TEACHERS' ASSESSMENT OF SECONDARY SCHOOL STUDENTS' CHARACTERISATION LEVEL OF AFFECTIVE BEHAVIOURAL OUTCOME IN MATHEMATICS IN NSUKKA EDUCATION ZONE OF ENUGU STATE

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Abstract
This study investigated teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematicsin Nsukka Education Zone of Enugu State. Two research questionswere answered whileone null hypothesis was tested at 0.05 level of significance.The research was conducted using a descriptive survey research approach. One hundred and sixty mathematics teachers in Nsukka Education Zonemade up the population. The sample was drawn from the entire population. Because the study's population was small, this was possible. Teachers' Assessment of Students' Characterisation Level of Affective Behavioural Outcome Questionnaire was used to collect data in this study (TASCLABOQ).Three specialists from the Department of Science Education, University of Nigeria Nsukka validated the instrument. Cronbach Alpha reliability tests produced reliability coefficients of 0.78. The research questions were answered using mean and standard deviation, and the null hypothesis was tested using analysis of variance (ANOVA) at a significance level of 0.05. The findings among other things revealed that: teachers' assessment of students' characterisation level of affective behavioural outcome in Nsukka Education Zone is of low extent. The result also revealed that teachers' assessment of characterisationlevel of students' affective behavioural outcome based on teachers' year of experiences is not statistically significant. Based on the findings of the study, it was recommended among others that government should organize seminar and workshop for teachers to educate them on the proper way of assessing students' affective outcome in mathematics as this will help in improving the competence of teachers towards assessment of the entire behavioural outcome especially affective domain".

Keyword: Teachers, Assessment, Secondary, School, Students', Characterisation, Affective, Behavioural, Outcome, Mathematics

Introduction
        Nations all over the world accordedpriority to education sector. Education is the process of developing the cognitive, affective and psychomotor behavioural outcomes of students in order to equip them with the knowledge and skills necessary to survive and make progress in the human society.The goal of schooling is to modify children's behaviour toward accomplishing national goals by exposing them to specific experiences through methodical presentation of skills, attitudes, concepts, and principles through the various courses offered in the curriculum. One of the subjects that is seen as the language of science and technology is mathematics (Olubukola,2015). Ideally, no nation can develop without integrating mathematics properly into her national life.
        Mathematics is a core science course that found expression in the social, political, scientific, and technological developmentof Nigeria. It's the branch of science that studies the logic of form, quantity, and order. According to Petti (2015), mathematics is a science of patterns that includes patterns of reasoning and communicating, patterns of motion and change, patterns of shape, patterns of symmetry and regularities, and patterns of position.Indeed nonation that wants to develop scientifically and technologically neglects the mathematical component of her school curriculum.Because of the importance of mathematics, the Federal Government of Nigeria made it a compulsory subject at primary and secondary school and basic requirement for admission into higher institution.It is prime instrument for exploring our scientific, economic and social world. The pertinent virtue of mathematics as well as its contribution to the development of mankind has earned the subject

the prominence it enjoys among others subjects. Agwagah(2013) states that mathematics forms the foundation of solid education and tone of modern society. Hence, mathematics permeates the entire society, for which reason it becomes necessary for everyone to have mathematical skills to function intelligently in today's world. And this can be achieved through mathematics education.

Mathematics education encompasses both the activity of teaching and learning mathematics as well as the research that is associated to it. According to Lawal (2017), mathematics education is the transfer of mathematical ideas with the goal of imparting appropriate mathematical knowledge, comprehension, and abilities to a wide range of students and other subjects. With reference to scholarly research, the central objective of mathematics education is to enhance students' mathematics literacy, with an emphasis on problem solving, reasoning, and communication through teaching and learning of mathematics (Reys, 2010). To achieve these objectives, mathematics teachers should teach mathematics for its comprehension, as well as to encourage the learner's positive attitude towards it, and acceptance of it as a useful or dependable channel towards their development into useful and responsible citizens in the society.

In spite of the objectives of mathematics at secondary school level, mathematics education has faced challenges that have become topic of discussion among stakeholders. One of the challenges often being discussed is students' poor achievement in mathematics examinations. Students' achievement in mathematics has been an issue bothering the minds of individuals, stakeholders, government agencies and society at large. According to Uka, Iji, and Ekweme (2012), mathematics education in Nigeria is still lacking, particularly in terms of students' achievement. Despite the fact that research have been undertaken on how to improve students' mathematics achievement (Olanipekun & Aina 2014; Ukwueze, 2017), the failure rate of students in mathematics continues to rise. The poor achievementin mathematics couldbe associated with some factors such as students' factor, teachers' factor, mathematics anxiety, class size, government factor, infrastructural difficulty, instructional technique, and so on (Akinsola, 2011). Studies have considered each of these factors as the major constraints that contribute to students' poor achievement. It is observed that one key factor of students' poor achievement in mathematics examination which is often neglected is the issue of assessment of all domains of behavioural outcomes of students. Majority of teachers focus only on assessment of cognitive domain neglecting or assigning values arbitrarily to psychomotor and affective domains

Assessment is critical to a person's and, of course, a nation's educational development. Assessment, according to Owolabi and Olasehinde-William (2007), is a quality control method for determining the level of accountability displayed by industry stakeholders, as well as determining the effectiveness of teaching and learning and determining students' achievement. Assessment also includes a teacher's assessment of a student to determine whether the student has learnt what he or she should have learnt in a course. Continuous assessment is a regular, cumulative, and comprehensive assessment process. Continuous Assessment (CA) is a system of assessment in education that considers a student's whole experience and achievement throughout their school career (Nworgu, 2015). The whole experience and achievement are the three domains- cognitive, affective, and psychomotor domains.

The cognitive domain comprises goals related to thinking, memory, knowledge, and problem solving. Knowledge, comprehension, application, analysis, synthesis, and evaluation are the six stages of Bloom's cognitive domain (Krathworhl, Bloom & Masia, 1964). Lorin Anderson, a former Bloom student, and David Krathwohl updated each stage as follows in the late 1990s: remembering, understanding, applying, analyzing, evaluating, and creating (Donald, 2015).The psychomotor domain includes tasks involving muscular and motor skills, material and object manipulation, and activities involving muscular coordination. Reflex movement, basic fundamental motions, perceptual capacities, skillful movement, and non-discourse communication are all categories of aims in the psychomotor domain. The objectives in the affective domain are those that have to do with emotional states and the degree of acceptance or rejection. Receiving, responding, valuing, organizing, and characterisation are the five degrees of understanding within the affective domain (Krathworhl, Bloom &Masia, 1964).

The assessment considers a student's entire performance in the cognitive, affective, and psychomotor domains of behaviour. Unfortunately, most teachers continue to focus solely on the cognitive domain, implying that the students' overall competence may not be assessed. This has seriously implicated the skills of mathematics teachers as evaluators. This is because teachers assign values arbitrarily and haphazardly while assessing psychomotor and affective domains. That is why this study found the extent to which mathematics teachers assess secondary school students' affective behavioural outcome in mathematics. The reason for this study on this level of affective behaviour is because students' emotional state is a big factor in their learning process. Changes in affective

component, produces changes in both cognitive and psychomotor components. Affective behaviour may hinder or promote learning especially in mathematics.As earlier stated Krathworhl, Bloom andMasia (1964) described the affective domain as falling intocharacterisation.

Characterisation entails functioning consistently in accordance with a set of internalized ideals as well as a life philosophy. Internalisating value is what characterisation is all about. In essence, the students absorb values and allow them to control or steer their actions. Learning outcomes at this level cover a broad range of activities, but the major emphasis is on the fact that the behaviour is typical. Instructional objectives in this level of affective behavioural outcome are students' general patterns of adjustment (personal, social, emotion). Internalize, verify, revise, require, avoid, resist, manage, resolve, act, distinguish, display, influence, alter, perform, practice, propose, qualify, question, serve, and solve are some examples of action verbs. Specific goals include demonstrating self-reliance while doing mathematics issues independently, demonstrating self-discipline in mathematics classes, and cooperating with classmates when solving mathematics problems.

The reasons why teachers do not usually assess this level of affective behavioural outcomes of students, could be due to the invisibility of changes in students' morals, values, attitudes, likes, dislikes, and sentiments. As a result, recording and evaluating them becomes challenging. Teaching experience has also been identified as a factor that controversially influences teachers' performances. Teachers may have varied teaching experiences.According to Okafor (2010), there was a substantial difference in mean mastery scores between experienced and less experienced teachers, with experienced teachers outperforming less experienced teachers.However, it is still unclear whether teaching experience has an impact on extents mathematics teachersassess secondary school students' characterisation level of affectivebehavioural outcome in mathematics.The main purpose of the studywas to investigate teachers' assessment of secondary school students'characterisation level of affective behaviour outcome in mathematics. Specifically, the study found out the:

1. extent to which Mathematics teachers assess students' characterisationlevel of affective behaviour
2. influence of years of experience on the extent to which mathematics teachers assess secondary school students' characterisationlevel of affective behavioural outcomes in mathematics.

Research Questions

The study was guided by the following research questions:

1. What is the mean rating score of mathematics teachers on their assessment of characterisationlevel of affective behavioural outcome in mathematics in Nsukka Education Zone?
2. What is the influence of mathematics teachers' years of experience on their assessment of characterisation level of affective behavioural outcome in mathematics in Nsukka Education Zone?

Hypothesis

The following hypothesis guided the study, and was tested at 0.05 level of significance:

Ho_1: There is no significant difference in the mean rating score onthe extent of mathematics teachersassess secondary school students'characterisationlevel of affective behavioural outcome in mathematics based on years of experience.

Method

The study was conducted using a descriptive survey research approach. This study was carried out with secondary school mathematics teachers in Nsukka Education Zone of Enugu State. The education zone is situated in Enugu North senatorial district. Nsukka Education zone comprises of three local government areas (LGA) namely; Igbo-Etiti LGA with 15 secondary schools, Nsukka LGA with 31 secondary schools, and Uzo-Uwani LGA with 14 secondary schools.The population of this study consisted of all the one hundred and sixty (160) mathematics teachers in Nsukka Education Zone. In Nsukka Education Zone, there are 90 mathematics teachers in the 31 secondary schools in Nsukka local government area, 40 mathematics teachers in the 15 secondary schools in Igbo-Etiti local government area and30 mathematics teachers in the 14 secondary schools in Uzo-uwani local government area. (Statistics Office, PPSMB, Nsukka Education Zone). The sample size of the study comprised one hundred and sixty (160) mathematics teachers in Nsukka Education Zone. So, no sampling was carried out. This is because the population of the study is a manageable size.

The instrument for this study was a structured questionnaire titled "Teachers' Assessment of Students'CharacterisationLevel of Affective Behavioural Outcome Questionnaires" (TASCLABOQ).The questionnaire was structured on a 4-point rating scale of: "Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE)"with corresponding values of 4, 3, 2, and 1 respectively. The instrument was subjected to face validation in order to determine its validity. Three experts in Science Education, one from the mathematics unit and two from the measurement and evaluation unit, validated the instrument in terms of the items' appropriateness and usefulness for the study.To ascertain the reliability of the instrument, it was trial tested using 30 respondents in a Secondary School in Obollo-Afor Education Zone of Enugu State. The reason for using the above education zone was that the respondents share the same characteristics with those that would be used for the study but in another zone. The reliability of the instrument was calculated as 0.84. The instrument was administered to the respondents (mathematics teachers) in each school. This was done by the researcher and six (6) research assistants, two from each L.G.A in the three L.G.As in Nsukka Education Zone. The instrument was collected by the person that administered them on the spot. This was done to ensure an immediate retrieval after completion by the teacher thus enhancing high rate of return of the questionnaire.The research questions were answered using mean and standard deviation.Interpretation criteria: Very High Extent (VHE) equals 3.50 - 4.00, High Extent (HE) equals 2.50 - 3.49, Low Extent (LE) equals 1.50 - 2.49 while Very Low Extent (VLE) equals 1.00 - 1.49. The hypotheses were tested at 0.05 levels of significance using Analysis of Variance (ANOVA).

Results

The results for this study were obtained based on the research questions answered. The responses to research questionsare presented in tables 1 to 2and hypotheses are in tables 3as follows:

Research Question One: What is the mean rating score of the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematics in Nsukka Education Zone?

Table 1: Mean rating score and standard deviationsofthe extent of mathematics teachers' assessment of secondary students' characterisation level of affective behavioural outcome in mathematics (n=160)

SN	Item Statement: Mathematics teachers can:	$\bar{X}$	SD	D
1.	Identify students who demonstrate self-reliance in working independently in solving mathematics problem	2.02	.77	LE
2.	Determine students who cooperate with their fellows during problem solving in mathematics	1.92	.73	LE
3.	Identify students who use the best approach in solving problems in mathematics	2.09	.75	LE
4.	Identify students who demonstrate self-discipline in mathematics classes	2.06	.81	LE
5	Determine students' punctuality to mathematics lessons	1.62	.74	LE
6.	Identify students who show politeness in explaining solutions to mathematics problems	1.88	.83	LE
	Grand Mean	**1.93**	**.47**	**LE**

Result in Table 1 shows the extent of mathematics teachers' assessment of secondary students' characterisation level of affective behavioural outcome in mathematics. The result indicates that the mean rating score of teachers for all the items (1-6) fall within the range of 1.50-2.49, which can be adjudged that mathematics teachers identify students who demonstrate self-reliance in working independently in solving mathematics problem, determine students who cooperate with their fellows during problem solving in mathematics, among others, to a low extent. Moreover, the grand rating mean of ($\bar{X}$ = 1.93, SD = 0.47) obtained also fall within the range of 1.50-2.49, which implies that there is low extent of mathematics teachers' assessment of secondary students' characterisation level of affective behavioural outcome in mathematics.

Research Question Two: What is the influence of years of experience on the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematics in Nsukka Education Zone?

Table 2: Mean rating score and standard deviation of the influence of years of experience on the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematics (n=160)

S/N	Item Statement: Mathematics teachers can:	Teachers' Experience								
		1-10years (n=77)			11-20years (n=66)			20 years and above(n=17)		
		$\overline{X}$	SD	D	$\overline{X}$	SD	D	$\overline{X}$	SD	D
1.	Identify students who demonstrate self-reliance in working independently in solving mathematics problem	2.08	0.77	LE	1.91	0.70	LE	2.18	0.95	LE
2.	Determine students who cooperate with their fellows during problem solving in mathematics	2.01	0.68	LE	1.79	0.70	LE	2.00	0.61	LE
3.	Identify students who use the best approach in solving problems in mathematics	2.06	0.83	LE	2.05	0.67	LE	2.35	0.61	LE
4.	Identify students who demonstrate self-discipline in mathematics classes	2.03	0.86	LE	2.06	0.80	LE	2.18	0.64	LE
5.	Determine students' punctuality to mathematics lessons	1.62	0.69	LE	1.45	0.77	LE	2.24	0.56	LE
6.	Identify students who show politeness in explaining solutions to mathematics problems	1.99	0.88	LE	1.64	0.74	LE	2.35	0.61	LE
	Grand Mean	**1.97**	**0.46**	**LE**	**1.89**	**0.48**	**LE**	**2.02**	**0.36**	**LE**

***Key:**n= Number of respondents, $\overline{X}$ = Mean, SD = Standard Deviation, D.=Decision.*

Result in Table 2 shows theinfluence of years of experience on the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behaviouraloutcome in mathematics. The result shows that the mean rating score for all the items (1-5) as rated by teachers who have1-10years of teaching experience, 11-20years and 21years and above teaching experiences respectively, were within the range of 1.50-2.49. The implication of this result is that the teachers irrespective of their years of experience identify students who demonstrate self-reliance in working independently in solving mathematics problem, determine students who cooperate with their fellows during problem solving in mathematics, among others to a low extent. The grand mean rating of 1.97 with a standard deviation of 0.46 obtained for teachers with 1-10years of teaching experience, and a mean of 1.89 with a standard deviation of 0.48 for those with 11-20years of teaching experience and a mean 2.02 with a standard deviation of 0.36 obtained for teachers with 21years and above teaching experience also fall within the range of 1.50-2.49. This result shows that teachers with 21years and above teaching experience had a slightly higher mean, followed by those with 1-10years experience and those with 11-20years of teaching experience. Based on this result, it is understood that there is a little influence of years of experience on theextent of mathematics teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematics.

Ho$_1$: There is no significant difference in the mean rating score of the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematics based on years of experience.

Table 3: ANOVA analysis of the difference in the mean rating score of the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematics based on years of experience

	Sum of Squares	Df	Mean Square	F	Sig.	Dec.
Between Groups	2.347	2	1.173	5.608	.094	NS
Within Groups	32.846	157	.209			
Total	35.193	159				

Key: *df = degree of freedom, F = ANOVA test statistic, Sig. = Significant level/Exact probability value, Dec. = Decision, NS = Not Significant*

Result in Table 3shows that an F-ratio of 5.608 with associated or exact probability value of .094 at (2, 159) degrees of freedom was obtained with respect to thedifference in the mean rating score of the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematics based on years of experience. Given that the associated or exact probability value of 0.094 when compared with 0.05 (a priori value), was found not significant because it is greater, thus, the null hypothesis one(H_{O1}) was not rejected. Hence, the conclusion drawn is that there is no statistically significant influence of years of experience on the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behavioural outcome in mathematics.

Discussion of Findings

Result revealed that mathematics teachers' assessment of students' characterisation level of affective behaviour in Nsukka Education Zone is to a low extent. These include; identifying students who demonstrate self-reliance in working independently in solving mathematics problem, determining students who co-operate with their fellow during problem solving in mathematics, identifying students who use the best approach in solving problems in mathematics, identifying students who demonstrate self-discipline in mathematics classes, determining students' punctuality to mathematics lessons and identifying students who shows politeness in explaining solutions to mathematics problems. The finding of the study is corroborating with Omare and Iyanu (2006) who revealed that teachers' overall effective evaluation competence were below the acceptance level. "The need of intensify the development of effective teaching skill in teacher education was recommended.

Results showed that there was a little influence of years of experience on the extent to which mathematics teachers assess secondary school students' characterisation level of affective behaviour outcomes in mathematics. The observed little influence implies that it is difficult for mathematics teachers, irrespective of years of experience, to assess some of the secondary school students' characterisation level of affective behaviour because affective objectives which border mainly on change behavioural patterns and otherwise do not easily come by.The finding from the test of hypothesis showedthat the difference in the ratings mean of the three groups of respondents, (i.e., 1 – 10 years; 11 – 20 years; 20 – above years) on the extent of mathematics teachers' assessment of secondary school students' characterisation level of affective behaviour is not statistically significant. This implies that the groups of respondents hold the same opinion on the extent of assessment of students' characterisation level of affective behaviour. The result of the study is not in agreement with Martin, Yin, and Mayall (2006) who found that experienced teachers managed their classrooms more effectively than less experienced teachers by taking more control than the novice teachers in establishing classroom routines and monitoring group work. But for the finding of this study, experience teachers and inexperience teachers were the same in the assessment of characterization level of affective domain. The reason for the disagreement may be due to the difference in the domain of behavioural outcome being assessed. The overall finding of this study therefore shows that the influence of teachers' years of experience on the assessment of secondary school students' characterisation level of affective behaviour is of low extent.

Conclusion

"Based on the findings of this study, the following conclusions were drawn. Mathematics teachers' assessment of characterisation level of students' affective behavioural outcomein Nsukka Education Zone is to a low extent."Hence, the said levels of affective domain are not usually assessed properly the way it should be by the mathematics teachers.

Furthermore, the teachers' assessment of students' characterisation affective behavioural outcome in mathematics based on years of experience in Nsukka Educational Zone is not statistically significant. Therefore, the researcher concludes that the number of years a mathematics teacher had put in teaching mathematics in secondary school does not make him /her knowledgeable to assess affective domain behaviours properly.

Recommendations

Based on the findings and discussions, the following were recommended:

1. The teachers who are the curriculum implementers and evaluators should acknowledge assessment of all domains especially affective domain as part of teaching and learning and also be sensitive to students' emotion while carrying out their duties.
2. The students should give their maximum co-operation to the teachers regardless of their year in the job when assessing themknowing that they are at the receiving end of any positive change in Education.
3. The government should organize seminar and workshop for teachers to educate them on the proper way of assessing affective outcome in mathematics as this will help in improving the competence of teachers towards assessmentof the entirebehavioural outcome especially characterisation level.

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