LEARNING STYLES OF PHYSICS STUDENTS IN SECONDARY SCHOOLS IN BENIN METROPOLIS

BY

COURAGE CHEKWUBECHUWKU BIOSE

EDU1702707

FACULTY OF EDUCATION

UNIVERSITY OF BENIN

BENIN CITY

FEBRUARY 2023

LEARNING STYLES OF PHYSICS STUDENTS IN SECONDARY SCHOOLS IN BENIN METROPOLIS

BY

COURAGE CHEKWUBECHUKWU BIOSE

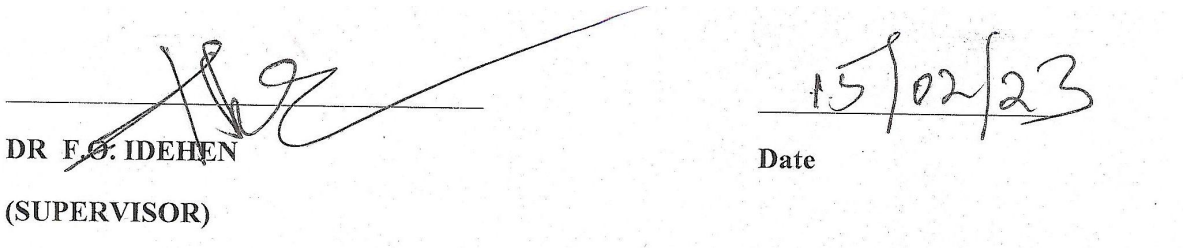
EDU1702707

A PROJECT PRESENTED TO THE DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY, FACULTY OF EDUCATION IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF SCIENCE EDUCATION (B.Sc. Ed) DEGREE IN PHYSICS, UNIVERSITY OF BENIN, BENIN CITY

FEBRUARY 2023

CERTIFICATION

We, the undersign certify that this project work is adequate in scope and was carried out by Courage BIOSE, in the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin City, Edo State, Nigeria; In partial fulfillment for the award of B.Sc (Ed) Degree in Physics.



DR F.O. IDEHEN — **Date**

(SUPERVISOR)

_____ _____

DR (MRS) F.N OFUANI **Date**

(PROJECT CO-ORDINATOR)

_____

PROF .O.K. OMORUGUIWA

(DEAN, FACULTY OF EDUCATION)

_____

Date

DEDICATION

This research work is dedicated to God Almighty whom alone I drew strength, courage, and inspiration needed to complete this program successfully.

ACKNOWLEDGEMENTS

With all pleasure, I wish to acknowledge the contributions of some people who have assisted me in some measure in my effort to undertake and complete this project.

First of all, I wish to express my profound appreciate to my supervisor, DR. IDEHEN F.O for his immense contribution in time spent in reading, correcting and offering useful guidance throughout the duration of the study.

It is with my deepest appreciation I acknowledge the unreserved support and encouragement given to me by my parents, Mr Alexander Uche Biose and Mrs Evelyn Aina Biose. Not forgetting my siblings Fortune Biose and Victory Biose. They were primarily my source of determination.

Finally, my gratitude goes to my friends Osakwe Anita, Ajayi Martins, Andrew Mordi, Favour Iselen, Ruth Ehigiamusoe and even those whose names are not mentioned, but have contributed in one way or the other to the success of this project work. It is my prayer that God will reward each of you abundantly.

TABLE OF CONTENTS

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

LIST OF APPENDIX

LIST OF TABLES

ABSTRACT

Learning Style is the preferred method of study, gathering and interpretation of information adopted by a student. Basically, there are three main types of learning styles and were examined in this study. They are; the visual learning style, audio learning style and the interactive learning style. This research investigated the use of these learning styles among physics students in secondary schools in Benin metropolis and the various factors that affect students' use of the learning styles.

The study adopted Descriptive Survey Design in which the questionnaire was used as instrument for data collection. After separating the population into strata of public and private schools, the study first adopted stratified random sampling technique to select Physics students from senior secondary schools in Benin metropolis, since the population was finite and heterogeneous. Simple random sampling technique was employed to select 150 Physics students. 50 students were selected from senior secondary school two and 100 students were selected from senior secondary school three. the schools selected for comprised of a mixed school, all boys school and all girls school. Based on the findings of the study, the following conclusions were made; the learning styles among the students were the audio learning style, visual learning style and the interactive learning style, the choice of learning style by the students differed by level as SS2 preferred the interactive learning style while the SS 3 students embraced the visual learning style. Factors that affected the students' learning styles were teaching method, individual differences, teacher's personality, peer influence and family background.

The following recommendations were made at the end of the study; the teacher should discover and encourage the individual learning style of the students, students should be guided by the teacher on the choice of suitable learning style based on the individual's differences and learning ability, education planners should be more sensitive to the different students' learning styles during the design and planning of learning curriculum, and lastly, parents should help the teachers in playing a supportive role towards encouraging the best learning style for their children.

CHAPTER ONE

INTRODUCTION

Background of the Study

Learning is defined as modification of behavior through experience. It is also defined as the acquisition of a desirable behavioral pattern. In other words, learning is the modification and co-ordination of the response of the organisms. Thus learning is essentially an active process and not a passive observation of knowledge. Learning predominantly consists of modification of reactions due to experience or practice (Ommen, 2015). Learning style refers to an individual's preferred way of processing new information for efficient learning. Dunn (2015) described the concept of learning style as "a unique way developed by students when he/she was learning new and difficult concepts". Learning style is about how students learn rather than what they learn. The learning process is different for each individual; even in the same educational environment, learning does not occur in all students at the same level and quality.

The ultimate goal of teaching or educational experiences both in and out of school is to enable the individual to meet new situations of various degrees of relatedness and similarities. The challenges in teaching is to create experiences that involve the student and support his own thinking, mode of learning, explanation, communication and

application of the scientific models needed to make sense of these experiences. To equip Nigerian citizens to live in this fast changing world of the 21st century, the educational system should undergo a radical reorientation. For decades, one of the most persistent problems which teachers have struggled to solve has been how to achieve maximum results with minimum but effective medium of instruction. There has been a need to change our emphasis on teaching by the teacher to learning by the learner. Thus, rather than be a teacher-centered activity, instruction has become learner-centered. Teachers need to ascertain what their students wish to know and how it is relevant to their life and work and how they learn best. Hence, for effective teaching and learning to take place, there must be a correlation between teacher's instructional strategies and students' learning styles (Akinbobola, 2011).

All students have different learning styles and the function of the teacher is to identify these learning styles and find appropriate instructional strategies that will match preferred styles in order to enhance effective teaching and learning process. Learning style is the adoption of a habitual and distinct mode of acquiring knowledge. Riding and Rayner (2010) define learning styles as a tendency to approach cognitive tasks with a preferred mental set. Gregore (2019) describes learning style as consisting of distinctive behaviors which serve as indicators of how a person learns and adapts to his/her environment. It

also gives clues as to how a person's mind operates. Dunn (2010) describes learning style as the way each learner begins to concentrate, process and retain new and difficult information. Learning style also represents both inherited characteristics and environmental influences. Keefe and Monk (2016) see learning style as being characteristic of the cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment. Sternburg (2011) indicates that an individual's learning style can be compared to his or her ability and is therefore not etched in stone at birth. A learning style model classifies students according to where they fit on a number of scales pertaining to the ways they receive and process information (Zywno & Waalen, 2020). According to Felder and Silverman (2018), learning style model can be Sensing/Intuitive, Visual/Verbal, Active/Reflective and Sequential/Global.

The Sensing/Intuitive learning style deals with the way information is perceived. Sensing learners get information through their senses. They solve problems by well establish methods but dislike complication. They are oriented towards procedures and facts and are practical. The learning styles of those who prefer sensing are characterized by a preference for direct, concrete experience; moderate to high degrees of structure; linear, sequential learning; and often, a need to know before doing something. They lack

confidence in their intellectual abilities and uncomfortable with abstract ideas. The path to educational excellence for sensing learners is usually from a practice – to – theory route. Intuitive learners get information through imagination, reflection and memory (Fedler, 2018). They are innovative, creative, independent, conceptual and oriented towards theories and meaning but dislike repetition. Intuitive learners love the world of concepts, ideas, and abstractions. Their path to excellence is from theory-to-practice and they often prefer open-ended instruction to highly structured instruction. They usually demonstrate a high degree of autonomy in their learning and value knowledge for its own sake. They prefer diversity in ideas.

The visual/Verbal learning style deals with the way information is presented. Visual learners get more information from visual images (schematics, graphs, diagrams, pictures and demonstrations). Verbal learners prefer written or spoken explanations and formulae. They learn information best by hearing, explanation and discussion (Akinbobola, 2011).

The Active/Reflective learning style deals with the way information is processed. Active learners learn best through participation, working in a group, trying things out and require body movement and action for optional results. Reflective learners understand lesson best by thinking about it quietly and prefer working alone.

The Sequential/Global learning style deals with understanding. Sequential learners gain understanding in an orderly manner in linear steps and go through logical step-wise path in finding solutions to problems. Global learners learn in large jumps. They solve complex problems quickly once they have grasp of the big picture (Zywno & Waalen, 2020.

Instructional strategies are plan action adopted in the acquisition of knowledge, skills or attitudes. They are various techniques adopted by the teacher in order to make teaching and learning effective (Akinbobola, 2011). There are three major types of instructional strategies. They are; guided discovery, demonstration and conventional instructional strategies.

Guided discovery is an instructional strategy in which the principal content of what is to be learned is not given but must be discovered by the learners. In guided discovery mode which is an enquiry on the other hand, the teacher provides illustrative materials for students to study on their own. Learning questions are asked by the teacher to enable students think and provide conclusions through the adoption of the processes of science. If the learner is allowed to discover relationships and methods of solution by himself, make his own generalizations and draw conclusions from them, he may then be better prepared to make wider applications of the materials learned. Discovery is a success

experience that reinforces appropriate attitude and value. A learner is active in discovery-learning, and provides for individual difference as well as makes the process of learning to be self-sequenced, goal directed with the goal perceived and the pace self-determined (Akinbobola & Ikitde, 2011).

Demonstration is an instructional strategy in which the teacher demonstrates an activitywith explanations where necessary while students or learners watch. Demonstration links explanation with practice Akinbobola & Afolabi, 2010). Demonstration is a technique of teaching concepts, principles or real things by combining oral explanation with the handling or manipulation of real things (Akinbobola, 2011). According to Adeyemo (2018), demonstration is an activity strategy where the teacher does some work and the learners endeavor to do it the way he has done it. Adeyemo holds that this method is employed when the teacher wants the learners to do a piece of work the way he has done it and learn a little by listening, a little more by watching but as a rule, learn most by actually doing the piece of work.

In conventional strategy, the principal function of this pedagogy is the presentation of ideas and information meaningfully and effectively such that clear, stable and unambiguous meaning emerge and are retained over a long period of time as an organized body of knowledge. The teacher's role is very important in the learning process

and involve the selection, the organization and the translation of subject-matter content in a developmentally appropriate manner. Conventional strategy is sometimes called deductive teaching because the teacher often begins with a definition of the concepts or principles, illustrates them and unfolds their implications (Akinbobola, 2011). The emphasis is that, the contents of the materials should be presented in a logical order, moving from generic to specific concepts, so that learners can form cognitive structures, and encode new information (Nwagbo, 2015).

The result from the findings of Akinbobola (2011) indicates that 31.67% of the sampled students were visual learners, 26.76% were audio learners while 41.66% were kinesthetic learners. The result also shows that students categorized as audio learners achieved significantly better than the students categorized as visual learners which in turn achieved significantly better than students categorized as kinesthetic learners when taught using the conventional teaching method. Riding & Grimley (2010) found that learning style interacts with the structure of the materials in affecting learning and that individuals learn best when information is presented in ways that are congruent with their preferred styles.

Research has shown that individuals exhibit different approaches in the learning process and a single strategy or approach was unable to provide optimal learning conditions for all individuals. This may be related to students' different backgrounds, strengths,

weaknesses, interests, ambitions, levels of motivation, and approaches to studying. To improve secondary school education, educators should become aware of these diverse approaches. Learning styles may be useful to help students and educators understand how to improve the way they learn and teach, respectively.

Determining students' learning styles provides information about their specific preferences. Understanding learning styles can make it easier to create, modify, and develop more efficient curriculum and educational programmes. It can also encourage students' participation in these programmes and motivate them to gain professional knowledge. Therefore, determining learning style is quite valuable in order to achieve more effective learning and provide information on how students learn and find answers to questions.

Statement of the Problem

Learners are the core of the teaching – learning process. Each learner is unique and their learning style also. Every teacher wants to be successful in the classroom. To be successful, every teacher has to "know the learner". The teacher should know the learner with reference to his entry behavior, level of motivation, interest in the subject, attitude, aptitude and some information about his family background.

It is generally acceptable that the conventional teaching style prevalent in schools does not accommodate the preferences of all students equally. Hence, one of the most important challenges that school teachers face is to be tolerant and perceptive enough to recognize learning differences among their students. Many teachers do not realize that students vary in the way they process and understand information. Therefore, there is always a mismatch between the preferred learning styles of students and the instructional strategies used by the teacher. To find solution to these problems, there is need to strive for a balance of effective instructional strategies and student's individual learning styles. In the view of these, will there be any difference in the students' achievement with different learning styles taught using different instructional strategies.

Research questions

The following research questions will guide the study:

1. What are physics students learning styles?
2. What factors affect the learning styles of physics students?
3. Do physics students learning styles differ by level?
4. Do physics students learning styles differ by point of entry?

Purpose of the Study

The purpose of the study was to investigate the effects of learning styles on Physics students' academic achievement in Nigerian senior secondary school.

Specifically, the study was designed to:

1. Examine the achievement of physics students with different learning styles.

2. Determine the factors that affect the learning style of Physics students.

3. To recommend the appropriate instructional strategy that would ensure effective learning style and optimum academic achievement for physics students in senior schools.

Significance of the Study

The results of the learning styles of physics students in senior secondary schools in Benin City will be a revelation of the learning styles in schools, with teachers acting as mediators. The study will assist teachers in determining which learning styles will best suit various learning situations. The findings will also help teachers design their instruction methods to connect with their students' learning styles by incorporating various combinations of experiences, reflections, conceptualization, and experimentation. These findings will aid in reducing the mismatch between a student's learning styles and teacher's teaching techniques. The learning styles will assist the teacher in understanding the operations and approaches to learning in order to develop better teaching strategies.

Scope/Delimitation of the Study

The scope of this study borders on the relationship between students' learning styles and their academic performance in physics in senior secondary schools. The research will be limited to the students in senior secondary schools in Ovia North Local Government Area of Edo State.

Operational definition of terms

The following keywords are defined in the context as they are used in this research work.

Learning Styles: Learning style is an individual's preferred way to absorb, process, comprehend and retain information.

Learning: It is the process of acquiring new understanding, knowledge, behaviors, skills, values, attitudes, and preferences either through experience or being taught.

Instructional Strategy: Instructional strategy is a method that teacher uses to deliver lesson – contents in ways that keep students engaged and practicing different skill sets.

Academic Achievement: Academic achievement is a representation of the performance outcome that indicates the extent to which a person had accomplished specific goals that were the focus of activities in instructional environments, specifically in school.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The related literature for this study shall be reviewed under the following subheadings:

Conceptual Framework

Factors Affecting Students' Learning Style

Ways to Know about Student's Learning Style

The Importance of Knowing the Students' Learning Style

Conceptual Framework

Education is the key that unlocks illiteracy which must be the priority of any nation that desires to build a great and dynamic economy. The ultimate goal of educational experiences, both inside and outside the school environment, may be able to meet and make more effective, new situations of varying degrees of relatedness and similarities so as to boost the social and economic life of its citizens. In this fast-changing 21st century world, there is the need to equip Nigerian students in order to meet up with new challenges in science and technology. There are lots of expectations placed on the Nigerian educational system to inculcate the necessary skills and attitudes that will

enhance collaboration, team-work, problem-solving and creativity in students. The implication is that the educational system may require radical reorientation, more so that Federal Republic of Nigeria (2014) outlined the development of a great and dynamic economy for the betterment of its citizenry, as one of the main goals of education in Nigeria. It was in that line of thought that Nigerian Educational Research and Development Council (2008) earlier specified the acquisition of basic literacy in physics by secondary school students, for functional living in the society. One of the ways to prepare the students for functional living in the society is to explore the appropriate learning styles that will help promote their literacy in physics.

Learning styles indicate an individual's preferential way(s) of focusing on different types of information, to enhance his or her understanding and achievement. Learning styles are various approaches which students employ to learn. These styles involve educating methods, particular to individuals which are presumed to allow the individual to learn effectively. This implies that students have different learning styles and having an understanding of the learning style preferences of students can provide effective teaching strategies for teachers to use. Tuan (2011) held the view that a learning style is an individual student's comfort zone or educational conditions under which the student learns best. Even though, Zhou (2011) defined a learning style as an external skill that a

student consciously employs to enhance his or her learning, Bostrom (2012) added that a student may also unconsciously employ a learning style. Students, who share a learning style that is attuned with the teaching style, remember information longer and are more optimistic about learning.

Research results revealed that when teachers pay attention to students' individual differences and learning characteristics, the quality of learning and achievement is enhanced (Tella & Adeniyi, 2019). There is the need, therefore, for physics teachers to adopt teaching styles that favors their students' learning styles. There are lots of learning styles that have been developed; these include klob learning style model, Gregoric mind styles, Honey learning styles and Felder-Silverman's learning styles. Felder and Silverman developed a learning style model which has five bi-polar learning style dimensions: These dimensions are the sensing/intuitive, visual/verbal, active/reflective, sequential/global and inductive/deductive learning styles. The model presents different dimensions that indicate learning style preferences by individual students. However, the inductive/deductive learning style dimension was later removed from the model because Felder viewed inductive presentation as not being concise and prescriptive and also posited that many or most students prefer deductive teaching than the less effective conventional lecture method presented to them.

Felder & Spurlin (2015), Platsidou & Metallidou (2019) opined that the Felder-Silverman's learning styles model provides the teacher with a good basis for choosing teaching methods that would address the learning needs of the students they teach. It is assumed that students vary in terms of the learning styles they employ and, according to Kelly (2013) all students have some degree of the four dimensions in them. The four dimensions of Felder-Silverman's learning styles model have been explained by Dalhan, Noor and Hashim (2010), Kelly (2013), and Platsidou and Metallidou (2019): Sensing/intuitive learners are also referred to as perception learners. Perception learning refers to the approaches students use to solve problems, and their tolerance for factual learning. The sensing learners prefer perceiving information through sights, sounds and physical sensations. They enjoy learning facts and are better at memorizing those facts; they also prefer well-established methods of solving problems; they do not like surprises, complications and taking big risks. On the other hand, intuitive learners (intuitors) prefer to perceive information through memories, ideas and insights. Such learners do not tolerate learning that requires repetition, routine and memorization of facts; they are innovative and are better at grasping new concepts. Visual/verbal learners are input learners whose ability to retain information is influenced by the way the information is presented. Input learning has to do with the modality that sensory information is mostly

effectively perceived by students. Visual learners prefer more visual modes of information intake such as through charts, diagrams, pictures. Graphs and demonstrations, while verbal learners appreciate more verbal explanations such as written and spoken words and formulae.

Dahlan, Noor and Hashim (2010), Kelly (2013), Naik (2013) and Platsidou & Metallidou (2019) further explained active/reflective and sequential/global learning: Active/reflective learners are processing learners. This dimension of Felder-Silverman's learning style refers to students' preferred degree of involvement in solving problems. Active learners prefer being actively engaged in solving the problem such as through group discussions and practical application of concept that have been learned. Reflective learners prefer learning through introspection; they like to think over concepts taught before indulging in any practical application; they also prefer to work single-handedly rather than in groups. Sequential/global learners are referred to as understanding learners. This dimension is concerned with the ways learners understand information or organize such information, and how the learners progress towards understanding the information. Sequential learners learn in a logical progression of small incremental steps; they establish logical connections from one piece of information to another. Conversely, global learners learn holistically (in large jumps). They do not immediately see the

relationships between materials, but are able to learn in large jumps; they use holistic thinking processes, putting pieces of materials together randomly before suddenly arriving at solutions.

Students' preferences on each dimension may be strong, moderate or mild, may change with time, and may vary from one subject or learning environment to another as opined by Ku & Chang (2011). This implies that the learning style preferences may be affected by a students' educational experience. Omar, Mohammed & Paimin (2014) carried out a research on dimension of learning styles and students' academic achievement. The result showed that there is no significant relationship between the dimensions of learning styles and academic achievement. However, when Chockjamsi, Deesomchok & Euathrongchit (2015) conducted their study, both pre-clinical and clinical students who were sequential learners were found to achieve high in medical courses. The study also found out that high achievement was only associated with reflective learners among pre-clinical students. Mohammed & Kiong (2017) conducted a study on learning styles and academic achievement among building construction students and the study revealed that the students tended to be visual learners. Munir, Ahmad & Ghani (2018) conducted a research on the relationship between learning styles and performance of secondary school students and the findings indicated that there is no significant relationship between

students' learning styles and their achievement. A study conducted earlier by Ling, Basit & Hassan (2017) had revealed that visual learning and sequential learning styles significantly affect students' achievement.

Gender is the range of physical, biological, mental and behavioral characteristics pertaining to and differentiating between feminine and masculine population. Interest in gender and physics achievement derives mainly from two concerns, equality between the sexes that focuses on the need to avoid sexual discrimination in education and for a wider interest and understanding in physics so as to eliminate gender gap in education issues. Filgona (2016) was of the view that gender characterizes the differing roles, responsibilities, constraints, opportunities and needs of females and males in any given social context. A study conducted by Inyang & Josiah (2016) on gender showed achievement superiority in physics of the male gender over their female counterparts. On the contrary, findings such as those of Aloa & Abubakar (2010), Bhat & Govil (2014) and Oomen (2015) revealed that students' achievement is not gender-biased. A study explored by Prajapati & Cubbidge (2011) found out that students' gender affects their learning styles, and that female students disproportionately prefer the equivalence of active/reflective and visual/verbal dimensions of Felder-Silverman's learning styles. Asuquo & Orim (2019) also found out that a significant difference exists between

students' learning styles and their gender, with the male students having a higher mean in the learning styles preference than their female counterparts. Besides students' gender, school type is another moderating variable in studies concerning learning styles of students.

Public and private schools differ in their administrations and conditions for teaching and learning. While public schools are fully dependent on the state for their finances, private schools depend more on student fees and private charity and occasionally on government for additional support; hence private schools have the optimal conditions for higher effectiveness compared to public schools. Okon & Archibong (2015) employed a multi-level modeling to examine private and public schools' differences in students' achievement in physics and science related areas and found that the achievement of students in public schools is lower than that of students in private schools. John & Ademola (2014) found out that private school students achieve higher in science (physics, chemistry and biology) than their counterparts in public schools.

Factors Affecting Students' Learning Styles

According to Rita Dunn in (Suhihartono, 2017) pioneers in other learning styles have found many variables that influence student learning style which are physical, emotional, sociological and environment. Some people can learn well in bright light, while others

can only learn if the light is bleak. There are some people who best accomplish their learning tasks in groups, while others prefer to learn for themselves because it is more effective. Some people choose to study with the background music accompaniment, while others cannot learn unless in a lonely atmosphere. Some people choose their work environment neatly, but others always hold everything out for everybody to see.

Meanwhile, according to David Kolb in Ghufron and Risnawati, student learning styles are influenced by personality type or habit and evolve with time and experience.

Based on the above explanation, many factors can influence the way and style of student learning, in addition to the factors that exist within the person itself (internal factors), there are many factors that come from outside the individual itself (external factors).

1. Internal factors that influence the learning style of students

a. Physical Factors: Physical factors include two parts; health and disability. Health factors affect the learning activities. Learning process will be disrupted if the health of a person is disturbed, but it will also be less excited when the body is weak, lack of blood or any interference on the senses of the body. While disability of the body is something that causes less good or less perfect of the body. The defects can be blind, half-blind, deaf,

half-deaf, broken legs, paralyzed and others. Such a state of disability also affects a person's learning activities.

b. Psychological Factors: These factors are intelligence, attention, interest, talent, motive, maturity and readiness.

2. External factors

a. Family Factors: Someone who learns will receive influence from the family in the way of educating people, relationships between family members, household atmosphere and family economic situation.

b. School Factors: School factors that will affect the way or style of learning of students include teaching methods, curriculum, teacher relationships with students, discipline or school rules, learning atmosphere, standard lessons, the state of building, the location of schools and others. Teacher factor such as teacher personality, teacher's ability to facilitate learning and the relationship between teacher and students also influence the way or style of student learning.

Ways to Know or Learn About Student Learning Styles

How to know the style of learning according to Wijaya Kusumah (2011) includes:

1. Using detailed observation of each learner through the use of various instructional techniques in the classroom. To familiarize learners who have an auditory learning style, use lecture methods in general. Next notice and note learners who like to listen diligently to the end. From here we can simply classify the types of learners with a more prominent auditory style.

2. By assigning tasks to learners to perform worl that requires unification of separate parts, for example, uniting the model of the house where the parts are separated. There are three possible ways of uniting the model of this house; (i) is to practice hands-on by trying to unite parts of the house after looking at the pieces; (ii) is to look at the design drawings of the house as a whole, just starting to unify; and (iii) is to read the written instructions, the steps required to build the house from beginning to the end.

3. Conduct survey or learning style test. This method of learning test usually involves the services of a particular consultant or psychologist. Because this learning style test uses a well-tested methodology, it is usually a high-accuracy survey or style test that makes it easy for teachers to get to know the learning style of the learner.

The Importance of Knowing the Students' Learning Styles

First, by knowing the learning styles of students, teachers can choose teaching methods and educational media suitable for learners. In this case, teachers' creativity is required in varying teaching methods and in the choice of instructional materials. Thus expected differences in learning styles among learners can be accommodated well.

Nasution (2013) states that various instructional techniques have been widely applied and tested to the students in order to obtain effective results in the learning process. In reality, there is no one better teaching strategy. If one instructional method has been established and do not show the expected results, then another alternative can be done by individual teachers in the learning process.

Bobbi and Hernacki (2013) mentioned that knowing different learning styles has helped teachers everywhere to be able to approach all students by simply understanding their individual differences.

Secondly, for parents, knowing their ch8ild's learning style will make it possible for them to provide learning facilities that match their children's learning style at home. This can be done by providing books and pictures for children with visual learning styles,

providing learning tapes and often discussing with auditory – style children, and providing practical tools for children with a kinesthetic learning style tendency.

Third, knowing learning style is important for the learner. By knowing your own learning style, learners can create their favorite atmosphere for learning. Whether it is by setting music, discussing with friends or parents, and so on. Thus, learner's motivation can be increased.

CHAPTER THREE

METHODOLOGY

This chapter is designed to describe the procedures adopted in this research. The procedure involves the following:

Design of the Study

Population of the Study

Sample and Sampling Technique

Research Instrument

Validation of the Instrument

Method of Data Collection

Method of Data Analysis

Design of the Study

The study will employ Descriptive survey research design. The method is adopted in order to ascertain the most preferred learning styles of Physics students in senior secondary schools and its impact on their academic achievement. The design was used because according to Fraenkel and Wallen (2010) it produces a good number of responses from numerous people at a time, provides a meaningful picture of events and seeks to explain people's perception and behavior on the basis of information obtained at

a point in time. Similarly, Johnson & Christenson (2012) are of the view that descriptive survey design describes the existing correlation between the dependent variable (Students' academic achievement) and the independent variable (Learning Styles) and, sometimes, the relationship that exists among those variables, and could be used with greater confidence with regards to particular questions which are of special interest and value to researchers (Esia-Donkoh, 2014).

Population of the Study

The target population that will be used for this study shall comprise of 150 students from 5 senior secondary schools in total from Ovia North East local, Oredo, Ikpoba-okha and Egor local governement areas. From these population, a representative sample will be drawn to carry out this investigastion.

Sample and Sampling Technique

After separating the population into strata of public and private schools, the study first adopted stratified random sampling technique to select Physics students from senior secondary schools in Ovia North East, Oredo, Egor and Ikpoba-okha Local Government Areas of Edo State, since the population was finite and heterogeneous. Simple random sampling technique was employed to select 150 Physics students. 50 students were selected from senior secondary school two and 100 students were selected from senior

secondary school three. the schools selected for comprised of a mixed school, all boys school and all girls school. Physics students in senior secondary school one were exempted because they were newly admitted into the senior secondary school level. 150 students were selected due to time and resource limitation.

Instrument for Data Collection

The structured questionnaire was used to collect data from the respondents. The research instrument which was titled "Learning Styles of Physics in Secondary Schools in Benin Metropolis" has three sections. The first section captured the bio-data of the respondent. The second and third section contained the items intended to measure by the instrument on a modified 4-point Likert scale ranging from strongly agree, agree, disagree to strongly disagree.

Validation of the Instrument

The validation was determined by the expert judgment of the supervisor. The judgment were sought to guarantee that each of the items in the instrument measured what it was supposed to measure. The final draft was adjudged valid by the project supervisor after recommendation from two other education experts who cross examined the instrument.

Method of Data Collection

The questionnaire was personally administered and collected by the researcher after careful explanation of the purpose of the study to the respondents. The respondents were given enough time to provide suitable response to each item in the questionnaire after which the questionnaires were immediately gathered.

Method of Data Analysis

The method of data analysis used in this project was frequency distribution and Simple percentages. In this research, the raw figures were converted to percentages and were been tabulated.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

This chapter presents the data analysis and discussion of findings in the following way,

Presentation of Results:

Research Question One: What is the learning style preference of Physics students in senior secondary schools in Benin metropolis.

Table 1: Learning Style Preference of Physics Students in Senior Secondary Schools in Ovia North East Local Government Area of Edo State

S/N	Learning Styles	No of Students	Percentage
1	Visual Learning	41	37.3%
2	Audio Learning	37	33.7%
3	Interactive Learning	32	29.0%
	Total	**110**	**100%**

Table 1 shows the preferred learning style of physics students in secondary schools in Ovia North East Local Government Area of Edo State. The findings show that 37.3% of the students prefer visual learning style, 33.7% of the students like audio learning style while 29% of the students prefer interactive learning style.

Research question two: What are the factors that affect the learning style of physics students?

Table 2: Factors Affecting the Learning Styles of Physics Students

S/N	FACTORS AFFECTING THE LEARNING STYLES OF PHYSICS STUDENTS	F	SA (%)	F	A (%)	F	D (%)	F	SD (%)
1.	Teaching method by the physics teacher can affect the learning styles of physics students	33	30%	58	52.7%	11	10%	8	7.3%
2.	Individual differences of the students' can affect their learning style	31	28.1%	63	57.2%	12	10.9%	4	3.6%
3.	My teacher's personality and can affect my learning styles of physics	46	41.8%	21	19.1%	24	21.8%	17	15.5%
4.	Influence from my peers can affect my learning styles as a Physics student	19	17.3%	52	47.3%	24	21.8%	15	13.6%
5.	My family background can influence my learning styles of physics	36	32.7%	49	44.5%	13	11.8%	12	10.9%
	Average Total		**30%**		**44.2%**		**15.3 %**		**10.2 %**

From Table 2 above, we seek to investigate the factors affecting the learning style of physics students. The result indicates that 44.2% of respondents agreed that there are factors affecting the learning styles of physics students and such factors are teaching method, individual differences, teacher's personality, peer influence and family

background; whereas, 15.3% of the student-respondents do not agree that learning styles of physics students could be affected.

Research Question Three: Do students' learning style differ by level?

Table 3: Students' Learning Style Based on Academic Level

S/N	Learning Style	Total	SS 1	(%)	SS 2	(%)	SS 3	(%)
1.	Visual Learning	41	16	39.0%	15	36.6%	10	24.4%
2.	Audio Learning	37	4	10.8%	18	48.6%	15	40.5%
3.	Interactive Learning	32	7	21.9%	14	43.8%	11	44%
	Total	**110**	**27**	**23.9%**	**47**	**43%**	**36**	**36.3%**

Table indicates that 39.0% of SS1 students preferred the visual learning style while 36.6% of SS2 students and 24. 4% of SS 3 students preferred the visual learning style. Also 10.8% of SS 1 students preferred the audio learning style while 48.6% of SS2 students and 40.5% of SS 3 students preferred the audio learning style. Lastly, 21.9% of SS 1 students preferred the interactive learning style while 43.8% of SS 2 students and 44% of SS 3 students preferred the interactive learning style. This implies that SS 1 students mostly preferred the visual learning, SS 2 students mostly preferred the Audio learning style while SS 3 enjoyed interactive learning style.

Discussion of Findings

Table 1 shows that the learning styles of physics students in Benin metropolis are: visual learning style, audio learning style and interactive learning style. This finding is in agreement with the model of Neil (1987) who categorized students' learning styles into visual, audio and interactive learning style. Cherry (2019) opined that the learning styles are designed to help students and others learn about their individual learning preferences.

Table 2 above shows that 37.0% of respondents agreed that there are factors affecting the learning styles of physics students and such factors are teaching method, individual differences, teacher's personality, peer influence and family background. The result supports the finding by Abucay (2019) who revealed that students' learning style can be affected by intellectual factor, physical factor, mental factor and environmental factor.

Table 3 shows that SS 1 students preferred the visual learning, SS 2 students preferred the audio learning style while SS 3 students preferred interactive learning style. The result above justifies the findings by Olamide (2011) who observed that in addition to individual differences, the learner's education level is a parameter that determines the best learning style to be adopted by the learner.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

As we live in the knowledge age, learning becomes the cornerstone of our successful life. Learning is something of which we all have an understanding and in which we have all participated. It is the individual's process of gaining knowledge through studying or experiencing results in behavioral change.

Learning is the key factor for survival, sustainability and competitive advantage at the level of the individual, the organization and the nation. During the learning process, individuals are more inclined to prefer different methods of dealing with, processing and interacting with information.

Learning style is the method by which the individual gets, keeps up and encourage the comprehension of acquired data. As individuals vary in their habit and views in certain conditions, so do their learning styles. It is realized that learning style vary from individual to individual.

It is in view of this that the study examined the learning style of Physics students in secondary schools in Benin metropolis.

Conclusion

Learning style is the variation in students' ability to accumulate as well as assimilate information. In order to investigate the learning styles of physics students in secondary schools in Benin metropolis and factors that affect the students' learning style, the study adopted Descriptive Survey Design in which the questionnaire was used as instrument for data collection.

After separating the population into strata of public and private schools, the study first adopted stratified random sampling technique to select Physics students from senior secondary schools in Ovia North East Local Government Area of Edo State, since the population was finite and heterogeneous. Simple random sampling technique was employed to select 150 Physics students. 50 students were selected from senior secondary school two and 100 students were selected from senior secondary school three. the schools selected for comprised of a mixed school, all boys school and all girls school. Based on the findings of the study, the following conclusions were made; the learning styles among the students were the audio learning style, visual learning style and the interactive learning style, the choice of learning style by the students differed by level as SS2 preferred the interactive learning style while the SS 3 students embraced the visual

learning style. Factors that affected the students' learning styles were teaching method, individual differences, teacher's personality, peer influence and family background.

Recommendations

Based on the Conclusions of the study, the following recommendations were made:

5. The teacher should discover and encourage the individual learning style of the students.
6. Students should be guided by the teacher on the choice of suitable learning style based on the individual's differences and learning ability.
7. Education planners should be more sensitive to the different students' learning styles during the design and planning of learning curriculum.
8. Parents should help the teachers in playing a supportive role towards encouraging the best learning style for their children.

REFERENCES

Abucay, R. (2019). Factors that may affect the learning process. *International Journal of Academic Research in Progressive Education and Development, 3(1), pp.16-27.*

Aloa, G. & Abubakar, N. (2010). Learning styles, culture and inclusive instruction in the multicultural classroom: A business and management perspective.

Asuquo, J. & Orim. G. (2019). Learning style preferences and course performance in an undergraduate physiology class. *Advances in physiology education, 33(4), pp.308-314.*

Bhat, O. & Govil, H. (2014). Learning styles of design students and the relationship of academic performance and gender in design education. Learning and instruction, 17(3), pp. 345-359.

Bobbi, K. & Hernacki, M. (2013). Learning styles and factors affecting learning: perception of 2013/2014 final year post-diploma sandwich students of the department of basic education, University of Education, Ghana.

Bostrom, D. (2012). The use of learning styles: Beyond the matching hypothesis. Cherry, R.S. (2019). Practical approaches to using learning styles in higher education. Greenwood publishing group.

Chockjamsi, B., Deesomchok, I., & Buathrongchit, M. (2015). Comparison of the learning styles among different nursing programs in Taiwan: implications for nursing education.

Felder, A. & Spurlin, H. (2015). Experiential learning and the acquisition of managerial tacit knowledge. Academy of management learning & education, 7(2), pp. 189-208.

Inyang, F. & Josiah, A. (2016). Learning styles and pedagogy in post-16 learning: A systematic and critical review.

John, A. & Ademola, C. (2014). The relationship between personality, approach to learning and academic performance. Personality and individual differences, 36(8), pp.1907-1920.

Kelly, C. (2013). Linking learning style preferences and ethnicity: International students studying hospitality and tourism management in Australlia.

Ling, Z., Bosin, F. & Hassan, W. (2017). Learning styles across cultures: Suggestions for Educators. Education & Training, 50(2), pp.155-127.

Mohammed, D. & Koing, F. (2017). Learning style, academic belief systems, self report student proficiency and academic achievement in higher education.

Naik, B. (2010). Implications of learning style, age group, and gender for developing online activities.

Nasution, J. (2013). Advances towards a learning movement: Translations at work. Human resource development international.

Olamide, A. (2011). Matching of learning styles and teaching styles: Advantage and disadvantage on ninth-grade students' achievement.

Omar, S., Mohammed, D. & Paimin, P. (2014). Learning styles: An overview of theories, models, and measures. Educational psychology, 24(4), pp.419-444.

Pletsidou, V. & Metallidau, B. (2019). An exploratory study of the relationship between age and learning styles among students in different education programs in Taiwan.

Tella, I. & Adeniyi, O. (2019). Learning style and course performance. An empirical study of Uniten IT students. *International Journal of Asian Social Science, 4(2), pp.208-216.*

Tuan, J. (2011). Learning styles and factors affecting the learning styles of general engineering students. *Journal of Academic Research in Progressive Education and Development, 3(1), pp.16-27*

Zhou, N. (2011). University students' learning styles and their ability to solve mathematical problems. *International Journal of Business and Social Science.*

APPENDIX

DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY

FACULTY OF EDUCATION

UNIVERSITY OF BENIN

QUESTIONNAIRE ON THE LEARNI7NG STYLES OF PHYSICS IN SECONDARY SCHOOLS IN BENIN METROPOLIS

INSTRUCTION: Please read carefully and respond to the questions below by ticking(√) in the box provided for each question. They are no wrong or right answers. Your opinions will be kept strictly confidential.

SECTION A: Demographic Information

Name of school: .....

Type of school: All boys[ ] All girls[ ] Mixed[ ]

Gender: Male [ ] Female [ ]

Class: SS 2 [ ] SS 3 [ ]

SECTION B: Items

Instructions: There are three (3) sub-sections in Section B and students are only allowed to answer the section that best suits their learning styles. Students are not to answer more than one sub-section.

S/N	VISUAL LEARNERS	SA	A	D	SD
1.	I prefer speakers or teachers that use charts, maps or graphs.				
2.	Iprefer learning that involves the use of practical examples				
3.	I am able to convey complex ideas visually				
4.	When learning I am mostly interested in visual features				
5.	I prefer learning when I can visually relate to what I am been taught				

	AUDIO LEARNERS	SA	A	D	SD
6.	I learn more by listening and hearing				
7.	When I learn I tend to say things out loud				
8.	I prefer teachers who use the question and response, group discussion method				
9.	I learn better when I communicate with my class mates or the teacher				
10.	I prefer learning when I listen to podcasts				

	INTERACTIVE LEARNERS	SA	A	D	SD
11.	I learn better when I interact with my teachers and class mates				
12.	I learn better when I am involved in asking and answering questions in class				
13.	When it involves face to face interaction with the tutor I learn better				
14.	I learn better when I participate in class activities				
15.	I learn better through online interactions such as chats and forums				

SECTION C: Items

Factors that affect the learning styles of physics students

S/N	FACTORS AFFECTING THE LEARNING STYLES OF PHYSICS STUDENTS	SA	A	D	SD
16.	Teaching method by the physics teacher can affect the learning styles of physics students				
17.	Individual differences of the students' can affect their learning style				
18.	My teacher's personality and can affect my learning styles of physics				
19.	Influence from my peers can affect my learning styles as a Physics student				
20.	My family background can influence my learning styles of physics				