

The Conceptualisation of Educational Measurement held by some Secondary School Teachers

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Abstract

In this study, the attitude of some teachers to educational measurement was investigated. A semantic differential scale was developed and used to collect information about the concept of educational measurement held by some secondary school teachers.

The subjects were a hundred and seventy (170) teachers from various subject areas such as Applied Arts and Science, Arts, Commercial/Technical and Science. Results of the study reveal that teachers are more familiar with testing as the instrument for measuring students' achievement. And one could infer that while they find the other measuring instruments not very useful and important.

Some of the recommendations and suggestions based on the findings of the study included making the school personnel realize their roles in educational measurement and providing in-service training for teachers to enable them get familiar with skills and procedures involved in educational measurement.

Introduction

Measurement and evaluation have played a significant role in human history than is generally recognized. Earliest records indicate that by the dawn of recorded history people had developed systems of measurement. The ancient Egyptians used accurate methods of measurement in building the pyramids. The book of Genesis states that Noah built his ark three hundred cubits long, fifty cubits breadth and thirty cubits high indicating that he carried out detailed measurement of the ark during construction.

Accurate, dependable measurement is a fact of life in our modern, technologically biased society. It is essential to efficient production in agriculture and industry. It is indispensable in many professions such as medicine, nursing and engineering and in all scientific work. Measurement is a valuable tool in making personnel decisions in business, government and the armed forces.

In education, measurement is also inevitable. Most important unbiased decisions, whether by or for individuals or in general matters such as promotions, counseling, accreditation and methods of teaching, developing curriculum or some aspect of the work, depend, at least in part

on the results of measurement. The constant evaluative role of the classroom teacher as he attempts to determine the degree of scholastic and social status and the academic growth of students that will help him make hundreds of major and minor educational decisions each year can not be overemphasized.

What is generally observed is that teachers have diverse ideas about educational measurements. Even now that great improvement has been made in educational test and evaluative procedures during the past years, some teachers are still adamant to the old methods. They seem not to be familiar with and have access to the possible range of appropriate measuring instruments, techniques and procedures.

In essence, enough attention has not been paid to measurement in education as a tool, a means to an end, in itself. With the pervasiveness and usefulness of measurement in education, it is intended that teachers should measure the capacity of individuals so that they can evaluate strengths and weaknesses in skills. And also, measure to determine the extent of a learner's progress towards the goal or objectives of education. Measurement in education should always serve to help do better a job of educating people.

Research Problem, Objectives and Plan

Classroom teachers cannot escape the necessity of evaluating the progress of their students. Students should have some "feedback" or knowledge of results of their efforts to learn in order that they may plan the use their time in learning. Many parents want to know about their children's performances. Administrators must keep records of the progress of individual students so that the whole school enterprises can be made to queries about individual students. These points to the need to lay much emphasis on educational measurement. But teacher have different understanding of educational measurement. Compared to the methods of measurement commonly used in early days, present day techniques and procedures are more objective and more carefully planned and constructed than their predecessors. Not all the teachers have the ability and interest to perform certain aspects which include, constructing tests, giving grade, assessing potentialities and interpreting standardized intelligence and achievement tests.

Teachers also encounter problem with using other measuring instruments besides testing. Two major issues can be raised at this juncture. These are whether teacher have the ability-know-how to carry out educational measurement. There is also the issue of teachers attitude towards educational measurement. These are areas that could be investigated.

In order to judge the attainment of pupils accurately and fairly, a teacher must have access to the best measurements available and must know how to use them properly and how to interpret the result obtained by their use. But the teacher may have the relevant instrument; know what to do with the instrument and yet fail to carry out the processes of educational measurement if he has not acquired favourable attitude towards educational measurement. This study has therefore investigated the general attitude of teachers to educational measurement. Different aspect of the processes of educational measurement are identified and teachers were requested to indicate towards these processes.

In doing this, the research found the works of Goslin and Mayo (1967) on social consequences of testing and the development of talent, and Conant (1963) on recommendation of the adequate implementation of instrument in tests and measurement in teacher – training programmed very useful. Educational measurement is valuable to the extent that it helps teachers, counselors, administrators and others connected with schools to do a better job of educating children and adults. Teachers therefore need to recognize the importance of using different kinds of instruments and relating data in helping the students in producing measurement progress toward desired instructional goals. This study has therefore emphasized the need for teacher to acquire favourable attitude towards educational measurement.

Literature review

Several related literature was reviewed in the study. Most importantly, those that focus on measurement at school. This chapter is divided into sub – headings, viz: The meaning of measurement; Major areas in measurement; Importance of measurement at school; Role of teachers in educational measurement.

The meaning of measurement

More often than not, there have been some confusion concerning the meaning of the term “evaluation” as it applies especially to education. In some instances, it is used as a synonym for the term “measurement”. Thus a teacher who administers an achievement test might say either that he is “measuring” achievement or that he is “evaluating” achievement, with little regard for the specific measuring of the two terms.

Ebel (1961) stresses that “evaluation” issued as a collective term for those appraisal method which do not depend on “measurement”. Ebel (1961) further says that this used of the two terms distinguishes “evaluation” as quantitative description of “students behaviour” (e.g. anecdotal records of behaviour) as opposed to “measurement” which are quantitative description (e.g. test scores). Norman (1976) defines evaluation as “a systematic process of determining the extent to which instructional objectives are achieved by pupils” Robert (1979) also defines measurement as, “a process of assigning numbers to the individual member of a set of objects or persons for the purpose of indicating differences among them in the degree to which they possess the characteristic being measured”.

According to Noll, Scannel and Craig (1979) as the term “measurement” is used in education. It is generally conceived of somewhat more broadly than testing (I. e. using tests), and it considers such matter as purposes, interpretation and use results. It is thought of as including the use of types of instruments other than tests such as rating scales, questionnaires and any tools that yield or can yield quantitative results.

Major areas in measurement

Stanley and Hopkins (1972) argue that constructing a satisfactory test is one of the hardest jobs a teacher has to perform; good test do not just happen. The process of constructing it demands an understanding of the objectives being assessed and of the examinees and their test taking behavior.

Stanley and Hopkins (1972) further state rules which are to be followed in constructing a test:

- 1) Adequate provision should be made for evaluating all the important outcomes of instructions.
- 11) The test should reflect the approximate typical emphasis in the course.
- 111) the nature of the test should reflect the conditions which it will be administered.

Classroom tests have useful educational functions; constructing them should cause instructors to think carefully about the goals of instruction in a course. Moreover, on the students' part the process of taking a classroom test and discussing the scoring of it afterwards can be a richly rewarding learning experience. As Stroud (1946) has said; 'it is probably not extravagant to say that the contribution made to a student's store of knowledge by the taking of an examination is as great, minute for minute, as any other enterprise he engages in.' Hence, testing and teaching need not be considered as mutually exclusive, as competitors for valuable class time. They are intimately related parts of the total educational process.

Importance of measurement at school

Nwana (1979) affirms that teaching and measuring need to be looked upon as complementary activities for teacher and the learner. No matter how efficient the teacher, how intelligent the pupils, how adequate the audio-visual equipment, if no provision is made for some evaluation of progress, the teaching effort may be completely invalidated.

There are good reasons to believe that the measurement of educational achievement is essential to effective formal education. Formal education, according to Ebel (1979) "is a complex process, requiring a great deal of time and money and the cooperative efforts of many people" efforts must therefore be directed towards the attainment of specific goals.

Education, according to Ebel (1979) is not automatically or uniformly successful. Some methods are often effective than others. Efficient use of learning resources often requires special motivation, guidance and assistance.

All of these concerned with the process of education students, teachers, parents and school officials these concerned with the process of education students, teachers, parents and school officials these concerned with the process of education students, teachers, parents and school officials needs to know periodically how successfully their efforts have been, so that they can decide which practices to continue and which to change. It is the function of education measurement to provide than with this knowledge.

The commonly used instrument for measurement is 'tests'. Test serve a variety of functions. They play an important role in today's schools and other aspects of life. Thus, teachers especially, as well as others must know how to use and interpret test correctly. Jacobs and Felix (1968) stress that standardized achievement tests have been the key source of data for evaluating the success of federally funded programmes in some countries. Outcome measure are necessary to determine whether an innovational one in facilitating the attainment of special curricular objectives.

Tests can and often do, help teachers to give valid, reliable grades. (Ebel, 1979). These grades are intended to summarise concisely a comprehensive evaluation of student achievement and reported to the students and their parents to indicate the effectiveness of their efforts. They are also entered in the school record and may help to determine honours and opportunities for further education or future employment, therefore obtaining measures of scholastic aptitude, achievement interest and personality is often an aspect of the counselling process. (Ebel. 1979)

The use of information from standardized tests and inventories can be helpful for guiding the selection of a college, choosing unrecognized abilities and so on. Frickle and Milliman (1957) buttress this claim when they state that: “when a student, because of proper use of test result is well adjusted and challenged in his school classes happy with his curriculum and aware of his abilities and interest with respect to this educational and vocational future then not only he himself benefits, but in the long run, teachers, counselors, school administrators, college personnel, employers and others benefit”.

Role of Teachers in Educational Measurement

Those who have assessed teacher’s knowledge of evaluation practices have consistently voiced concern that teachers’ knowledge and skills are inadequate. For example, Goslin (1967) noted weakness in teachers’ knowledge of standardized tests and Mayo (1967) found that teachers have an inadequate understanding in several measurement areas.

Lindquist(1951) assume that ‘if measurement is to continue to play an increasingly important role in education, measurement workers must be more than technicians. Unless their efforts are directed by a sound educational philosophy, unless they accept and welcome a greater share of responsibility for the selection and clarification of education objectives, unless they show much more concern with what they measure as well as with how they measure it, much of their will prove futile or ineffective’

To this, Ebel(1961) outline six requisites for a teacher to be competent in educational measurement:

- 1) To know the educational uses, as well as the limitations of educational tests.
- 2) Know the criteria by which the quality of test should be judged and how to secure evidence relating to these criteria.
- 3) Know how to plan a test and write the question to be included in it.
- 4) Know how to select a standardized test that will be effective in a particular situation.
- 5) Know how to administer a test properly, efficiently and fairly.
- 6) Know how to interpret tests scores correctly and fully, but with recognition of their limitations. In short, teachers must make daily, or at least frequent appraisals of the work of every pupil in term of instructional objectives to determine the progress each pupil I making in light of his or her abilities.

Developing the research model and Hypothese

This study was designed to find out teachers’ conceptualization of educational measurement as regards construction of instrument, administering, scoring and interpretation among teachers in some secondary schools in ondo town. The design was purely a survey to find out teachers’ response to some issues raised in the instrument.

Population and sample Design

The subjects chosen for the study were secondary school teachers in ten selected secondary schools in ondo Town. One hundred and seventy (170) teachers responded to the questions in the instrument out of two hundred and twenty (220) given.

Secondary school teachers in selected secondary schools in ondo town were involved in the study. There were seventy (70) teachers from Science department; sixty four (64) from Arts;

Twenty two (22) from Applied Arts and Science department and fourteen (14) from Commercial/Technical department.

Research Design and Data Collection

The research instrument used in the study is a 44-items semantic differential questionnaire referred to as conceptualization of educational measurement scale (C.E.M.S.). The C.E.M.S. is presented in Appendix 11 information requested from the teachers has to do with what teachers feel about educational measurement processes. The educational measurement procedures include. Identifying learning outcome to be tested, constructing tests and other measuring instrument besides tests, administering, scoring and interpreting tests scores. Other information on student requested from the teachers are what teachers feel about providing comprehensible measurement information on students' performance to parents/ guardians, discussing test results for instructional planning and keeping of results of scores.

The educational measurement processes formed eleven concepts in the study. The processes were rated on four bipolar adjectival pairs. These are useful – useless; important – unimportant; easy – difficult; like a lot – dislike a lot. The researcher administered copies of the questionnaire with the help of the head of department a times. With the instructions on top of each copy, the teachers were asked to fill in the spaces provided. The researcher had to go back to the schools the following day to collect the data since the teachers were required to answer the questions at their leisure time.

The research instrument was designed to measure the attitude of teachers to educational measurement. It is a semantic differential scale designed to assess teachers' attitude to each of the eleven concepts of educational measurement as defined in the study. In scoring the C. E. M. S. the seven point on the bipolar scale were assigned the values +3 to -3 (e. g. useful to useless) with neutral point assigned 0. The scores were then reduced to a 4* 11 tables of scales by concepts using the mean score of the groups on each scale. The mean scores, then become the data for analysing the information.

Data analysis and model testing

The investigation used for the data was carried out among teachers in selected secondary school. The table below shows the results in concept and scales as in the C. E. M. S.

The scales are:

- 1) Useful - useless
- 2) Important - unimportant
- 3) Easy - difficult
- 4) Like a lot - dislike a lot

And the concepts are as listed below:

- i) Identifying this learning outcome to be tested.
- ii) Constructing tests.
- iii) Constructing other measuring instruments besides tests (e.g. questionnaires, rating scales).
- iv) Administering tests.
- v) Administering questionnaires and rating scales in school teaching.
- vi) Scoring tests, questionnaires or rating scales.
- vii) Computing statistical data for interpreting scores.

- viii) Providing comprehensible measurement information on students performance to parents/guardians.
- ix) Discussing test results with students to improve learning.
- x) Using test results for instructional planning.
- xi) Keeping suitable records of scores.

Table I
Table of scales by concepts

Scales	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Useful/Useless	2.6	2.4	1.5	2.4	1.4	1.8	1.6	2.5	2.6	2.0	2.8
Important/Unimportant	2.3	2.3	1.1	2.3	1.1	1.6	1.3	2.3	2.6	1.8	2.7
Easy/Difficult	0.4	0.2	0.3	0.9	0.1	0.1	0.2	1.7	2.8	0.8	1.4
Like a lot/Dislike a lot	1.8	1.7	0.8	1.9	1.9	1.1	1.8	2.0	1.9	2.3	2.7

The above table shows that the teachers find it very useful to identify learning outcome to be tested since the mean score was 2.6. the teachers also feel it is important since the mean was 2.3 but they are undecided as to whether it is easy or difficult, the mean for this was 0.4. and they like it with the score as 1.8.

For constructing tests, the teachers feel it is useful as well as important since the mean scores are 2.4 and 2.3 respectively. Their attitude to whether it is easy or difficult is neutral, the mean was 0.2 and they also like it with the mean score of 1.7. teachers feel it is useful and not too important to construct other measuring instruments besides tests, the mean scores were 1.5 and 1.1 respectively.

To them it is neither difficult nor easy since the mean score was 0.2 and this is neutral. They also like it a bit, the mean was 0.8. For administering tests, teachers find it useful and also important, the mean scores were 2.4 and 2.3 respectively. They also find it easy and like it, since mean score were 0.9 and 1.9. as regards administering questionnaires and rating scales, teachers find it fairly useful with the mean scores of 1.4 and fairly important with the mean of 1.1. they rather tend towards the negative in term of whether it is easy or difficult. The mean was -0.1 and the mean of 1.9 for like a lot or dislike a lot, showed that the teachers like it.

Teachers also feel that it is useful and important to score tests, questionnaires or rating scales, the mean scores for these were 1.8 and 1.6 respectively. They do not know if the concept is either easy or difficult since the mean was 0.1 and they like it a bit. As for computing statistical data for interpreting scores, teachers find it useful with the mean of 1.6 and fairly important with the mean score of 1.3. they are neutral to whether it is easy or difficult, they mean score for this was -0.2 and they also like it, having the mean score of 1.8.

The table as well shows that the teachers feel it is useful and also important to provide comprehensible measurement information on students performance to parents /guardian, they have the mean score of 2.5 and 2.3 respectively. To them, it is easy with the mean score of 1.7 and they like it as well, the mean here also was 2.0. For discussing test results with students to improve learning, teachers find it very useful and very important since the mean scores were 2.6

each. They also find it very easy with the mean score of 2.8 and they like it having the mean score of 1.9.

From the table, it is observed that teachers find using tests results for instructional planning useful and important since the scores were 2.0 and 1.8 respectively, they find it fairly easy having the mean score of 0.8. teachers also like this idea because the mean score was 2.3. For keeping suitable records of scores, teachers feel it is very useful and very important since the mean scores were 2.8 and 2.7 respectively. And to them, it is somehow easy having the mean score of 1.4 and they also like it a lot since the mean score was 2.7.

Discussion and Conclusion

The results as show earlier brought out a number of interesting issues for discussion. The results relevant for each of the question is presented and discussed here one after the other. Generally, the results showed that the teachers selected for the study find some concepts more useful than another. For example, they find identifying the learning outcome to be tested, providing comprehensible measurement information on students performance to parents/guardians, discussing test results with students to improve learning and keeping suitable records of scores very useful because the mean scores ranged between 2.5 and 2.8. To the teachers, constructing tests and other measuring instruments besides tests, administering tests, scoring tests and other instrument and computing statistical data for interpreting scores are useful as their mean scores ranged between 1.5 and 2.4 but only administering questionnaires and rating scales in school teaching is fairly useful to them since the mean score was 1.4.

As shown in the table, it can be observed that teachers feel that discussing tests results with students to improve learning and keeping suitable records of scores are very important since their mean were 2.6 and 2.7 respectively. They feel that identifying learning outcome to be tested, constructing tests, administering tests as well as scoring instrument, providing comprehensible measurement information on students performance to parents/guardians and using test results for instructional planning are just important with the mean scores raging between 1.6 and 2.3. For constructing other measuring instruments besides tests, administering questionnaires and rating scales in school teaching and computing statistical data for interpreting scores, teachers feel they are fairly important as they have the mean scores between 1.1 and 1.3.

Obviously, as shown in the table, teachers' responses to whether these concepts are easy or difficult imply that they find most of the concepts somehow difficult. For instance, the mean scores of identifying learning outcome to be tested, constructing tests and other measuring instrument, administering questionnaires and rating scales in school teaching as well as scoring measuring instruments and computing statistical data for interpreting scores ranged from 0.2 and 0.4. But they find discussing tests results with students to improve learning very easy with the mean score of 2.8 while providing comprehensible measurement information on student performance to parents/guardian just easy for them as the mean score was 1.7. Also to the teachers, administering tests, using test result for instructional planning and keeping suitable records of scores which have the mean scores between 0.8 and 1.4 are fairly easy.

On the whole, the teachers like many of the concepts as identifying learning outcome to be tested, constructing tests, administering tests as well as computing statistical data for

interpreting scores, providing comprehensible measurement information on students' performance to parents/guardians, discussing test results with the student to improve learning and using tests results for instructional planning have the mean scores ranging from 1.7 to 2.3. On the other hand, they like keeping suitable records of scores a lot but for constructing other measuring instruments besides tests, administering questionnaires and rating scales in school teaching as well as scoring tests, questionnaires or rating scales having mean scores between 0.6 and 1.1, teachers do not like as such.

The research findings in the area of study revealed that feeling of teachers about measurement in education and also answered the research question. It has been found that teachers have different attitudes towards each of the measurement processes highlighted in the questionnaire. While they have favourable attitudes to some of the process, to some it is contrary.

The findings of the research may be interpreted to mean that teacher's attitude to identifying learning outcome to be tested is satisfactory expected that they find it rather difficult. The implication of this is that teachers may not be carrying out this process.

The findings portray that teachers do not have satisfactory feelings towards constructing other measuring instruments besides tests as much as they have for constructing tests and this buttressed the fact that test is the most commonly used measuring instrument in schools. Furthermore, in administering measurement instruments, the findings show that teachers find administering tests more useful and important than other instruments like questionnaires and rating scales. They find it easier to administer test than other instruments.

The findings also reveal that scoring instrument is useful and important to teachers but not easy and for computing statistical data for interpreting the scores, teachers responses were not very favourable. This implied that teachers are not likely to be exposed to this process of computing statistical data for interpreting scores.

Also from the findings, it was gathered that teacher are familiar with proving comprehensible measurement information on students performance to parents/guardians as well as discussing test results with students to improve learning. By implication, teachers might have been carrying out these processes. The findings further portray that teachers feel that using test results for instructional planning and also keeping suitable records of scores are useful but rather difficult.

The findings above, suggest that teachers are used to testing as the instrument for measuring students' achievement. In this regard, they are likely to have favourable attitudes to it. As to other measuring instruments, teachers do not seem to find them useful or important.

In view of the fact that above implication have been deduced from the findings of the study, the following recommendations are hereby given:
Teachers should determine students' progress through the use of series of measuring instruments. From such analysis, they would be able to decide whether to modify, abandon teaching techniques or teach the content all over again with the aid of appropriate audio-visual materials.

School personal should be aware of their role of being accountable. Suggestion to teachers and schools generally include statements of

- 1) Objectives for students outcome.
- 2) Programmes specifically designed to achieve the objectives
- 3) Measurement of the expected outcomes, and
- 4) Systematic reporting of result with explanation of costs and apparent strengths and weakness.

School personnel should be able to realize what they must know about measurement in education and the abilities they need in this area, that is to provide principles and “Know-How” so that people who have the responsibility of making examination and other measuring instruments will be able to do this better.

Above all, there should be in-service training in educational measurement so as to expose teachers to the processes involved and make them aware of recent development as far as measurement in education is concerned.

Limitations and Further Research

This study was limited to selected secondary school in Ondo township of Nigeria. It made use of teaching staff in the schools since the test items in the questionnaire are to be answered by the teachers. The researcher could not carry out the investigation beyond Ondo town due to time and financial constraints.

However, further investigation could be carried out to expand this study to tertiary institutions in Nigeria. Further studies will require the use of different research methods and larger samples to make the work richer.

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