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Maximizing the Utilization of School Based Assessment to Enhance Teaching and Learning Experience in Science Subjects

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ABSTRAK

Keberhasilan penerapan asesmen berbasis sekolah telah mencatat pengaruh positif pada proses belajar mengajar di negara maju di dunia. Namun, di antara negara berkembang seperti Nigeria, tampaknya ada banyak tantangan. Tujuan penelitian ini, menentukan pengaruh asesmen berbasis sekolah terhadap pengalaman belajar mengajar pelajaran sains di Negara Bagian Anambra, Nigeria, dan tantangan yang dihadapi. Investigasi dilakukan dengan survei deskriptif. Analisis data menggunakan rata-rata dan simpangan baku. Hasil menunjukkan bahwa asesmen berbasis sekolah memengaruhi pengajaran dan pembelajaran mata pelajaran sains secara signifikan. Guru yang tidak profesional, motivasi guru/siswa yang kurang, dan kurangnya minat siswa untuk mengikuti asesmen berbasis sekolah merupakan beberapa masalah yang dihadapi. Sementara, motivasi guru yang memadai, guru yang terlatih, dan menyelenggarakan konferensi dan seminar untuk melatih guru tentang pedoman asesmen berbasis sekolah dapat diajukan sebagai solusi.
Kata kunci: Mata Pelajaran Sains; Pengajaran dan Pembelajaran; Penilai Berbasis Sekolah.

ABSTRACT

The successful implementation of school based assessment has recorded positive influence on teaching and learning process in developed countries of the world. However, among the developing countries like Nigeria, there seem to be a lot of challenges. Hence, the purpose of study was to determine the extent school based assessment influence the teaching and learning experience in science subjects in Anambra State, Nigeria and the challenges encountered in the process. The investigation was conducted using a descriptive survey design. The study made use of mean and standard deviation for data analysis. The findings of the study revealed that school based assessment influences the teaching and learning of science subjects to a high extent. Moreover, the use of unprofessional teachers, inadequate teachers/students motivation and lack of unwillingness by the students to take part in school based assessment are some of the problems facing the successful implementation of school based assessment while adequate motivation of the teachers, employment of trained teachers and organizing conferences and seminars to train the teachers on school based assessment guidelines among others were proffered as the solutions.
***Keywords**: School Based Assessmen; Science Subjects; ; Teaching and Learning.*

INTRODUCTION

One of the major aspects of teaching and learning especially in science subjects is evaluation. Teaching according to Schlecty (2004), is an art which enhances the behaviour of students in a way that leads to learning, whereas, learning is a process of development and a form of exercise (Ambrose et al, 2010). Therefore, the process of teaching and learning of science leads to the acquisition of needed knowledge, attitude and skills. Science is a body of knowledge acquired through observation and systematic experimentation (Ezeudu, 2011). It is a discipline, a body of knowledge about the universe, the structure and reactions of matter, conservation and transfer of energy, the interaction between living things and their environment. Through science, Aniodoh and Egbo (2013) asserted that the way man thinks, explore and apply scientific knowledge is affected. Underlining the role of science in the modern world, Ezeudu (2011) affirmed that science holds a great prospect for mankind in terms of reducing the burden of life and improving both individual and national development. For that reason, science serves are a fulcrum for advancing quality of life, the health, economy and security sectors of nations and invariably serves as a tool for industrialization and national development. To achieve this, it then becomes imperative that teaching and learning of science subjects in secondary schools in developing countries especially Nigeria should be given a top priority. This can be harnessed through using appropriate assessment such as school based assessment.

School based assessment (SBA) is an assessment system which the teachers conduct in schools to effectively assess the students' cognitive, affective and psychomotor aspects of learning. This could be formative, summative, diagnostic, authentic among others. The main purpose of SBA is that it serves as avenue that provides learning feedback to the teachers and students. According to Thusarika and Nawastheen (2019), SBA can be used to assess students' abilities and evaluate practical work which requires more time such as workshops, field trips, projects. Furthermore, as obtained in schools where different types of assessment are used, SBA is used to increase the validity and reliability of assessment which prevents over dependent on examination. This will help to decrease examination pressure and emphasis students centered learning. In SBA several assessment techniques are used to ensure that students' achievement and skills are captured. Some of them are quizzes, different types of test, assignments, group activities, projects, workshops, seminars among others. Aduloju, Adikwu and Agi (2016) pointed out that some of the characteristics of SBA which include ability to involve the teachers all through the learning process and in making judgments based on the assessment of the students, allows the collection of students' sample of performance over a given period of time, and allows the students to be actively involved in the assessment process especially if self or peer assessment is used together with the teacher assessment. According to Aduloju, Adikwu and Agi (2016), SBA not only supports the learner to participate in the assessment in schools but enhances their individual learning at home. Hence, SBA plays a major role to play in the education and National development of any

nation. School based assessment (SBA) is one of the essential tools for effective evaluation in education. This is because it makes certain quality control in science learning. It also plays a major role in the development of students in both school and at home, and provides the overall academic assessment of students. Consequently, SBA enhances the effectiveness of teaching and learning experience in science subjects (such as Mathematics, Physics, Biology, Chemistry and so on) in secondary schools by providing a cumulative judgment of students' performance.

SBA policy has been adopted in most countries across the world such as the United Kingdom, the United States of America, Canada, New Zealand, Australia and as a National Educational policy in Asia, not forgetting some developing countries like Ghana, Malawi, Zimbabwe, Zambia and Nigeria (Williamson, 2017). SBA is a holistic education tool used by subject teachers to assess the cognitive, affective and psychomotor aspect of learning (Opara et al., 2015). Therefore, it serves as an aid towards improving students' achievement in school (Md-Ali, Veloo, & Krishnasamy, 2015). The adoption of SBA has been one of the most important changes to Nigeria's educational landscape. As a result of their part in the national curriculum innovation initiative, educational planners and administrators are more aware than before. Furthermore, with the formalization of school-based assessment as a key element of the evaluation process, a fundamental shift in the method of evaluating students' performance has also occurred (Idowu & Esere, 2009). Nonetheless, the results of final examinations administered by classroom teachers and external bodies have continued to be the major determinant in students' overall learning outcome in the school's present assessment procedures. According to Essien (2010), this has caused teachers to focus on or rush through the syllabus without considering the understanding of the students, students to continue with poor study habits, students to participate in examination malpractice, and parents to become extremely nervous and restless, which may or may not help their child/ward pass the public example examination. As a result, graduates have degrees but lack essential life skills, literacy, and numeracy skills (Essien, 2010). Thus, it is imperative to make the most of SBA while keeping in mind its significance for Nigeria's educational system.

Based on empirical reviews, studies on SBA have been carried out in Nigeria towards maximizing its potentials. For instant, Yusuf (2014) argued that SBA provides the overall teacher judgment of students' academic works and performance by systematic collection of grades or marks. Also, Mahmus, Halim and Drus (2020) carried out a study on teachers' assessment practices and showed that teachers lack adequate training and are not ready to meet the demand for SBA in classrooms. Iddrisu (2020) in a study on teachers' knowledge and practices of school-based assessment at primary schools in the Savelugu Municipality of Ghana found out that primary school teachers' knowledge in SBA was high with a corresponding practice of SBA. Awoniyi (2016) opined that most of the teachers still practice the old assessment types as they do not understand the SBA guidelines. Whereas, Talib et al (2014) found an insufficient knowledge and inconsistent practice of SBA among teachers. Using the teachers in public junior secondary schools in Benin City,

Nigeria, Omorogiuwa and Aibangee (2017) carried out a study to examined factors affecting the effective implementation of school-based assessment; it was found that SBA practice affected teachers' level of awareness, attitude of school managements and teachers' classroom management. Also, Veloo and Md Ali (2016) revealed that inadequate equipment and teachers' inadequate knowledge even after attending conferences can hinder the implementation of SBA. Some of the challenges of SBA according to Aduloju, Adikwu and Agi (2016) is that it generate percentage scores which do not lead to strong educational decision-making in the classroom and always a poor indicator of what a student knows.

Furthermore, extant literature has shown that the successful implementation of SBA has recorded positive influence on teaching and learning process. As Veloo, Ramli, and Khalid (2016) posited a positive impact of SBA on students' growth and it promotion of higher order thinking skills. However, in spite of the role SBA plays in improving students' achievement, ensuring the acquisition of skills and providing help to ensure effective students assessment, studies conducted by Malakolunthu and Hoon (2010), Opara, Onyekuru and Njoku (2015) and Awoniyi (2016) maintained that teachers still lack the adequate knowledge of SBA and hence, do not effectively implement it in the classroom, especially science classrooms in Nigeria. There is therefore the need to maximize the use of SBA by science teachers and external examination bodies in Anambra State, Nigeria and empirically investigate the challenges and possible solutions towards the successful implementation of SBA. Consequently, the researchers sought to determine the extent school based assessment influence the teaching and learning experience in science subjects in Anambra State, Nigeria; the problems facing the successful implementation of school based assessment in secondary schools and solutions to the problems facing the successful implementation of school based assessment in secondary schools.

METHOD

A descriptive survey research design was used for the investigation. All of the science teachers in the 32 public secondary schools in Anambra State's Onitsha Education Zone made up the study's population. Two of the three Local Government Areas of the Zone—Onitsha North and Onitsha South Local Government Areas—were chosen for the study using a purposive sample technique. All 158 science teachers in the 2021/2022 academic section in the 22 public secondary schools made up the sample size. The science teachers used for the study comprised of 91 females and 67 males. Specifically, senior secondary school science teachers teaching Biology (55), Chemistry (38), Physics (35) and Mathematics (30) were used for the study.

"Questionnaire on Maximizing the Utilization of School Based Assessments in Teaching and Learning of Science Subjects in Secondary Schools" was the name of the instrument created by the researchers to collect data. A, B, and C were the three clusters that made up the instrument. Every cluster addressed a different study purpose; while clusters A and B each had five elements, cluster C had six. Thus,

there are a total of 16 items on the instrument, with Strong Agree (SA) receiving a score of 4, Agree (A) receiving a score of 3, Disagree (D) receiving a score of 2, and Strongly Disagree (SD) receiving a score of 1.

Three specialists from the Department of Science Education at Nnamdi Azikiwe University in Awka, Anambra State, verified the instrument. Using the Cronbach alpha formula, the reliability indices were calculated. For clusters A, B, and C, respective reliability indices of 0.90, 0.64, and 0.90 were obtained, while the total reliability index was 0.87. Each respondent received the questionnaire from the researchers in person utilizing a face-to-face approach. This helped guarantee a 100% return rate, which was attained. Every school visited had its questionnaire returned that same day. For the 22 schools, the data collection process took place across 11 days. The researchers obtained a letter of identification from the Head of Department at Nnamdi Azikiwe University, Awka and with the letter sought the approval of the principals of the schools used for the study. This was in compliance with the ethical considerations for such a study in the study area. They also informed the teachers about the study's purpose, its ethical nature, and the confidentiality of the data they sought to collect. The research questions were answered using the mean and standard deviation. To determine the extent of at which school based assessment is used in the teaching and learning of science subjects in secondary schools the real limit of numbers based on the following mean scores were used; low extent (2.49 and below); moderate extent (2.50-3.49) and high extent (3.50-4.00) while for research question two and three, any item with a mean rating of 2.5 and above indicated a positive response or acceptance while items with mean rating of 2.49 and below indicated a negative response or rejection.

RESULTS AND DISCUSSION

Results

Extent school based assessment influence the teaching and learning of science

Table 1: Mean and standard deviation scores of the extent at which school based assessment influence the teaching and learning of science subjects in secondary school

S/n	Item	Mean	SD	Decision
1.	School based assessment ensures that science students regardless of race or socio-economic background can be of great influence in students' academic expectations	3.75	0.49	High Extent
2.	Standardized test plays a pivotal role in ensuring that science schools are held to the same standards	3.60	0.65	High Extent
3.	The aggregate data of science students obtained through SBA act as an independent yardstick to judge the effectiveness of curriculum used to meet national state or local standards	3.70	0.46	High Extent
4.	School based assessment helps low achievers in achieving their academic goals.	3.51	0.62	High Extent
5.	School based assessment ensures that science students acquire the needed knowledge, skills and attitude as stipulated in their objectives	3.62	0.79	High Extent

Overall Mean and Standard Deviation	**3.64**	**0.32**	**High Extent**

According to Table 1, items 1, 2, 3, 4, and 5 have mean scores of 3.75, 3.60, 3.70, 3.51, and 3.62 respectively. Additionally, a mean of 3.64, which is higher than the benchmark of 2.50, was found overall. This suggests that science teaching and learning are significantly influenced by school-based assessment.

Problems facing the successful implementation of school based assessment in secondary schools

Table 2: Mean and standard deviation scores of the problems facing the successful implementation of school based assessment in secondary schools

S/n	Item	Mean	SD	Decision
6.	It is most often carried out by unprofessional teachers	3.63	0.50	Accepted
7.	Insufficient science equipments to effectively carry out the practical aspects of the assessment	2.94	0.81	Accepted
8.	Teachers not using school based assessment in the overall scores of the students	3.32	0.67	Accepted
9.	There is inadequate motivation to drive school administrations of the need to ensure the use of the school based assessment scores	3.04	0.82	Accepted
10.	Lack of unwillingness by the students to take part in school based assessment	3.82	0.40	Accepted
	Overall Mean and Standard Deviation	**3.35**	**0.36**	**Accepted**

The result in Table 2 shows the mean and standard deviation scores of the problems facing the successful implementation of school based assessment in secondary schools. From the Table 2 above, all the items were accepted, since they were above 2.50 cut off mark which shows that these items namely the use of unprofessional teachers, insufficient science equipments, non usage of the students overall SBA scores by their teachers, inadequate motivation from the school administrations and lack of unwillingness by the students to take part in school based assessment are the problems facing the successful implementation of school based assessment in secondary schools.

Solutions to the problems facing the successful implementation of school based assessment in secondary schools

Table 3: Mean and standard deviation scores of the solutions to the problems facing the successful implementation school based assessment in secondary schools

S/n	Item	Mean	SD	Decision
11.	Adequate motivation of the teachers	3.44	0.67	Accepted
12.	Employment of trained teachers	3.46	0.69	Accepted
13.	Designing curriculum to give enough time for evaluation	3.60	0.65	Accepted
14.	Motivating of students with best scores	3.30	0.75	Accepted
15.	Organizing conferences and seminars to train the teachers on school based assessment guidelines	3.55	0.55	Accepted
16.	Making school based assessment a compulsory part of the overall score of every science subjects	3.51	0.62	Accepted
	Overall Mean and Standard Deviation	**3.48**	**0.45**	**Accepted**

The result in Table 3 shows the mean and standard deviation scores of the solutions to the problems facing the successful implementation of school based assessment in secondary schools. The Table indicates that all the items were

accepted, since they were above 2.50 cut off mark which shows that these items namely adequate motivation of the teachers, employment of trained teachers, designing curriculum to give enough time for evaluation, motivating of students with best scores, organizing conferences and seminars to train the teachers on school based assessment guidelines and making school based assessment a compulsory part of the overall score of every science subjects are the solutions to the problems facing the successful implementation of school based assessment in secondary schools.

Discussion

The findings revealed that to a high extent school based assessment influences the teaching and learning of science subjects positively, This is as school based assessment among others ensures that science students acquire the needed knowledge, skills and attitude as stipulated in their objectives, plays a vital role in ensuring that science schools are held to the same standard for the teaching and learning of science and helps low achievers in achieving their academic goals. This is in line with Davidson (2007) who stated that school based assessment attempts to provide better alignment between assessment and curriculum and to enhance the students' ability of self-evaluation and lifelong learning. Similarly, the finding is supported by Ajzen (1991) theory of planned behaviour which argues that the behaviour of an individual is driven by intention which is a function of attitude, subjective norms and perceived behavioural control which in the context of this study when acquired by science teachers and effectively enhance SBA. Also, Mahmud, Halim, and Drus (2020) posited that the over SBA practice among teachers was strong which has invariably influence and enhance effective teaching and learning.

The findings showed that the problems facing the successful implementation of school based assessment in secondary schools include the use of unprofessional teachers, insufficient science equipments, non usage of the students overall SBA scores by their teachers, inadequate motivation from the school administrations and lack of unwillingness by the students to take part in school based assessment. This in line with Gulee (2015) who averred that despite the importance of school based assessment; it has been subjected to a great deal of abuse and misinterpretations by the science teachers because many teachers in the secondary schools appear not to understand the rational for School-Based Assessment. This is similar to Lukman and Uwadiegwu (2012) who asserted that large class size, teachers' commitment and teachers' lack of SBA techniques are some of the challenges of implementation of school based assessment. Also, the finding is in consonance with Veloo and Md Ali (2016) which revealed that inadequate equipment and teachers' inadequate knowledge hinders the successful implementation of SBA.

Moreover, the findings of the study indicated that the solutions to the problems facing the successful implementation of school based assessment in secondary schools are adequate motivation of the teachers, employment of trained teachers, designing curriculum to give enough time for evaluation, motivating of students with

best scores, organizing conferences and seminars to train the teachers on school based assessment guidelines and making school based assessment a compulsory part of the overall score of every science subjects. The findings are in line with Lukman and Uwadiegwu (2012) who recommended In-service training for teachers for effective implementation of SBA. Similarly, the findings agree with the study done by Perera, Bandara and Ekanayake (2020), where it was suggested that a proper and well-organized training on SBA models in order to enable the teachers understand the subject matter towards ensuring students achievement. The implication of the finding is that there is an urgent need to adequately motivate the teachers, design the best curriculum to give enough time for evaluation and ensure the proper implementation of SBA in schools towards the overall development of the learners. It will also provide the parents useful feedback on their children's performance and ensure that school administrators are provided the necessary data on the state of SBA in secondary schools in Nigeria. This data will help the school in achieving the implementation of SBA as enshrined in the nation policy on education.

CONCLUSION AND RECOMMENDATION

The researchers concluded based on the findings that school based assessments are highly essential for effectively teaching and learning of science subjects. Also, it was stated that the problems that affect the successful implementation of school based assessment in secondary schools in Onitsha North Local Government Area are the use of unprofessional teachers, lack of funds, non usage of the students overall SBA scores by their teachers, inadequate motivation from the school administrations and lack of unwillingness by the students to take part in school based assessment. Nevertheless, adequate motivation of the teachers, employment of trained teachers and organization of conferences and seminars to train the teachers on school based assessment guidelines were mentioned as some of the solutions to the aforementioned problems. The following recommendations were made based on the finding: government and school administrations should ensure the employment of trained science teachers for the proper implementations of school based assessment; conferences and seminars should be organized to train the teachers on effective school based assessment; curriculum designers and science teacher should design curriculum that ensures the use of different school based assessment in science classrooms. For researches on SBA, it is better to sample a state in Nigeria, instead of an education zone in a state to ensure a better generalization of the findings, hence, the limitation of the results. However, it is hoped that the finding will improve students teaching and learning practices through the appropriate use of school based assessment in schools.

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