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The Role of Mathematics Knowledge in Advancing Learning of Science in Public Junior Secondary Schools in Rivers States

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The study investigated the roles of Mathematic knowledge in advancing learning of science in public junior secondary schools in River State. It identified mathematics knowledge and other factors required for advancing learning of science teaching and learning in public secondary schools. A descriptive survey method involving a population of 635 (585 students and 50 teachers) was adopted for the study. The study was guided by four research questions and one hypothesis. Mean was used to answer the research questions while t- test was used to test the hypothesis at 0.05 level of significance. The instrument Advancing Science through Mathematics Knowledge Questionnaire (ASMKQ) consisting of 20 items was validated by two experts in Integrated Science for content and face validity. The reliability coefficient of the instrument was 0.89 obtained using test- retest method and Pearson Product Moments correlation coefficient (r). The main findings of the study are that, the effectiveness of student mathematics knowledge is required for their

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advancement of science learning, teachers mathematics knowledge influences the advancement of science teaching at the junior secondary school level and there are challenges to the advancement of science such as inadequate infrastructures (laboratories for experimentation), poor attitude to learning of science and mathematics, teachers lack of empathy. Also, the influence of the male and female teachers' mathematics knowledge for the advancement of science teaching at the junior secondary school does not differ significantly. Based on these findings, it was recommended that students should improve in their mathematics knowledge and interest in science learning while the teachers' mathematics knowledge and integration skills be improved if remarkable advances will be made in science teaching.

Keywords: Mathematics; knowledge; secondary school student.

1. INTRODUCTION

The basic education programme has metamorphosed through different acronyms but definite in its purpose based on the specific goals of education enshrined in the National Policy of Education [1]. These goals involves, inculcation of permanent literacy and numeracy , ability to communicate effectively, laying of a sound basis for scientific reflective thinking , developing in the child ability to adapt to the changing environment, manipulative skills and basic tools for further studies, amongst others.(p.14).

The policy has placed immeasurable responsibility on teachers who through the teachers' development programmes obtained the qualification and professionalism to Bachelors of Education. The basic science teachers develop interest and content that would encourage active participation and learning of mathematics concepts which compliment science learning. The concern for learning about the environment and use of mathematics knowledge in exploring the science knowledge at the junior secondary level has necessitated the inauguration of Elementary Science Series for Africa (ELSSA). The ideals of the organisation is to foster encouragement of students in learning science, reinforcement of the child's natural skills and taking students ahead in a changing environment [2]. Science teaching at the junior secondary school (Basic Science) should incorporate literacy in science involving basic laws and science principles, characteristics of living matter, energy and environment in an interdisciplinary approach with content areas and objectives stated in the Nigerian Integrated Science Program(NISP) and adapted in teaching and learning of integrated science [3]. Teaching of science at the JSS level is deliberate in order to inspire students critical thinking abilities, cultivate interest of scientific enquiry and give the child ideas of the making of a scientist while his or her scientific literacy will bring about understanding of the key concepts of the principles of science as relating to life and technology on the society and how the child would acquire skills to observe, think, solve problems and experiences of the environment through inquiry and primary experience.

In order to accomplish these laudable roles, Mathematics education is important. More especially, as it involves critical thinking. Theoretically, mathematics science and technology have interface, Mathematics is a tool for interpretation and understanding of scientific discourse. Most often it's relationship is symbiotic showing relationships and attributes to significance of science learning. Science phenomenon can be reinstated in formula and discussed based on mathematical reasoning. The relationship of science concepts are easily illustrated using mathematical symbols and manipulation, hence without a progress in mathematics; pupils would lose meaningful interest and make very slow progress in science learning. Edeh [4], emphasized that mathematics is very vital to our lives as the application of it is found in other sciences. More so, Joab [5] stated that the relationship between Mathematics education and science teaching is significantly close and interdisciplinary hence students at all levels need to be abreast with those math concepts that are easily identified in science. Asuriz- Bravo [6] and Ledeman [7] stated in research that mathematics knowledge is a prerequisite to analysing models of physical events and organisation of theoretical models which has its roots in mathematics, the advancement in scientific knowledge have been encouraged through some effort of integration. At the Basic Science level, concepts are interrelated, simplified and built up with foundation of home science practices. Matthew [8] suggested practices, ensuring pupils ability to name, identify, quantify and imagine using

science process skills, use of enquiry/discovery method, making accurate predictions, drawing mathematic relationship with physical concepts, solving everyday problem as building blocks for encouraging science and mathematics knowledge. The intent of this research is to determine the roles of mathematics knowledge in the advancement of science learning amongst junior secondary school students.

1.1 Statement of the Problem

Progress have been made in identification of common features of difficulties faced in teaching of science and scientific literacy among junior secondary school students such as lack of use of adequate teaching methods resulting from inadequate teacher experience, use of experimentation and project-based learning methods, learners' curiosity to learn science and problem-solving inadequacy. Advancing science teaching will require all of these skills and provision of equipped laboratory for primary science where concepts are not only discussed but areas relating to mathematics are identified. Students lose interest in scientific discourse once it has delved into use of mathematics, maybe due to students' phobia for mathematics concept or the requisite problem-solving skills for advancement in mathematics or experiences of quality teaching that require integrating instructional resources, mathematics knowledge and science knowledge as a whole. This scenario will consequently negate students' interest in science, poor math development skills, poor interest in physical sciences and at long-run grossly affect the realisation of the goals of scientific studies as enshrined in the policy for science education at the basic level. Intellectual skills involving creativity and science content mastery, scientific skill and maths knowledge would enhance students' performance in basic science. Ivowi [9], Dammole [10] and Ochu & Haruna [11] bemoaned students' lack of interest in science as basic to their poor science skills and poor performances. The essence of improved or innovative instructional methods is to deter students poor interest while improve math skills would energize and build students interest.

The teaching of science has been affected by some factors such as inadequate teaching methods, lack of adequate teaching experience, teacher development programs, scarcity of laboratories for teaching primary science and many more. Mathematics resources such as mathematics laboratory proper application of mathematics teaching strategy and students mathematics phobia has contributed to students' lack of proper attitude during discussions in mathematics related science concept. This gives concern especially for the foregoing essay on science and mathematics relationship and how the teaching of science can be advanced. Students' progress in science can be hampered without adequacy in Math knowledge to an extent. Poor mathematics knowledge of students can be improved by incorporating mathematics resources, individualizing learning of mathematics concepts for never- do-wells, teacher expertise and specifics on interrelated concepts. However, the study will seek to identify and emphasize the roles of mathematics knowledge in the advancement of science learning at the JSS level. It is the intent of this advanced research to determine whether the Mathematics knowledge do affects the advancement of students learning of Basic Science in public secondary school.

1.2 Aim and Objectives of the Study

The aim of the study is to determine the roles of Mathematics knowledge in advancement of science learning in public senior secondary schools in River state. The following objectives will be achieved in course of the study:

1. To determine the effectiveness of mathematics knowledge in advancing the learning of basic science among students.
2. To investigate the influence of relevant mathematics knowledge on advancement of science teaching among teachers in the research area.
3. To identify other challenges to advancement of science teaching at the junior secondary levels in the research area.
4. To determine how teachers' mathematics knowledge influence the advancement of science teaching at the junior secondary school level with respect to gender.

1.3 Research Questions

The following research questions are formulated in order to guide the study.

1. How does the effectiveness of students' mathematics knowledge advanced learning of basic science?
2. How does teachers' mathematics knowledge influence advancement of science teaching at the junior secondary school level?

3. What are the other challenges to advancement of science teaching at the junior secondary school levels in the research area?
4. How does male and female teachers' mathematics knowledge influence the advancement of science teaching at the junior secondary school level?

1.4 Hypothesis

The following null hypothesis were formulated and tested at 0.05 significance level

Ho_1: The influence of teachers' mathematics knowledge for the advancement of science teaching at the junior secondary school does not differ significantly with respect to gender.

1.5 Significance of the Study

The study on the roles of mathematics knowledge on advancement of science teaching at the public junior secondary schools in Rivers State is significant to the teachers, students and authorities responsible for teaching/learning development. To the teacher, knowledge of mathematics skills, symbols, problem solving approaches, quantitative assessment are basic in science teaching especially in the math- related concepts in chemical and physical sciences. Teachers would have assessed how their Mathematic knowledge would benefit advancing science learning at the basics. Teachers at the basic science can be encouraged to engage in further studies and build interest in handling math science concepts. The improved pedagogical content knowledge of most teachers in the science and mathematics can create improvement in interest for the advancement of science teaching.

The students who learn science would appreciate the relevance of their math knowledge in handling numerical problems in the sciences and thereby improve on their math skills.

1.6 Scope of the Study/Area of the Study

The study is carried out in Obio/Akpor local government area among junior secondary schools teachers and students in basic 9. The content is delimited to mathematics knowledge relevance of teachers and students as challenging to the advancement of science teaching and learning. The challenges of variables to effective science teaching and measurements of construct of mathematics knowledge was based on teacher and students response to questionnaire. Obio/Akpor local government area is located at latitude 04°45'0" and longitude 07°01'0" in the metropolis of Port Harcourt. It is one of the major centres of economic activities in Nigeria and covers about 200km square with a population of about 464789 people (Census, 2006). The people of the area are fishermen and subsistence farmers. There are higher institutions of learning and industries in the area.

2. METHODOLOGY

The research design for this research is a descriptive survey design. According to Nwankwo [12] descriptive survey is usually used as a precursor to qualitative research design giving some valuable pointers to handling of qualitative data unbiased and without manipulating the independent variables and generalization of the results on the population of the study.

The population of the study involve 6023 male students and 8038 female students in JSS3 in 23 schools in Obio/Akpor local government area and 50 Mathematics teachers (UBE statistics, 2022). A sample of 635 comprising of 585 students (252 boys and 333 girls) and 50 teachers were used for the study. The instrument that was used for data collection is the Advancement of Science through Mathematics Knowledge Questionnaire (ASMKQ) designed by the researcher using logical method; the items were keyed relating mathematics knowledge to the advancement of science. The instrument ASMKQ is responded to by teachers and students and have undergone validation for face and content validity by two experts in Mathematics and Integrated Science of the Faculty of Education of the University of Port Harcourt. ASMKQ is reliable and has sufficient reliability coefficient of 0.82 estimated on administering the instrument on 20 students and five teachers who are not part of the sample of the study but within the population. The instrument ASMKQ consisted of 20- items. Weighed on 4- point likert scale with response level of SA- 4 points, A-3 points, D- 2points and SD -1 point, where SA- Strongly Agree, A- Agree, D- Disagree, SD- Strongly Disagree. The data obtained is used to analyse the research questions using rank order and mean descriptive analysis. The hypothesis was tested using t- test.

3. RESULTS AND DISCUSSION

3.1 Results

Research Question 1: How does the effectiveness of students' mathematics knowledge advance learning of basic science?

Table 1 showed that the grand mean is 2.75 greater than the criteria mean of 2.50; this implies that students improved mathematics knowledge only affects advancement in learning of science among students in the junior public secondary schools in the Obio/Akpor local government area. It is revealed that advances in science which involve exposing learners to science teaching can be enhanced if science equipment is provided for instruction in the sciences ($\bar{x}$:3.23>2.50). Students solving mathematics problems, learning concepts which have a relationship with math and possessing other math knowledge will improve their science learning skills ($\bar{x}$: 2.92 >2.50). Table 1 showed that to advance in science, students' interest and equal math knowledge acquisition is a necessity ($\bar{x}$: 2.83 >2.50) and that the learning of science will be enhanced if students develop a positive attitude towards the learning of Mathematics concepts ($\bar{x}$: 2.74 >2.50). More so, students doing well in science related courses in future will need improvement in their mathematics knowledge based on the taught subjects ($\bar{x}$: 2.68 >2.50).

The learning of numerical (calculations) concept were seen as difficult ($\bar{x}$: 2.55 >2.50) despite students' opinion that learning science is like learning mathematics to an extent (x: 2.52 >2.50). However, they opined that mathematics is a difficult subject and hence, learning science which involves concepts relating to mathematics was ignored. This attitude could hamper advances in science learning ($\bar{x}$: 2.50 > 2.49). These results were confirmed by the t-test statistics done, since the p-values of 0.027 is significant at 5%, it implies that Students' response on mathematics knowledge can advance the study of science.

Research Question 2: How does teachers' mathematics knowledge influence the advancement of science teaching at the junior secondary school level?

Table 2 indicated that in science teacher's mathematics knowledge demand, most teachers became subject-specific and not interdisciplinary ($\bar{x}$: 3.50 >2.50) hence there is a relationship between Mathematics knowledge and science ($\bar{x}$: 3.50 > 2.50). Most science teachers are knowledgeable in mathematics, handle math related science concepts effectively and this could improve the advancement of science teaching ($\bar{x}$: 3.02 >2.50). It is therefore expected that science teachers pose adequate mathematics knowledge for furtherance of the teaching and learning of the sciences ($\bar{x}$: 2.68 >2.50). However, the teachers opined that the mathematics demand for the Junior Secondary Basic Science curriculum is not difficult for advancing of science teaching and learning ($\bar{x}$: $2.36 < 2.50$). Mathematics knowledge of teachers influence advancement of science teaching due to the interrelatedness of mathematics and science, particularly at the basic level , Grand mean(($\bar{x}$ G_{mean}): $3.01 > 2.50$).

These results were confirmed by the t-test statistics done, since the p-values of 0.056 is significant, it implies that teachers' mathematics knowledge influence the advancement of science teaching at the junior secondary school.

Research Question 3: What are the other challenges to the advancement of Science Teaching at the junior secondary school level?

Table 3 showed that the advancement of science teaching at the junior secondary level can be impeded by lack of infrastructure such as adequate classrooms and laboratories for experimentation ($\bar{x}$: 3.43>2.50). The poor attitude of students especially towards the learning of science is a challenge to advancing science teaching and learning ($\bar{x}$: $3.22 > 2.50$). The lack of adequate training and conceptual knowledge in integrated science at the JSS level can hamper the advancement of science teaching. ($\bar{x}$: 3.20 >2.50). Teachers and students lack of academic engagement and apathy adversely affect the students interest and learning capacity in integrated sciences ($\bar{x}$: 3.05 >2.50). However, teachers' view of the JSS curriculum is that the mathematics demand for advancement for science teaching is low ($\bar{x}$: $2.97 > 2.50$) given the themes in integrated science. Teachers lack of integration skills would particularly affect mathematics knowledge skills and hinder advances in science teaching

Table 1. Students' mathematics knowledge and advancement of the study of science

S/N	Questionnaire variables	SA	A	D	SD	Mean x	Decision order
1.	Mathematics is a difficult subject and concepts relating to science study are ignored and this could hamper advances in science.	124 (496)	206 (618)	88 (176)	167 (167)	2.49	8th
2.	Basic science involving numerical concepts is difficult.	107 (428)	208 (624)	170 (340)	100 (100)	2.55	6th
3.	Advances in science would require students' interest leading to equal advances in mathematics knowledge.	218 (872)	147 (441)	120 (240)	100 (100)	2.83	3rd
4.	Advances in science involve exposing the learner to science teaching at schools providing science equipment for instruction.	321 (1284)	128 (384)	86 (172)	50 (50)	3.23	1st
5.	Doing well in science-related courses in future will need improved Math knowledge based on taught concepts.	215 (860)	104 (312)	132 (264)	134 (134)	2.68	5th
6.	Math problems, discussion of math-related concepts and accessing other mathematics knowledge as learners will improve advances in science.	314 (1256)	28 (84)	124 (248)	119 (119)	2.92	2nd
7.	Learning of science will be enhanced if students develop a positive attitude towards the learning of mathematics concepts.	157 (628)	210 (630)	128 (256)	90 (90)	2.74	4th
8.	Learning science procedures to an extent is the same as learning mathematics procedures.	180 (720)	121 (363)	106 (212)	178 (178)	2.52	7th
	Grand mean					2.75	
Testing the grand mean if it is significant from the Criterion mean t -test statistics (p-values)		2.793 (0.027**)					

*Criterion mean = 2.50; **=Sig. at 5%*

Table 2. Teachers' mathematics knowledge and influence on the advancement of science teaching

S/N	Questionnaire variables	SA	A	D	SD	Mean x	Rank order
9.	Science teachers need mathematics knowledge. Most science teachers are subject-content-specific and not interdisciplinary.	32 (128)	12 (36)	3 (6)	5 (5)	3.50	1st
10.	There is substantive relationship between math knowledge and science teaching.	32 (128)	12 (36)	3 (6)	5 (5)	3.50	1st
11.	Most science teachers knowledgeable in mathematics handle math-related science concepts effectively.	24 (96)	13 (39)	3 (6)	10 (10)	3.02	3rd
12.	The mathematics demand for the JSS curriculum is high and difficult for science teachers.	8 (32)	12 (36)	20 (40)	10 (10)	2.36	5th
13.	Science teachers are expected to pose adequate mathematics knowledge for advancing of science teaching and learning	12 (48)	18 (54)	12 (24)	8 (8)	2.68	4th
Testing the grand mean if it is significant from the Criterion mean t -test statistics (p-values)		2.276 (0.056**)					

*Grand mean = 3.01, Criterion mean = 2.50; **=Sig. at 5%*

Table 3. Challenges to advancement of science teaching at Junior secondary schools

S/N	Questionnaire item	SA	A	D	SD	Mean (x)	Rank Order
14.	Teachers lack of integration skill would affect mathematics integration in science teaching and hence a challenge to advancement of science.	217 (868)	102 (306)	124 (248)	182 (182)	2.53	6th
15.	Lack of adequate training and conceptual knowledge in integrated science at the JSS level can hamper advancement in science teaching.	350 (1400)	130 (390)	110 (220)	25 (25)	3.20	3rd
16.	Curriculum for basic science is thermic with low mathematics demand	300(1200)	100 (300)	150 (300)	85 (85)	2.97	5th
17.	Inadequate infrastructures such as classroom, mathematics laboratories pose serious challenge to advancing science teaching in the research area.	412(1648)	103 (309)	104 (208)	16 (16)	3.43	1st
18.	Learner's poor attitude of science affects the advancement of science teaching and learning.	350 (1400)	140 (420)	100 (200)	25 (25)	3.22	2nd
19.	Academic engagement as opposed to apathy and lack of interest of learners adversely affect the teaching of science.	300 (1200)	150 (450)	100 (200)	85 (85)	3.05	4th
20.	Teaching of mathematics related concepts are required for advancement of science in school.	100 (400)	400 (800)	25(75)	105 (105)	2.17	7th
Testing the grand mean if it is significant from the criterion mean t -test statistics (p-values)		2.639 (0.039**)					

*Grand mean = 2.94, Criterion mean = 2.50; **=Sig. at 5%*

Table 4. Teachers' mathematics knowledge and influence on the advancement of science teaching with respect to gender

S/N	Questionnaire variables	Male				Total	Mean	Std	Female				Total	Mean	Std
		SA	A	D	SD				SA	A	D	SD			
1.	Science teachers need mathematics knowledge. Most science teachers are subject-content-specific and not interdisciplinary.	18 72)	5 (15)	2 (4)	3 (3)	94	3.36	1.17	14(56)	5 (15)	1 (2)	2 (2)	75	3.41	1.59
2.	There is substantive relationship between math knowledge and science teaching.	17 (68)	5 (15)	2 (4)	4 (4)	91	3.25	1.09	15 (60)	4 (12)	2 (4)	1 (1)	77	3.50	1.63
3.	Most science teachers knowledgeable in mathematics handle math-related science concepts effectively.	14(56)	8 (24)	1 (2)	5 (5)	87	3.11	0.89	10 (40)	5 (15)	2 (4)	5 (5)	64	2.91	1.29
4.	The mathematics demand for the JSS curriculum is high and difficult for science teachers.	5 (20)	7 (21)	11 (22)	5 (5)	68	2.43	0.29	3 (12)	5 (15)	9 (18)	5 (5)	50	2.27	0.89
5.	Science teachers are expected to pose adequate mathematics knowledge for advancing of science teaching and learning	7 (28)	10 (30)	6 (12)	5 (5)	75	2.68	0.44	5 (20)	8 (24)	6 (12)	3 (3)	59	2.68	1.12
Grand mean							2.966							2.954	

Criterion mean = 2.50

Table 5. Teachers' mathematics knowledge influence for the advancement of science teaching by gender

Statistics	Group	N	Mean	Std. Deviation	T	Sig. (2-tailed)	Remark
Teachers Mathematics knowledge	Male	28	2.966	0.3955	0.041	0.968	Not Sig.
	Female	22	2.954	0.512			

($\bar{x}$: 2.53 >2.50). However teaching mathematics concept is not the only requirement for advances in science ($\bar{x}$: 2.17 <2.50) The Challenges to advancement of science teaching at the JSS level include inadequate infrastructures, learners poor attitude, lack of adequate training, and conceptual knowledge in integrated science, non-academic engagement due to apathy, gross loss of students interest in the sciences and teachers lack of integration skills of math knowledge and not necessarily math knowledge.

These results were confirmed by the t-test statistics done, since the p-values of 0.039 is significant at 5%, it implies that there are challenges to advancement of Science teaching at Junior secondary schools as listed above.

Research Question 4: How does male and female teachers' mathematics knowledge influence the advancement of science teaching at the junior secondary school level?

Table 4 showed how the male and female teachers' mathematics knowledge influence the advancement of science teaching at the junior secondary school level. The mean response for the male is 2.966 and that of the female is 2.954 which is higher than the criterion mean of 2.50 This shows that both teachers, male and female mathematics knowledge greatly influence the advancement of science teaching at the junior secondary school.

3.2 Test of Hypothesis

Ho_1: The influence of teachers' mathematics knowledge for the advancement of science teaching at the junior secondary school does not differ significantly with respect to gender.

Table 5 showed that the t-cal value is 0.041 with p-value of 0.968 which is greater than the significance of 5%, hence the null hypothesis was not rejected. The influence of the male and female teachers' mathematics knowledge for the advancement of science teaching at the junior secondary school does not differ significantly.

3.3 Summary of Finding

The summary of findings of the study is as follows:

1. The effectiveness of student mathematics knowledge is required for their advancement of science learning ($\bar{x}$: 2.75 >2.50).
2. Teachers mathematics knowledge influences the advancement of science teaching at the junior secondary school level ($\bar{x}$: 3.01 >2.50).
3. The challenges to advancement of science are inadequate infrastructures (laboratories for experimentation), poor attitude to learning of science and mathematics, teachers lack of empathy, gross loss of interest among students, teachers lack of integration of skills and efficient mathematics knowledge ($\bar{x}$: 2.94 >2.50) and not teachers not teaching math concept related basic science concepts ($\bar{x}$: 2.17 >2.50).
4. The influence of the male and female teachers' mathematics knowledge for the advancement of science teaching at the junior secondary school does not differ significantly.

3.4 Discussion

Mathematics knowledge of the teachers and students are relevant to the advancement of science teaching at the junior secondary school level due to the interrelationship between mathematics and science. Students at the junior secondary school level may encounter, for instance, concepts of energy; numerical problems in energy, conservation principles, determination of population in a habitat, measurement in ecological studies will find it difficult to make advances without adequate math knowledge. This finding agreed with Ledeman [7], Joab [5] and Asuriz-Bravo [6] that mathematics is the basis of interpretation of the physical events interns of measurement and that there exists a significant relationship between mathematics and science.

However, teachers' knowledge in mathematics is complementary to other factors such as the classroom and laboratory need, students interest (Dehu & Haruna, 2014) and teachers' lack of integration skills and efficiency in identifying mathematics-related concepts in the sciences for specific attention and instruction.

4. CONCLUSION

Advancing the study of science in the junior secondary school category can be enhanced through adequate teaching of sciences and teachers' mathematics knowledge, provision of infrastructure (laboratory) for basic science,

teachers integration skills and students positive learning attitude (interest).

5. RECOMMENDATIONS

Based on the findings of the study, it is recommended that:

1. Students should improve in their Mathematics knowledge through improved interest to learn Maths and science at the basic level.
2. Science teachers should be exposed to teacher development programmes to become knowledgeable in skills required for integration of maths in science so as to identify and instruct on the math related concepts in science.

CONTRIBUTIONS TO KNOWLEDGE

Advancing science teaching/learning requires teachers mathematics knowledge, integration, skills, students mathematics knowledge and interest in science at the junior secondary school level.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Federal Republic of Nigeria. National Policy on Education. Yaba, Lagos: NERDC Press; 2014.
2. Elementary Science Series for Africa. Policy on Elementary Science Teaching. ELLSA; 2000.
3. Nwanekezi AU, Arokoyu AA. Teaching integrated science constructively. Port Harcourt: Soteria Publishing House; 2014.
4. Edeh CS. Important of math in every day life:12 benefit and uses; 2022. Available:https//bschorly.com
5. Joab CC. Advancing the study of science through mathematics education in Junior secondary school. Un published undergraduate project, University of Port Harcout; 2018.
6. Asuriz-Bravo F. Sharpening mathematics tools for the 21st Century. NTCM Summing Up; 2012. Available:http://www.nctm.org/about/content.aspx?=29275
7. Lederman L. Engaging young children in science and mathematics. Journal of Elementary Science. 2007;17(2):27-41.
8. Matthew M. Describing primary mathematics lessons observed in the leverhulme numericy research programme: A qualitative framework. Paper presented at the Twenty-fourth conference of the international group for the psychology of mathematics education, Hiroshima, Japan; 2006.
9. Ivowi UMO Sustaining students interest in science: A perspective for curriculum instruction. Abuja: Foremost Educational Services Ltd; 1999.
10. Danmole BT. Emerging issues on the universal basic education curriculum in Nigeria. Medwell Journals. 2011;8(1): 62.
11. Ochu AN, Haruna PF. Challenges and prospects of creativity in basic science classroom. The perception of the basic science teachers. British Journal of Education Society and Behavioural Science. 2014;5(2):237-243.
12. Nwankwo OC. A practical guide to research writing: For students in education and social sciences (revised 6th Edition) M&J Grand Orbit and Communication Ltd. University of Port Harcourt; 2013.

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