

Students' Assessment of Teaching Effectiveness of Basic Science Teachers

Lawrence Achimugu¹, Mercy Asibi Ochijenu², Dominic Ojonugwa Solomon³, Alice Oladehinde Abu⁴, Joy Aladi Obera⁵, Sadiq Saliu Arivi⁶, Phebe Hassana Obaka⁷, Victor Ojoarome Omale⁸, Noah Ojodomo Audu⁹, Ojonoka Agah Oche¹⁰

^{1,2,4, 6,8,9 and 10} Department of Science Education Prince Abubakar Audu University, Anyigba, Kogi State, Nigeria.

^{3 and 7} Department of Educational Foundation Prince Abubakar Audu University, Anyigba Kogi State, Nigeria.

⁵ Department of Arts Education Prince Abubakar Audu University Anyigba Kogi State, Nigeria

Article History:

Received: 12-01-2025

Revised: 15-02-2025

Accepted: 01-03-2025

Abstract:

Introduction: The study was based on the search for effective assessment approaches that will give good and reliable data aimed at using the research findings to address students' poor achievement in basic science in junior secondary schools

Objectives: Thus, the study investigated junior secondary school students' assessment of teaching effectiveness of basic science teachers in Kogi State. The study was carried out using descriptive survey design with four research questions.

Methods: The population of the study was made up of 4,276 junior secondary schools basic science students. The sampling technique used was multi stage and the sample size was 366. The instrument used for this study was questionnaire tagged "Basic Science Teachers' Teaching Effectiveness Questionnaire (BSTTEQ, $r = 0.84$)". Mean and standard deviation was used to answer the research questions.

Results: Results revealed that basic science teachers were effective in subject matter, communication skills and evaluation skills but ineffective in instructional presentation skills.

Conclusions: The study concluded that since the students' assessment of their teachers are holistic; their feedback should be used to enhance teachers job performance.

Keywords: Basic science, assessment, teaching effectiveness, students, teachers.

1. Introduction

The importance of science and technology in economic and social development of any country cannot be over emphasized. As a result, it is beneficial that every child acquire the basic knowledge of basic science and technology. Thus, basic science is a compulsory subject offered at primary and junior secondary schools in Nigeria. Basic science formally known as integrated science is the first point to which a child is exposed to the study of science. For junior secondary school which is of interest in this study, a student that is not well grounded in basic science at this level of education may not show interest in offering core science subjects at the senior secondary schools that is prerequisite for studying pure and applied courses in tertiary institutions (David, 2018; Mbonu & Okoli, 2019 & Ihkwoaba, *et al.*, (2022)). This means that, for students to study any science-based professional courses at tertiary institution, they must have been satisfactorily exposed to quality

teaching of basic science (Samba, *et al.*, 2018; Ngu, *et al.*, 2019 & Uzowulum & Egbuana 2015). It is important that a good foundation of studying science courses is laid at this level of education so as to ensure that the young scientists will grow to become great scientists and engineers that will enhance national development (Dewitt, *et al.*, 2014; Ochihu, 2018 & Shodiende & Yisa, 2019).

Despite the importance and relevance of basic science as foundation course for science and for socio-economic development of a nation, results from various examination bodies such as state ministry of education (SMOE) and National Examination Council (NECO) have consistent trend of poor performance of students in Basic Education Certificate Examination (BECE) in basic science (Kebutu, 2015; Ovute, 2018; Olatunji & Mbanefo, 2019). Micah, *et al.*, 2018) revealed that the average failure rate of students in BECE in basic science from 2010 to 2015 was 48.28%. This implies that, less than half of all the students who sat for JSS/BECE in basic science at this period failed to obtain the necessary grades to pursue science related courses in senior secondary schools vis-à-vis tertiary institutions. It has been observed that poor performance of basic science is influenced by many factors which include teacher's factors especially ineffective teaching of basic science by the basic science teachers (Nwafor & Aja, 2017; Opara & Nwankwo, 2016 & Achimugu, 2021).

A basic science teacher is an individual who is trained on the content area of integrated or basic science as well as methodology of imparting the knowledge and values to the students. Mbonu and Okoli (2019) sees junior secondary school basic science teacher as an individual who is trained on imparting knowledge, skills and attitude in basic science and is working as a teacher in junior secondary school or primary schools. The authors further explained that the role of basic science teachers include coordinating, planning, organizing and implementing the basic science activities. Generally, the position of the teacher in teaching and learning processes is so central that the Federal Government of Nigeria (FGN) through the national policy of education pointed out that no educational system can rise above the quality of its teachers (FRN, 2014). This clearly shows that the teacher occupies a very important and strategic position for the successful implementation of basic science programme. Therefore, the basic science teachers' effectiveness is indispensable in ensuring the attainment of the objectives of basic science.

Teaching effectiveness denotes the extent to which the teacher is able to impactfully and fruitfully deliver his/her lesson to students in order to achieve the goals of any institution of learning. Omiko (2016) and Inameti (2022) sees teachers' effectiveness as teachers presenting their lesson intelligently with social and emotional stability, sense of love for learners and help to learner to develop good qualities towards learning. It can be said that the effectiveness of the teacher is the centre in which the school administrators have their focus. Olakunle and Akpan (2018) and Amatari (2019) opined that teaching effectiveness outweighs other school factors that has been identified to influence students' achievement. Achimugu (2016) identified eight components of teaching effectiveness as follows: knowledge of the subject matter, use of teaching method, use of instructional materials, assignment to students, communication skills, attitudes to work, practical activities and evaluation techniques. Effiong, *et al.*, (2018) noted communication, instructions and assessment/evaluation as components of teaching effectiveness. The present study would focus on

the assessment of the following dimensions; knowledge of the subject matter, instructional presentation skills, communication skills and evaluation skills.

Assessment is the method or tool that educational researchers including teachers use in gathering information to measure progress and make educational decisions (Nnoli, 2016; Muhammad, *et al.*, 2018 & Obushi, 2019). Assessment is important as it helps to determine teachers' strength and weaknesses targeted at enhancing their continuous teaching effectiveness (Sambo, *et al.*, 2014; Oladimeji & Tunji, 2019 & Adikwu & Agi, 2022). This study critically assesses the teaching effectiveness of basic science teachers from the perspectives of the students. Over the years, effectiveness of teachers in junior secondary schools has mostly been done by the ministry, school boards, principals and head of department focusing on teachers' notes of lessons, time books and other school records. The students rarely assess their teachers despite the advantages of such assessment. Students' assessment of their teachers implies that students that are direct beneficiary of teacher's work are made to express their opinions and feelings concerning the effectiveness of their teachers. The students' assessment of their teachers is vital and novel as they are direct consumer of teacher's lesson and therefore in better position to objectively assess their teachers. According to Inameti (2022), such students' opinions and feelings can be used as: feedback data to improve instruction and enhance professional growth of teachers; the basis for some personnel decisions like promotion, pay rise, dismissal and other forms of award/ reprimand for the teachers being assessed; and, it can be used to hold teacher accountable to the students. Additionally, students' involvement in assessing their teachers will positively improve students' academic output, add to the knowledge bank in the teaching effectiveness of teachers in junior secondary schools, and the instrument developed will be used by school administrators to effectively supervise the teachers.

2. Objectives

Empirically, the study conducted by Achimugu, (2016) revealed that chemistry teachers were ineffective in the use of teaching methods, instructional materials, communication skills, practical activities and evaluation technique when assessed by their students. The study by Madu (2016) revealed that secondary school teachers were ineffective in their lesson preparations and instructional delivery of the lessons in the classroom. The study conducted by Amatari (2019) revealed that students rating of lecturers' teaching effectiveness variables of instructional feedback, class management, class attendance and lecturer students' relationship can be said to be good. Cobbinah, *et al.*, (2019) showed that students' has generally good perception of the teachers' job performance but the students sometimes had problems of understanding their teachers during lessons. Research report by Inameti (2022) showed that mathematics teachers are effective in instructional delivery, assessment procedure and subject matter mastery but are still lacking in area of marking assignment and give students their corrections.

In the light of the above empirical review, it is clear that there are conflicting reports' on teachers' effectiveness. Therefore, there is need to carry out further research in this area of interest. Secondly, students' assessment of teachers are mostly conducted in senior secondary schools and tertiary institutions involving core science subjects such as biology, chemistry, physics, mathematics etc. and by so doing neglecting basic science (foundation of science) in junior secondary schools. This implies studies in basic science at junior secondary schools is scarce and need to be studied so as to

use the research findings to address the present poor achievement of students in basic science. Thirdly, all the literature reviewed strongly recommended the need for teachers to be constantly assessed by their students so as to encourage them to be more effective. This study is therefore, undertaken to fill these gaps. Therefore, the problem of the study put in question form, is: what is the extent of effectiveness of basic science teachers in terms of the dimensions of teaching effectiveness as perceived by students in junior secondary schools?

The aim of this study was to determine the teaching effectiveness of basic science teachers in Kogi State from the perspective of junior secondary schools students. Specifically, the objectives of this study are to determine:

1. The basic science teachers' knowledge of the subject matter.
2. The basic science teachers' instructional presentation skills.
3. The basic science teachers' communication skills.
4. The basic science teachers' evaluation skills.

Research questions

1. The following research questions were posed to guide the study.
2. What is the extent of the effectiveness of basic science teachers in terms of knowledge of the subject matter?
3. What is the extent of effectiveness of basic science teachers in terms of instructional presentation skills?
4. What is the extent of effectiveness of basic science teachers in terms of communication skills?
5. What is the extent of effectiveness of basic science teachers in terms of evaluation skills?

3. Methods

Descriptive survey design was adopted for the study, the population of the study consisted of all the 4, 276 Junior Secondary School 3 (JSS3) students in public secondary schools in Kogi East Educational Zone of Kogi State, Nigeria. The choice of JSS3 was based on the fact that the students have spent more than two years in the school and therefore more matured to assess their teachers than their junior ones in JSS1 and JSS2. The sample size was 366 which was determined by using, Taro Yamane sampling formula in (Ezeliora, *et al.*, 2011) and this was adequate. A multistage sampling technique was used to select the respondents. The first stage involved selecting 3 Local Government Areas (LGA) out of 9 Local Government areas of Kogi East using simple random sampling technique (balloting). The second stage involved the selection of 8 schools from the 3 LGA's using proportionate sampling technique. Third stage involved the use of proportionate sampling technique to select the required sample size of 366 students from 24 sampled secondary schools. The instrument for data collection was a questionnaire developed by the researcher titled; "Basic Science Teachers' Teaching Effectiveness Questionnaire" (BSTTEQ). The instrument was made of two sections; A and B. Section A measured the demographic variables of the respondents. Section B was made up of 20 items statements categorized under components of teaching effectiveness: knowledge of subject matter, instructional presentation skills, communication skills, and evaluation skills on 4-point Likert scale of: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree

(D) = 2 and Strongly Disagree (SD) = 1. To make sure that the instrument measures what it was purported to measure the instrument was validated by three experts (two from measurement and evaluation and one from integrated science education) from Benue State University, Makurdi. The experts were requested to check the comprehensiveness and appropriateness of the items, identify ambiguous statements, and assess the relevance of the items bearing in mind the objectives and research questions of the study. Their corrections and suggestions were duly effected before the final draft of the instrument was produced. To ensure the consistency of the instrument, the researcher carried out reliability test by administering (trial testing) the instrument to 30 students that did not participate in the research but possess the same characteristics with the sample. After the pilot test, the raw scores obtained were subjected to statistical analysis using Cronbach Alpha reliability method and this yielded reliability coefficient of 0.84. The result was considered suitable to be used for this study. Data collection was done by three research assistants (one each from the LGA) who visited the schools and sought permission from the principals. All copies of the instruments were distributed and retrieved immediately from the respondents after their responses. The data collected were analysed using mean and standard deviation to answer the research questions. The decision rule for answering the research questions was arrived at by finding the average of 4-point scale which is 2.50. Thus, any item with mean of 2.50 and above was interpreted as agreed that the basic science teachers are effective while the mean score below 2.50 were interpreted that the respondents disagreed, implying that the basic science teachers are ineffective.

4. Results

Data analysis was carried out aimed at answering the four research questions according to Tables 1-4 respectively.

Table 1: Mean and Standard Deviation of the Teachers' Effectiveness in Terms of Knowledge of the Subject Matter.

S/No	Items	Mean	Standard Deviation	Remarks
1	My teacher is knowledgeable about basic science as a subject.	2.68	0.78	Effective
2	My teacher gives students notes that are rich in content areas.	3.12	0.82	Effective
3	My teacher teaches with great deal of confidence	2.34	0.87	Ineffective
4	My teacher confidently answers all questions, the students ask him/her.	2.25	0.84	Ineffective
5	My teacher is always prepared to teach basic science.	3.42	0.65	Effective
	Aggregate values	2.76	0.79	Effective

Table 1 shows that out of five items used in assessing the teachers' knowledge of the subject matter, the teachers were effective in three items. On the other hand, the teachers were ineffective in two of the items. Overall, the aggregate mean score of 2.76 shows that the teachers were effective in terms of knowledge of the subject matter.

Table 2: Mean and Standard Deviation of the Teachers' Effectiveness in Terms of Instructional Presentation Skills.

S/No	Items	Mean	Standard Deviation	Remarks
6	My teacher makes use of innovative teaching methods to ensure students active participation in the lesson.	2.38	0.86	Ineffective
7	My teacher uses digital instructional technology to deliver his/her lesson.	2.22	0.84	Ineffective
8	My teacher uses instructional materials to make his/her lesson clearer to the students.	2.61	0.68	Effective
9	My teacher makes his lesson interesting to the students.	2.42	0.79	Ineffective
10	My teacher makes sure that he/she covers his/her instructional objectives	2.58	0.81	Effective
	Aggregate values	2.44	0.80	Ineffective

Table 2 shows mean response scores of teachers toward instructional presentation skills. Out of five, the teachers were effective in two items. On other hand, they were ineffective in three items. Overall, the aggregate mean values of 2.44 shows that the teachers were ineffective in terms of instructional presentation skills.

Table 3: Mean and Standard Deviation of Teachers' Effectiveness in Terms of Communication Skills.

S/No	Items	Mean	Standard Deviation	Remarks
11	My teachers uses clear speech in enhance students' understanding of the lesson.	3.12	0.77	Effective
12	My teacher sustains students' attention in the class by being fluent.	2.81	0.82	Effective
13	My teacher takes his/her time to explain difficult concepts of the lesson.	2.45	0.85	Ineffective

14	My teacher listens to the students with open mind.	2.66	0.67	Effective
15	My teacher has a good sense of humour.	2.74	0.63	Effective
	Aggregate values	2.76	0.75	Effective

Table 3 shows that out of the five items used in assessing the communication skills of teachers, the teachers were effective in four items. In other hand, they were not effective in one item. Overall, the aggregate mean value of 2.76 indicates that the teachers were effective in terms of communication skills.

Table 4: Mean and Standard Deviation of Teachers’ Effectiveness in Terms of Evaluation Skills.

S/No	Items	Mean	Standard Deviation	Remarks
16	My teacher begins his/her lesson with appropriate review questions.	2.66	0.67	Effective
17	My teacher asks questions during the lesson.	2.58	0.63	Effective
18	My teacher asks questions at the end of the class.	2.70	0.74	Effective
19	My teacher allows the students to ask questions during lesson.	2.31	0.96	Ineffective
20	My teacher sets termly examination questions on content areas covered in a term.	2.67	0.73	Effective
	Aggregate values	2.58	0.75	Effective

Table 4 shows that out of five items used in assessing teacher’s evaluation skills, the teachers were effective in four. In other hand, they were ineffective in one. Overall, the aggregate mean value of 2.58 shows that the teachers were effective in terms of evaluation skills.

5. Discussion

The results in research question one revealed that, overall basic science teachers were effective in their knowledge of subject matter but showed weakness in the areas of teaching with confidence and also confidently answering all the students’ questions. This implies that teachers were well trained in the content areas of basic science in the tertiary institutions they attended. This finding concurs with the findings of Inameti (2022) and Amatari (2019) which stated that science teachers were effective in their knowledge of the subject matter. The above two mentioned studies are similar to the present

study because the three of them focused on student's assessment of their teachers, utilized structured questionnaires and found that overall teachers were effective in their knowledge of the subject matters. However, the two aforementioned studies differ from the present study because in the present study the students agreed that three out of the five dimensions listed were effective in measuring the knowledge of subject matter. On the other hand, the present study revealed that their basic science teachers were ineffective in the area of teaching with confidence and confidently answering students' questions. This variance in the present study compared to Inameti (2022) and Amatari (2019) will add value to the existing pool of knowledge in the area of research interest. Generally, it has to be noted that the positive feedback of the students on the strength of teachers on the knowledge of subject matter would serve as morale booster for teachers to continue to do their best in their teaching job. This in turn would significantly contribute to students' achievement in basic science. The feedback will also offer students opportunity to be active participants in teaching and learning processes.

The results in respect of the research question two, revealed that teachers were ineffective in their instructional presentation except in the areas of teachers use of instructional material and covering the objectives of their lessons. This implies that teacher's classroom interaction pattern is devoid of innovative teaching method that ensured participatory, student-centered and activity based learning. Instead the teachers use conventional teaching methods that are teacher-centered which stifle thinking and foster student's poor achievement in basic science. The finding of this study align with the studies of Achimugu (2016) and Madu (2016) which revealed that secondary school teachers were ineffective in their use of teaching strategies and were lacking in the area of preparation of lessons and ensuring class participation. The two highlighted studies above are similar to the present study because the three of them focused on students' assessment of their teachers and their findings indicated that in general term, teachers were ineffective in their instructional presentations. However, the two aforementioned studies differ from the present study because it was carried in mathematics in senior secondary schools while the present study was carried out in basic science in junior secondary schools. Furthermore, the highlighted studies differ from the present study which revealed that basic science teacher were effective in two dimensions namely, in the use of instructional materials and covering the objectives of their lessons. These two findings provided avenue to say that basic science teachers were effective and committed their job in the two areas and hence new ground were created in this study when compared to the two previous studies. However, in overall, ineffective instructional presentation of basic science lesson indicates that the teacher is not sound on the methodology of imparting the content area of science subjects yet instructional presentation skill is one of the most essential components of teaching process. Data from students' assessment indicated that overall, teachers are not doing well in the area of instructional presentation and this will go a long way in lowering student's achievement in basic science, if the trend is not reversed. To reverse this ugly trend, basic science teachers are called upon to initiate action plan for improvement in their area of weakness, while on the other hand, the school authority should ensure strict supervision of teacher's lesson plans and classroom presentation of the lessons.

The results in research question three revealed that basic science teachers were effective in communication skills in their lesson delivery. This implies that the students had generally good

perception of their teachers in the area of communication skills despite the fact that the teachers sometimes had problems explaining difficult concepts of the lesson to the students. Effective communication apparently leads to students' active participation and understanding the teacher's lesson delivery. The result of this study is in agreement with the assertions of Achimugu (2016) and Cobbinah, *et al.*, (2019), which stated that students had good perception of teacher's performance including communication skills. The highlighted studies are similar to the present study as the three focused on students' assessment of their teachers' job performance and both found in the overall, that the teachers were effective in communication skills. However, the two aforementioned studies differ from the present study because the present study revealed that the basic science teachers were ineffective in one of the dimensions (explaining difficult concepts of the lesson) of communication skills and this calls for improvement on the part of basic science teachers in this area of weakness. On the other hand, the communication skills of the teacher are very paramount to the quality teaching and learning. As the students agreed that in overall, their teachers are doing good job in this area, the finding would spur both the teachers and students to be at their best in teaching and learning processes. Thus, the students would understand the lessons better which in turn would spur them to perform better in basic science examinations.

Results in respect to research question four shows that basic science teachers were effective in evaluating their students. Evaluation is a very important aspect of teaching and learning process because it provides the necessary feedback on the achievement of the instructional objectives. The findings of this study concur with the finding of Omiko (2016), Olakunle and Akpan (2018) who found that teachers are effective in their assessment procedure. Teacher's assessment skills as far as the students are concerned are good. The two studies above are similar to present study as the three focused on student's assessment of their teachers and they found that teachers were effective in evaluating their students. However, the above two mentioned studies differ from the present study because in the present study, teachers were ineffective in one aspect of evaluation procedure namely, the area of not allowing students to ask questions during lessons. This finding is new and basic science teachers are called upon to be proactive in allowing students to ask questions during lessons. Overall, teachers are encouraged to keep up the good work on assessment technique so as to enhance students' learning outcomes positively. On students' part, this would encourage them to participate fully in their classroom interaction pattern and hence increase their academic knowledge.

On Oladimeji and Tunji (2019), Adikwu and Agi (2022), the present work is similar to them because the three of them focused on the assessment of teachers in junior secondary schools but the other two differ from the present study as the present study focused on student's assessment of their teachers while the two previous studies of Oladimeji and Tunji (2019), Adikwu and Agi (2022) focused on teachers' assessment of themselves. Students' assessment of their teachers in junior secondary schools appears to be scarce and /or new. Finally, differences exist between the previous studies and the present study especially in the methodological approach (scope) of the study. Firstly, previous studies were conducted in other countries and some states in Nigeria but the present study was conducted in Kogi State Nigeria and findings will add value to the existing pool of knowledge in this research area. Secondly, most studies in the past were conducted in senior secondary schools and high institutions but the present study is conducted in basic education level specifically junior

secondary schools. The finding of the study will go a long way in encouraging school authorities at this level of education to use students' assessment in planning actions that will improve classroom teaching and learning. Thirdly, most of the previous studies on students' assessment of their teachers were carried out in core science subjects (biology, chemistry, physics and mathematics) but the present study focus on basic science which is the foundation course that makes way for the core science subjects mentioned above. Feedback obtained at assessment of teachers in basic science would be used to enhance the efficiency of teachers and quality instruction which in turn will enhance students' learning outcomes in basic science

Based on the available evidence in this study, there are some educational implications. Firstly, the feedback from students' assessment of their teachers might more easily provide students with experience that will facilitate their active participation in teaching and learning process. Hence students should be encouraged to constantly assess their teachers to always keep them at their best. Secondly, data provided by the students' assessment of their teachers would give opportunity for teachers to reflect on their strengths and weaknesses and hence initiate action plans that would ensure their improvement in classroom delivery. Thirdly, data provided will give opportunity for curriculum planners to initiate curriculum review especially on teacher's methodology to ensure effective classroom presentation of lessons. Fourthly, government at various levels should give awards to teachers based on the outcome of the students' assessment so as to encourage the teachers to be at their best in utilizing the research findings of students' assessment in effective teaching and learning of basic science. Fifthly, the instrument developed by the researchers in this study could be used by the authorities of junior secondary schools for effective monitoring of teaching and learning processes.

6. Conclusion

Based on the findings of this study, the researchers concluded that generally speaking, basic science teachers were effective in teaching in the areas of subject matter, communication skills and evaluation techniques, and were ineffective in teaching in the area of instructional presentation. Students' assessment of their teachers' teaching effectiveness has provided good and holistic assessment and thus, students' involvement in the assessment of their teachers should be encouraged. More so, the management of junior secondary schools should endeavor to use students in assessing their teachers and the feedback should be used in promoting effective teaching and learning of basic science in junior secondary schools.

References

- [1] Achimugu, L. (2016). Senior Secondary School Students' Assessment of Chemistry Teachers' Effectiveness in Teaching Chemistry in Kogi State, Nigeria, *The International Journal of Science and Technology* 4(4),196 – 202
- [2] Achimugu, L. (2021). Predictive validity of basic science education certificate examination in Basic Science on senior secondary certificate examination in chemistry, *Frontiers in Societal Development (FSD), KSU Journal Series*. 1(1), 77 – 83.

- [3] Adikwu, O. & Agi. C.I. (2022). Assessment of implementation of Universal Basic Education Mathematics Curriculum in Junior Secondary Schools in Benue State, *Nigeria Journal of Education Research and Evaluation* 21(1), 182 – 198
- [4] Amatari, V.O. (2019). Undergraduates' Assessment of Lecturers' Teaching Effectiveness in Faculty of Education, Niger Delta University, Bayelsa State, *ASSEREN Journal of Educational Research and Development* 7(1), 111 – 119
- [5] Cobbinah, A., Akande, J.A. & Bamidele, S.T. (2019). Students' Perception of Mathematics Teachers' Job Performance in Selected Colleges of Education in Nigeria, *Journal of Education* 4(1), 91 – 99.
- [6] David, A.U. (2018). Innovative practices in science education: A Panacea for improving secondary school students' academic achievement in science subjects in Nigeria, *Global Journal of Educational Research* 17(1), 23 – 30
- [7] Dewitt, J., Archer, L. & Osborne, J. (2014). Science related aspiration across the primary-secondary Divide: Evidence from two surveys in England. *International Journal of Science Education* 36(10), 1609 – 1629.
- [8] Effiong, S.C., Obushi, L.A. & Adebola, A.J. (2018). Teachers' assessment indices of teachers and total quality management principles of education in primary schools in Akwa Ibom State, Nigeria. *Nigeria Journal of Education Research and Evaluation*. 17(1), 71 – 83
- [9] Ezeliora, B., Ezeokara, J. & Inyega, H. (2011). *Principles of research in education and social sciences* – Fourth Dimension Publishing Co, Ltd.
- [10] Federal Republic of Nigeria (2014). *National Policy on Education*, NERDC Press.
- [11] Ihkwoaba, C.K., Ihekwoaba, C.N. & Ihekwoaba, B.O. (2022). Evaluation of the implementation of national curriculum for basic science in upper Basic Schools in Imo State Nigeria *Journal of Evaluation* 7(1), 57 – 69
- [12] Inameti, U.P. (2022). Students' evaluation of instructional effectiveness of mathematics teachers in Calabar education zone of Cross River State, *Nigerian Journal of Educational Research and Evaluation*, 21(1), 364 – 273.
- [13] Kebutu, F.R., Oloyede, O.I. & Bandele, M.F. (2015). An investigation into the achievement of Junior Secondary School Students taught integrated Science using the cooperative learning strategy in Nigeria. *European Journal of Physics and Chemistry* 7(2), 63 – 73
- [14] [13] Madu, C.I. (2016). Students' Evaluation of Mathematics Teachers' Preparedness for Effective Instruction," *IOSR Journal of Research and Method in Education* 6(3), 10 – 14
- [15] Mbonu, J.N. & Okoli, B.U. (2019). Effects of multimedia integrated instruction on students' achievement in basic science, In A.S. Ifamuyiwa (Eds) 60th Annual Conference Proceedings of Science Teachers Association of Nigeria, pp. 229 – 237, The STAN place Ltd.
- [16] Micah, M., Ozoji, B.E., Hai, Y.D. & Ikpechukwu, E.E. (2018). Effects of vee-mapping strategy on junior secondary school students' achievement in Basic Science in Kausa local government Area of Kaduna State. *Nigerian Journal of Educational Research and Evaluation* 17(1), 19-29.
- [17] Muhammad, M.H., Garba, Y. & Mustapha, S. (2018). Assessment of the implementation of NCE Hausa language curriculum in colleges of education in Nigeria, *International Journal of Education and Evaluation* 4(6), 96 -109.

- [18] Ngu, A.N., Nworgu, L.N. & Ella, F.A. (2019). Assessing the professional development needs of Junior Secondary School Science Teachers in Enugu State, *Journal of Science Teachings Association of Nigeria*, 54(1), 88 – 98.
- [19] Nnoli, J.N. (2016). Assessment of chemistry material resources and the level of acquisition of entrepreneurial skills. *Journal of Science Teachers Association of Nigeria*. 2(4), 112 – 117
- [20] Nwafor, C.E. & Aja, L. (2017). Effects of constructivist based teaching strategy on Junior Secondary School Students' achievement in basic science. *Journal of Science Teachers Association of Nigeria*. 52(1), 33 – 42.
- [21] Obushi, A.I. (2019). Assessment of trade entrepreneurship subjects in *River State secondary schools*, *Journal of Evaluation* 4(1), 159 – 173.
- [22] Ochiu, A.O. (2018). Effectiveness of target task approach of teaching on students' achievement and retention in mensuration, *Journal of Research in Curriculum and Teaching* 10(3), 98 – 109.
- [23] [Oladimeji, E.A & Tunji, H.O. (2019). Assessment of implementation of universal basic education programme in south west Nigeria: issues, problems and prospects, *Literacy Information and Computer Education Journal*. 10(4), 77 – 89.
- [24] Olakunle, B.J. & Akpan, I.F. (2018). Assessing basic science and technology teachers' teaching effectiveness in junior secondary schools in Eket senatorial district. *Journal of Science Teachers Association of Nigeria* 53(1), 157 – 160
- [25] Olatunji, F.O. & Mbanefo, M.C. (2019). Effect of peer instructional strategy on students' academic performance and retention in Basic Science, In A.S. Ifamuyiwa (Eds) 60th *Annual Conference Proceedings of Science Teachers Association* pp. 238 – 244. The STAN place Ltd.
- [26] Omiko, A. (2016). An evaluation of classroom experience of basic science teachers in Secondary Schools in Ebonyi State, Nigeria. *British Journal of Education* 4(1), 64 – 76
- [27] Opara, I. M. & Nwankwo, C. (2016). Junior School certificate examination as predictor of students' Academic performance in Senior School certificate examination. *Journal of Contemporary Issues and Development* 5(4), 48 – 56, 2016.
- [28] Ovute, A.O. (2018) Assessment analysis of research findings on influence of school location on students' achievements in physics, *American Journal of Scientific Research*. 10(1), 18 – 21.
- [29] Samba, R.M.O., Kurumah, M.C. & Bash, A.E. (2018). Using Jigsaw cooperative learning to improve students 'achievement and interest in basic science; implication for quality education," *Journal of Research in Curriculum and Teaching* 10(3), 90 -97.
- [30] Sambo, M.H., Kukwi, I.J., Eggari, S.O. & Mahuda, A.M. (2014). Assessment of implementation of basic science programme in Junior Secondary Schools in Nasarawa West Zone. *Development Country Studies* 4(20), 12 – 24.
- [31] Shodiende, O.A. & Yisa, A.M. (2019) Assessment of resource inputs into electrical and electronic trade in technical colleges, *KIV Journal of humanities*. 4(4), 389 – 371
- [32] Uzowulum, O. & Egbuana, N.B. (2015). Relevance of instructional teaching and learning of science in public schools". *Journal of Science Education* 12(2), 156 – 162.