondary science to ensure a more science literate society in developing countries. In this regard, the model in China where physics is made compulsory up to year 11 with a specialized 'physics for art' course for the non-science students is worthy of emulation. This would help to prepare young people to be equipped with scientific and technological skills and knowledge to drive the growth of developing countries.

This paper examines the significance of teacher continuing professional development in junior secondary schools in Botswana. The junior secondary school situation is a fluid sphere that demands continuing professional development of teachers. Changes in school's physical and social environment, curriculum, and educational policy take place too often. Teachers need to adapt to such situations to be effective in such a dynamic environment. Continuing professional development of teachers is critical to deal with the

gaps in training due to time and changes. The paper is an extract of a study that investigated the availability of structures or programs that facilitate continuing professional development of teachers and factors that impede teacher development in seven randomly selected Junior Secondary Schools in northern region of Botswana. The study was quantitative and qualitative in nature. Data was gathered using questionnaires and interviews. A computer aided statistical analysis (SPSS version 20) was used to analyze the quantitatively derived data. The analysis engaged both descriptive and inferential statistical analysis. Qualitative responses were coded, categorized and analyzed into major and minor themes. The results indicated lack of structures or programmes in junior secondary schools which facilitate teacher development. Furthermore, results revealed other impediments to professional growth of teachers in junior secondary schools.

It emerged from the outcomes of the study that there are barriers to CPD of teachers in Junior Secondary Schools in northern Botswana. These barriers include amongst others: time constraints; insufficient funding; untrained personnel to facilitate CPD of teachers. Therefore the Ministry of Education and Skills Development should make all necessary attempts to overcome these barriers of CPD of teachers in JSS. Arguably, the basis for teacher quality is the provision of adequate opportunities for personal and professional growth of teachers. These prospects include amongst others structures or programmes in schools which facilitate professional growth of teachers. Importantly, teachers require access to serious and sustained learning opportunities at every stage in their career for them to be able to teach in ways that meet new standards for learning. From all the reviewed literatures there was none that research on perceptions of physics teachers' Continuous Professional Career Development (CPCD) and curriculum implementation practices in Niger East Senatorial Zone of Niger State, hence, the rationale for the study.

2.4 Summary of the Literatures Reviewed

There is a growing concern of the society about the realization of secondary education objectives due to doubt that there has been a steady decline in teachers' instructional task performance and students' academic performance, which is mainly caused by lack of adequate Teachers' Career Development programme at secondary schools. This has been attributed to gaps in teachers' competence, curriculum instruction, learning facilities and resources, funding and institutional management. Findings from literature (Ayeni, 2010) revealed that Teachers' Career Development education is being affected by many problems. The major identified gap and challenge responsible for it is the "inadequate provision of training facilities to develop teachers for professional growth and increased productivity".

Considering the above shows a more significant challenge ahead of teachers partly because of existing gaps and inadequacies in their instructional and supervisory duties. Thus, this study aims to determine the perception of Teachers on Continuous Professional Career Development on the Implementation of Physics Curriculum among Physics Teachers in Niger East Senatorial Zone of Niger State

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The research design used for the study is the descriptive Survey Research Design. This design is used because survey research design is practical and enables the researcher to estimate the target population's characteristics without necessarily reaching all target population members. (John & Patrick, 1986). This design involved the use of a questionnaire to collect data from the respondents (Physics teachers) on the influence of Continuous Professional Career Development (CPCD) on the implementation of physics curriculum among physics teachers in Niger East Senatorial Zone of Niger State

3.2 Population of the Study

The total population for this study comprises of seventy-six (76) physics teachers (53 males & 23 females) from all the Senior Secondary Schools in Niger East Senatorial Zone of Niger State (Appendix A). All seventy-six (76) physics teachers were used for this study. This is because there are few physics teachers in the senior secondary schools in Niger East Senatorial Zone of Niger State.

3.3 Sample and Sampling Techniques

There was no sampling, therefore the entire population was used for the study.

3.4 Research Instrument

The research instrument used for this study was questionnaire designed by the researcher for this study. The questionnaire is titled "Questionnaire on Perception of Physics Teachers' on Continuous Professional Career Development and Curriculum Implementation Practices in Physics (QUPOPTOCPCDCIPP). The questionnaire consists of two sections; A and B. Section A is about the physics teachers (respondents) bio-data

such as gender, teaching subject, qualification and teaching experience while section B contains the question items on the Perception of CPCD among Physics Teachers. In this section, the teachers are expected to express opinions or views about teachers' continuous professional career development programs in the senatorial zone. The questionnaire was designed in line with six research questions. Each research question contains five (5) items, and it's on a 5 point scale: Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D), and Strongly Disagree (SD). The decision means for the instrument is 3.00. this implies that any mean from 3.00 and above signifies agree and the construct is accepted, while any compromise below 3.00 represents disagree and the construct is rejected.

3.5 Validity of Research Instrument

The questionnaire (QUPOCOPCAD) was validated by two experts from the Department of Science Education and one expert from the Physics Department, the Federal University of Technology Minna and also my supervisor. The face and content validity of the instrument and the grammatical aspect of the instrument were determined. The corrections, suggestions and recommendations were used to produce the final copy of the instrument for this study.

3.6 Reliability of Research Instrument

To determine the reliability coefficient for the instrument, a pilot test was conducted using sixteen (11 males & 5 females) physics teachers from Niger South senior secondary schools which is outside the research area. The physics teachers used were given the questionnaires (QUPOPTOCPCDCIPP). The questionnaires were filled and returned to the researcher. The data collected were analyzed using Crombach Alpha, and a reliability coefficient of 0.73 was obtained. This indicates that the instrument is reliable and can be used for this study.

3.7 Method of Data Collection

The researcher first visited all the senior secondary schools to be used for the study to seek permission from the school authorities to use the schools for the study. After the consent has been granted by the school principals, the researcher was introduced to the physics teachers of the schools; the researcher briefed the teachers about the purpose of the research study to be conducted in the schools. A research assistant was appointed for each of the sub-zones. This lasted for three (3) weeks as one week was used for each Emirate sub-zones. Questionnaires were distributed to the physics teachers of the schools through the research assistants, particularly for Suleja and Kagara Emirate sub-zones. Face to face method was used. The researcher or research assistant waited and collected the filled questionnaires from the teachers on the same day. This is to control the risk of mortality (failure or refusal of some teachers to return the filled questionnaires), threatening the study's internal validity. The researcher or research assistant visit one school at a time and finish with one school before moving to the other. Data collection was completed within two weeks. Therefore, this study lasted for five (5) weeks

3.8 Method of Data Analysis

The data collected using the QUPOPTOCPCDCIPP were analyzed using Mean (\bar{X}) and Standard Deviation (SD). In addition, descriptive charts were used to describe the data analysed adequately. Students Package for Social Sciences (SPSS) version 23 was used for data analysis.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Answer to Research Questions

Research Question One

What is the perception of Continuous Professional Career Development on teachers' qualification and Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State?

To answer this research question, Mean and Standard Deviation was used as shown in Table 4.1.

Table 4.1: Mean and Standard Deviation on the Perception of Continuous Professional Career Development on Teachers' Qualification and Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State

S/N	Items	N	Mean	SD	Decision
1	Physics teachers' academic qualification brings about effective implement Physics Curriculum	76	4.58	1.02	Agree
2	Physics teachers' academic qualification makes his/her preparation and presentation in the classroom easier while implementing Physics Curriculum	76	4.55	1.01	Agree
3	Physics teachers' academic qualification simplifies his/her method of teaching Physics	76	3.68	0.16	Agree
4	Physics teachers' academic qualification makes his/her classroom management easier while implementing Physics Curriculum	76	4.58	1.02	Agree
5	Physics teachers' academic qualification affords him/her easy ways to assess and evaluate his/her students while implementing Physics Curriculum	76	4.97	1.04	Agree
Grand Mean Total			4.47	1.05	Agree

Table 4.1 shows the mean and standard deviation of the perception of Continuous Professional Career Development on teachers' qualification and Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State. The table reveals that, physics teachers' academic qualification affords easy ways to assess and evaluate students while implementing Physics curriculum with the highest mean of 4.97 (with Standard Deviation of 1-04). Also, the grand mean total is 4.47 with Standard Deviation of 1.05 which is also higher than the decision mean of 3.00. This result therefore, indicates that Continuous Professional Career Development on teachers' qualification is perceived to be significant on the Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State.

Research Question Two

What is the perception of Continuous Professional Career Development on teaching experience and Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State?

To answer this research question, Mean and Standard Deviation was used as shown in Table 4.2.

Table 4.2: Mean and Standard Deviation on the perception of Continuous Professional Career Development on Teachers' Teaching Experience and the Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State

S/N	Items	N	Mean	SD	Decision
6	Physics teachers' teaching experience is necessary for his/her ability to implement Physics Curriculum effectively	76	4.89	0.89	Agree
7	Physics teachers' teaching experience promotes his/her ability to prepare and presents lesson effectively in the classroom while implementing Physics Curriculum	76	4.13	0.63	Agree

8	Physics teachers' teaching experience influences his/her method of teaching Physics	76	4.64	0.84	Agree
9	Physics teachers' teaching experience influences his/her classroom management skill while implementing Physics Curriculum	76	3.83	0.13	Agree
10	Physics teachers' teaching experience promotes his/her easy ways of evaluating his/her students while implementing Physics Curriculum	76	4.51	0.81	Agree
TOTAL			4.40	0.66	Agree

Table 4.2 shows the Mean and Standard Deviation on the perception of Continuous Professional Career Development on teaching experience and Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State. The table reveals that physics teachers' teaching experience is necessary for his/her ability to implement Physics Curriculum effectively with the highest mean of 4.89 (with Standard Deviation of 0.89). Also, the grand mean total is 3.94 with Standard Deviation of 0.44 which is also higher than the decision mean of 3.00. This result therefore, indicates that Continuous Professional Career Development on teachers' teaching experience is perceived to be significant on the Implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State.

Research Question Three

Do physics teachers undertake Continuous Professional Career Development for curriculum implementation practices in Niger East Senatorial Zone of Niger State?

To answer this research question, Mean and Standard Deviation was used as shown in Table 4.3.

Table 4.3: Mean and Standard Deviation on the types of Continuous Professional Career Development undergoes by Physics Teachers in Niger East Senatorial Zone of Niger State during curriculum implementation

S/N	ITEAMS	N	Mean	SD	Decision
11	I always receive TCPCD programme at the beginning of every academic session	76	2.70	1.30	Disagree
12	I always receive TCPCD programme at the beginning of every term	76	2.67	1.24	Disagree
13	I always receive TCPCD programme once in every two years	76	2.83	1.60	Disagree
14	I always receive TCPCD programme once in every three years	76	2.73	1.40	Disagree
15	I have not received TCPCD programme since I started teaching	76	2.80	1.50	Disagree
	TOTAL		2.75	1.41	Disagree

Table 4.3 shows the Mean and Standard Deviation on Professional Training undertaking by Physics teachers in Niger East Senatorial Zone of Niger State. The table reveals that physics teachers always receive Teachers Continuous Professional Career Development (TCPCD) programme once in every two years with the highest mean of 2.83 (with Standard Deviation of 1.60). Also, the grand total mean of 2.75 (with Standard Deviation of (1.41) was obtained which is also less than the decision mean of 3.00. This result therefore implies that Physics teachers in Niger East Senatorial zone of Niger State do not undergo or undertake any professional training that could help them implement Physics Curriculum effectively in Niger East Senatorial zone of Niger State.

Research Question Four

Does motivation enhance physics curriculum implementation practice in Niger East Senatorial Zone of Niger State?

To answer this research questions, Mean and Standard Deviation was used as shown in Table 4.4.

Table 4.4: Mean and Standard Deviation on whether Motivation enhances Physics Teachers in Niger East Senatorial Zone of Niger State for effective curriculum implementation

S/N	Items	N	Mean	SD	Decision
16	Special Salary package is always given to Physics teacher as motivation	76	1.03	0.08	Disagree
17	Accelerated promotion is always given to Physics teacher as motivation	76	1.05	0.14	Disagree
18	Special grant is always given to Physics teacher as motivation	76	1.02	0.06	Disagree
19	Study leave with full allowances is always given to Physics teacher as motivation	76	1.10	0.20	Disagree
20	Apart from monthly emolument, there is no any special motivation received by Physics teachers	76	1.98	0.98	Disagree
TOTAL			1.24	0.50	Disagree

Table 4.4 shows the Mean and Standard Deviation on weather motivation enhance physics curriculum implementation practice in Niger East Senatorial Zone of Niger State. The table reveals that physics teachers don't received any special motivation apart from monthly emolument with the highest mean of 1.98 (with Standard Deviation of 0.98) which is less than the decision mean of 3.00. This indicates that, there is no any form of motivation received by Physics teachers talks less of being enhanced to effectively implement Physics curriculum in Niger East Senatorial Zone of Niger State.

Research Question Five

What are the challenges faced by Physics teachers towards physics curricula implementation practices in Niger East Senatorial Zone of Niger State?

To answer this research question, Mean and Standard Deviation was used as shown in Table 4.5.

Table 4.5: Mean and Standard Deviation on challenges faced by Physics teachers in Niger East Senatorial Zone of Niger State during Curriculum Implementation

S/N	Items	N	Mean	SD	Decision
21	TCPCD programmes for Physics teachers is always affected by inadequate fund	76	2.60	1.30	Disagree
22	TCPCD programmes for Physics teachers is always affected by instability of government policy	76	2.87	1.40	Disagree
23	TCPCD programmes for Physics teachers is always affected by inexperienced school administrators	76	2.00	1.10	Disagree
24	TCPCD programmes for Physics teachers is always affected by lack of cooperation from the community members where the schools are located	76	2.70	1.30	Disagree
25	TCPCD programmes for Physics teachers is always affected by lack of cooperation from the Physics teachers themselves	76	2.40	1.20	Disagree
	TOTAL		2.51	1.12	Disagree

Table 4.5 shows the Mean and Standard Deviation on the challenges faced by Physics teachers towards physics curricula implementation practices in Niger East Senatorial Zone of Niger State. The table reveals that Teachers Continuous Professional Career Development (TCPCD) programmes for Physics teachers is always affected by instability of government policy with the highest mean of 2.87 (with Standard Deviation of 1.40) which is less than the decision mean of 3.00. Also, the total grand mean of 2.51 (with Standard Deviation of 1.12) is lower than decision mean of 3.00. This implies that Physics teachers in Niger East Senatorial Zone of Niger State are faced with numerous challenges with respect to implementation of Physics curriculum.

Research Question Six

Is there effective schools' supervision towards physic curricula implementation in Niger East Senatorial Zone of Niger State?

To answer this research question, Mean and Standard Deviation was used as shown in Table 4.6.

Table 4.6: Mean and Standard Deviation on whether there are supervision and monitoring Mechanisms for Effective Curriculum Implementation by Physics Teachers in Niger East Senatorial Zone of Niger State

S/N	Items	N	Mean	SD	Decision
26	My HOD strictly check my lesson plans on weekly basis as a Physics teacher	76	1.63	1.08	Disagree
27	My Vice Principal Academics strictly check my lesson plans on monthly basis as a Physics teacher	76	1.56	1.10	Disagree
28	Inspectors from Ministry of Education (MOE) visits my school for supervision at the beginning of every term	76	1.43	1.16	Disagree
29	Inspectors from MOE visits my school for supervision at the middle of every term	76	1.36	1.20	Disagree
30	No any Inspector from MOE visits my school for supervision.	76	1.03	0.28	Disagree
	TOTAL		1.40	0.96	Disagree

Table 4.6 shows the Mean and Standard Deviation on whether there is effective schools' supervision towards physic curricula implementation in Niger East Senatorial Zone of Niger State. The table reveals that Head of Departments strictly check their lesson plans on weekly basis as a Physics teacher with the highest mean is 1.63 (with Standard Deviation of 1.08) which is less than the decision mean of 3.00. Even the total grand mean of 1.40 (with Standard Deviation of 0.96) is lower than the decision mean. This implies that there are no effective schools' supervision towards physic curricula implementation practices in Niger East Senatorial Zone of Niger State.

4.2 Summary of Findings

1. Finding from research question one reveals that physics teachers' academic qualification affords easy ways to assess and evaluate students while implementing Physics curriculum.
2. Finding from research question two reveals that physics teachers' teaching experience is necessary for his/her ability to implement Physics Curriculum effectively.
3. Finding from research question three reveals that physics teachers always receive Teachers Continuous Professional Career Development (TCPCD) programme once in every two years.
4. Finding from research question four reveals that physics teachers don't received any special motivation apart from monthly emolument.
5. Finding from research question five reveals that Teachers Continuous Professional Career Development (TCPCD) programmes for Physics teachers is always affected by instability of government policy.
6. Finding from research question six reveals that Head of Departments strictly check their lesson plans on weekly basis as a Physics teacher.

4.3 Discussion of Findings

Finding from research question one reveals that physics teachers' academic qualification affords easy ways to assess and evaluate students while implementing Physics curriculum in Niger East Senatorial of Niger State. This indicated that, teachers' qualification has a significant role to play on the implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State. This finding is in agreement with the finding of Umar (2011) who reported that lack of enough qualified science teachers to be employed by Ministry of Education to teach at secondary school level has forced the available ones to

adopt poor instructional strategies which is one of the major factors contributing towards poor performance of science students. It is also observed by the chief examiners' report on Junior School Certificate Examination (JSCE) conducted by National Examination Council (NECO, 2010) that, poor teaching of science subjects generally by science teachers at Secondary School level is due to lack of qualified science teachers to handle science curriculum professionally.

Finding from research question two reveals that physics teachers' teaching experience is necessary for his/her ability to implement Physics Curriculum effectively in Niger East Senatorial Zone of Niger State. This indicated that, teachers' teaching experience plays a significant role on the implementation of Physics Curriculum in Niger East Senatorial Zone of Niger State. This finding is in line with the finding of Muhammed (2013) who reported that some science teachers at secondary schools level do not have enough pedagogical experience in science teaching therefore, they are incapable of imparting scientific knowledge to students properly. This subsequently results into students' poor performance at their final examinations. In addition, Aliyu *et al.* (2019) reported that teachers' teaching experience has a significant influence on the implementation of science curriculum.

Finding from research question three reveals that physics teachers always receive Teachers Continuous Professional Career Development (TCPCD) programme once in every two years in Niger East Senatorial Zone of Niger State. This finding is in agreement with the finding of Aliyu *et al* who conducted similar research study in Bida Educational Zone of Niger State and reported that Basic Science and Technology teachers in Bida Educational zone of Niger state do not receive any kind of professional training that could help them implement Basic Science and Technology curriculum effectively. Adegoke (2011) reported that one of the identified reasons why larger percentage of our secondary

school students fail at their final examination is because teachers are not exposed to regular Continuous Professional Career Development periodically while implementing science curriculum.

In another research study, Muhammed (2013) recommended that Government and Non-Governmental Organizations (NGOs) should jointly provide science teachers with the needed professional training to enable them implement their respective curricula effectively. They reported that Government and Non-Governmental Organizations (NGOs) are paying less attention to science teachers' Continuous Professional Career Development (CPCD) which is one of the major factors responsible for science teachers' use of wrong or poor instructional strategies during curriculum implementation.

Finding from research question four reveals that physics teachers don't received any special motivation apart from monthly emolument in Niger East Senatorial Zone of Niger State reveals that, there are no motivations received by Physics teachers in the zone. This finding is in agreement with the finding of Umar (2011) who asserted that, as a result of lack of both intrinsic and extrinsic motivation of teachers by government at all levels of our education system, teachers' training Institutions have not been able to provide quality training to potential teachers during training. Also school management have failed to provide teachers especially the science teachers with periodic Professional Career Development (PCD) due to lack of motivation.

Finding from research question five reveals that Teachers Continuous Professional Career Development (TCPCD) programmes for Physics teachers is always affected by instability of government policy in Niger East Senatorial Zone of Niger State reveals that, there are many challenges militating against effective Physics curriculum implementation by teachers in the zone. This finding is in agreement with the finding of Umar (2013); Ahmed (2013) and Aliyu *et al.* (2019) who asserted that many factors are responsible for poor

curriculum implementation by teachers. Some of the factors they identified include poor management and control of teacher education programmes, poor teacher training and retraining programmes of Colleges of Education and faculty of education of the universities that are responsible for the training of science teachers. This inadequate teachers' training programmes results in wrong selection and organization of curriculum content, poor methods of curriculum implementation and evaluation, poor arrangement and use of teaching materials by science teachers. Also, Umar (2011) reported that most teachers use teacher-centred method which emphasizes learning through the teacher's guidance at all times without the use of instructional materials. This instructional method therefore, exposes the students to learning by listening to lectures and hence, learns little from the lecture. In addition, teachers' training Institutes exposes the potential teachers to too large classroom sizes, inadequate functional laboratory equipment, overloaded syllabus amongst others.

Finding from research question six reveals that Head of Departments strictly check their lesson plans on weekly basis as a Physics teacher in Niger East Senatorial Zone of Niger State reveals that, there are no effective schools' supervision (Quality Assurance Mechanisms) towards effective curriculum implementation by Physics teachers in the zone. This finding is in agreement with the finding of Aliyu *et al.* (2019) who reported that, the major factor responsible for non proper implementation science curriculum by science teachers is lack of effective quality control measures on schools and teachers by ministry of education and other relevant educational agencies.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the findings, the study conclude that; teachers' qualification plays a significant role in implementing Physics curriculum in Niger East Senatorial Zone of Niger State. Teachers' teaching experience significantly influences the implementation of the Physics curriculum in Niger East Senatorial Zone of Niger State. Physics teachers in Niger East Senatorial Zone of Niger State do not receive any professional training that could help them implement the Physics curriculum effectively. There are no motivations available to Physics teachers towards effective implementation of the Physics curriculum in Niger East Senatorial Zone of Niger State. Many challenges militate against Physics curriculum implementation by teachers in Niger East Senatorial Zone of Niger State. There are no effective (Quality Assurance Mechanisms) towards effective curriculum implementation by Physics teachers in Niger East Senatorial Zone of Niger State.

5.2 Recommendations

Based on the findings of this study, the following recommendations were made:

1. Physics teachers with requisite qualifications and training should be employed to teach at the secondary school level of education in the Niger East Senatorial district.
2. Teachers' teaching experience should be the basis for allocating teachers to conduct a particular class or subject at every level of our educational system
3. Physics and indeed, all science teachers should be subjected to periodic teachers' Continuous Professional Career Development in the form of seminars, conferences or workshops

4. Non-Governmental Organizations should be encouraged to contribute to providing Continuous Professional Career Development to our teachers, and teachers should be promptly motivated at all levels of our educational system
5. Government and other educational stakeholders should also look into all the identified challenges militating against effective curriculum implementation by teachers at all levels of Nigeria educational system, and all other necessary instructional materials should be made available for teaching at all levels of education
6. There should be a functional and effective Supervisory Unit (Quality Assurance Unit) established for effective curriculum implementation by teachers at all levels of education.

5.3 Contribution to Knowledge

The present study has greatly contributed to the field of study. By discovery of physics teacher's qualification as the key role in implementing physics curriculum, making available some motivation package that can improve effective implementation of physics curriculum. The present study has also pushed the frontier of knowledge by serving as reference point and a basis for further research.

5.4 Limitations of the Study

The following limitations were observed in the course of the study: the discoveries of the present study on teachers qualification and teaching experience as the key values in physics curriculum implementation might not be generalized beyond Niger East Senatorial Zone of Niger State on the grounds that it studied seventy six (76) physics teachers only.

5.5 Suggestion for Further Studies

Based on the experience gathered during the course of this study, the following suggestion are made for further research on the perceptions of physics teachers' on continuous professional career development and curriculum implementation practices in Niger East Senatorial Zone of Niger State.

1. This study should be replicated in other location to find physics teachers' on continuous professional career development and curriculum implementation practices.
2. Secondary school teachers from sample of this study; for future research, higher institutions of learning like universities and colleges of education may be used as research sample.
3. The study should be replicated in other fields of study.

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APPENDIX A

LIST OF SECONDARY SCHOOLS IN NIGER EAST SENATORIAL ZONE OF NIGER STATE

1	DSS MAIKUNELE	29	ADSS PAIKO
2	DSS MAITUMBI	30	DSS GAWUBABANGIDA
3	VTC MINNA	31	DSS DIKO
4	ADSS MINNA (A)	32	DSS KABO
5	ADSS MINNA (B)	33	DSS GAWUBABANGIDA
6	MBGSC MINNA	34	GSS KUTA
7	DSS BOSSO – MINNA	35	DSS GWADA
8	DSS CHANCHAGA (A)	36	GGDSS KUTA
9	DSS CHANCHAGA (B)	37	DSS ERENA
10	DSS BEJI	38	DSS TUM – TUM
11	DSS MAITUMI	39	GSS ALLAWA
12	ABSS MINNA	40	DSS SHIRORO (NEPA)
13	GGSS MINNA	41	DSS GURMANA
14	GSS MINNA (A)	42	DSS GUSORO
15	GSS MINNA (B)	43	DSSSHAKWATU
16	WDC MINNA	44	DSS MANTA
17	GDSS MINNA (A)	45	WDC KUTA
18	GDSS MINNA (B)	46	GSS SULEJA
19	DSS TUNGA – MINNA (A)	47	CSS (DSS) SULEJA (A)
20	DSS TUNGA – MINNA (B)	48	CSS (DSS) SULEJA (B)
21	ADSS PAIKO (A)	49	GGDSS SULEJA (A)
22	ADSS PAIKO (B)	50	GGDSS SULEJA (B)
23	GGSSKAFFINKORO	51	WDC SULEJA
24	DSS KAFFINKORO	52	GGSS SABONWUSE
25	DSS ADUNU	53	DSS GARAMA
26	DSS ISHAU	54	DSS IJAGWARI
27	DSS KWAKUTI	55	DSS GUNI
28	28MSGSS PAIKO	56	DSSSARKINPAWA

SOURCE: Niger State Secondary Education
Board (2019)

APPENDIX B

Perception of Physics Teachers' Continuous Career Professional Development and Curriculum Implementation Questionnaire (PPTCCPDCIQ)

SECTION A:

INSTRUCTION: Kindly tick the appropriate opinion

Gender: Male Female Teaching Subject.....

Qualification:

1. National Diploma
2. Nigerian Certificate in Education
3. First Degree
4. Masters Degree
5. Others (Specify)

Teaching Experience:

1. 0 ----5years
2. 6 ----10years
3. 11---15years
4. Above 15years

SECTION B:

INSTRUCTION: Kindly tick the appropriate opinion

KEY:1. Perfectly Acceptable = (PA), Slightly Acceptable = (SA), Neutral = (N), Slightly Unacceptable (SU) & Totally Unacceptable (TU)

2. (SA) = Strongly Agree, (A) = Agree, (UD)= Undecided, (DA)=Disagree& (SD)= Strongly Disagree.

3. PTCCPD= Physics Teachers Continuous Career Professional Development

S/N	ITEM	PA	SA	N	SU	TU
1	RESEARCH QUESTION ONE					
	Physics teachers' academic qualification brings about effective implement Physics Curriculum					
2	Physics teachers' academic qualification makes his/her preparation and presentation in the classroom easier while implementing Physics Curriculum					
3	Physics teachers' academic qualification simplifies his/her method of teaching Physics					
4	Physics teachers' academic qualification makes his/her classroom management easier while implementing Physics Curriculum					
5	Physics teachers' academic qualification affords him/her easy to assess and evaluate his/her students while implementing Physics Curriculum					
6	RESEARCH QUESTION TWO					
	Physics teachers' teaching experience is necessary for his/her ability to implement Physics Curriculum effectively					
7	Physics teachers' teaching experience promotes his/her ability to prepare and presents lesson effectively in the classroom while implementing Physics Curriculum					
8	Physics teachers' teaching experience influences his/her method of teaching Physics					
9	Physics teachers' teaching experience influences his/her classroom management skill while implementing Physics Curriculum					
10	Physics teachers' teaching experience promotes his/her easy ways of evaluating his/her students while implementing Physics Curriculum					
	RESEARCH QUESTION THREE	SA	A	UD	D	SD
11	I always receive TCPCD programme at the beginning of every academic session					
12	I always receive TCPCD programme at the beginning of every term					
13	I always receive TCPCD programme once in every two years					
14	I always receive TCPCD programme once in every three years					
15	I have not received TCPCD programme since I started teaching					
	RESEARCH QUESTION FOUR	SA	A	UD	D	SD
16	Special Salary package is always given to Physics teacher as motivation					
17	Accelerated promotion is always given to Physics teacher as motivation					
18	Special grant is always given to Physics teacher as motivation					
19	Study leave with full allowances is always given to Physics teacher as motivation					

20	Apart from monthly emolument, there is no any special motivation received by Physics teachers					
	RESEARCH QUESTION FIVE	SA	A	UD	DA	SD
21	TCPCD programmes for Physics teachers is always affected by inadequate fund					
22	TCPCD programmes for Physics teachers is always affected by instability of government policy					
23	TCPCD programmes for Physics teachers is always affected by inexperienced school administrators					
24	TCPCD programmes for Physics teachers is always affected by lack of cooperation from the community members where the schools are located					
25	TCPCD programmes for Physics teachers is always affected by lack of cooperation from the Physics teachers themselves					
	RESEARCH QUESTION SIX	SA	A	UD	D	SD
26	My HOD strictly check my lesson plans on weekly basis as a Physics teacher					
27	My Vice Principal Academics strictly check my lesson plans on monthly basis as a Physics teacher					
28	Inspectors from Ministry of Education (MOE) visits my school for supervision at the beginning of every term					
29	Inspectors from MOE visits my school for supervision at the middle of every term					
30	No any Inspector from MOE visits my school for supervision.					