# RIVERS STATE UNIVERSITY, PORT HARCOURT

# EVERYTHING, SEEN AND UNSEEN, IS MEASURABLE AND EVALUABLE: THE PSYCHOMETRICIAN'S PERSPECTIVE

## AN INAUGURAL LECTURE

By


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Professor of Educational Measurement & Evaluation



SERIES NO. 80

Wednesday, 31st August, 2022

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NKPOLU-OROWORUKWO,
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# DEDICATION

THIS
INAUGURAL LECTURE
IS DEDICATED TO
ALMIGHTY GOD,
MY POWER
AND STRENGTH.

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## PROTOCOL

The Vice Chancellor,
Members of Governing Council
Deputy Vice Chancellor (Administration)
Deputy Vice Chancellor (Academics)
Registrar, Librarian and Acting Bursar
Former Vice Chancellors and Emeritus Professors
Provost, Deans and Directors
Heads of Departments and Other Units
Distinguished Professors and Associate Professors
Former Registrars and Librarian
Other Academic and Non-academic Staff
Your Royal Majesties, Highnesses and Chiefs
Bishops, Reverends, Pastors
Knights and Ladies of the Order of
Knights of St. Christopher
Other Knights and Ladies of the Church and Church Members
Visiting Academics and Captains of Industries
Faculty Members of Education
Distinguished Guests and Friends
Graduate and Undergraduate Students of this Great University
Gentlemen of the Press
Ladies and Gentlemen.

## 1.0 PREAMBLE

Vice Chancellor Sir and respected audience, there are many positive and negative accidental occurrences in everyone's life, all of which are the products of the grace and mercy of God. With a grateful heart full of joy, I thank Him for helping me through the good and bad challenges that came up by accident as I went through my life journey and for making this day possible. With all I have passed through in life, I finally find myself today in academics.

My choice of academics as a career was premised on the fact that I had a dream some years ago that one day I would be a professor. Later, I started my academic journey in 1993 as a Graduate Assistant.

My journey from the rank of Graduate Assistant to Professor was not an easy one. It was just like using a small canoe to ferry across the Atlantic Ocean. But blessed be the Lord, who saw me through by His mercy and grace, and with a token of hard work.

Today, I am standing before you to deliver 80th Series of the Inaugural Lectures of this University. Eighty (80) is a very significant number. It is significant because if it is divided by ten (10) different numbers, such as 1, 2, 4, 5, 8, 10, 16, 20, 40, and 80, there will be no remainder or fraction. If 80 is divided by one, the answer is 80; if 80 is divided by 80, the answer is one; if 80 is divided by two, the answer is 40; if 80 is divided by 40, the answer is 2. If 80 is divided by 20, the answer is 4; if 80 is divided by 4, the answer is 20; if 80 is divided by 5 the answer is 16, if 80 is divided by 16, the answer is 5. If 80 is divided by 8, the answer is 10, and finally if 80 is divided by 10, the answer is 8, signifying the day and month (that is 8th August, 2003); I resumed duty in this university as a Lecturer II. These mathematical operations make this 80th Inaugural Lecture so unique. With this, "What should I do rather than to love you, my God?" Mr. Vice Chancellor Sir, permit me to worship my God at this juncture with the words of Charles Wesley from the Church of Nigeria (Anglican Communion) Hymnal No. 80 to mark the 80th Inaugural Lecture of this great University of excellence and creativity.

This is the 9th inaugural lecture from the Faculty of Education; the 4th in the Department of Business Education; and the first in the towering field of measurement and evaluation of this great University. I am humbled that the Lord has given me grace to present this lecture as the first Professor of Educational Measurement and Evaluation of this University.

Mr. Vice-Chancellor Sir, it is apparently true that we, as teachers and lecturers, have been carrying out assessment and evaluation practices in our homes and our institutions of learning for several years, meaning that we have the knowledge, skills, and experience in testing, measurement, assessment, and evaluation practices. Perhaps there may be some younger and older ones who may or may not have acquired the knowledge, skills, and experience in carrying out assessment best practices. This means that almost all lecturers and teachers are in the business of measuring and evaluating.

For the fact that we are familiar with these practices, my mission today will be very simple: to share with you that in education, everything seen or unseen is assessable, quantifiable, measurable, and evaluable. Also, it will be my role today to demonstrate that apart from an individual's academic ability, every human characteristic, trait, or attribute can indeed be assessable, quantifiable, measurable, and evaluable to a significant degree of accuracy. Also, my goal for today is to make teachers, lecturers, and the rest of the audience aware of the best ways to construct tests that measure, assess, and evaluate students' academic achievement and other psychological variables. Finally, I want to use this medium to challenge teachers and lecturers in the education system on the need for them to acquire the professional knowledge, skills, and competencies they need to use in test construction.

## 2.0 INTRODUCTION

The topic of today's inaugural lecture is ***"Everything, Seen and Unseen, is Measurable and Evaluable: The Psychometrician's Perspective."*** This topic is part of the field of Measurement and Evaluation, which is also known as Educational Evaluation, Test and Measurement, Differential Psychology, and Psychological Assessment.

Measurement and evaluation as an academic discipline in education has its roots in psychology and statistics, hence it is referred to as Psychometrics. It is a course or programme of study housed in the Department of Educational Foundations in the Faculty of Education of this University, and in some universities, it is housed in the Department of Science Education, and others in the Department of Educational Psychology, Guidance and Counseling. Because it is so important to education, the National Universities Commission (NUC) made the course Measurement and Evaluation (M&E) or Test and Measurement (T&M) a requirement for all Teacher Education Programmes in its benchmark and minimum academic standards. The course includes educational statistics, research methods in education, psychological testing, appraisal techniques, test construction, and programme evaluation. Its application spans through all aspects of education. Because of this, whether you are a lecturer or professor in law, medical sciences, engineering, or a field that has nothing to do with teaching as a profession, you practice psychometrics (measurement and evaluation) principles in the school system every day, whether you know it or not.

Psychometrics Science is a field of study concerned with the theories and techniques of educational and psychological measurements, which include the measurement of knowledge, abilities, attitudes, and personality traits with the knowledge and skills acquired in basic statistics. It is also concerned with the construction and validation of measurement instruments such as personality assessment instruments, tests, and questionnaires. Psychometrics, or psychometry,

deals with two major tasks, which are the construction of instruments and the procedures for measurement. A psychometrician is simply an expert or a practitioner of psychometrics.

In the field of education, there are those specifically trained as psychometricians, evaluators, or measurement or evaluation experts, just as we have people trained in other educational disciplines such as Educational Management or Educational Administration and Planning, Philosophy of Education, Educational Technology, Physical and Health Education (Human Kinetics), and Adult and Non-Formal Education, among others. Therefore, not every educator is a Measurement and Evaluation expert, an educational evaluator, or a psychometrician, unless such a person is trained to be one. The fact that someone is able to construct tests or craft examination questions does not and will not qualify such a person as an educational evaluator or a measurement and evaluation expert or a psychometrician. Test construction entails some technicalities as well as knowledge and skills that are not taught or learnt at the undergraduate level. Tests are just one form of instrument utilized for evaluation in the education system. Other forms of instruments are questionnaires, rating scales, interview schedules, inventories, sociometrics, critical-incident observation kits, Biodata, network, checklists, Q-Sort, occupational information inventories, etc., used to elicit information from the respondents (learners) for the purpose of assessing, quantifying, measuring, and evaluating seen or unseen psychological variables. With these kinds of tools, it is clear that evaluating students in the education system is a very big, complicated, and all-encompassing task.

In the everyday activities of man, an evaluation process takes place in one way or the other. If the evaluation process is absent in one's life, then it implies that the aim of one's life may be in jeopardy. According to Chigeru (2020), it is only through evaluation that one can discriminate between good and bad, as well as right and wrong; hence, the whole circle of social development revolves around the

evaluation process. That being so, one can say that "Evaluation is everything and everything is evaluation".

Educational evaluation has played a far more prominent role in human history than is generally recognized, and in recent times, it has become one of the topical issues of discourse in our educational system due to the assessment patterns of pupils and students' learning outcomes. It is noteworthy that no meaningful research, teaching, and learning activities can take place in the absence of quality and proper evaluation of students' learning outcomes before, during, and after instruction. So, evaluation is an important task that cannot be separated from teaching at any level of the education system.

## 3.0 HISTORICAL DEVELOPMENT OF TESTING

Every area of human endeavour takes its historical root from the Bible, and Testing, Measurement, and Evaluation as a field of study is not left out. Evaluation started with God's creation of earth and man, continues throughout man's existence on earth, and will end on the last day of God's judgment of man. In the same vein, in the school system, Evaluation starts at the beginning of schooling, continues throughout the schooling process, and ends on the day the learner graduates from school.

God is the founder and originator of testing, measurement, and evaluation. This is because evaluation itself are instructions, and commands handed down to humanity by Almighty God from the beginning of creation. Hence, the origin of Testing, Measurement, and evaluation started with God in creation. Genesis, Chapter 1, reveals God as the first evaluator ever to exist. For instance, the Bible makes us understand that at the end of each day, God evaluated and passed judgment that everything He created was good and, of course, none was wrong. As He continued with His creation activities with modification and improvement on the first five days and on the sixth day, God carried out a formative evaluation. He also performed both formative and summative evaluations after concluding the

creation activities. That is what caused the woman to be created from the man, completing the story of man's evolution and environment (Genesis 1 & 2). In fact, He did not stop testing, measurement, and evaluation of the activities of man. Several testing, measurement, and assessment activities also took place in the Bible.

Jesus Christ passed through several tests and evaluation process. In course of His assignment to bring salvation to humanity, Jesus the son of God, proved His credibility and efficiency and passed the tests (Assessment and Evaluation).

In the time of Noah, God instructed him to build an ark with quantitative and measurement specifications. Having met God's specifications and standards, Noah passed the examination, and so Noah, his family, and samples of all animals and birds were saved from the flood that then consumed the earth. Again, with regards to the Biblical narrative of testing, different types of tests were administered to determine the different attributes of human behaviors, such as tests of faith, honesty, obedience, and dedication, etc. This shows that tests are as old as the existence of man, like Adam and Eve on earth. Ukwuije (2009) revealed many instances in the Bible where some great prophets of God and others were tested based on their faith, honesty, obedience, and power.

In educational settings, the history of testing programme started in China as far back as 2200 BC, when oral examinations were used to select civil servants (officers) in the public service and for promotion decisions (Singh, 2007). This pattern of examination continued in China until 1905, when it was officially abolished. The Chinese system of examination triggered many other countries to emulate it.

The most basic concept underlying educational and psychological testing is individual differences and the publication of Charles Darwin's book, The Origin of Species, in 1859. This established an important step toward understanding the concept of individual differences. In 1869, Sir Francis Galton applied Darwin's theories to the study of human beings, which he articulated in his book, “Hereditary Genius." He demonstrated that individual differences exist in human sensory and motor functioning, such as reaction time, visual acuity, and physical strength (Galton, 1879). An American psychologist known as Cattell extended Galton's work and came up with the term "mental test" (Cattell, 1890). From what has been said, it is clear that Darwin and Galton's work on measuring individual differences and Cattell's work on measuring mental ability were the first steps in the development of psychological testing (Singh, 2007).

The second important part of the testing was based on the work of the German psychophysicists Herbart, Weber, Fechner, and Wundt, who are known as the "fathers of experimental psychology." From the work of Herbart, Weber, Fechner, and Wundt came the idea that testing, like an experiment, requires rigorous experimental control, such as administering tests under highly standardized conditions. Mathematical models of the mind was developed by Herbart and used as the basis for educational practices. Later, Weber, Fechner, Wundt, Titchner & Thurstone built on this tradition, which led to the creation of the Strong Vocational Interest Blank (SVIB).

The breakthrough in the development of modern tests can be traced to the 20th century when different types of examinations, tests, and instruments were published for various settings such as schools, businesses, hospitals, and the army and for employment. These include intelligence tests, achievement tests, personality inventories, interest inventories, and projective techniques, etc. In 1905, Alfred Binet and T. Simon developed the Binet-Simon scale, and in 1916, L.M. Terman and collaborators made the Stanford-Binet Intelligence Scale available, which became a landmark in the field of testing.

During World War 1 (1914 –1918), the development of Army Alpha and Army Beta human ability tests led to the emergence of standardized achievement tests that provided multiple choice questions that were standardized on a large scale sample to produce norms against which the results of new testees could be compared. At this time, personality tests was used in measuring presumably stable characteristics or traits that theoretically underlie behavior, began to receive serious attention. In 1920, the earliest personality test, known as the Woodworth Personal Data Sheet, a structured paper-and-pencil group test, was published. Its simplistic assumption that the content of an item could be accepted at face value led to the development of projective personality tests, like the Rorschach Inblot Test (1921) and the Thematic Apperception Test (TAT) (1935). The two tests present ambiguous stimuli (pictures) depicting a variety of scenes and situations. While the Rorschach test required the client to explain what the inkblot might be, the TAT asked the client to make up a story about the ambiguous scene. Psychoanalytically oriented psychologists believe that behavior is determined by unconscious processes more than conscious ones, and that a test that asks straightforward questions is unlikely to tap the roots of an individual's personality characteristics. Projective tests assume that an individual will 'project' his or her personality into the ambiguous situations of such tests and thus make responses that give clues to this personality. As of today, there are several thousand different types of tests available and published in An Annotated Bibliography of Mental Tests and Scales. Other sources where useful information could be found include the Mental Measurement Year Book.

# 4.0 WHAT WE MEASURE AND EVALUATE IN SCHOOLS

## 4.1. Student's Traits (Unseen)

The business of schooling is teaching and learning. Those directly involved in this business are teachers and learners, In essence, teachers are found in the school because learners or students are there. Where there are no learners in school, teachers will not be engaged. In the schools, the role of teachers is to aid and guide the learners or students to learn for them to acquire the needed attributes such as knowledge, attitudes, skills and competencies. Acquisition of these attributes will assist them to have a relatively permanent change in their behavior and character due to constant practice, training or experience gained. Hence, every individual learner has certain qualities, attributes, or traits. Traits are characteristics or attributes of individuals about which information is required. These characteristics or attributes are simply referred to in this lecture as the unseen things. In the school setting, the learners' ***character and learning*** for the award of the institution's certificate or degree are assessed, measured, and evaluated based on what they have been taught. Character and learning are simply the unseen things (qualities, characteristics, or traits of the learners) that teachers assess, measure, and evaluate in schools. This assessment and measurement processes informed every university management to always make that declarative statement after a final decision (that is, judgment = evaluation) is made on the students' result scores during convocation ceremonies for the conferment of higher and bachelor's degrees on the graduands. The declaration is"... I present to you persons... who have been found worthy both in character and in learning to be admitted into the degree of..."

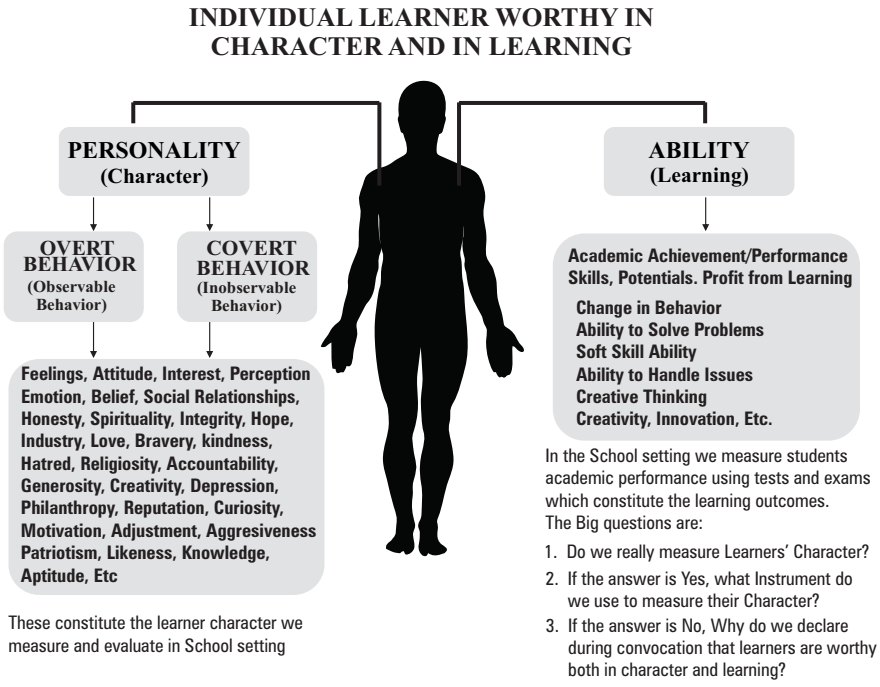


**Figure 1: Individual Learner worthy in Character and in Learning**

It is based on the teaching-learning process that the learning objectives are achieved. To determine if the learning objectives are achieved is through assessment, measurement, and evaluation of the qualities or attributes or characteristics or traits of learners or students. Consequent upon this, some psychologists such as (Bloom, Engelhart, Hill, Furst & Kratwohl, 1956; Anderson & Kratwohl, 2001; Kratwohl, Bloom, & Masia, 1976; Harrow, 1972; Simpson, 1972 cited in Gronlund, 1985; Ezewu, 1985 and Ubulom, 2001) saw the need to classify the taxonomy of educational outcomes into cognitive, affective, psychomotor, psycho-productive and psycho-manipulative domains. A comprehensive evaluation of educational outcomes must include samples of learner behavior from all three domains.

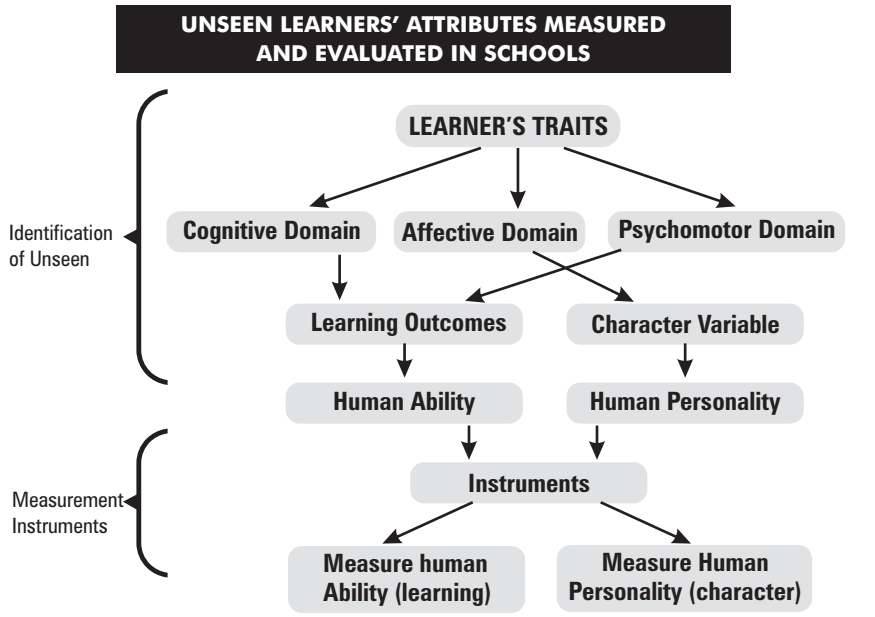


**Figure 2: Unseen Learners' attributes Measured and Evaluated in Schools**

Figure 1 shows the classification of the learners' traits, characteristics, or qualities built into cognitive, affective, and psychomotor domains, generally referred to as the head, heart and hand respectively pictorially presented as Plates 1, 2 and 3.

***1. Cognitive Domain:*** The cognitive domain simply refers to the intellectual results of schooling; that is, the improvement in the individual's intellectual structure, his increase in knowledge, and his ability to reason rather than only to remember. The cognitive characteristics include outcomes like ability or intelligence, academic achievement, and aptitudes. These traits are also known as intellectual characteristics.

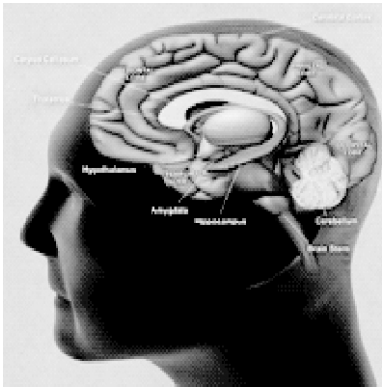

**Plate 1:**
**Cognitive Domain (The Head)**

***2. Affective Domain:*** The affective domain is simply the individual's psychological and emotional characteristics; that is, his acquisition of certain desirable behaviour and characteristics such as attitudes, interests, and appreciation. These characteristics include the individual's emotional feelings, attitudes, anxiety, interests, self-concept, and other personality traits, which are non-intellectual in nature.

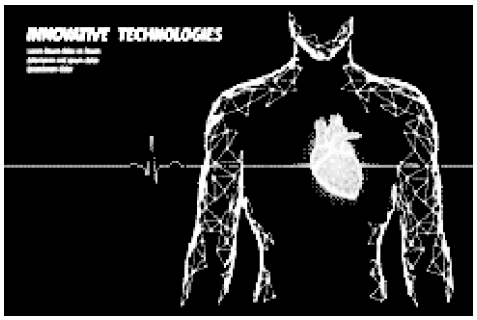


**Plate 2:**
**Affective Domain (The Heart)**

***3. Psychomotor Domain:*** The physical manipulative skills learnt in school are referred to as the psychomotor domain. This type of characteristic deals with movements such as gross and finely coordinated movements of parts of the body (Joe, 1995).

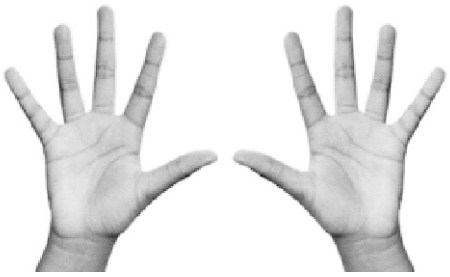

Plate 3: Psychomotor Domain (The Hand)

Through the application of mathematical techniques, the measurement process facilitates the understanding of the nature of a variable or trait. Thus, measurement may be defined as the science of assigning numerical data (discrete or continuous) to the characteristic properties of objects, events, and systems in order to precisely describe the object, event, or system. Measurement makes ideas and concepts clearer, and knowledge and skills more organized and comparable.

## 4.2. Students' Individual Difference (Unseen)

Individuals differ in many ways, and no two individuals are exactly the same. Also, no two persons can share the same traits or characteristics. Even identical twins may not be exactly the same. We can only say that a child resembles his father or mother or any of his relatives. Hence, each individual child is said to be unique, and his uniqueness implies that there is no typical child for whom a general educational programme would be favorable without some changes. It therefore becomes imperative for teachers to understand and appreciate individual differences so as to systematically plan and monitor an ideal educational programme that provides each and every child with the educational experiences that are necessary to promote the child's interests and potential.

The term "individual difference" is synonymous with the concept of personality, which is both seen and unseen thing. Every one of us differs in the inherent traits that make up our personality; for instance, in our character or behaviour, sex, age, physical appearance, socio-economic background, home background, intellectual interests, attitudes, emotional feelings, etc., they cannot be the same. Even so, differences in individuals may not just be in their physical variations, such as heights, weights, and shapes. There may also be variations in the individuals' intelligence, temperament, and needs, as well as so on. No matter their background, personality assessment instruments possess their own distinctive, unique characteristics. Some of us are either slow or quick to anger; some are shy or fearful, while others readily go where angels fear. These are also applicable to students or learners.

Learners are unique individuals. This uniqueness is a function of the biological make-up at conception (nature) and/or the environmental influences (nurture) on the individuals.

## 4.3. Taxonomy of Learning Outcomes for Students' Assessment

In order to specify the objective of education behaviourally and accurately for effective teaching, learning, testing, and measurement, eminent psychologists have come up with the taxonomy of educational objectives, which are the cognitive, affective, and psychomotor domains. These are also known as learning outcomes domains earlier discussed.

### *4.2.1. Cognitive Domain:*

Bloom *et al.* (1956) developed the cognitive domain classified six (6) levels of complexity, as presented in Figure 3.

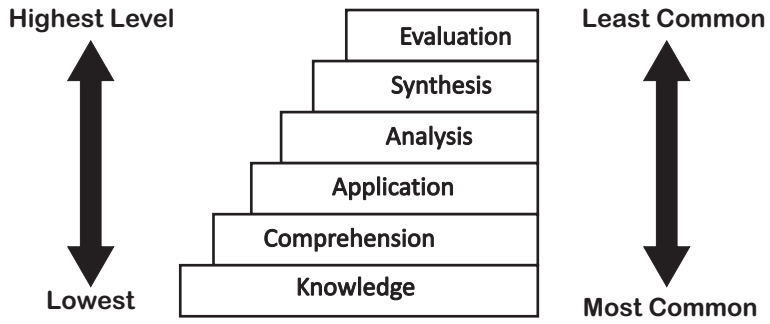


**Figure 3: Taxonomy of educational objectives cognitive domain**

***1. Knowledge Level:*** Objectives at this level require the students to remember. Test items ask the student to recall or recognize facts, terminology, problem-solving strategies, or rules.

***2. Comprehension Level:*** Objectives at this level require some level of understanding. Test items require the student to change the form of a communication (translation), to restate what has been read to see connections or relationships among parts of a communication (interpretation), or to draw conclusions or consequences from information (inference).

***3. Application Level:*** At this level, objectives require the student to use previously acquired information in a setting other than that in which it was learned. Application differs from comprehension in that questions requiring application present the problem in a different and often applied context. Thus, the student can rely on neither the question nor the context to decide what prior learning information must be used to solve the problem.

***4. Analysis Level:*** Objectives written at the analysis level require the student to identify logical errors (e.g.,

point out a contradiction or an erroneous inference) or to differentiate among "facts," "opinions," "assumptions," hypotheses, or conclusions. Questions at the analysis level often require the student to draw relationships among ideas or to compare and contrast.

*5.* ***Synthesis*** **Level:** Objectives written at this level require the student to produce something unique and original. Questions at the synthesis level require students to solve unfamiliar problems in a unique way or to combine parts to form a unique or novel whole.

*6.* ***Evaluation Level:*** Objectives written at the synthesis level require the student to produce something unique and original. Questions at the synthesis level require students to solve unfamiliar problems in a unique way or to combine parts to form a unique or novel whole.

However, there is a similarity between the old cognitive taxonomy of Bloom et al. (1956) and the new one developed by Anderson & Kratwohl in 2001. What is new in Anderson and Kratwohl's taxonomy of the cognitive domain is the last higher level of creativity. This level places emphasis for learners to be prepared through the teaching-learning process on the need for them to be creative and innovative. This means that Nigerian schools should emphasize the advancement of science and technology through creativity and innovation. Both Figures 2 and 3 show that the levels are presumed to be hierarchical. That is, higher-level objectives are assumed to include and be dependent on lower-level cognitive skills. Each level of the taxonomy has different characteristics.

Figure 4 presents the difference between the original domain and the new domain.

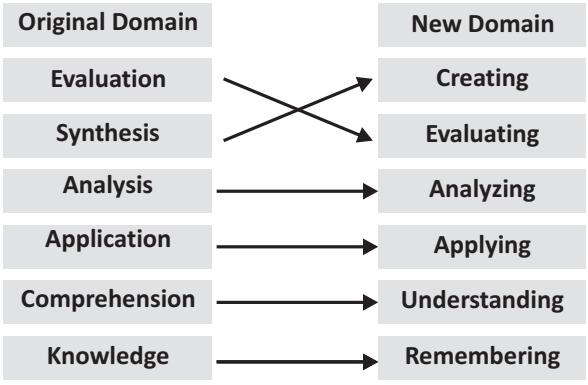


Figure 4: Taxonomy (Bloom's, 1956) & Anderson & Kratwohl, 2001)

### *4.3.2. Affective Domain*

The Affective Taxonomy was developed by Kratwohl et al. (1964). They classified this domain into six (6) levels, as shown below:

1. ***Receiving (Attending):*** Progressing through this level requires that a student have at least an awareness of some stimulus. Once this has occurred, a willingness at least to listen to or attend to the stimulus must be present (i.e., tolerance). A student will next be able to attend selectively to various aspects of the context within which the stimulus exists, differentiating those that are relevant to the stimulus from those that are not.

2. ***Responding:*** This refers to active participation on the part of the learner. At this level, the learner does not only attend to a specific phenomenon; rather, he also reacts to it in some other way. At this stage, learning outcomes emphasize acquiescence in responding (readassignment materials), willingness to respond (voluntarily read to acquire knowledge) and satisfaction in responding (read for pleasure).

*3.* ***Valuing:*** This is concerned with the worth or value a learner attaches to a particular phenomenon, behavior, or thing. It ranges in degree from the simpler acceptance of a value (desires to improve skills) to the more complex level of commitment (assumes responsibility for the effective functioning of the group). Learning outcomes at this level are concerned with behaviours that are consistent and stable enough to make the values clearly identifiable.

*4.* ***Organization:*** As ideas are internalized, they become increasingly interrelated. That is, they become organized into a value system. This requires first that a student conceptualize a value by analyzing interrelationships and drawing generalizations that reflect the valued idea. It may be noted that such an activity is cognitive.

*5.* ***Characterization by a value or set of values.*** Students operating at this level behave in a way that is consistent with their value system, avoiding hypocrisy and behaving consistently with an underlying philosophy "automatically." The first sublevel is characterized by a generalized set. This means the individual is predisposed to perceive, process, and react to a situation in accordance with an internalized value system. The next level, characterization, can be seen in how a person's thoughts and actions match up with each other.

### *4.3.3. Psychomotor Domain*

This taxonomy of psychomotor behaviors was developed by Harrow (1972). This domain is classified into five (5) levels as shown on the next page:

***1. Reflex Movement:*** Reflex movements are involuntary movements that are either evident at birth or develop with maturation. Sub-levels include segmental reflexes, inter-segmental reflexes, and supra-segmental reflexes.

***2. Basic-Fundamental Movements:*** Basic fundamental movements are inherent in more complex or skilled motor movements. Sublevels include locomotor movements, non-locomotor movements, and manipulative movements.

***3. Perceptual Abilities:*** Perceptual abilities refer to all the abilities of an individual that send input to the brain for interpretation, which in turn affects motor movements. Sublevels include *kinesthetic, visual, auditory, tactile discrimination, and coordinated abilities.*

***4. Physical Ability:*** Physical abilities are the characteristics of an individual's physical self, which when developed properly enable smooth and efficient movement. Sublevels include endurance, strength, flexibility, and agility. Skilled movements are the result of learning. Often, complex learning results in efficiency in carrying out a complex movement or task. Sublevels include simple, compound, and complex adaptive skills.

***5. Non-discursive Communication:*** This communication occurs through movement. Such nonverbal communication as facial expressions, postures, and expressive dance routines are examples. Sublevels include expressive movement and interpretive movement.

# 5.0. BASIC CONCEPTS IN EDUCATIONAL EVALUATION

## 5.1. The Concepts of Test and Examination

An examination is an important tool for evaluating the learning outcomes and requires proper planning to meet high standards in all the test development, test administration, and post-test administration/award procedures. It is the process or the act of testing for knowledge and ability in order to determine the value. This implies that a test is a means of measuring the knowledge, skills, or aptitudes of an individual. The word "examination" is a broad term which connotes the assessment of knowledge, skills, and intelligence acquired by the individual in an educational system (Osindeinde, 2000).

Some scholars view tests and examinations as meaning the same thing. It is a measurement device or technique used to quantify behavior (Kaplan & Saccuzzo, 2009). According to Ojerinde (2011), a test or examination connotes the presentation of a standard set of questions to be answered. As a result of a person's answers to such a series of questions, a measure of the characteristics of that person is obtained (Mehrens and Lehmann, 1991). It may also be defined as a standard set of items which are specific stimuli to which a person overtly responds and which can be scored. Items, that is, the specific statements, questions, tasks or problems that comprise the test, are the building blocks of tests. Responses to test items produce a measure, a numerical score or grades. Tests and examinations are simply stamps of external authority in which result scores are used to take decisions and take valued judgment and thereby placing a mark of distinction or stigma on pupils. It is an instrument or a systematic procedure for measuring a sample of behavior.

An examination is an instrument used to measure a sample of behaviour. Tests and examinations are instruments for determining the degree of change that has occurred among individuals or things following the end of treatment conditions. These are the systematic procedures for comparing the behavior of two or more persons. Finally, they are objective instruments for measuring what is either in education or another human activity. In psychometrics (the science of testing), the words "examination" and "test" mean the same thing and are used for assessment in schools and will be used in that sense in this discourse.

If a question is asked: ***"How well does the individual learner perform, either in comparison with others or in comparison with a domain of performance tasks?"*** In order to answer this question, it means that **norm-reference assessment** is used to determine "how well the individual learner performs in comparison with others," while **criterion-reference assessment** is used to compare a domain of performance tasks (See Figure 5).

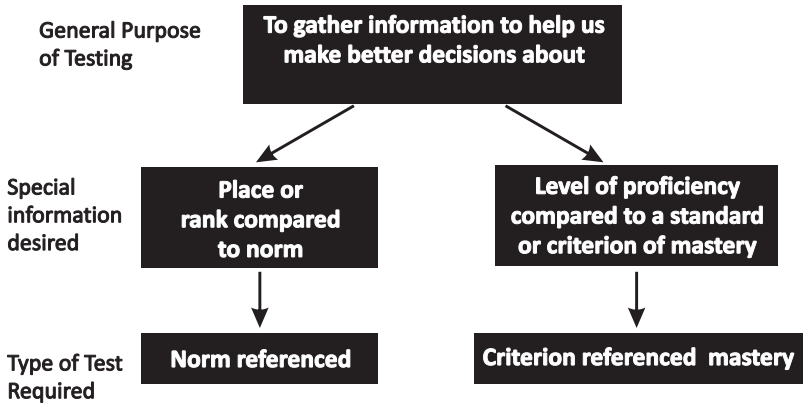


**Figure 5: Relationship between Purpose of testing, Information desired and the type of test required**

## 5.2. Measurement

Measurements are used in both the physical and educational sciences. In the physical sciences, it is known as physical measurement, while in educational sciences, it is referred to as educational, psychological, or mental measurement. Physical measurement exists in the physical and material world (Sidhu, 2007) and is concerned with dimensions like age, weight, length, capacity, etc. These measures are quantitative and therefore require units like years and months, kilograms and grams, centimetres and metres, litres, etc.

Measurement is the process used in obtaining the score and may involve the use of test or non-test methods. Educational measurement requires the quantification of attributes according to specified rules (Dibu-Ojerinde, 2012). It is the quantitative description of behavior, events, objects, or things using certain devices. It is the assigning of numerals to objects or events according to rules. In other words, it is the application of rules for assigning numbers to objects or events. A classic definition of measurement is simply the process of collecting data concerning the traits or characteristics or attributes of students, events, or objects based on specified rules for the purpose of research generalization or making evaluative judgments.

There is a saying that "whatever the mind can conceive can be measured". Hence, a great philosopher, Galileo, once stated, "measure what is measurable, and what is not measurable, make measurable". This means that there is nothing on earth that cannot be assessed, quantified, measured, and evaluated. For instance, human beings' traits or characteristics or properties such as interests, beliefs, social relationships, attitude, honesty, hope, industry, bravery, kindness, hatred, and love can be measured. Other uncommon and unseen variables that can be measured are: religiosity, spirituality, accountability,

generosity, creativity, intelligence, depression, intelligent quotient, philanthropy, reputation, curiosity, motivation, adjustment, patriotism, aggressiveness, likeness, knowledge and aptitude, etc. In the educational system, what to assess, quantify, measure, and evaluate is virtually endless. It is based on this premise that necessitated the choice of this lecture topic.

## 5.3. Assessment

In the school environment, classrooms are busy places where teachers and students effectively interact during the teaching-learning process. On daily basis, teachers in the classroom make decisions about their students, the success of their instruction and the classroom climate. Assessment is the process of collecting, synthesizing, and interpreting information to aid in decision making (Airasian, 1997). It involves much more than scoring and grading paper-and-pencil tests. Assessment in the classroom situation includes the full range of information teachers gather in their classrooms concerning the learners; information that assists them understand their students, monitor their instructional delivery, and establish a viable classroom community as well as variety of ways teachers collect, organize, analyze, synthesize, and interpret the information so gathered. Therefore, assessment is an indispensable tool that is usually used to determine whether or not learning institutions (that is, schools) have attained their goals of making their students learn.

## 5.4. Evaluation

Evaluation can be viewed as applied research, examination, research design, and programme of study (that is, area of specialization). From observation of our daily activities, we can also infer that everybody does one form of evaluation or the other. Nevertheless, everyone is not an evaluator because

evaluation is scientifically done in its modern form. It is an associate of research, and we all know that research is a scientific endeavour, done sequentially and systematically. A good example of what can be called evaluation is medical examination of sick people, especially as done in tertiary health institutions, where in addition to asking questions, the patient is examined by the specialist, using some calibrated, reliable, and valid instruments, as well as being sent for laboratory investigations before the medical specialist arrives at the nature of their sickness. Also, evaluation in education, as in other areas of human endeavours, is carried out scientifically after being well thought out, followed by the crafting of the research questions and hypotheses, and must also take cognizance of the possible and appropriate method of analysis (statistical and/or qualitative) to be employed, among other things. Thus, the development or adoption/adaptation of instruments for use is usually customized and most often useful only for one purpose, or occasionally for a few similar ones with modifications. This indicates that evaluation research in education and social and management sciences also requires the use of instruments for collecting reliable and valid data. However, this process has the same feature of calibration (validation) as the medical evaluation equipment. The calibration (more appropriately termed "validation") differs in method. Even at this, the medics depend to some extent on other medical scientists to provide evidence to carry out a thorough evaluation as has been outlined earlier. In the legal profession, it is the judges that evaluate the evidence adduced in court by the advocates in a particular case, using the constitution and other relevant legal frameworks for their evaluation before making their pronouncements (that is, giving judgments) on the case. Thus, those saddled with the responsibility of passing value judgment differ from one discipline to the other. In every sphere of life, we evaluate

ourselves in everything we do geared towards achieving our target objectives much better.

Usually, during an evaluation exercise, the objectives or theory of change guiding a policy, programme or project and whatever may be the object of an evaluation are examined by using relevant instruments to collect data from appropriate stakeholders, so as to determine the extent to which the objectives are being realized (formative) or have been realized (summative). Data collection could be on how the implementation is being carried out or the policy/programme outcome. In the education system, it could be to determine how teaching-learning interaction is being carried out, whether it is yielding the right result or not, or to determine who is responsible for what is happening and what is not happening, what is to be done to ameliorate any discovered anomalies to return implementation to track, etc.

## 5.5. Difference between Measurement, Assessment and Evaluation

Measurement includes tests, which are totally separate from measurement. It provides the tools for assessment, after which evaluation takes place. Assessment consists of collating, scoring, analyzing, and interpreting the data which was gathered through measurement instruments. While evaluation, which is the last of the three stage-process of evaluation, scrutinizes the correctness of the analyses and interpretations as provided by the assessment stage of the process, to ensure that the interpretations are consistent, valid, correct, and usable in terms of the conclusions to be drawn from them. Evaluation provides alternative decision proposals to be inferred from the exercise and reported to the decision-maker, and also from which judgment could be passed accurately. This process is shown more vividly in Plate 4 and Table 1, respectively.

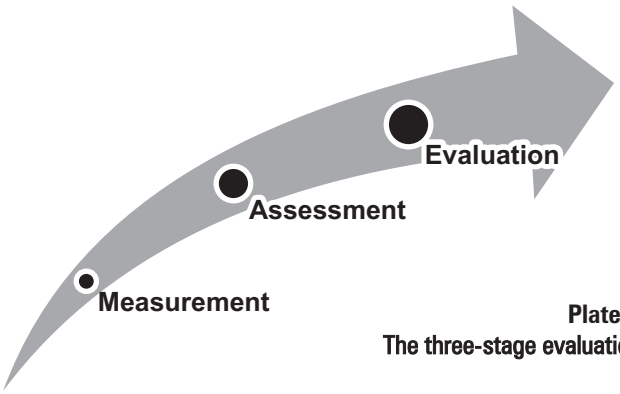


**Plate 4:**
**The three-stage evaluation process illustrated.**

**Table 1: Suggested Elements of Measurement, Assessment and Evaluation**

| No | Measurement | Assessment | Evaluation |
|---|---|---|---|
| 1. | Quantities are assigned to the attributes of an object to be measured using any of the four statistical scales of nominal, ordinal, interval or ratio as the case may be | The returned instruments are scored and interpreted | The result from analyzing evaluation data is subjected to further scrutiny to ensure that the interpretations are correct and usable |
| 2. | Relevant instruments on the basis of the chosen scale are developed to carry out the measurement | The scores are collated for analysis | Different suitable and relevant inferences are derived from the data interpretation to prepare a set of appropriate information for decision making or judgment of value to be passed |
| 3. | The measuring instruments so developed are administered on the target audience/ participants, who respond to the items on the instrument as may be appropriate | The data are then analyzed and interpreted | From the alternatives provided by the above exercise, judgment of value is passed and/or appropriate decision is made for systemic and learning improvement. |
| 4. | — | — | The above process ultimate provides feedback to the system which invariably may lead to another round of the evaluation or teaching-learning improvement. |

Table 1 reveals some elements that distinguish the three concepts in the evaluation process from one another. The table depicts some elements one may find at each stage of the evaluation process. It is noteworthy to state that evaluation also reveals the level to which there is accountability in programme conception, design and implementation. That is how responsive the programme is to the needs of those whom it is meant to serve and how much each person concerned with its operation takes responsibility for their actions. Similarly, evaluation and accountability are linked to programme quality assurance.

## 5.6. Forms of Examinations

There are two major forms of examination taken in Nigeria, and they are classified according to who conducts the examination. These are internal and external examinations. While the items/questions are constructed by the classroom teachers and administered by the teachers in their individual institutions, an external examination is an examination conducted on behalf of the state and open to all those who meet the defined entry requirements. These examinations can be categorized into two main groups: performance and written tests.

### *5.6.1. Public Examinations in Nigeria*

These examinations are mainly external by design, and are usually taken at the end of a specific course or educational level. They include the Teachers' Grade I1 Certificate Examination (National Teachers' Institute, NTI, Kaduna); Public Service Examinations (ASCON, Badagry); Junior School Certificate Examination (JSCE, National Examinations Council and the Ministry of Education of each State); Senior School Certificate Examination (SSCE, WAEC, and NECO); and University Tertiary Matriculation Examination (UTME, Joint Admissions and Matriculation Board JAMB).

## 5.7. Tests and other Measurement Instruments used is Schools

As long as many types of students' behavior exist, so too does the existence of many types of tests. These several tests are classified into two broad categories: personality and ability tests, which are diagrammatically presented in Figures 6a, 6b, and 6c.

**CLASSIFICATION OF HUMAN ABILITY TESTS**

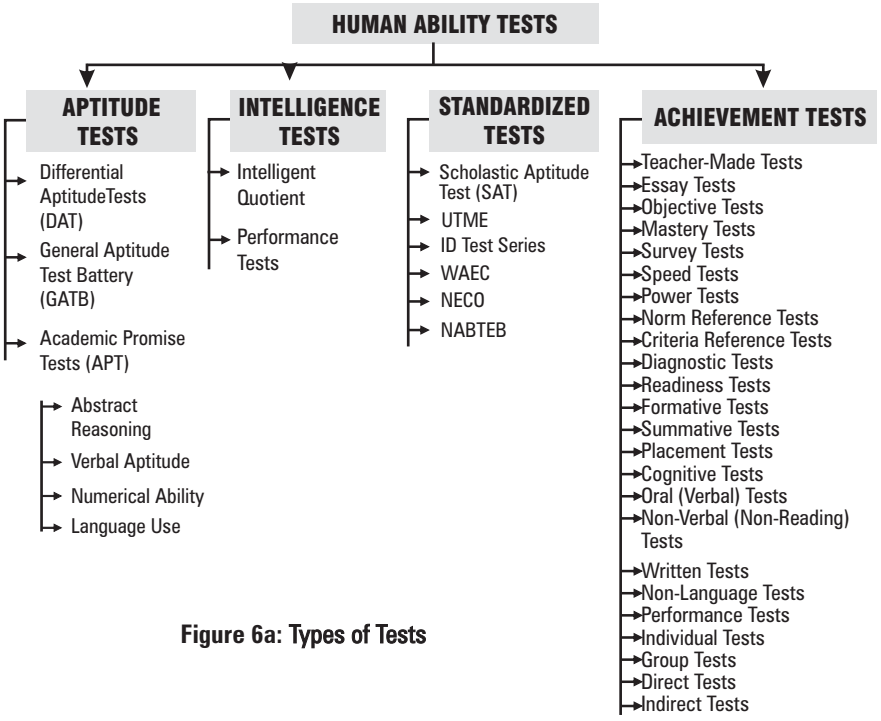


**Figure 6a: Types of Tests**

### *5.7.1. Personality Tests:*

Personality tests measure patterns of behavior and thinking that prevail across time and situations and the personal characteristics that underlie and determine them. Figure 6b presents personality tests.

### *5.7.2. Ability Tests:*

Ability tests are designed basically for potential, capacity, and skills, and they are utilized to elicit information from learners in order to measure their knowledge, understanding, and skills in terms of speed and accuracy. Examples of ability tests are aptitude, intelligence or performance, standardized and achievement tests. The types of ability tests are shown in Figure 6c.

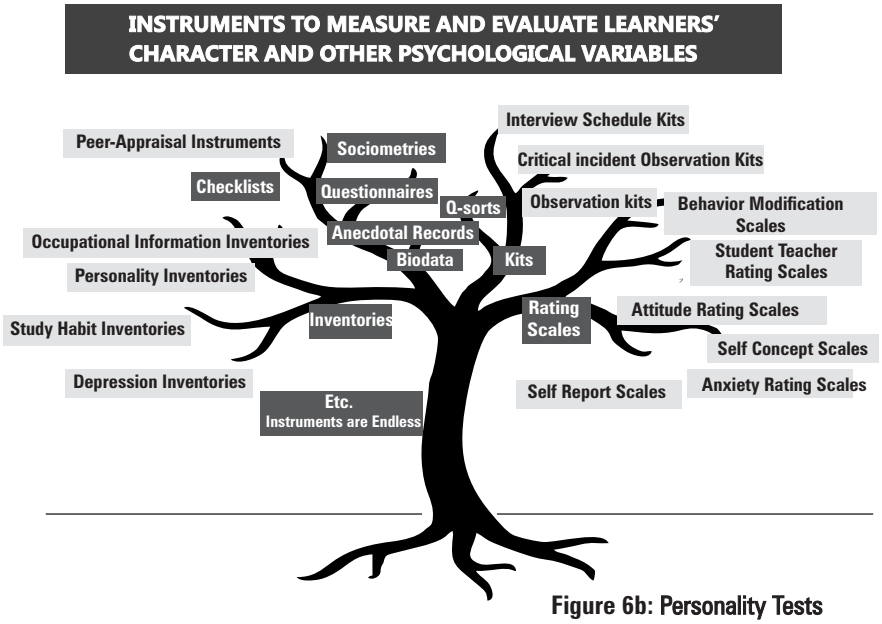


**Figure 6b: Personality Tests**

### *5.7.2(a) Aptitude Tests:*

Aptitude tests measure an individual's capacity to benefit from future learning experience. This is the type of test administered in order to determine or predict an individual's future potential to successfully learn various tasks. It is broadly divided into three parts: a special mental aptitude test, a general mental aptitude

test, and a multiple mental aptitude test. A special mental aptitude test measures one specific area, like mechanical, clerical, language, or artistic tests, etc. The general mental aptitude test measures individual intelligence, mental ability, and intelligent quotient; it is made up of an intelligence test, a mental ability test, or an IQ test. The multiple mental aptitude test measures many factors and consists of sub-tests (batteries); e.g., the Differential Aptitude Test (DAT), the General Aptitude Test Battery (GATB), and the Academic Promise Test (APT), which has four subsets (Abstract Reasoning, Numerical Ability, Verbal Aptitude, and language usage).

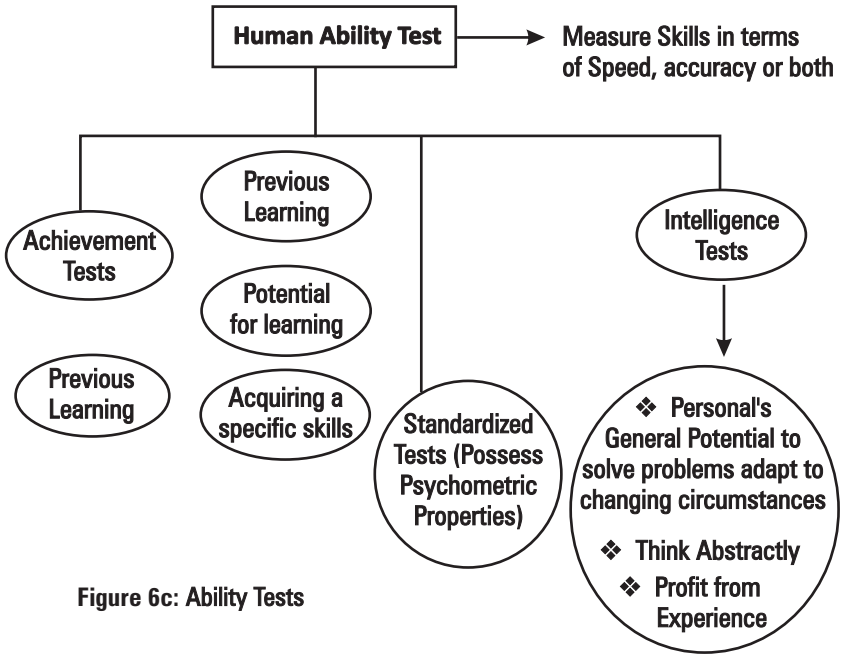


Figure 6c: Ability Tests

### *5.7.2(b) Intelligence Tests:*

Another ability test is the intelligence test, which traditionally measures a person's general potential to solve problems, adapt to changing circumstances, and think abstractly. It is also known as the "general mental aptitude test" or "performance test," and it measures a student's general ability to learn. The tests are classified based on age levels; hence there are intelligence tests for pupils or students who are 3, 4, 5,..., 20 years old, respectively. A student's intelligence quotient (IQ) is measured in terms of his/her mental age (MA) and chronological age (CA), the student's actual age. It is computed thus.

IQ = MA/CA x 100

For instance, if Belema is six years old and she took an intelligence test in which she answered correctly up to nine years old, then her IQ = MA/CA x 100;

Where: Her Mental Age (MA) = 9 years Old

Chronological Age (CA) = 6

Therefore Belema's IQ = 9/6 x 100 = 150
Since Average IQ is 100; therefore 150 indicates a high IQ

Usually, when psychologists, school teachers and counsellors administer IQ tests, the scores are grouped or identified with some labels or names. Other factors that may affect the development of IQ may include poor health, inadequate nourishment during mothers' pregnancy, lack of adequate stimulation in school and inappropriate method of teaching and learning (Ukwuije, 2009). Intelligence tests have been criticized among others as being culturally biased and this has led

to the development of culture fair intelligence test; for example, the Raven Progressive Matrices. It is important to note that in Nigeria, the use of aptitude and intelligence tests is rare, non-existent and even not utilized as opposed to developed countries of the world.

### *5.7.2(c) Standardized Tests:*

These tests are constructed or written by specialists or test construction experts known as psychometricians. The tests have norms, manuals and cover wide content areas of the school syllabus. For example I.D. Test Series, Scholastic Aptitude. Test (SAT) and Unified Tertiary Matriculation Examination (UTME). They possess psychometric properties.

### *5.7.2(d) Achievement Tests:*

Achievement tests assess knowledge obtained through direct experience or instruction. These are tests administered to determine how much has been achieved after teaching. These tests can take different forms like survey test, speed test, power test, norm reference test, criterion reference test, diagnostic test, readiness test, formative test, summative test, cognitive test etc. An important thing to note here is that a particular test can function in more than one capacity. For example, a norm reference test constructed by a classroom teacher can be a speed test, formative in nature and of the objective format. In our educational institutions, evaluation in terms of examination, achievement tests is commonly used. They comprise of teacher-made tests and objective and essay test items. The teacher-made test is the most commonly used achievement test in our educational institutions. In most cases, teacher-made tests are crafted to take the form of objective and essay test items.

### *(i) Teacher-Made Tests*

Vice Chancellor Sir, we are aware that the type of achievement tests teachers and lecturers administer in all levels of education in Nigeria during termly and semester examinations is a teacher-made test. A teacher-made test is the day-to-day method of assessing students' learning. It serves as part of the learning process because it is simply a criterion-referenced test designed to assess students' mastery of a specific body of knowledge. In essence, if students perform well in the teacher-made tests, then they are more likely to earn good grades in external examinations.

These are tests designed by the classroom teacher to evaluate the learners. They can be essay (short or long) or objective (true/false, multiple choice, completion, arrangement, and matching) tests, or both. They do not seem to possess any psychometric properties. This is due to the fact that the teachers who craft or develop teacher-made tests (whether essay or objective) have little or no knowledge and skills in basic test construction principles. They only use residual knowledge when creating test items.

### *(ii) Essay Tests*

An essay test is a test item which requires a response composed by the examinee, usually in the form of one or more sentences, of such a nature that no single response or pattern of response can be listed as correct, and the accuracy and quality of which can be judged subjectively only by one skilled person or a specialist in the subject. Essay tests are classified into short-response essay and extended-response essay tests.

### *(iii) Objective Tests*

This is the type of test whereby the test taker selects his answer from options supplied by the test constructor. These types of items are referred to as "objective test items." In reality, the good thing about an objective test item is its simple scoring pattern. This is because anyone can score the test using a simple procedure without raising issues of reliability in scoring. Basically, objective tests are used to elicit responses from the testees concerning their traits or attributes in order to measure the three lower levels of their cognitive domain, namely, knowledge, comprehension, and application. An objective test does not contain only multiple choice items (MCI) because MCI is only one form of objective test. Other forms of objective tests are (a) supply (completion) test, (b) alternative response (true/false or Yes/No test), (c) matching test, (d) rank-order test, and (e) pictorial test items.

The objective test is made up of multiple-choice, true-false, completion, and matching. They are referred to as select or fixed response types. What differentiates the objective test from the essay test is that for the objective test, two to five response options are usually provided for the testees to choose one as the correct answer key, while other provided incorrect answer options, which are very similar to the correct answer key, are just distracters. Others are association, substitution, incomplete, combined response, multiple response, paired item, interpretive, and answer-until-correct. The two option types are Yes/No or True/False, while the three to five options have a correct answer key and 2-4 distracters. In this case, it is only those who really know the particular answer that can tick the correct option.

## 5.8. Theories in Testing

However, in a review of over 300 studies on projective tests, Lundy (1985) found low reliability and validity for projective tests such as the Rorschach and Thematic Apperception Test (TAT). In a comprehensive and critical review of the scientific status of projective tests, Lilienfield, Wood, & Garb (2000) corroborate this position. It was discovered that projective tests could not withstand a vigorous examination of their psychometric properties (Wood, Nezworski, Lilienfield & Garb, 2003). In 1943, the Minnesota Multiphasic Personality Inventory (MMPI) revolutionized structured personality tests, using empirical methods to determine the meaning of a test response. This era reached a greater height with the appearance of personality tests based on the statistical procedure of factor analysis, a method of finding the minimum number of dimensions called factors, to account for a large number of variables. The introduction of the Sixteen Personality Factor Questionnaire (16PF) in the late 1940's remains an important example of a structured test developed with the aid of factor analysis. Today, factor analysis is used in the design and validation of most major tests. From the 1950's came rapid changes in the status of testing with applications to health, industry, business, counseling, law, education, social work, and schools to solve practical human problems.

Basically, there are three (3) types of theories of testing, namely, Classical Test Theory (CTT), Item Response Theory (IRT), and Generalizability Theory (G-theory). The 1960s saw the emergence of a new measurement perspective, the Item Response Theory (IRT), after the Latent Trait Theory (LTT) was first initiated and introduced in 1950 by a mathematical sociologist, Paul Lazarsfield. Its seeds lie in the psychometric tradition of the Classical Test Theory (CTT), upon which testing has hitherto been based. This new theory was promoted

largely by Frederic Lord (see Lord, 1952). Unlike the CTT, which is based on a respondent's observed score on a whole instrument, the item is the unit of focus in the IRT. Its simplest model, the Rasch or One-Parameter Logistic (IPL) model, utilizes the Item-Characteristic Curve (ICC) as building blocks, which describe the performance of an item in a test and is unique to each item. An important attribute of IRT is that its parameters, the item and person parameters, are not test or sample dependent. Its methodology led to applications in the equating of alternate examination forms, computerized adaptive testing, item banking, and the detection of test bias, among others (Lord, 1980). De-Ayala (2009) identified three reasons why IRT has not been embraced by everyday researchers. These include the large sample size required, its complicated mathematics, and the software for estimating the parameters of the model that is not readily available.

Another important theory of testing recently introduced in the field of measurement and evaluation is the Generalizability Theory. Generalizability Theory, otherwise known as G-theory, is a statistical theory that is used for the evaluation of the reliability or dependability of behavioral measurements. It emerged as an advancement of the Classical Test Theory (CTT), otherwise referred to as the True Score Theory. In CTT, a person's (p) observed score (Xpi) on an item (i) is assumed to comprise both a true score (Xt) and an error component (Xe). However, the error component of Xpi is said to be an undifferentiated random variation which cannot be disentangled (Webb and Shavelson, 2005). To have the opportunity of disentangling the components of measurement errors, Lee Cronbach and his colleagues (Cronbach, Gleser, Nanda, & Rajaratnam, 1972) propounded a psychometric theory that is able to identify the major sources of error in behavioral measurements and pinpoint the magnitude of variability introduced by each of the sources of error in the

measurement. G-theory does not make any assumptions about equal means, variances, or covariances of observed scores. Instead, it makes only assumptions about random parallel tests from the same universe.

G-Theory also provides two reliability indexes: (a) generalizability coefficient (classical relative-reliability) and (b) dependability coefficient (absolute reliability). These coefficients are determined after the sources of errors introduced into measurement have been identified and the weighted average contribution of each of the sources of variability has been determined. A measurement situation has characteristic features such as test form, test item, rater, and/or test occasion. Each characteristic feature is called a "facet of a measurement." A universe of admissible observations, then, is defined by all possible combinations of the levels of the facets (e.g., items, occasions).

In G-theory, variability in measurement is attributable to sources like the student or person whose traits are being measured (p), the items (i) employed in conducting the test, the occasion (o) under which the testing was conducted, and the interaction between the person, the items, and some other errors not included in the G-theory analysis known as residuals (e). In G-theory, measurements are regarded as random selections of admissible observations from a universe. A universe is defined in terms of those aspects (called facets) of the observations that determine the conditions under which an acceptable score can be obtained. This universe consists of all possible observations that decision makers consider to be acceptable substitutes (e.g., scores sampled on Occasions 2 and 3) for the observation at hand (scores on Occasion 1).

Shavelson and Webb (1991) demonstrated the decomposition of behavioral measurement. According to them, a G-study is designed specifically to isolate and estimate as many facets of measurement error as is reasonably and economically feasible. The study looks at the most important things that different people who make decisions might want to generalize about, such as products, forms, events, and raters.

## 6.0. OTHER BASIC TERMS IN EDUCATIONAL EVALUATION

### 6.1. Measurement Scales in Education

In measurement, the system of rules for assigning numbers to objects must be clearly defined. The basic feature of these types of systems is the scale of measurement. There are three important properties of measurement scales, namely, magnitude, equal intervals, and absolute zero. A scale has the property of magnitude if we can say that a particular instance of the attribute represents more, less, or equal amounts of the given quantity than does another instance. At equal intervals on a scale, it means the difference between two points at any place on the scale has the same meaning as the difference between two other points that differ by the same number of scale units. Where such an event occurs, the relationship between the measured units and some outcome can be described by a straight line or a linear equation. An absolute zero occurs when nothing of the characteristic being measured exists.

There are four scales of measurement associated with the properties just described. They are the **nominal, ordinal, interval and ratio scales**. Nominal scale classifies individuals into two or more groups, the members of which differ with respect to the characteristic being scaled, without any

implication of gradation or distance between the groups; dimensionality is not warranted. In the ordinal scale, individuals are ranked along the continuum of the characteristic being scaled, but without implication of distance between scale positions. The ranks are mere relative positions. The interval (or cardinal) type of scale has equal units of measurement, thus enabling the interpretation of, not only the order of scale scores, but also the distances between them. The highest level of measurement is the ratio scale, which has the properties of an interval scale together with a fixed origin or zero point. In psychological and educational measurement, the level of measurement is at best at interval level, and this delimits the statistical operations that are permissible, as well as the deductions and conclusions that can be reached. Moser and Kalton (1979) provide comprehensive discussion on the use of Thurstone, Guttman, Semantic differential, social distance **and** H-scales. The influence of the errors of central tendency, leniency, severity and halo effects, and the problem of faking are also highlighted.

## 6.2. Purpose of Assessment

Teachers carry out classroom assessment for several purposes. This is because they are required to make a broad range of decisions. The purposes of assessment are to:

(a) Diagnose students' problems;

(b) Make judgments about students' academic performance;

(c) Provide students with feedback and incentives.

(d) Student placement;

(e) Plan and carry out instructional delivery

(f) Establish and maintain social equilibrium in the classroom.

## 6.3. Functions of Assessment

*1.* ***Instructional Functions:*** This is simply a form of formative assessment, whereby test results are used to determine the level of performance of candidates in various subjects.

*2.* ***Guidance Functions:*** Shertzer and Stone (1976) identified some major uses of tests by the counselor in guidance and counseling services and programmes; namely, (a) to secure accurate and reliable information about each candidate's abilities, interests, aptitudes, and personal characteristics in order to assist pupils in self-understanding; and (b) to give academic guidance to the students on how to overcome their weaknesses or how to sustain their areas of strengths; advise the students in their choice of subjects; careers; study habits; study groups; vocational preferences; and psychological and social problems.

*3.* ***Administrative Functions:*** Test results aid administrators in the placement of pupils or students in the appropriate classes based on their performances (pass or fail). Similarly, they are used for the classification of students into different groups (normal class, special, commercial, science, arts, etc.). Test results are used for administrative functions by the management team of the institutions to select individuals for admission, employment, and certification.

During convocation ceremonies, the administrative functions of assessment are used to make a final value judgment on the graduating students by saying that they have been found worthy ***both in character and in learning,*** and they are therefore awarded degrees in their areas of specialization. However, this statement is often only partially true because little or no attention is paid to the assessment of character (affective and psychomotor domains). ***In most universities, little or no instrument or test is being used to elicit***

***information from students during their studies to assess their characters*** (affective and psychomotor domains). These are part of the unseen things that are not always being assessed, quantified, measured, and evaluated at all.

It is assumed that teachers do not know how to quantitatively assess, measure, and evaluate the learner's character because they lack knowledge of the instruments to be used or because they are not exposed to these instruments. It is the teachers obligation assess, measure, and evaluate the learner's character with the use of different types of instruments. That being so, the management of all educational institutions should make it mandatory for teachers to measure and evaluate students' characters in schools using instruments just as they carry out measurement, assessment and evaluation of their students in the different subjects or courses the teach (that is, assessment of students' cognitive learning outcomes).

Experience has shown that the behavior so exhibited by the some graduates despite their beautiful looks clearly indicates that they are not worthy in character even when

Also, it is assumed that teachers do not know how to quantitatively assess, measure, and evaluate the learner's character because they lack knowledge of the instruments to be used or because they are not exposed to these instruments. It is the teachers obligation assess, measure, and evaluate the learner's character with the use of different types of instruments. That being so, the management of all educational institutions should make it mandatory for teachers to measure and evaluate students' characters in schools using instruments just as they carry out measurement, assessment and evaluation of their students in the different subjects or courses the teach (that is, assessment of students' cognitive learning outcomes).

*4.* ***Research Functions:*** Data is used in predictive studies of how well a person will do at a later time in future engagements. Predictions based on quantitative data are more reliable than those based on mere guessing. Assessment data can be used in comparing performance across boards and national boundaries as well as documentation of information. Indeed, without test results, it would have been difficult to conduct empirical studies.

*5.* ***Accountability Functions:*** Institutions are usually required to account for any money given to them, and such reports do include evidence of academic performance and achievements. Students' performance in examinations can be used to determine investment priorities in education. It might be found in performance in public examinations that a segment of society is lagging behind others in a particular aspect. This might inform the government's decision to allocate more resources to education or the development of facilities in the area of weakness so as to improve performance in it. One example of this is putting in place a quota system for college admissions and setting up different kinds of programs to help students who need help.

## 6.4. Classification of Assessment

Assessment is classified into two (2) categories, namely, (i) formative and (ii) summative assessments. Formative assessment is to identify areas in the instruction and learning process that need improvements to enhance the quality of instructional delivery and learning experiences, while summative assessment is to record and report on the students' learning achievements at a given time. Formative assessment enhances students' development through teacher/student classroom interaction, while summative assessment is aimed at providing students with their current capability and identifying whether progress needs to be made.

*Ojerinde (2011), Dibu-Ojerinde (2012) and Asuru (2017) further classified assessment into three (3) categories on the basis of their intertwined purposes; namely, (i) assessment for learning (AFL), (ii) assessment as learning (AAL) and assessment of learning (AOL).*

***(a) Assessment for learning (AFL):*** This is comprised of two (2) phases: (i) Diagnostic or Initial Assessment, and (ii) Formative Assessment. Assessment for learning is used to motivate students and encourage and commit them to being serious in their learning (diagnostic assessment). This is because it clarifies their purpose—that is, what to learn, their expectations, and provides them with appropriate guidance on how to improve their learning. It occurs throughout the learning process, from the onset of the course of study (formative assessment) to the time of summative assessment (end of study). The examinations for selection, classification of candidates, and students' areas of competencies and capabilities fall into this category.

Assessment for learning should be part of constructive planning, teaching, learning and assessment. It should be recognised as central to classroom practice. Therefore, questions and tasks that will enable the learners to exhibit certain knowledge, attitudes, skills, competencies, or values should form part of the assessment process. This means that teachers should be able to assess students using a variety of tools and methods, such as observation, verbal, written, and nonverbal communication. With assessment for learning, teachers should be conscious of the learners' emotional feelings. This type of assessment should be constructive, sensitive, and recognize how the impact of the assessment activities will be on the learners based on their emotional feelings.

***(b) Assessment as learning (AAL):*** This method extends the role of formative assessment for learning by emphasizing the role of the student, not only as a contributor to the assessment and learning process, but as the critical connector between them, which is the regulatory process in meta-cognition. Assessment as learning occurs when students personally monitor what they are learning and use the feedback from this monitoring to make adjustments, adaptations, and even major changes in what they understand. It seeks to understand the learners' previous knowledge so as to solve their current problems and needs (Ojerinde, 2011). This assessment type focuses on the current status of the learner.

***(c) Assessment of learning (AOL):*** This is the traditional form of assessment commonly known and utilized in our educational system. It is traditionally referred to as a summative assessment. It is the use of tests or tasks to assess students' achievement against outcomes and standards at the end of a unit of teaching (topic, term, course, semester, or programme) (Asuru, 2017). The Assessment of Learning (AOL) is used to record and report what the learner has learnt and therefore provides evidence of the level of achievement in the learning to the students, teachers, parents, school administrators, employers and other stakeholders.

## 6.5. Types of Assessment

In the school system, there are many types of assessments being done, out of which ten (10) are listed as follows: School Base Assessment (SBA), Computer Base Assessment (CBA), Classroom Base Assessment (CBA), Continuous Assessment (CA), Educational Assessment (EA), Psychological Assessment (PA), Mental Assessment (MA), Students' Teacher Assessment (STA), Student's Self-Assessment (SSA), Teacher's Self-Assessment (TSA), and Portfolio Assessment (PA).

## 6.6. Forms of Assessment Techniques

Different types of assessment techniques exist for teachers, examination bodies, and testing experts to utilize in order to achieve desired results. These include: Closed Book Assessment Techniques include: Open Book Assessment, Pre-published Assessment, Open-Time Assessment Oral Assessment, Practical Work Assessment, Project Work Assessment, and Technology-Driven Assessment (TDA)

### *6.6.1. Technology-Driven Assessment (TDA)*

According to Adeniji & Ubulom (2016) and Ubulom & Wokocha (2017), CBT is a technologically advanced method of testing in which the questions and responses are electronically recorded. They added that the CBT system might be a stand-alone or a part of the virtual learning environment, possibly accessed via the World Wide Web on the Internet. Some universities use this kind of testing right now for exams like the Post-Unified Tertiary Matriculation Examination (PUTME) and some internal exams. This form of assessment or testing has some advantages over the traditional paper and pen testing (PPT). It reduces the large proportion of workload on examination training, supervision, grading, reviewing, and archiving. It makes it simple, and the types of test items often used in the e-examination are multiple-choice objective test items and quizzes that can be formally and easily evaluated and are very useful for item banking (Adeniji & Ubulom, 2016). It is easy to administer, gives instant results, is devoid of paper work, and reduces the problem of marking and misplacing of students' scripts. It can check for examination malpractice and has capabilities for automatic control of time and to effect corrections if need be (Ukwuije, 2009). Appropriate implementation of e-examination will improve the quality of assessment and, hence, the quality of education. A problem envisaged may be a lack of IT literacy. This might not be tenable since we are in the computer

age and anybody who cannot use a computer may have him/herself to blame, after all registration and checking of results are done online. Other problems include infrastructural and human development.

Mr. Vice Chancellor, this great University should also be thinking in this direction to utilize Technology-Driven Testing (TDT) for every semester examination just as it is being used for public examinations like PUTME.

## 6.7. Levels of Evaluation

Two main levels of evaluation exist; namely, programme evaluation and students' evaluation. Professors and Associate Professors. Figure 6 presents the two levels of evaluation.

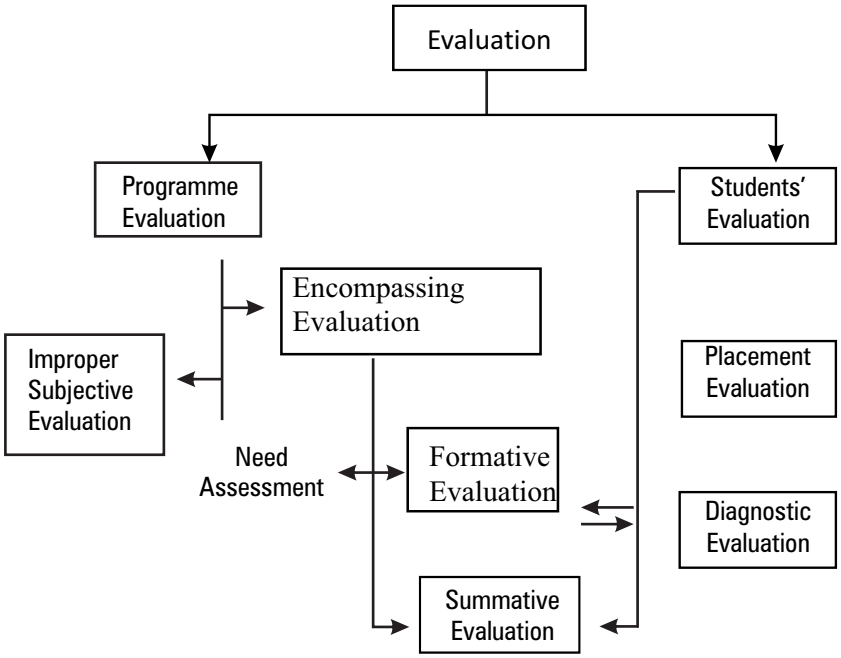


**Figure 7: Levels of Evaluation**

***1. Programme Evaluation:*** This is concerned with the determination of how successfully a given programme is being implemented. Programme evaluation can be classified into:

(a) Improper subjective evaluation, and

(b) Encompassing evaluation.

The encompassing evaluation is further divided into:

(i) Need Assessment,

(ii) Formative Evaluation, and

(iii) Summative Evaluation.

***2. Students' evaluation:*** This is concerned with the determination of how well students perform in a programme. Student's evaluation is made up of four (4) types of evaluation; namely:

(a) Placement evaluation,

(b) Formative evaluation,

(c) Diagnostic evaluation, and

(d) Summative evaluation.

### *6.7.1. Factors affecting Successful Programmes' Implementation*

To determine whether any programme has been successfully implemented or not, salient questions must be posed and answered:

1. Is the content of the programme of desirable quality?
2. Is there a positive relationship between actual learning outcomes and intended learning? Were the intended learning outcomes achieved?
3. Are the intended learning outcomes identified and corrections made for them?

4. Is the content relevant to the needs of the students? Is the content relatively simple and comprehensible, and is it able to be extended and generalized to situations within and outside the school?
5. Are casual and functional relationships identified and analyzed?
6. Does the implementation aid the programme to continue to be effective?
7. Are the materials available locally or obtainable from other sources with relative ease and convenience and at reasonable cost?
8. Are necessary supportive or maintenance services provided?

It is only when these and other relevant questions are answered that one will be able to objectively determine the success or failure of any programme. However, there are certain factors which can militate against the successful implementation of any programme. These are: inadequate teacher preparation; a lack of teaching experience among the young teachers typically assigned to teach the program; too many activities to be performed and materials so diverse that a thorough completion of the program is impossible; an overemphasis on process to the almost total exclusion of products of knowledge and vice versa; reliance on in-service teacher training courses; and a tendency to prepare materials that can favour the programme.

### *6.7.2. Types of Evaluation*

Four types of evaluation exist in every educational system; they are:

***1. Placement Evaluation:*** This is the evaluation of a learner's entry behavior into a sequence of instruction through the use of a test. It is designed to find out a learner's entry behaviour for a course or a unit of it.

***2. Formative Evaluation:*** Formative Evaluation refers to the evaluation of the learning progress of students during instruction with the use of teacher-made tests, observations, questionnaires, interviews, etc.

***3. Diagnostic Evaluation:*** When a student continues to experience learning difficulties despite all efforts to improve him, there arises the need to engage in a detailed diagnosis of his learning problems. To this end, an evaluation is conducted to determine what special difficulties are encountered by the student.

***4. Summative Evaluation:*** This type of evaluation is usually conducted at the end of a course or unit of instruction. At the end of a course or unit of instruction, a test is administered with the view of finding out how many of the instructional objectives have been attained. Examples of summative evaluation are mid-term and end-of-term assessments. External examinations such as West African Examinations Council's Senior School Certificate Examinations and General Certificate of Education Examinations; National Examinations Council's Senior School Certificate Examinations and General Certificate of Education Examinations; and Royal Society of Arts Examinations are also examples of summative evaluation.

## 6.8. Evaluation Models

A number of evaluation models exist for use in evaluating educational programmes. Some of them are the decision-objective models (Tyler, 1958; Matfessel and Michael, 1967; Hammond, 1969; and Wormer, 1970) and the course improvement model (Cronbach, 1963). Other models are the assessment of merit model (Scriven, 1967), the countenance model (Stake, 1967), the discrepancy model (Provus, 1969), the decision-management—oriented model (Alkin, 1969), the CIPP model (Stufflebeam, 1971), the Kentucky Vocational Education Evaluation Model (Denton, 1973), and the Model for Evaluating Vocational Teacher Education Programme in Nigeria (Okoro, 1985).

***(i) Course Improvement Evaluation Model:*** Cronbach (1963) developed the Course Improvement Evaluation Model. Cronbach said in his work that there are two reasons why evaluation is getting more attention, especially at conferences of directors of the "Course Content Improvement Programme." The first, according to him, is out of "sheer scientific curiosity" to actually understand the events that take place in a classroom. This implies that there are individuals who are interested in evaluating the instructional programs because it will afford them the opportunity to understand the intricacies of existing variables in a classroom setting or during the teaching-learning process. The second, he added, is that there are those who take an interest in evaluation in order to provide evidence to sponsors of the workability of a programme, and such evidence is no doubt needed for continued sponsorship.

***(ii) Countenance Evaluation Model:*** Stake (1967) postulated the Countenance Evaluation Model, which emphasized that the role of an evaluator should be to provide description and judgment data of educational programmes based on

formal inquiry techniques. To provide a description is to delineate the variables in a phenomenon and to describe all the activities under each variable, while to provide judgment is to provide data on which judgment is to be based. To stake, it is not the responsibility of an evaluator to pass judgment on a programme; rather, his job is to provide data that will help a decision maker pass judgment. Stake noted that judgment would become an increasing part of evaluation, but the responsibility for processing judgment is much more acceptable to the evaluation specialist than one for rendering judgment. This purpose statement forms the pivot around which his model is built.

***(iii) Discrepancy Evaluation Model:*** Provus (1969) proposed a systematic approach to evaluation known as the Discrepancy Model. His major emphasis was to identify any discrepancy that may exist between posited programme standards and programme performance. Malcolm Provus did not lay emphasis on rendering judgment during programme evaluation rather he based his argument on the fact that evaluation involves the comparison of performance with standards. According to him, programme evaluation entails the process of:

1. Defining programme standards;
2. Determining whether there is a disparity between some aspects of the programme performance and the standards that govern the aspect of the program; and
3. Using discrepancy information either to change performance or to change programme standards.

***iv. CIPP Evaluation Model:*** CIPP is one of the best-known decision-management-oriented evaluation schemes. Daniel Stufflebeam originated it in 1971. Stufflebeam (1971) pointed out that since evaluation is performed in the service of

decision-making, its emphasis should be on the provision of useful information to those who make decisions. In this model, more emphasis is placed on data collection and storage of information to aid decision makers with less emphasis placed on judgment. His model is made up of three steps, namely: delineating, obtaining, and providing information. In all, Stufflebeam believed that delineating and providing operations are carried out collaboratively between the evaluator and the decision-maker, whereas the obtaining of information is a technical activity carried out mainly by the evaluator.

CIPP is an acronym representing the four (4) types of evaluation which this model identifies, namely: context evaluation, input evaluation, process evaluation, and product evaluation. Context evaluation is mainly for decision planning, while input evaluation is for decision structuring. Process evaluation and product evaluation are mainly for decision implementation and decision recycling, respectively.

Context evaluation provides rationale for determining programs' objectives by defining the relevant environment in which they operate; describing what should transpire or exist within the setting; identifying needs and unmet needs; and finding out or diagnosing the causes of unmet needs and unused opportunities. At this point of evaluation, an evaluator relies on conceptual analysis, empirical studies, as well as authoritative opinions and theories of experts in order to delineate the problem areas to be solved. For the input evaluation, its aim is to determine resources and how to utilize the available resources in order to achieve the programme objectives by identifying appropriate agents, strategies for achieving objectives, and assessing designs for implementing selected strategies.

Process evaluation takes place at the stage where a program has been installed and its purpose is to provide periodic feedback to people responsible for implementing plans and procedures. This can be achieved by detecting or predicting defects in the procedural designs or their implementation during the implementation stage, providing information for programme decisions, and maintaining a record of the procedure as it occurs. In fact, what happens at this point are the installation and process stages of the program. Also, the purpose of product evaluation is to measure and interpret attainments not only at the end of a program circle but as often as necessary during the duration of the programme. This is done by providing operational definition of objectives; measuring criteria associated with objectives; comparing these measurements with predetermined absolute or relative standards; and making a rational interpretation of the outcomes using the recorded context, input, and process information.

## 7.0. PROCEDURES IN CRAFTING OF ACHIEVEMENT

The construction or crafting of achievement or teacher-made tests, specifically, objective tests, involves four major stages, namely: the planning stage; item-development stage; item-analysis stage; and marking scheme development stage.

### 7.1. The Planning Stage:

The planning stage is a very important one in test construction. The quality of the test depends largely on the seriousness and care taken. The planning stage involves some specific steps in this order:

(a) Determination of test objectives;

(b) Content specification;

(c) Test blue-print preparation; and

(d) Test Development and Selection.

***(i) Definition of Test Objectives:*** The teacher has to determine the objectives of his test; that is, the purpose he wants the test to serve. These have to be stated as behavioral objectives. When objectives are stated in behavioral terms, they serve a useful purpose in evaluation. It is therefore important for teachers to be familiar with the characteristics of behavioral objectives. These are listed as follows:

- Objectives should be clearly stated in regards to the students' behaviour that is observable and measurable and not based on learning activities.
- They should commence with action verbs that indicate the students' behaviour is expected to be exhibited based on the test content. Examples of the verbs are mention, explain, draw, criticize, analyze, distinguish, etc.
- The objectives should be stated precisely using unambiguous terms that have uniform meaning and interpretation for all.
- They should be stated at an appropriate level of generality.
- Each objective statement should only apply to one process. In essence, the objectives should be unitary.
- The objectives should represent the intended direct outcomes of the planned programme.
- They should be realistic in terms of the time available for teaching and the level of the students.

The cognitive domain has six major levels of objectives arranged in hierarchical order based on the complexity of the task. The levels, starting from the lowest to the highest level, are explained on the next page.

1. **Knowledge:** This involves recall or recognition of facts, principles, or processes.
2. **Comprehension:** This is sometimes referred to as understanding, which requires the acquisition of skills to explain or summarize or to perform some mathematical logarithms or manipulations.
3. **Application:** This is the ability to make use of acquired knowledge in a noble or new situation.
4. **Analysis:** This is the ability to break apart a whole or concept into components to show the hierarchy or other internal relations of ideas, like the ability to recognize form and pattern.
5. **Synthesis:** This is the ability to arrange and combine pieces, parts, or elements in such a way as to constitute a pattern or structure that was not in existence before.
6. **Evaluation:** This involves qualitative and quantitative judgments about the extent to which materials and methods satisfy criteria laid down by students or teachers.

***(ii) Content Specification:*** The content of a test is necessary since it is the bedrock through which the process objectives should be achieved. The syllabus for a particular subject could be the content, and it is the responsibility of the teacher to specify the content for his test depending on the extent to which he has covered the syllabus. The content is to provide the learning experiences that will enable the test to achieve its stated objectives. It could be as broad as a syllabus or as short as a topic in a subject.

Test content should be consistent with the broad educational goals and the immediate instructional objectives, which have been defined in terms of behavioral objectives. Though the content is determined mainly by the purpose of the test, it should reflect all the class activities, lessons, assignments, and projects. The content should also present a detailed analysis of the curriculum content coverage that is to be considered in the test. Such a detailed analysis of the content helps the test planner to determine the relative importance of the various aspects of the content and whether emphasis should be placed on the specific areas. The content outline therefore serves the dual functions of specification and guidance to the test planner.

***(iii) Test Blue-print (Table of Specification):*** This is a two-dimensional grid showing the contents and objectives and specifying the proportion of test items or examination questions allotted to each of the behavioural objectives and topics within the content of the course or subject taught. While preparing the test blue-print, the following should be noted:

(a) The cell of the matrix should include some indication about the relative weighting of each cell.

(b) The weighting of each cell is a matter of judgment. However, the time spent in teaching such topic is importance to be considered.

(c) The test can only sample the content and objectives, hence it is not necessary for all the cells to be allotted.

(d) The table is a flexible plan and should not be used rigidly.

### *(A) Functions of the Test Blue-Print*

The functions of the table of specifications are to:

(a) Specify the appropriate number of items in the appropriate content and behaviour categories, and ensures that there is a balance between the two. Without it, there would be the tendency for more questions to be asked in some areas and none or few in other areas.

(b) Help in order to avoid the usual lazy man's approach of getting questions by lifting from textbooks, and/or writing it as they come to mind.

(c) Guide in writing test items of higher level objectives is more difficult than those of lower level objectives. Except it is a blue-print that calls for them, they will tend to be ignored.

From Tables 2 and 3, the test has 65 objectives type items. In the extreme left hand column are listed the process objectives of the lesson while the specified content areas based on the levels of cognitive domain are listed on the top row. In all, there are eighteen cells to be filled. The number of items in each of the cells can be computed by using the specified percentage on the top row or the ones on the extreme left column.

**Table 2: Test Blue Print on SS 1 Book-Keeping (Accounting)**

| Content | Behaviour/Objectives | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Know 20% | Comp 19% | Appl 31% | Ana 15% | Syn 3% | Eva 12% | 100% |
| Definition Subject Matter | 3 | 3 | 2 | 1 | – | 1 | 10 (15%) |
| Explaining Basic Concepts | 6 | 6 | 8 | 3 | – | 3 | 26 (10%) |
| Posting of Trans-actions into the required books | 4 | 3 | 10 | 6 | 2 | 4 | 29 (45%) |
| Total | 13 | 12 | 20 | 10 | 2 | 8 | 65 100% |

Table 2 show the Taxonomy of Educational Objectives of Bloom et al (1956)'s version of Test Blue Print for test construction.

We had indicated that the test blueprint should give a teacher the opportunity to determine the relative emphasis of content areas based on the levels of cognitive domain and the process objectives. The proportion of test items in each content area should correspond with the instructional emphasis given to the topic. Again, the proportion of items calling for each process objective should correspond with the test planner's perception of the importance of the process objective with respect to the testees. For instance, suppose a teacher spent one or two weeks teaching topics B and A, respectively. Topic B should also attract the same emphasis when allocating items. Weighting of both content areas and process objectives is done by assigning percentages to each content area and to each process objective in such a way that the total of the percentages across the

content areas and the process objectives is added up, which should arrive at 100% respectively (see Tables 2 and 3).

However, Anderson & Katwohl (2001) revised this Taxonomy and came up with the one presented in Table 3.

**Table 3: Test Blue Print on SS 1 Book-Keeping (Accounting B)**

| Content | Behaviour/Objectives | | | | | | Total 100 % |
|---|---|---|---|---|---|---|---|
| | Reme-mber 20% | Under-stand 19% | Apply 31% | Anal-yze 15% | Eval-uate 3% | Create 12% | |
| **Factual Knowledge** Definition Subject Matter | 3 | 3 | 2 | 1 | — | 1 | 10 15% |
| **Conceptual Knowledge** Explaining Basic Concepts | 6 | 6 | 8 | 3 | — | 3 | 26 10% |
| **Procedural Knowledge** Posting of Trans-actions into the required books | 2 | 1 | 5 | 3 | 1 | 2 | 13 20% |
| **Meta-Cognitive Knowledge** Balancing Account | 2 | 1 | 5 | 3 | 1 | 2 | 14 22% |
| **Total** | 13 | 12 | 20 | 10 | 2 | 8 | 65 100% |

As an illustration, suppose we want to compute the number of items in cell 1:

Total number of items for content area A -10
Percentage of process objective 1 = 20%

Therefore number of items in cell 1 = $\frac{20}{100} x \frac{10}{1}$

= 2 items

The test blueprint also guides the test planner to determine the total number of items for the test. For the essay type of test, there is an opportunity for a few questions or items of the test to be prepared for the students, whereas for the objective type of test, the planner has a very broad opportunity. Whichever type of test the planner intends to use, it should be realized that the more total items are included in a test, the better the test. This is because the use of many test items provides an adequate sample of students' behavior across content areas and process objectives. Some of the factors to consider in deciding the number of items in a test are:

1. The type of items used on the test (essay or objective);
2. The age and educational level of testees;
3. The ability level of testees;
4. The length and complexity of the items; and
5. The type of process objectives being tested.

## 7.2. Item-Development Stage

The next task of the test planner is to prepare the test items. This stage is very crucial as poor attempts could make the whole test construction exercise useless. When developing test items, another important decision needed to be taken into consideration during the planning stage should borders on the difficulty level of test items after handling the general guidelines that are common to all types of test construction.

There are general guidelines that are common to all types of test construction, and they should be considered first. They include the need for the test planner to:

(i) Keep the test plan or blue-print in mind.

(ii) Draft the test items in advance;

(iii) Have the items examined and criticized by one or two colleagues, and

(iv) Prepare a surplus of test items.

Table 4 below shows how to determine the difficulty level of objective test items

**Table 4: Difficulty Levels of Objective Test Items**

| Types of Item | Average difficulty level |
|---|---|
| Completion type/short answer items | 0.50 |
| 5-option multiple-choice | 0.70 |
| 4-option multiple-choice | 0.74 |
| 3-option multiple-choice | 0.77 |
| True-False items | 0.85 |

### (A) Objective Tests Types:

Prominent among the types of objective tests is the multiple-choice item test, which is often being used in public examinations and schools. The following are different types of objective tests: (a) Alternative-Response Item, (b) Completion Item, (c) Matching-Item, (d) Rank Order, (e) Pictorial-Item, and (f) Multiple-Choice Item Tests.

### (B) Multiple-Choice Item Test

It should be noted that the teacher should be conversant with some of the terminologies associated with a multiple-choice item test, such as stem, options, distracters, and discrete item.

(i) Stem is simply the initial part of an item in which the task is specified. It could be a question, a direction, or an incomplete statement;

(ii) Options are all the options or possible answers given for the item;

(iii) Key is the correct option; the answer to the question;

(iv) Distracters are the incorrect options. These incorrect options borrowed their names from the fact that they are intended to distract students who are not sure of the correct options, and

(v) A discrete item is a complete multiple-choice question, which includes the stem, the key, and the distracters.

The practicing teacher that wants to develop a multiple-choice item tests should endeavour to make the test reflect the following attributes:

(a) Each test item should present a definite problem that is specifically focused

(b) A greater part of the test item should constitute the stem.

(c) The test should not contain negative items and such options as "all of the above", "none of the above".

(d) Each item should have one correct or best answer.

(e) The option of an item should be grammatically consistent with the item and the distracters should be plausible.

(f) The relative lengths of the options should not provide clues to the keys.

(g) The keys of the items should not be arranged in any regular pattern.

(h) Items that are designed to measure reasoning ability and problem-solving ability should reflect novel situations.

### (C) General Guidelines and Suggestions of Writing Objective Test Items

The test maker should be guided by the following guidelines and suggestions. He should:

(a) Keep the test item's reading difficulty and vocabulary level as simple as possible.

(b) Make certain that all experts agree on the best answer to the question.

(c) Ensure that each item addresses an important aspect of the subject matter.

(d) Ensure that each item is self-contained; that is, the answer to one item should not be required for the next item to be solved, nor should it aid in the solution of another item.

(e) Avoid tricky and catchy questions.

(f) Create clear and unambiguous test items for problems.

(g) Organize the test items so that they are easy to read.

(h) Design the exam so that separate answer sheets can be used to record answers.

(i) Group items with the same format together (e.g., multiple-choice, pictorial, alternative-response, etc.).

(j) Group items that deal with the same topic together.

(k) Arrange items so that the difficulty level progresses from easy to difficult and can be easily identified.

(l) Create a set of detailed instructions for each item type.

## 7.3. Item Analysis Stage

An analysis of the responses that students might have made to the items on a test is meant to provide diagnostic information for determining the quality of the items. Such an analysis provides information about item difficulty, the discriminating power of the item, the effectiveness of the distracters, etc.

### *(a) Determination of Item Difficulty:*

Item difficulty is a term to indicate the extent to which an item is difficult for testees. The item difficulty level can be determined by estimating the percentage of testees who are likely to get the item right when it is administered.

In computing the index of item difficulty (difficulty index), the test papers are scored and arranged in order of starting from the highest score to the lowest score. The high and low groups of the test papers are selected with an equal number of cases being included in each group. The groups are constituted to be the upper and lower 27% or the upper and lower 33%. The next step is to count the number of correct responses to the item occurring in the two groups and then divide it by the number of testees in the two groups. For example, in a class of 100

students, the upper 27% and the lower 27% will give 27 respondents in each group (a total of 54 testees in both groups). Considering that the responses of the two groups to an item have C as a key. The relevant dataset for determining the difficulty level of the item is presented in Table 5.

**Table 5:** Determination of Item Difficulty

| Options | Upper 27% | Lower 27% | Total |
|---|---|---|---|
| A | 1 | 4 | 5 |
| B | 5 | 7 | 12 |
| C | 18 | 12 | 30 |
| D | 3 | 4 | 7 |
| Omit | 0 | 0 | 0 |

The difficulty index of an item (D) is given by the formula:

$$D = \frac{CR_U + CR_L}{N_U + N_L}$$

Where:

D = Difficulty Index

$CR_U$ = Number of correct responses from upper group

$CR_L$ = Number of correct responses from lower group.

$N_U$ = Number of respondents in the upper group

$N_L$ = Number of respondents in the lower group

From the data on the test item, $CR_U$ $CR_L$, $N_U$, and $N_L$ are 18, 12, 27 and 27 respectively. Substituting these values in the formula:

$$D = \frac{18 + 12}{27 + 27}$$

$$D = \frac{30}{54}$$

$$D = 0.56$$

The item difficulty index varies from 1.0 to 0.0. When it is 1.0, it means that the test item is very simple since it is easier for all the students from the upper and lower groups to pick the correct options, C. However, when it is zero, it implies that none of the students from the upper or lower groups were able to pick the key. This is an indication that the test item is very difficult. It thus implies that the lower the index, the more difficult the test item.

**(b) Discriminating Index:**

A discriminating index is a phrase used to indicate the extent to which a response to a test item could distinguish between the strong and weak students. Just like the difficulty index, most test items are found to have discriminating indices varying between 0 (zero) and 1.00, while some test items may be found to exhibit negative indices. With this, the test items tend to penalize more of the strong students than the weaker ones, which shows that it is an abnormal behaviour. Hence, such items should be reassessed.

Consider the data presented in Table 5. The following steps are taken to calculate the discriminating index of the item:

(i) Subtract the number of correct responses in the lower group from those in the upper group.

(ii) Divide this difference by the number of respondents in either group.

The steps are summarized in the formula of the Discriminating Index (U).

$$(U) = \frac{CR_U - CR_L}{N_U}$$

The Table shows that $CR_U = 18$, $CR_L = 12$, $N_U = 27$ and $N_L = 27$

Therefore, Discriminating Index (U) $= \frac{18 - 12}{27}$

$$= \frac{6}{27} = 0.2$$

The discriminating index is at best a skeletal measure of the extent to which an item discriminates between testees who earn high scores on the whole test and those who earn low scores. It is therefore a measure of whether or not a given item contributes toward the general direction of the other test items. In essence, this is based on the assumption that most of the test items contribute significantly towards the efficacy of the test in order to discriminate between the strong and weak students.

## 7.4. Marking Scheme Development Stage

A marking scheme is a sketchy compilation of all the points that are essential to earning the possible maximum score on a question paper. It indicates what marks are to be awarded for what. The total score in a marking scheme should therefore tally with the obtainable score; for example, 100%. For this, it is necessary that the marking scheme is exhaustive enough to accommodate the possible answers to each essay. The marking scheme should also clearly show:

(i) General instructions about the award of marks;

(ii) Specific instructions about marks for procedure, accuracy, minimum number of points are required to give maximum marks; etc., and

(iii) Penalties for no diagrams, diagrams not drawn or labelled as required; etc.

## 8.0. ESSAY TEST ITEMS

The practicing teacher who is developing essay test items of high quality should:

(i) Ensure that the essay test should be developed only if the objective test is considered a less suitable means of measuring the expected learning outcomes.

(ii) Determine the type of behavioural objectives that should be assessed before constructing the test items accordingly; e.g., the behavioural objectives could border on knowledge, comprhension, evaluation, analysis, synthesis, etc. In each of the objectives, certain terms are considered more appropriate than others. For instance, "Give reasons for", "Discuss the view", "Compare and contrast", "Explain why", "Distinguish", "Critically examine", "Analyse how", "To what extent would you agree", etc.

(iii) Ensure that the language of the instructions and the questions as simple as possible.

(iv) Maintain high precision in designing the questions so that the questions will not be vague.

(v) Provide a time limit for each of the essay test items.

## 8.1. Controversy on Essay Tests used in Universities

Essay tests are designed to elicit responses from the testees concerning their traits or attributes in order to measure the four (4) higher levels of the cognitive domain, namely, application, analysis, synthesis, and evaluation. In an essay test, the freedom of response is provided, ranging from one extreme to another. This attribute forms the basis of our classification of essay tests into two types: the extended (free) response and restricted response (short answer) essay tests.

Recently, there has been constant debate about the types of essay tests used in universities. This controversy has brought about a serious argument that some items or some questions in the essay test should not be made compulsory. Recently, the Quality Assurance Directorate of our Great University formulated and sponsored a policy presented to the University Senate that **"no lecturer should make any test item or question compulsory in any essay type of test in the University."** The policy went through the Senate brief deliberation, approval given, and implementation commenced immediately. However, this has now become the University's policy. Okoroma (2017) rightly pointed out that a policy somersault has to do with a complete reversal of a policy or decision that has earlier been taken, especially at the stage of implementation. Frankly speaking, this policy seems to have violated the psychometric properties' principles as well as testing theories such as Classical Test Theory (CTT), Item Response Theory (IRT), and Generalizability Theory (G-Theory) as usually applied in test construction globally. Such an essay test cannot produce validity evidence because such tests were not subjected to construct and content validities. Hence, they do not possess psychometric properties of good test, hence cannot measure what they purport to be measuring.

## 8.2. Psychometricians' Views on Essay Tests

For essay tests to be valid and reliable in order to measure what they are purported to measure, psychometricians such as Kubiszyn & Borich (2003), Joshua (2005), Upadhya & Singh (2007), Singh (2007), Ukwuije (2009), Orluwene (2012), Ezugwu (2015), Asuru (2015), Ubulom, Uzoeshi, Amini & Vipene (2019) and Onwuka, 2021) revealed the guide used in crafting or developing essay tests to maintain the psychometric properties principles in test construction.

Ukwuije (2009) and Orluwene (2012) warned teachers not to use optional questions unless they can accurately equate the scoring of responses to different questions. In essence, teachers should avoid the use of optional questions (Kubiszyn & Borich, 2003; Joshua, 2005; Upadhya & Singh, 2007; Singh, 2007; and Orluwene, 2012). Also emphasizing on the issue of making some questions compulsory in essay tests, Ezugwu (2015) and Onwuka, 2021) stressed that optional questions should be avoided as much as possible, while Asuru (2015) advocated that it is preferable to make all questions compulsory so that all testees can answer the same questions so that their performance can be objectively compared. Ubulom, Uzoeshi, Amini & Vipene (2019) stressed that it is best to allow testees to answer the same number of questions in essay tests rather than give them optional as doing so will make for objective evaluation.

Therefore, it is absolutely clear that essay tests should always come with the instruction "Answer ALL Questions" so as to reduce the subjectivity inherent in essay tests since testees are allowed to express themselves freely. If testees are allowed to respond to optional test items in an essay test, such an act will decrease test content validity and the teacher's basis for comparison among students due to the varied difficulty levels found among the various test items. Hence, all test takers are

required to answer all the questions in the essay test. This is the global best assessment practice that provides the teacher the opportunity to objectively compare the learners' performance because the teacher also need to develop a marking scheme that brings out the main points that are required to be found in the answers being given by examinees to enable him objectively assign scores to the answers provided.

Vice Chancellor Sir, it is unprofessional to craft or construct and administer essay tests in which the test items or questions are made optional for the testees to answer. ***This lecture is not intended to fault or somersault the University's Senate approved policy and decision on the essay test; rather, it intends to peach a tent with the professionalism of psychometric properties principles in testing, measurement, assessment, and evaluation based on global best practices.*** The lecture therefore advocates that, professionally, the right thing should be done by adhering to psychometrics professionalism and principles in test development, measurement, assessment, and evaluation based on global best practices. It is also necessary that before any policy in any area of academics is formulated, experts in such field should be consulted.

Therefore, it is absolutely clear that essay tests should always come with the instruction "Answer ALL Questions" so as to reduce the subjectivity inherent in essay tests since testees are allowed to express themselves freely. If testees are allowed to respond to optional test items in an essay test, such an act will decrease test content validity and the teacher's basis for comparison among students due to the varied difficulty levels found among the various test items. Hence, all test takers are required to answer all the questions in the essay test. This is the global best assessment practice that provides the teacher the opportunity to objectively compare the learners' performance

because the teacher also need to develop a marking scheme that brings out the main points that are required to be found in the answers being given by examinees to enable him objectively assign scores to the answers provided.

## 8.3. Psychometric Properties of Good Tests

The dysfunctionalities in psychometric principles of tests in Nigeria have become national issues that we are yet to be resolved. They are:

(a) The admissions process into schools in terms of test quality (validity, reliability, and usability);

(b) JAMB's Computer Based Test concerning indifference in the use of test theories such as Classical Test Theory (CTT), which identifies the measurement errors; Item Response Theory (IRT), which uses the new rules of measurement as well as Generalizability Theory (GT);

(c) Scarcity, inadequacy, and overcrowding of examination halls and centers;

(d) School examination administration and malpractice;

(e) The federal character and the quota system for school and employment placement; and

(f) Implementation of pedagogical curriculum in schools

## 8.4. Determining Psychometric Properties of Tests

### (a) Validity of Tests

Four (4) popular methods are used to determine the quality of good tests. They are content validity, criterion-related, construct and face validity. However, experts have revealed that face validity is not a form of validity at all because it does not offer evidence to support conclusions drawn from test scores. Although content, criterion-related and construct validities are acceptable, the current practice today is that there is an agreement by experts that all the three existing methods of establishing validity of a test should to be combined together into **Construct Validity.** Hence Construct Validity is now known as a **Unified Validity.**

***Construct Validity***

In psychology, the term "construct" refers to something that is not seen or observable. Construct validity is defined as the degree to which a test performance mirrors or brings out the existence of some psychological characteristics in an individual. An intelligence test result is an example of construct validity, because the test is used to bring out the Intelligence Quotient (IQ) in an individual. It is also used to find out if an individual is intelligent or not.

Most individual's traits such as intelligence, aggression, stress, attitude, emotion etc. are referred to as constructs. The existence of these traits is inferred from the individual's behaviour or attitude.

Mr. Vice Chancellor Sir, it is a fact that not all the tests we use in all our semester examinations seem to be valid to measure what they purport to measure to

produce validity evidence scores. This is because not all of us are trained to acquire the required psychometric principles, knowledge and skills in test construction.

Validity is the most important quality or characteristic of a test. It simply means truthfulness of the test. The concept of validity is normally an assessment of the quality of an instrument or experimental design. In order to further explain the concept of validity of tests, the following questions are posed:

1. Does the test measure what it purports to measure?

2. Are the conclusions from test results justified by evidence?

Validity is the agreement between a test score or measure and the quality it is believed to measure. It defines the meaning of tests and measures. The questions now are:

(a) How to we determine the psychometric properties of good tests and research instruments we use in schools?

(b) Do the tests we used measure what they purport to measure?

(c) Are the conclusions from test results justified by evidence?

In order to validate tests or research instruments, emphasis is placed on four (4) popular methods, which are content validity, criterion-related, construct and face validity. However, according to Joshua (2005), face validity is a minor kind of validity; Gregory (2006); and Kaplan & Saccuzzo (2009) stated that face

validity is not really a form of validity at all because it does not offer evidence to support conclusions drawn from test scores. For Anastasi and Urbina (2009), face validity is not validity in the technical sense; it refers not to what the test actually measures but to what it appears to measure superficially. Afolabi (2012) stated that face validity provides weak evidence of validity. Asuru (2015) and Ubulom, Uzoeshi, Amini & Vipene (2019) revealed that in the real sense, there is nothing like face validity, yet people still use it as a form of validity.

Mr. Vice-Chancellor Sir, this is a common practice in our educational system. On the other hand, Kaplan & Saccuzzo (2009) stated that they are not suggesting that face validity is unimportant; rather, in many settings, it is crucial to have a test that "looks like" it is valid. Face validity simply means the reasonableness of a test. It is the degree to which a test appears superficially to measure what it purports to measure. A test that, on the first impression or mere inspection, measures what it intends to measure is an example of face validity. Face validity asks such questions as, "Does the content of the test appear relevant even to the eyes of non-professionals in the field?"

### (a) Content Validity

This kind of validity can also be referred to as rational or curricular validity. Content validity, according to Thorndike & Hagen (1977), answers these questions: How well do the tasks of this test represent what are considered to be important outcomes in the areas of instruction? How well do these tasks represent what the best and most expert judgment would consider to be important knowledge of skills?

If the answers are positive, we consider the test to have content validity. Content validity is simply the extent to which test items cover the content and objectives of the subject on which the subject is based. It is the extent to which the variable or subject is being measured. Content validity is useful in evaluating achievement tests' tables of specification.

For the content validity of a test, three stages of measurement activities that take place in the classroom during the teaching-learning process are presented in Figure 8.

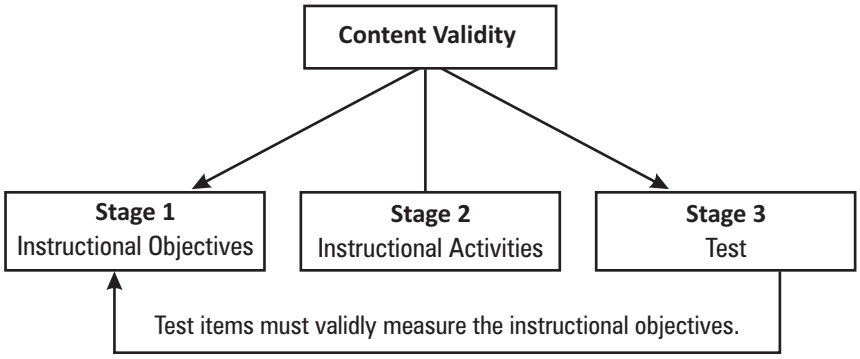


**Figure 8: The three stage classroom measurement model**

### (b) Criterion Related Validity

This is also known as empirical or statistical validity. This is because criterion-related validity uses empirical techniques in studying the relationship between scores on a test and some outside criterion. According to Gronlund (1976), criterion-related validity is the extent to which test performance is related to some other valued measure of performance. Criterion-related validity can also be seen as when a researcher makes use of a test score in predicting future performance or calculating the current performance on some valued outcomes other than the test itself. Because of its role in predicting future performance, criterion-related validity could be described as validity predicting. For example, one can predict a student's future performance in a university based on his school certificate result. Criterion-related validity is classified into two types: predicting and concurrent validity.

#### *(i) Predictive Validity*

This is the extent to which the performance in a test predicts success in the performance of a future task. For example, the scores of a student in JAMB can be used to predict his future performance in pre-JAMB aptitude examinations and success in university. Also, an applicant's performance in a view can be used to predict his performance and success when he is eventually employed.

#### *(ii) Concurrent Validity:*

This is the extent to which test results predict current or present performance. Concurrent validity is also used to compare performance of a student's actual life behaviour with that of other individual students within the group or class at the same period of time. It deals with how test scores reflect the present level of

behaviour or the competence of the testee compared with others. For example, the result of a test in cooking can be used to measure current skill in cooking. Also, a test on driving could be used to determine the present or current driving skill of an individual by watching how the individual drives. Usually, concurrent validity is determined or estimated through observation. The major difference between predicative and concurrent validity is the time when a particular behaviour or event is displayed. Predictive validity is futuristic; that is, it is based on the future, while concurrent validity is based on the present or current event or behaviour.

### (c) Construct Validity

In psychology, the term "construct" refers to something that is not seen or observable. Most individual's traits such as intelligence, aggression, stress, attitude, emotion etc. are referred to as constructs. The existence of these traits is inferred from the individual's behaviour or attitude. Construct validity is defined as the degree to which a test performance mirrors or brings out the existence of some psychological characteristics in an individual. An intelligence test result is an example of construct validity, because the test is used to bring out the Intelligence Quotient (IQ) in an individual. It is also used to find out if an individual is intelligent or not.

## 8.5. Factors affecting Validity of Tests

There are certain factors that can negatively influence the validity of tests scores. They are the test itself; test administration and scoring; testee's test responses; and factors affecting validity co-efficient.

Mr. Vice Chancellor sir, it is a fact that not all the tests we use in all our semester examinations seem to be valid to measure what they purport to measure to produce validity evidence scores. This is because not all of us are trained to acquire the required psychometric principles, knowledge and skills in test construction.

Validity is the most important quality or characteristic of a test. It simply means truthfulness of the test. The concept of Validity is normally an assessment of the quality of an instrument or experimental design. In order to further explain the concept of validity of tests, the following questions are posed:

(a) How to we determine the psychometric properties of good tests and research instruments we use in schools?

(b) Do the tests we used measure what they purport to measure?

(c) Are the conclusions from test results justified by evidence?

Validity is the agreement between a test score or measure and the quality it is believed to measure. It defines the meaning of tests and measures.

## 8.6. Construct Validity as a Unified Validity

In 1985, a Joint Committee of the American Psychological Association (APA) and the National Council on Measurement in Education (NCME) published a booklet, "Standards for Educational and Psychological Testing" (Standards) in which validity is now conceived as: (i) specific to a particular use; (ii) a matter of degree; and (iii) a unitary concept (Gregory, 2006; Kaplan & Saccuzzo, 2009; Anastasi & Urbina, 2009).

The revised 1999 edition of the Standards no longer recognizes different categories of validity but the three (3) categories of evidence for validity, namely, (i) specific to a particular use; (ii) a matter of degree; and (iii) a unitary concept. This shows that there is a paradigm shift in the validation and application principles of the tests and research instruments we use in schools.

As we have in the Athanasian Creed of the Christian Religion in the Church of Nigeria, Book of Common Prayer (2007), we always say that "we worship one God in Trinity, and Trinity in unity... for there is one Person of the Father, another of the Son, and another of the Holy Spirit ... and all is but ONE." There are no longer three types of validity in tests, measurement, and evaluation, but only ONE type of validity known as construct validity. This, in other words, is referred to as "Unified Validity." All other aspects of validity are subsumed under construct validity. Based on test experts' agreement on the validity issue, testing pioneers (i.e., Cronbach, 1980 and Messick, 1988), summarized their subsisting position and pronounced that "all validation is one" and, in a sense, all is construct validation (p.99). Validity can be evidenced by examining the content of the test for the sampling adequacy of the items; that is, if the test adequately represents the conceptual domain it is designed to cover. In assessment process, inadequate content representation is regarded as construct under representation, while the introduction of elements unrelated to what is being measured is construct-irrelevant variance. For example, teachers who give tests in which students who did not cover 50% of the course/subject content in their preparations receive an 'A' (simply because such teachers selected a few of the topics covered) or those who ask questions that were not covered during lectures or lessons are both guilty of these errors.

Content coverage is logical rather than statistical and is often made by expert judgment. The evidence of item sampling adequacy can be corroborated in support of construct validity by correlating the test score with a well-defined criterion measure (that is, the standard against which the test is compared). When the criterion is used to forecast the power of the test, the validity evidence is predictive, but when the test and the criterion score are obtained simultaneously, the validity evidence is concurrent. The relationship between a test and a criterion is expressed as a validity coefficient, which is usually not larger than 0.60. Its square is the percentage of variation in the criterion that we expect to know in advance due to our knowledge of the test scores.

Campbell and Fiske (1959) distinguished between two types of evidence essential for a meaningful test. They are convergent and divergent (discriminant) evidence. Convergent evidence is when a measure is well correlated with other tests believed to measure the same construct, while in discriminant (divergent validation) evidence, a test should have low correlations with measures of unrelated constructs. This demonstrates the uniqueness of the test. Assembling construct-related evidence for validity requires validation against many criteria. Content-related validation is an essential step in construct-related validation. Criterion-related evidence is similar to convergent and discriminant evidence.

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## 9.0 UTILIZATION OF TESTS IN THE EDUCATIONAL SYSTEM

Ubulom (2020) revealed several ways in which tests are utilized in the educational system. Tests are used to motivate students to study; they determine how much students have learned; the adequacy of instructional resources; the learning progress; and the students' vocational interests. Tests are also used to identify students' special difficulties and abilities, provide efficiency, and predict students' performance. In schools, tests are utilized to select learning experiences, place or advance students to the next class or level, determine school effectiveness and school needs assessment, as well as measure teachers' attitudes and competence. In the school system, tests are used to:

- motivate students to study;
- determine how much students have learned;
- identify students' special difficulties and abilities;
- determine the adequacy of instructional resources;
- provide feedback on the strengths and weaknesses of teaching objectives;
- determine learning progress;
- predict students' performance;
- select learning experiences;
- determine students' vocational interest;
- ascertain curriculum efficiency;
- determine school effectiveness;
- measure teacher attitudes and competence;
- determine school needs assessment; and
- select, place, or advance students to the next class or level.

## 10. EXAMINATION MALPRACTICES

Examination malpractice originated from the Bible when Adam and Eve were connived by Serpent to disobey God's directive not to eat the forbidden fruit in the Garden of Eden. Adam copied the answer of the test of obedience from Serpent (Satan) and tested the fruit and he was caught by God for cheating and being involved in examination malpractice.

Today, the issue of examination malpractice has become a serious problem in the formal education system in Nigeria, which has generated constant day-to-day discourse. In the educational sector, it is assumed that examination malpractice brings about proliferation and forgery of academic qualifications, low quality of graduates, and low standard of education, bribery and corruption.

Some people claim that examination malpractice has caused serious damage to our societal norms and values. It is also assumed that examination malpractice has resulted in an increased crime rate in areas of armed robbery, theft, forgery, fraud, and falsification of age so as to be retained longer in public services. In fact, it leads to the provision of justice (Asuru, 1997). These assumptions denote the negative effects of examination malpractice on our societal lifestyle.

The trend of examination malpractice in WACE examinations from 2000 to 2020 is presented in Table 6 and graphically presented in Figures 9 and 10.

Table 6: Trend of Examination Malpractice in May/June WACE from 2000-2020

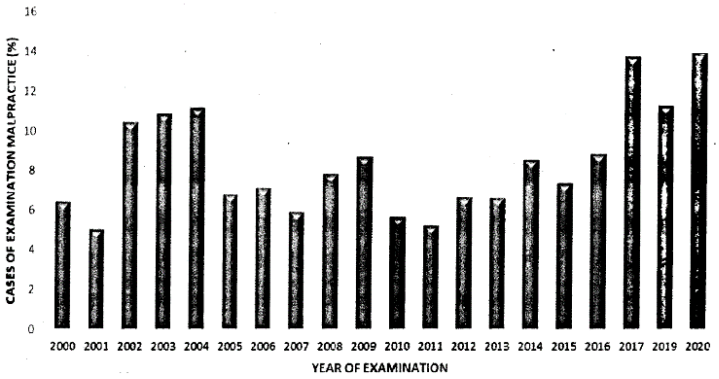
| Year | Embroilment | Cases of Exam Malpractice | Percentage (%) |
|---|---|---|---|
| 2000 | 636,064 | 41,090 | 6.46 |
| 2001 | 1,025,185 | 51,977 | 5.07 |
| 2002 | 909,888 | 95,265 | 10.47 |
| 2003 | 1,066,831 | 116.071 | 10.88 |
| 2004 | 1,035,280 | 115,641 | 11.17 |
| 2005 | 1,080,162 | 73,050 | 6.86 |
| 2006 | 1,153,561 | 82,941 | 7.19 |
| 2007 | 1,251,826 | 74,734 | 5.97 |
| 2008 | 1,274,467 | 100,428 | 7.88 |
| 2009 | 1,357,071 | 118,602 | 8.74 |
| 2010 | 1,351,557 | 77,168 | 5.7 |
| 2011 | 1,540,250 | 81,573 | 5.29 |
| 2012 | 1,672,224 | 112,000 | 6.70 |
| 2013 | 1,689,188 | 112,865 | 6.68 |
| 2014 | 1,692,435 | 145,795 | 8.61 |
| 2015 | 1,593,442 | 118,101 | 7.41 |
| 2016 | 1,544,234 | 137,295 | 8.89 |
| 2017 | 1,559,162 | 214,952 | 13.79 |
| 2018 | 1,572,396 | Withheld | Withheld |
| 2019 | 1.590173 | 180.205 | 11.33 |
| 2020 | 1,538,445 | 215,149 | 13.98 |

Source: Adapted from Osuji (2020) cited in Asuru (2021)

Based on the data above, one can assume that if adequate measure is not establish to curb this menace, it will become a serious virus than that of COVID-19 in Nigeria, which may eventually engulf the entire educational system as these candidates that were involved in examination malpractices

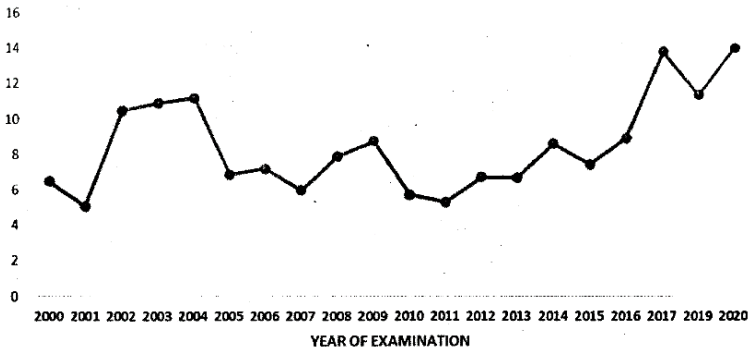
gain admissions into universities and other tertiary institutions of learning to pursue their higher education programmes.

The implication of the data on Table 7 is that the level of involvement in examination malpractices in Nigerian secondary schools is on the increase on yearly basis.




**Source:** Adapted from Asuru (2021)

**Figure 9:** Bar chart showing the trend of examination malpractice in WACE-2000 - 2020




**Source:** Adapted from Asuru (2021)

**Figure 10:** Graphical presentation of the trend of examination malpractice in WACE-2000 - 2020

Furthermore, the trend of examination malpractice is becoming alarming. For instance, the report has gone viral that WAEC examinations malpractice in 2021 in Lagos State was so pathetic to the extent that 27 secondary schools in Lagos State were asked to pay a fine of N13.3 million naira based on the Lagos State Ministry of Education investigation report.

## 11.0. MY CONTRIBUTIONS TO SCHOLARSHIP

Vice Chancellor, Sir, I commenced my academic career in Business Education in 1993 at the Rivers State College of Education, teaching Business Education courses at the undergraduate level, and will terminate my career while teaching Measurement and Evaluation and Business Education courses at the undergraduate, Masters, and PhD levels in this university, and will terminate my career as a Professor of Educational Measurement and Evaluation. But for the number of years I have taught, I want to say that I have contributed tremendously and extensively to scholarship. Today, I am here to showcase my contributions to knowledge that qualify me to be the first Professor of Educational Measurement and Evaluation of this great university.

In my 29 years of service in the university system as a teacher, supervisor, and mentor, I have had the privilege and honour of supervising numerous postgraduate students who have obtained PhD degrees in Measurement and Evaluation and in Business Education. I have successfully supervised 7 persons who obtained their PhD degrees and 15 others who bagged their M.Ed. degrees in Measurement and Evaluation in this university. Again, I have successfully supervised a post-doctorate degree candidate in Business Education at Ignatius Ajuru University of Education, Port Harcourt as well as 5 persons who have bagged PhD degrees and 41 others who have obtained their M.Ed. and M.Sc. degrees in Business Education of this University.

Through teaching, research and community service, I have made several academic contributions to knowledge. I carried out research to assess, quantify, measure, and evaluate the seen and unseen in educational system using psychometric principles in Measurement and Evaluation. My research studies fall within the scope of Education, Measurement and Evaluation, Educational Psychology, Guidance and Counseling, Business Education and Information and Communication Technology.

## 11.1. Studies in Continuous Assessment

Continuous assessment is one of the assessment techniques approved for use in the Nigerian education system for teachers and lecturers to carry out the evaluation of students' or pupils' learning outcomes. The Federal Republic of Nigeria (FRN, 1985) defined it as a mechanism whereby the final grading of a learner in the cognitive, affective, and psychomotor domains using data from tests, checklists, rating scales, projects, observations, interviews, and so on, systematically takes account of all his/her performances during a given period of schooling.

Continuous assessment is a formative evaluation technique teachers and lecturers utilize to find out, in a systematic manner, the overall gains that a student has made in terms of knowledge, attitudes, and skills after a given set of learning experiences (Ubulom & Ikpa, 2020). It utilizes a multiplicity of instruments to determine learners' performance in order to objectively describe the learner (Wagbara-Sampson & Ubulom, 2021).

### *11.1.1. Continuous assessment scores and accounting students' academic achievement:*

Ubulom & Ikpa (2020) carried out an evaluation study to determine whether continuous assessment scores can influence accounting students' academic achievement in senior secondary schools in Rivers State. The findings revealed that a continuous assessment technique was utilized to assess accounting students' academic achievement in senior secondary schools and that though accounting teachers used continuous assessment techniques in the areas of assignments, field projects, and teacher-made tests to assess their students, they lacked knowledge and skills in psychometric principles of test construction. The implications of these findings is that the lack of competencies on the part of accounting teachers in senior secondary schools in doing proper continuous assessment evaluation cannot produce or provide construct validity evidence in the students' CA scores. The lack of validity evidence has resulted in a major measurement error in assessment best practices, which has therefore jeopardized and negatively affected the academic achievement levels of students that passed through their institutions of learning.

### *11.1.2. Teachers' competencies in using continuous assessment:*

Similarly, Wagbara-Sampson & Ubulom (2021) carried out a study to determine teachers' competencies in using continuous assessment in junior secondary schools in Rivers South East Senatorial District, Nigeria. It was discovered that the teachers do not have the competency in test construction, the competency in using information from continuous assessment to modify their instructional strategies, and the competency in continuous assessment score record keeping. The implications of these findings are that the lack of competencies on the part of junior secondary school teachers in carrying out proper

continuous assessment in their schools cannot produce or provide construct validity evidence in the students' CA scores. The lack of validity evidence has caused a major measurement error in assessment best practices, which has therefore jeopardized and negatively affected the academic achievement levels of students that passed through their institutions of learning.

## 11.2. Studies on Students' academic achievement:

### *11.2.1. Relationship between students' attitudes, self-concept and anxiety and their academic achievement in Business Education:*

Ubulom (1999) investigated if a relationship existed between students' attitudes, self-concept, and anxiety and their academic achievement in Business Education. The statistical analysis of the results showed a high level of positive correlation existing between students' attitudes, self-concept, individual differences, anxiety and their academic achievement in Business Education at a 0.05 level of significance. The implication of these findings is that psychological factors could influence students' levels of academic performance. Therefore, there is the need for students to always develop positive attitudes, realistic self-concept, low levels of anxiety, and minimize the level of individual differences in order for them to record a high level of academic achievement.

### *11.2.2. Students' temperament and academic Achievement:*

Ubulom, Abam & Dambo (2016) carried out a study to determine if a relationship exists between students' temperament and their academic achievement in Junior Secondary School Basic Technology in Port Harcourt Metropolis. A simple random sampling method was used to

select 720 Junior Secondary School students to use as respondents for the study. The findings of this study show that psychological variables such as temperament could negatively influence students' levels of academic performance. As a result, students must always maintain control of their temper in order to avoid negatively affecting their academic performance.

### *11.2.3 Teachers' expectations and students' academic achievement:*

Ukwuije & Ubulom (2000) investigated the influence of teachers' expectations on students' performance. Using the stratified random sampling method, 300 students were selected for the study. A self-structured People's Expectancy Scale (PES) and a teacher-made test were used to collect data from teachers and students respectively. A statistical analysis of the results showed a high positive correlation between expectancy and students' achievement at a 0.05 level of significance. The implication of this is that if students define situations as real, they are real. Therefore, the student's perception of his strengths and weaknesses is a significant factor in the learning process and assessment. For effective learning, teachers should help students resolve false conceptions about their ability to succeed in their work and assist them in the development of realistic self-concepts.

## 11.3. Studies on Testing and Psychometric Principles

### *11.3.1. Effect of guessing on test scores:*

Ubulom and Amini (2012) investigated the effect of guessing on test scores. One of the basic assumptions in testing is that test items should be able to separate high-ability students from low-ability ones. For a test with good psychometric properties, this should be ideal because such a test will have the items constructed in such a way that the distractors are able to attract low-ability students easily. The foregoing presupposes that if all the students in a testing situation do not possess the ability or theta (q) demanded by the test items, they should all score zero. The mean and standard deviation scores of the students will be zero. However, in order to guide the examiners to adequately score the responses of the examinees, there is a need for them to adopt a correction for guessing formula, which is:

$$\text{Correct Score (X)} = R - \frac{W}{n-1}$$

Where:

R = The number of Questions answered correctly;
W = The number of Questi ons answered incorrectly;
and
n = The number of options for the test items.

As an illustration, let R be equal to 48, W = 21, and n = 4. As a result, the corrected score is 48 - 7 = 41.

In using the guessing formula, the items omitted or not answered are not considered. However, the formula assumes that any wrong response is as a result of guessing and that all options are equally effective. The results of this study show that test takers scored some items zero while some had 1 test item correctly. This implies that pupils do not possess the ability demanded by test items. Hence, the questions answered correctly by the testees were based on guessing. The results of this study also revealed that 1 out of 20 primary school pupils who responded to the test answered 4 test items correctly, 2 out of 20 of them got 4 test items correctly, and none of them had 2 test items correctly. The results failed to agree with the perfect Guttman scale. A perfect Guttman scale assumes a triangular pattern due to students' responses to items according to the number of characteristics or traits or abilities possessed by them. Findings of this study are in agreement with the opinion of Lord since the test was constructed and applied in the classical test theory pattern and it was established that the pupils do not possess the ability demanded by the items. This implies that guessing is a serious factor that affects examinees' test scores. The researchers noted that if appropriate instructions are given to the examinees, the problem of guessing can be eradicated.

## 11.4. Development of Evaluation Model:

### *11.4.1. Kernel of Truth Evaluation Model:*

Ubulom (2012) developed an evaluation model known as the Kernel of Truth (See Figure 10) for the evaluation of educational programmes.

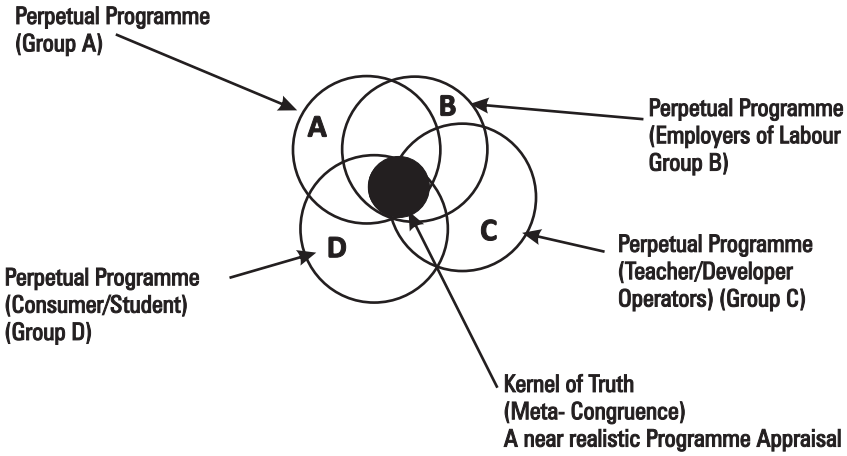



Figure 11: The Kernel of Truth (Meta- Congruence/Evaluation Model Theory

Ubulom stated that evaluating an educational program is complicated because it is made up of many different parts. Because of this, he concluded, no one model is seen as the best for evaluation.

He revealed the following to be the components of educational programmes to be evaluated: need for the programme; philosophical and objective consideration; values and assumptions underlying the programmes; and other related programmes. He added that for the evaluation, the context for the environment in which the programme will function or is functioning, the input resources, process, the alternative ways the programme is implemented and the product competency of

the programme. In this model, there must be a point of agreement in the opinions of all the stakeholders of the programmes, known as the "Kernel of Truth" or "Point of Congruence" (that is, a near-realistic point of appraisal of the programmes).

## 11.5. Development of Educational Domain (Psycho-Manipulative):

Ubulom (2001) emphasized the six levels of the psycho-manipulative domain as shown in Figure 11.

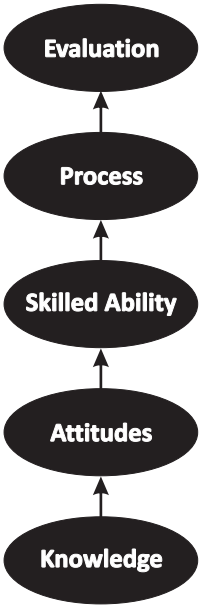



**Figure 12: Psycho-Manipulative Domain**
**Source: Ubulom (2001)**

Ubulom (2001) proposed a new taxonomy known as **Psycho-Manipulative** for effective instructional delivery, learning, and assessment of competencies and skills in vocational and technical education subjects.

## 11.6. Studies on Examination Malpractices

### *11.6.1. Effects of examination malpractice in Rivers State:*

Ubulom and Ukwuije (2001) conducted research on the consequences of examination malpractice in Rivers State. Findings from the study revealed that examination malpractice has a negative effect on the educational life pattern of people living in Rivers State, no matter their state or place of origin. Examination malpractice also has a negative effect on the economic lifestyle of people living in Rivers State. Examination malpractice has an impact on the political lives of Rivers State residents. Examination malpractice has a negative effect on the social life pattern of the people living in Rivers State.

### *11.6.2. Effects of examination malpractice in Rivers State:*

Ubulom, Enyekit and Vinazor (2011) carried out a study on examination malpractice and the falling standard of education in Nigeria. The study revealed that examination malpractice has serious negative effects on our entire life pattern; hence, it is an anti-development. The findings of this study imply that examination malpractice has become a cankerworm which has eaten deep into people's lifestyles, thus our educational, socio-economic, and political systems are greatly negatively affected.

## 11.7. Studies on Teachers' Assessment Competencies

The school environment has a strong positive relationship with students' ratings of their overall school satisfaction, students' self-esteem, and attainment of educational objectives. Due to their importance in driving the activities of the school system, teachers' competencies enhance their ability to create an enabling school environment that is fair, understanding and acceptable for students in order to acquire diverse ideas, experiences, knowledge and skills. Attainment of educational goals is how well an individual is able to demonstrate desired abilities. Whereas the competencies of secondary school teachers to achieve educational objectives during the teaching-learning processes are questioned, it appears that a knowledge gap has been created that needs to be empirically filled, hence the need for this evaluation study.

### *11.7.1. Teachers' competencies in attaining educational objectives:*

Ubulom and Ikpa (2019) evaluated teachers' competencies in attaining educational objectives of senior secondary education in Rivers State. In this study, it was discovered that teachers' knowledge and mastery of subject matter, teachers' teaching skills, and attitudes significantly influence their attainment of educational objectives in senior secondary education in the three senatorial districts of Rivers State. The implication of these findings is that where teachers have good knowledge and mastery of subject matter, adequate teaching skills, and positive attitudes towards their duties in schools, there is the tendency that they may not be able to achieve the educational objectives of senior secondary education as stipulated in the National Policy on Education by the Federal Republic of Nigeria (FRN, 2013), meaning that their services are fruitless.

### *11.7.2. Financial Accounting Teachers' Competencies in Assessing Students' Cognitive Achievement:*

Ikpa, Ubulom & Obilor (2022) carried out an evaluation study on financial accounting teachers' competencies in assessing students' cognitive achievement in senior secondary schools in Rivers State. In this study, it was discovered that the financial accounting teachers in senior secondary schools in Rivers State have subject mastery knowledge in financial accounting but lack knowledge of the use of test blueprints in constructing their test items and that they also use residual knowledge in instrument development. These findings imply that senior secondary school financial accounting teachers did not receive adequate training in test construction, and as a result, they lack psychometric principles in crafting their test items. This scenario clearly reveals that the tests used by these teachers and other teachers in schools lack psychometric properties, and hence have not been measuring what they claimed to be measuring. To this end, the obtained students' scores through these tests cannot have validity evidence.

## 11.8. Evaluation Studies

### *11.8.1 Evaluation of Internet Service Availability and Utilization in Schools:*

Ogwunte and Ubulom (2016) evaluated internet service availability and utilization by private secondary school students in Port Harcourt, Rivers State. The findings of this study revealed the non-availability and inadequacy of internet services in private secondary schools in Rivers State. The implications of this are that the absence of internet service is detrimental to student learning and could militate against proper student exposure as well as diminish the benefit derived and increase the challenges faced by the students. The study said that practical use of the internet should be made

mandatory to improve learning, and that teachers and students should get training on how to use computers and the internet on a regular basis.

### *11.8.2. Evaluation of teacher-centered and learner–centered Instructional Methods for effective Teaching Accounting in secondary schools:*

Ubulom and Ogwunte (2017) evaluated teacher-centered and learner-centered methods utilized for effective instructional delivery of senior secondary accounting subject. The study recommended, among other things, that the learner-centered method, which was found to be very effective, be made mandatory in the teaching of accounting subjects in all Rivers State secondary schools.

### *11.8.3. Process Evaluation of Instructional Strategies Effectiveness for the Implementation of New Junior Secondary Business Subjects Curriculum:*

Ubulom and Ogwunte (2017) carried out a process evaluation study of instructional strategies' effectiveness for the implementation of the new junior secondary business subjects' curriculum in South-South, Nigeria. The study revealed that teachers who teach business subjects mainly use teacher-oriented methods and that the majority of teachers who teach business subjects are holders of Bachelors of Education. The study advocates, amongst others, that business studies teachers be retrained to acquire the pedagogical competencies for teaching business studies in junior secondary schools.

### *11.8.4. Evaluation of Undergraduate Business Education Degree Programmes:*

Ubulom (2003) evaluated undergraduate Business Education programmes of tertiary institutions in Rivers State. In the study, it was discovered that the objectives of the programme in Rivers State University of Science and Technology were well stated and met the required minimum academic standards of the National Universities Commission. The study also revealed that for the then Rivers State College of Education, the academic programme was not that of an undergraduate Business Education degree programme, rather it was Business Studies. The study further revealed that the two institutions were able to give students' broad-based training in teacher education as well as in any of the functional (accounting, distributive, and secretarial) areas of Business Education and with these qualifications they awarded the degrees to the grandaunts. The study also revealed that the facilities at the Rivers State University of Science and Technology were inadequate but adequate at the Rivers State College of Education.

### *11.8.5. Evaluation of Instructional Resources for Teaching Business Subjects in Public Secondary Schools in Rivers States:*

Ubulom and Ogwunte (2017) evaluated instructional resources for teaching business subjects in public secondary schools in Rivers State and discovered that physical facilities (classrooms, typing laboratories, and model offices) for business subjects in Rivers State public secondary schools are moderately adequate while others (such as libraries and books) are not adequate.

#### *11.8.6. Evaluation of Entrepreneurship Skills and Competencies Acquisition:*

Ubulom and Ogwunte (2017) evaluated the entrepreneurial skills and competencies expected of Business Education graduate workers in Rivers State and Bayelsa States. The study revealed that Business Education graduate workers in Rivers State and Bayelsa possessed entrepreneurial skills and competencies to a great extent. The study advocates that the government should endeavour to encourage entrepreneurship by introducing elements of entrepreneurship at all levels of the educational system.

### 11.9. Contributions in Needs Assessment

#### *11.9.1. Needs assessment survey of communities in Andoni and Opobo/Nkoro Local Government Areas:*

Ubulom and Uranta (2013) carried out a needs assessment survey of communities in Andoni and Opobo/Nkoro Local Government Areas in Rivers State and found out that in some communities such as Asarama, Okoroboile, Ekede, Ebukuma, Ikuru Town, Ngo, in Andoni Local Government Area and communities such as Opobo Town, Queen's Town, Epelema community, Minima, Kalasunju, Kalaibiama, Iloma in Opobo/Nkoro Local Government Area in Rivers State Andoni Local Government Area have no rural electrification, health care facilities, rural water supply, or road construction leading to all the communities; that there is a high level of unemployment and poverty; and that their shore needs embankment, protection, and landing jetties and According to the study's findings, the high level of oil spill in the areas. The study advocated for the government's intervention and multinationals operating in these areas to provide social amenities. Again, efforts should be intensified to approach the federal

government of Nigeria, Rivers State and Local Government Area to find the provision of some projects for the communities.

## 11.10. Other Studies

Ubulom (1999) carried out a study to find out some factors that could influence students' choice of career. One hundred and fifty undergraduates were drawn from three tertiary institutions in Rivers State, namely, Rivers State University, University of Port Harcourt, and Rivers State College of Education, and used as respondents in the study. He analyzed the data using t-test and Analysis of Variance statistics in order to test the three null hypotheses. The results of the study revealed that students' gender and their parental socio-economic background had no significant influence on the students' choice of career. Rather, the amount of guidance and counseling services received had a significant influence on their choice of career. He advocated for the inclusion of career counseling education at all levels of education to help young people make sound career decisions.

Ubulom, Ukwuije & Uzoeshi (2001) carried out another study to determine some factors responsible for students' choice of Business Education as a career using 150 undergraduate Business Education students drawn from Rivers State University and Rivers State College of Education as respondents. The hypotheses were tested with the use of the t-test. The findings of this study were that psychological and physiological variables were responsible for students' choice of Business Education as a career, whereas sociological variables were not responsible for their choice of Business Education as a career.

## 11.11. Further Publications

### *11.11.1. Other Evaluation Studies*

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## 12.0. CONCLUSION

Mr. Vice Chancellor Sir, my respected audience, distinguished ladies and gentlemen, for the past hour or so, we have been discussing this very important activity needed for quality measurement, assessment and evaluation best practices in the school system. No proper learning can take place without assessment of the learner's learning outcomes and the assessor himself. Various factors that tend to hinder the effectiveness of educational assessment and evaluation have been highlighted in this lecture and modalities to ameliorate their influence have been suggested because of the negative impact this will generate on society and for national development. For effective and successful assessment in schools and to achieve quality education, the assessor must possess the required psychometric knowledge and skills in test construction as well as the development of other measurement instruments required to assess, quantify, measure, and evaluate the seen and unseen students' psychological and mental attributes in the school setting.

## 13.0. RECOMMENDATIONS

Based on the knowledge and ideas we have drawn from the literature and empirical studies we have come across as well as our contributions to scholarship, we advocate that:

(i) This community can leverage the insight and services of Tests, Measurement, Assessment and Evaluation in many ways.

(ii) There is need for teachers and lecturers to be retrained on the principles and theories of test construction. This will assist them acquire the needed knowledge and stills in test development.

(iii) Continuous Assessment (CA), as intended, should at least provide students with opportunities to demonstrate their abilities and skills at regular intervals in courses offered during each semester. This will provide the motivation for students to study for mastery throughout the semester if it is properly implemented, and its guidance-oriented function lets students know where they stand, including their strengths and weaknesses in their courses, and what more they need to do. Conducting CA a few weeks or days before examinations appears to be cosmetic, merely to fulfill a statutory requirement, not to monitor students' learning progress or provide feedback to lecturers on what they can do differently to enhance students' understanding and performance. Moreover, releasing CA results close to examinations (if at all) is even less effective. Sometimes, CA scores are kept on the chests of lecturers, only to be used for discriminatory purposes after examination scores are known, sometimes to upgrade the final scores of undeserving candidates. There may therefore be a need to adjust the timing of CA on the academic calendar to reflect its continuous nature and to encourage lecturers to submit CA scores to Heads of Departments and publish them before the commencement of semester examinations.

(iv) Lecturers routinely make use of tests to determine students' knowledge and performance. It is part of the normal academic duties. But test construction requires the use of appropriate psychometric procedures and techniques for test design, standardization, and administration. Notwithstanding that, as a result of ICT, the administration and scoring of test items may be technology-driven, the construction and development of the items remains a professional enterprise. Towards this end, the university may wish to organize regular workshops on educational assessment, especially educational testing, which academic staff of all cadres should be encouraged to attend. This could also be a part of the training that all new academic staff should get before they start working in their departments, just like it is done in the best companies.

(v) The assessment of academic staff, hitherto, reflects only the views of individual lecturers, their colleagues, and different levels of management. The significant other is missing; that is the students. Students are largely the direct recipients of the services of lecturers and are key stakeholders in the system. Their views should count in the assessment of the teaching component of a lecturer's job. An appropriate test assessment instrument that can serve this purpose can be developed and will be objective, dependable, and fair. This will contribute to the validity of the assessment scores of lecturers on teaching.

(vi) The university management should encourage every academic department to always carry out in-house evaluation of their programmes in order to me up with the current global trends.

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Thank you all for your attention.

# CITATION

ON

## PROFESSOR WILLIAM JAMES UBULOM

Professor William James Ubulom was born on Monday, the 5th day of March, 1961 at Okorobo-Ile Town into a God fearing and humble family of Late Elder James Aaron Ubulom of Okorobo Compound in Okoson Group of Royal Houses; his mother was Late Madam Love James Ubulom (nee Sunday Otowo) of Egep-Kifuuk of Okoroboile Community in Andoni Local Government Area of Rivers State, both of the blessed memory. He is the third son out of four children (boys) of his parents. He is the first Professor of Measurement and Evaluation of this University and of the Obolo (Andoni) nationality. He is a seasoned administrator and a mentor to many undergraduate and post-graduate students at Rivers State University and outside the university.

Professor William James Ubulom had his primary education at State School, Okoroboile, and after the Nigerian Civil War, he later enrolled at Baptist Day School, Aggrey Road, Port Harcourt, where he completed his primary education in 1972. He attended King's College of Commerce, Buguma, where he obtained his West African School Certificate in 1980. He was the Deputy Senior Prefect of his set (1980) and a resourceful footballer who played First-Eleven in the school football team. He had his secondary education with a Rivers State Government Scholarship.

Professor Ubulom worked briefly with Rivers State Broadcasting Corporation (Radio Rivers), Port Harcourt as an Accounts Clerk/ Cashier (1981-1984) and later proceeded to Rivers State University (then Rivers State University of Science and Technology), Port Harcourt, where he obtained his Bachelor of Science (B.Sc.) Degree

in Business Education (Secretarial Education Option) in 1990. After his primary assignment as a Corp Liaison Officer of the Ezinihitte Mbaise Local Government Area for the National Youth Service, he worked for a short time at Ezinihitte Mbaise Local Government, in Imo State.

Professor Ubulom was the First Local Government Secretary of Andoni/Opobo Local Government Council from January, 1992 to February, 1993, after which he started his academic career at the Rivers State College of Education (now Ignatius Ajuru University of Education), Rumuolumeni, Port Harcourt, in March, 1993 as a Graduate Assistant, where he taught business education and business related courses. To consolidate his position as a lecturer, Professor Ubulom proceeded to the University of Port Harcourt, where he obtained his Master of Education (M.Ed.) Degree in Measurement and Evaluation in 1997, and in 2001, he was promoted to the rank of Lecturer II. He was awarded a Federal Government Scholarship for his Master's Degree Programme.

After serving Rivers State College of Education (now Ignatius Ajuru University of Education), Rumuolumeni, Port Harcourt for a decade, Professor Ubulom's service was needed at Rivers State University (then Rivers State University of Science and Technology), Port Harcourt, where he was engaged as a Lecturer II in August, 2003. To satisfy his quest to be a renounced scholar and a university don, Professor Ubulom proceeded to the prestigious University of Nigeria, Nsukka with Elf Total Fina's Scholarship, where he bagged his Doctor of Philosophy (PhD) Degree in Science Education with a specialization in Measurement and Evaluation in 2006.

As a lecturer, Professor Ubulom rose through the ranks in the university teaching career to the rank of Professor of Educational Measurement and Evaluation. He has successfully supervised five (5) PhD theses, over fifty (50) MSc and M.Ed. dissertations, and over 150 BSc and B.Ed. research projects. As an accomplished scholar, Professor Ubulom has over one hundred (100) national and

international publications to his credit, which include papers in referred indexed journals, authored and co-authored books, chapters of books, papers in referred conference proceedings, and technical reports, 95% of which are found online and indexed on Google Scholar, Research Gate, and Academia. He has also attended over thirty national and international conferences and workshops. He is an analyst on topical public issues in radio and television. He serves as editor, reviewer and assessor for several national and international journals as well as external examiner of undergraduate programmes for many tertiary institutions, among which are the Department of Educational Psychology, Guidance and Counseling of the then Rivers State College of Education, Rumuolumeni; the Department of Office Management and Technology, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State; and the National/Higher National Diplomas' Programmes of Rivers State Polytechnic, Bori. He is currently an external examiner of post-graduate programmes in the Department of Educational Psychology, Guidance and Counselling of the Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State.

Professor Ubulom held several positions in the University, some of which are the Departmental Examinations Officer (2003–2005), Departmental Coordinator, Post-Graduate Programme (2006-2010), Departmental Undergraduate Projects Coordinator (2010–2013), Faculty Coordinator, Continuing Education Programmes Faculty of Technical and Science Education (2012–2015), Acting Head of Department, Department of Business Education (2015–2017), Member, Rivers State University Senate (2015-Date), Member, Rivers State University Research Ethics Review Committee (2018-Date) and Coordinator, Teachers' Registration Council of Nigeria (2018–Date). Professor Ubulom served as the Head, Department of Business Education, Federal University Otuoke, Bayelsa State while on a one-year Sabbatical Leave and a Member, Federal University Otuoke Senate (2018-2019). He is still a visiting Professor to the same University.

His achievements during his tenure as the Acting Head of the Department of Business Education include:

1. Created a conducive and cordial work environment where love, oneness, sincerity of purpose, teamwork and peaceful co-existence were exhibited among the Department Staff.

2. Developed Master of Science (MSc) Degree programmes Curricular in Business Education with options in Accountancy, Entrepreneurship and Office Management and Technology. Developed PhD Degree programme Curriculum in Business Education.

3. For the first time since the inception of this university and the Business Education Undergraduate Degree Programme in 1981, these two (2) post-graduate programmes commenced in the 2016/2017 Academic Session. As of today, the Department of Business Education has produced up to 20 PhD degree holders in Business Education. Some of them have been engaged as lecturers in the Department. This is a huge achievement, Mr. Vice Chancellor Sir.

Professor Ubulom has assessed six (6) scholars who have been promoted to the rank of Professor and seven (7) scholars who have been promoted to the rank of Associate Professor. His areas of specialization and research interest are programme evaluation, research methods, statistics, tests, measurement and evaluation, test theories, psychological testing, technology-driven testing, tests and instrument development and standardization, measurement of students' academic achievement, information and communication technology, and business education.

A versatile and internationally known scholar, Professor Ubulom is a member of many national and international learned and professional societies, among which are the American Psychological Association (APA), Association of Educational Researchers and Evaluators of Nigeria (ASSEREN), Association of Business Educators Evaluators of Nigeria (ABEN) and the Nigerian Institute of Management (NIM). He is also a Member of the International Chartered Management Consultants (CMC) and a Professional Member of the Teachers' Registration Council of Nigeria (TRCN). A recipient of several awards and scholarships, Professor Ubulom is a Fellow of the Institute of Corporate Administration (FCAI), a Fellow of the Institute of Management Consultants (FIMC), and a Fellow of the Institute of Corporate Resource Management (FCRMI).

Professor Ubulom has carried out several consultancy services for government agencies (Federal Road Safety Corps, schools) and international organizations such as the Niger Delta Development Commission (NDDC) and Elf Total (Nigeria) Plc. Some of the consultancy services rendered are outlined below:

1. Training the trainers' programmes.
2. Staff training and retraining programmes,
3. Development of Staff' Attitude to Work Rating Scale,
4. Development of Niger Delta Youth Needs Assessment Inventory
5. Development of Education Initiative Intervention Performance Evaluation Kits
6. Carried out a need assessment survey for Andoni and Opobo/Nkoro Local Government areas of Rivers State.
7. Served as a facilitator for NDDC and Elf-Total Plc intervention programmes of their host communities.

Professor Ubulom is a Worthy Knight of the Order of Knight of St. Christopher (KSC), Anglican Communion. He has served the Church Community in different capacities at home, Port Harcourt and Diocesan levels in many capacities, prominent among which were Treasurer, Andoni Archdeaconry, Niger Delta Diocese (2011–2013), Member of Parish Church Council, St. Cyprian's (Anglican) Church, Port Harcourt (2011–2013), Chairman, Schools Management Board and Scholarship Board of St. Cyprian's (Anglican) Church, Port Harcourt (2011–2015), Chairman, Steward Guild of St. Cyprian's (Anglican) Church, Port Harcourt (2013–2015), Treasurer, Men Christian Association of St. Cyprian's (Anglican) Church, Port Harcourt (2012–2013) and Treasurer/People's Warden of St. Cyprian's) Church, Port Harcourt (2013–2015). He was the Secretary of the Niger Delta Diocese's Council of Knights from 2012 to 2015, the Administrative Secretary to the Bishop of the Niger Delta Diocese from 2011 to 2015, the Diocesan Deputy Chairman of the League of Anglican Media Practitioners (LAMP) from 2011 to date, the Diocesan Deputy Diocesan Communicator of the Niger Delta Diocese from 2011 to date, and a Patron of the Niger Delta Diocese Youth Fellowship.

Professor Ubulom has at different times served as Patron, President, Chairman, Secretary, and/or member of several community-based organizations (CBO) at the social, religious, and cultural levels. He served as Secretary-General of the National Union of Andoni Students (NUAS) and as National President of the National Union of Andoni Students (NUAS) for two terms before receiving the National Union of Andoni Students (NUAS) Life Membership Award. He was the Founder and First Chairman of the Life Members Forum's National Union of Andoni Students (NUAS), the Founder and First President of the Uja-Obolo Circle of Nigeria, as well as the Founder and First Chancellor of the League of Obolo Academics Worldwide.

Professor Ubulom is a traditional ruler and a custodian of Obolo tradition and culture. He was conferred with the Chieftaincy title of Eneire-Ama I of Okoroboile, Andoni in 1993 and was later crowned with the Chieftaincy title of Ogwuboon Agalaga, The Okan Okoson Group of Royal Houses of Okoroboile, Andoni. He was once the Chairman of Okoroboile Internal Development Association (OKIDO) and Okoroboile Community Development Committee (CDC) in Andoni Local Government Area, Rivers State. Sir Chief Professor William James Ubulom is a lover of music, culture, and sports as well as the patron of many socio-cultural organizations, among which are the Port Harcourt Royal Male Choir and the Niger Delta Diocese Anglican Youth Fellowship (AYF). He was a member of the Port Harcourt and District Amateur Football Association (DAFA) (1981-1985), the Rivers State Football Association (RSFA) (1981-1984) and the Rivers State Judo Association (1993-1997). Professor Ubulom is married to Lady Elfrida (Nee Oba), and their union has produced a slew of good and fine children.

Mr. Vice Chancellor Sir, ladies and gentlemen, it is my honour to present a rare gem, a born and trained teacher, a psychometrician, an evaluator, a behavioural and educational scientist, a seasoned administrative icon, a Knight of St. Christopher of the Anglican Communion, a traditional ruler and a custodian of Obolo custom and tradition, and a role model whose content and vision should be explored, analyzed, and amplified, the 80th Inaugural Lecturer, who happens to be the first in the field of Measurement and Evaluation in the Faculty of Education of this great university, Professor William James Ubulom, to deliver his lecture entitled "Everything, seen and unseen, is measurable and evaluable".

Thank you.