

## COMPETENCIES POSSESSED BY MATHEMATICS TEACHERS IN HANDLING MATHEMATICS LABORATORY IN PUBLIC SECONDARY SCHOOLS IN IMO STATE

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### **Abstract**

*The incessant poor performance of students in Mathematics in Imo state, in spite of the provision of Mathematics laboratory by Okorochoa led administration, has drawn the attention of stakeholders in education sector. Against this background, several studies have been conducted to proffer solution to this menace. It is on this note that this study examined competencies possessed by Mathematics teachers in handling Mathematics laboratory in public secondary schools in Imo state. The study had four research questions and four null hypotheses. It adopted an analytical survey design. The sample size for this study was 110 Mathematics teachers which were purposively sampled from 59 out of 274 public secondary schools, where Mathematics laboratories are available. In each of the 59 secondary schools sampled, all the Mathematics teachers were used for the study. The instruments used for data collection were Mathematics Laboratory Knowledge Questionnaire (MLKQ) for gathering of teachers' knowledge of Mathematics laboratory and Mathematics Laboratory Handling Observation Schedule (MLHOS), which was used to collect data on the competencies possessed by the teachers. The reliability coefficient of the MLKQ and MLHOS were determined to be 0.85 and 0.94 respectively, using Cronbach Alpha. The MLKQ was administered to the teachers while MLHOS was rated by the researcher during direction observation. The research questions were answered with mean and standard deviation, while the hypotheses were tested with t-test at probability level of .05. After the data analysis, the following findings were made: Mathematics teachers possess considerable competencies in the arrangement of equipment and materials and in the use of safety rules in the handling of Mathematics laboratory; Mathematics teachers do not possess the competencies of maintaining equipment and materials; and keeping record in the Mathematics laboratory as they claimed to possess. Based on the findings, the researcher recommended that, emphasis should be placed on practical Mathematics in colleges of education and teacher training institutions so as to give prospective teachers solid foundation, not just on theoretical knowledge, but also on necessary skills and competencies in practical knowledge; examination bodies should make Mathematics laboratory, in secondary schools, a prerequisite, just like other science laboratories, for approving any school for senior school external examinations.*

**Keywords:** *Mathematics laboratory, laboratory competencies, teachers and public school.*

### **Introduction**

Mathematics, according to the National Policy on Education, is a core subject, up to secondary school levels of education in Nigeria, (FGN, 2014). It serves as foundation for pupils' level of thinking, skill development and problem solving. Any nation that must develop their manpower scientifically and technological, must have a strong mathematical foundation at the basic school level, (Malik & Salman, 2018). That is to say that any nation that relegates Mathematics to the background, does so at the risk of remaining a technologically backward nation in a jet – moving world ruled by science and technology. In line with this point of view, Malik (2017) opined that Mathematics is a unifying subject that prepares pupils for a useful and meaningful living, and that Mathematics is the language and key to everyday activities of mankind in science and technology.

Furthermore, Davies and Hersh (2012) see Mathematics as the important subject not only from the point of view of getting an academic qualification at school or college, but also is a subject that prepares the students for the future as well, irrespective of which work of life they choose to be a part of. Mefor (2014) summarized it all by saying that Mathematics relates to everything in the universe from the smallest to the largest. Anaduaka and Okafor (2013) consider Mathematics as one subject that is an integral part of everyone's life and affects virtually every field of human endeavor. For instance, a house wife requires a good sense or knowledge of ratio; estimation and calculation to enable her prepare a pot of soup that has all the necessary ingredients in appropriate proportions, (Anaeche, 2015). On a serious note, a student requires a good pass in Mathematics in senior school certificate examination or its equivalent if he/she is to gain admission to study any of the science courses like Medicine, Pharmacy, Physics, Chemistry, Computer Science, etc., in Universities or Colleges of Education.

From the above expressed points of view of importance of Mathematics, it is necessary, just like in every profession, to assess the extent of the competencies possessed by the teachers who teach this subject, especially as it concerns the competencies required for handling Mathematics laboratories. This helps to improve the quality of services rendered by the teachers. In our secondary schools, we lack good results in some of the subjects after every school certificate examination. Such subject as Mathematics tends to own poorest results. The scenario is worrisome and poses a threat to the advancement of the nation in general and Imo state in particular.

Commenting on this poor results of students in Mathematics examinations, several researchers such as Anaduaka, & Okafor (2013) and Kurumeh, & Uhon, (2012) opined that Mathematics education in Nigeria is still in a deplorable state. This continuous students' poor achievement in Mathematics has triggered a lot of reactions from Mathematics educators in the country. Therefore, in order to address this issue, Mathematics educators such as Harbor-Peters (2001), Obodo (2007), Iji (2012) and Anaeche (2020) explored different strategies to ensure that Mathematics is properly taught and learnt in schools. Various attempts have been made towards improving students' poor achievement in Mathematics in secondary school education without any remarkable success. This could be due to lack of appropriate competencies by Mathematics teachers in handling

Mathematics laboratory during instruction. Mathematics teaching, just like any other science subject, should be activity oriented. This explains the need for a standard and well equipped Mathematics laboratory in all secondary schools and even tertiary institution, where Mathematics teaching and learning processes take place. Based on this, therefore, there is need to explore the competencies possessed by Mathematics teachers handling Mathematics laboratories so as to enhance students' performance in the subject.

Mathematics laboratory is where laboratory techniques take place under the leadership of an experienced teacher who can handle the laboratory equipment very well. According to Ezike and Obodo (1991) in Obodo (2004), the Mathematics laboratory is a room where things can be counted, ordered, recorded, packed, grouped, arranged, rearranged, measured, partitioned, constructed, experimented, among many other activities. From the foregoing, Mathematics laboratory is built on the principles of learning by doing, students' centeredness, and from known to unknown. It accommodates both the fast and slow learners of Mathematics. This is why Obodo (2018) refers to it as a remedial environment where the advantaged or disadvantaged, the poorest or the best gifted students may have active sensory experiences from which concepts emerged. In the words of Ali (1998), "Laboratory is central to effective science teaching and learning".

Furthermore, in the view point of Eze and Ugwuoke (2001), laboratory works give students an opportunity to participate in, and have an appreciation of the methods and processes of science. This implies that when students become actively involved in laboratory activities, their participation tends to motivate them and foster their interest in science, especially Mathematics – the mother of all sciences. Stressing on the importance of laboratory activities, especially among secondary school students, Aniodo (2008) listed the following importance of laboratory activities:

1. Laboratory work gives students an opportunity to participate and have an appreciation for the methods and spirit of science.
2. Practical experience promotes the development skills with a wide range of generalizable effects.
3. Students enjoy activities and practical work and consequently become motivated and interested in science (P.41).

It is therefore necessary that Mathematics laboratories be provided and effectively managed to ensure effective Mathematics teaching and learning in secondary schools. This may be one of the reasons why the previous state government of Imo state considered it necessary to provide laboratory equipment to all schools. Worthy of note is that Mathematics laboratory needs not necessarily be a well-equipped room separated from or attached to the main school building. It can be a corner of the regular classroom with tables and apparatuses where students test mathematical facts and theories. That is, where the process of Mathematics is emphasized much more than the product of Mathematics. In this way, concepts and theories are not given to the students; these arise naturally from their investigations.

The afore-mentioned activities demand a lot of competences on the part of the teacher to be able to handle the Mathematics laboratory effectively during instruction. Researchers (Given, 1971, Popoola, 1997 & Farmer, et al 2003) offer a detailed empirical and theoretical explanation of the multiple levels or extent of competencies, planning and decision-making entailed in the teaching of Mathematics and how it pays to be competent in handling Mathematics laboratory. The studies further describe the teacher's professional vision as an important factor too. All these support mathematical competencies a teacher must have for effective management and/or handling Mathematics laboratory.

Generally speaking, competencies are concerned with what people can do, that is, an individual's ability in a specified area of activity. This shows that competency refers to as the ability to perform a particular task according to prescribed standards. The word competency is derived from a Latin word "*mpetere*" meaning "to be suitable". The Oxford Advanced Learners' dictionary (7<sup>th</sup> edition) defines competency as "having the necessary skills or knowledge to do something well". In other words, competency can be seen as knowledge, attitude, and skills of employees relevant for organizational performance. In terms of performance on the job, competency is any skill knowledge, ability, motive, behavior or attitude, essential to job performance. This implies that competencies are general descriptions of behaviour or actions needed to successfully perform within a particular organization or job context. With the intention of determining the 'action needed' by the teachers for 'successful performance', the researcher gathered data on the knowledge of Mathematics laboratory by Mathematics teachers through questionnaire and compared it with the teachers' competencies in the actual handling of Mathematics laboratory which was gathered by direct observation of the teachers in handling Mathematics laboratory.

### **Statement of Problem**

Mathematics teacher should know their subject considerably beyond the content they are expected to teach, and know how professionals in their field think and analyze the world around them. Being at home with the content knowledge of the subject area, enables the teacher to understand major concepts, assumptions, debates, processes of inquiry and ways of knowing that which are central to the discipline they teach, and even know how to apply information from their discipline to real world situation. Considering the level of qualification of most Mathematics teachers and the knowledge they possess on the principles of Mathematics laboratory, there is a disconnect between the knowledge possessed by Mathematics teachers about Mathematics laboratory and the competencies possessed in handling Mathematics laboratory. This accounts for the consistent poor performance of students in Mathematics. More so, Mathematics laboratories and equipment have been provided in most schools in Imo state, but the laboratories are almost in disused state. This situation puts to doubt the competencies of the teachers in the actual usage of the Mathematics laboratories during Mathematics instruction. Based on this, it became necessary to determine the extent of knowledge of Mathematics laboratory and the competencies possessed by Mathematics teachers handling Mathematics laboratory.

## **Purpose of the Study**

The main purpose of this study was to assess the extent of competencies possessed by Mathematics teachers handling Mathematics laboratory in secondary schools in Imo State. Specifically, the study sought to:

1. Find out the extent of arrangement of equipment and materials in the Mathematics laboratory by Mathematics teachers.
2. Find out the extent of safety rules used by the Mathematics teachers in the management of Mathematics laboratory.
3. Find out the extent of maintenance of equipment and materials in the management of Mathematics laboratory.
4. Find out the extent of keeping laboratory records in the Mathematics laboratory by Mathematics teachers handling Mathematics laboratory.

## **Research Questions**

For the purpose of assessing the extent of competencies possessed by Mathematics teachers handling Mathematics laboratory, the researcher formulated the following research questions:

1. What is the extent of arrangement of equipment and materials in the management of Mathematics laboratory by Mathematics teachers?
2. To what extent are safety rules used by the Mathematics teachers in the management of Mathematics laboratory?
3. What is the extent of maintenance of equipment and materials in the management of Mathematics laboratory?
4. What is the extent of keeping of laboratory records in the Mathematics laboratory by the Mathematics teachers handling Mathematics laboratory?

## **Hypotheses**

The researcher formulated the following hypotheses to further validate the research questions:

1. There is no statistically significant mean difference between the teachers' knowledge of arrangement of equipment and material in the Mathematics laboratory and the competence possessed by the teachers in the arrangement of equipment and materials in Mathematics laboratory.
2. There is no statistically significant mean difference between the teachers' knowledge of safety rules in Mathematics laboratory and the competence possessed by the teachers in the use of safety rules while handling Mathematics laboratory.

3. There is no statistically significant mean difference between the teachers' knowledge of maintenance of equipment and materials and the competence possessed by the teachers in maintaining equipment and materials in the Mathematics laboratory.
4. There is no statistically significant mean difference between the teachers' knowledge of record keeping and the competence possessed by the teachers in keeping record in the handling of Mathematics laboratory.

### **Research Methods**

The study adopted an analytical survey research design. According to Olaviwola (2010), an analytical research design is a method that describes a given state of affairs at a particular time. The research design permits the gathering of information through the use of questionnaire based on appropriate sampling techniques. It was on this basis that the researcher decided to use analytical survey design since the study gathers information on the knowledge of Mathematics laboratory and competencies possessed by Mathematics teachers in handling Mathematics laboratory. The study was conducted in the six educational zones in Imo state. It covers only public secondary schools where Mathematics laboratory are made available by the government. The population of this study consisted of 546 Mathematics teachers in the 274 public secondary schools in Imo state. A sample of 110 Mathematics teachers was used for the study. A purposive sampling technique was used to arrive at this sample size since only 59 out of 274 public secondary schools have Mathematics laboratory. In each of the 59 schools, all the Mathematics teachers were used as respondents of this study. Hence, the researcher found the mean of the respondents' responses in the instruments for each school and compared it with the mean of the direct observation of the teachers in the handling of Mathematics laboratory. The instruments used for the study were Mathematics Laboratory Knowledge Questionnaire (MLKQ) for gathering of teachers' knowledge of Mathematics laboratory and Mathematics Laboratory Handling Observation Schedule (MLHOS), which was used to collect data on the competencies possessed by the teachers. The two instruments were developed by the researcher. The ratings for the observed traits and responses to the questionnaire were each measured on a five-point rating scale of Very Large Extent (VLE), Large Extent (LE), Moderate Extent (ME), Small Extent (SE) and Very Small Extent (VSE). The instruments were validated by two experts in Mathematics education and one expert in Measurement and Evaluation from the Department of Science and Computer Education, Godfrey Okoye University and their comments were incorporated in the final draft of the instruments. The reliability of the instruments was tested by administering them to 40 respondents from public secondary schools in Enugu state. The reliability indices of MLKQ and MLHOS were found to be 0.85 and 0.94 respectively using Cronbach Alpha. The MLKQ was administered to the respondents by the researcher, thereafter, MLHOS was rated by the researcher as the teachers handle Mathematics laboratory. The research questions were answered with mean standard deviation while the hypotheses were tested with t-test statistic at 0.05 probability value.

### **Results**

The following were the findings of the research:

### Research Question 1:

What is the extent of arrangement of equipment and materials in the management of Mathematics laboratory?

**Table 1: The means responses and observation ratings on arrangement of equipment and materials by Mathematics teachers.**

S/ N	Items Description	Questionnaire		Scores	Observation	Ratings	
		$\bar{X}$	SD	Decision	$\bar{X}$	SD	Decision
1	Collect and sort material	3.69	1.26	Competent	3.47	1.1	Competent
2	Specify the criteria for classification	3.44	1.36	Competent	3.33	1.3	Competent
3	Identify the similarities and differences of certain equipment	3.53	1.30	Competent	3.28	1.3	Competent
4	Communicate the need and essence of proper arrangement of things in the laboratory to the students	3.41	1.40	Competent	3.31	1.3	Competent
5	Ensure priority placement on items and equipment that one arranged	3.43	1.38	Competent	3.26	1.3	Competent
6	Make use of the storing cupboards	4.02	1.14	Competent	3.64	1.1	Competent
7	Make maximum use of the little space in the laboratory for easy of free movement	3.65	1.31	Competent	3.69	1.3	Competent
<b>Grand mean/Std. dev.</b>		<b>3.59</b>	<b>1.31</b>	<b>Competent</b>	<b>3.43</b>	<b>1.2</b>	<b>Competent</b>

Table 1 above shows that there is a complementary agreement that the teachers have considerable knowledge of Mathematics laboratory with a matching competencies in handling the laboratory. This is evidenced by mean of all the items that is over 3.00 in both the questionnaire responses and the observation ratings. In all, the grand means of 3.59 and 3.43, and the grand standard deviations of 1.31 and 1.29, for questionnaire responses and

observation ratings, respectively, confirmed the individual means. This is also confirmed by the grand means of the standard deviations of both scores which are almost the same value.

**Research Question 2:**

To what extent are safety rules used by the Mathematics teachers in the management of Mathematics laboratory?

**Table 2: The means of responses and observation ratings on observance of safety rules**

S/N	Items Description	Questionnaire		Scores	Observation		Ratings
		$\bar{X}$	SD	Decision	$\bar{X}$	SD	Decision
8	Use appropriate warning symbols for dangers	3.55	1.24	Competent	3.61	1.27	Competent
9	Only limit access to laboratory to teachers and laboratory assistants (if any)	3.72	1.10	Competent	3.12	1.20	Competent
10	Provide procedures for any laboratory activity to avoid injuries	3.42	1.13	Competent	3.58	1.32	Competent
11	Safeguard already made	3.38	1.25	Competent	2.75	1.33	Not Competent



12	models for future use Communicate the safety rules to the students and other users of the laboratory	3.18	1.45	Competent	3.04	1.41	Competent
13	Ensure strict implementation of the safety rules	3.77	1.12	Competent	2.48	1.41	Not competent
14	Dispose of all materials or equipment that have no further use	3.58	1.32	Competent	3.13	1.24	Competent
<b>Grand mean/Std. dev.</b>		<b>3.52</b>	<b>1.23</b>	<b>Competent</b>	<b>3.10</b>	<b>1.31</b>	<b>Competent</b>

Similarly, in table 2, the overall grand means of 3.52 and 3.10, and standard deviations of 1.23 and 1.31, for questionnaire responses and observation ratings, respectively, confirmed that teachers have enough knowledge of Mathematics laboratory and corresponding competencies in keeping the safety rules in handling the laboratory. However, there is a disagreement between the two sources of data on items 11 and 13. While the teachers claimed to have knowledge of safeguarding already made models for future use and ensuring strict implementation of the safety rules; the observed traits proved otherwise.

### Research Question 3:

What is the extent of maintenance of equipment and materials in the management of Mathematics laboratory?

**Table 3: The means of responses and observation ratings on maintenance of equipment and materials**

S/ N	Items Description	Questionnaire		Scores Decision	Observation		Ratings Decision
		$\bar{X}$	SD		$\bar{X}$	SD	
15	Grease or oil the equipment that have joints in order to ensure proper functioning	2.65	1.57	Not Competent	2.74	1.61	Not Competent
16	Ensure the dusting and clearing of the laboratory and its equipment and materials therein	2.27	1.35	Not Competent	2.64	1.07	Not Competent
17	Encourage the construction of models with durable materials for posterity	3.92	0.95	Competent	2.95	1.66	Not Competent
18	Prevent terminate attacks on laboratory furniture	3.71	1.44	Competent	2.29	1.44	Not Competent
19	Dismantle sophisticated and fragile equipment after use	2.40	1.61	Not Competent	2.40	1.61	Competent
20	Ensure that all equipment that have cases or special storing devices are properly placed back after use	3.90	1.34	Competent	2.41	1.50	Not Competent
<b>Grand mean/Std. dev.</b>		<b>3.14</b>	<b>1.38</b>	<b>Competent</b>	<b>2.57</b>	<b>1.48</b>	<b>Not Competent</b>

More so, table 3 shows that the knowledge claimed by the teachers as it concerns maintenance of equipment and materials in the management of Mathematics laboratory, does not agree with the observed traits. This was evidenced by the overall means of 3.14 and 2.57, and standard deviation of 1.38 and 1.48, for questionnaire responses and observation ratings, respectively. However, items 15, 16 and 19 confirmed that Mathematics teachers do not possess the claimed knowledge of maintaining equipment and materials in the management of Mathematics laboratory.

**Research Question 4:**

What is the extent of keeping of laboratory records in the Mathematics laboratory by the Mathematics teachers handling Mathematics laboratory?

**Table 4: The means of responses and observation ratings on keeping of laboratory records**

S/ N	Items Description	Questionnaire		Scores Decision	Observation		Ratin gs Decis ion
		$\bar{X}$	SD		$\bar{X}$	SD	
21	As a Mathematics teacher, I ensure that the names of models/equipment are boldly and neatly written on them	3.00	1.29	Compete nt	2.64	1.51	Not Comp etent
22	Ensure that all the planned stock record books are provided and used	3.73	1.35	Compete nt	2.09	1.31	Not Comp etent
23	Ensure that all the dates of arrival, removal for repair; and damage are properly recorded	3.20	1.34	Compete nt	2.74	1.49	Not Comp etent
24	Keep accurate record of breakages/damages in the laboratory	2.40	1.61	Not Compete nt	2.81	1.30	Not Comp etent
25	Keep accurate record of all the equipment, materials and models in laboratory	3.75	1.45	Compete nt	2.48	1.55	Not Comp etent

26	Ensure adequate recordings of all special activities or achievements by the students in the laboratory for posterity	3.89	1.36	Competent	2.40	1.50	Not Competent
<b>Grand mean/Std. dev.</b>		<b>3.33</b>	<b>1.40</b>	<b>Competent</b>	<b>2.53</b>	<b>1.44</b>	<b>Not Competent</b>

Finally, table 4 shows that the claimed knowledge of teachers on keeping of laboratory records does not manifest itself in the actual observation of the teachers in the handling of Mathematics laboratory. This was shown by the grand means of 3.33 and 2.53, and standard deviation of 1.40 and 1.44, for both questionnaire responses and the observation ratings respectively.

### Test of Hypotheses

**HO<sub>1</sub>:** There is no statistically significant mean difference between the teachers’ knowledge of arrangement of equipment and material in the Mathematics laboratory and the competence possessed by the teachers in the arrangement of equipment and materials in Mathematics laboratory.

**Table 5 – t-test Test of Hypothesis 1**

	Paired Differences		95% Confidence Interval of the Difference		t	Sig. (2-tailed)	Decision
	Mean	Std. Deviation	Lower	Upper			
Questionnaire Responses - Observation Ratings	.01000	.1425	-.1218	.14188	.186	.859	NS

**NS = Not Significant**

In table 5, the significance value of .0859 is greater than the probability level of .05, therefore, the HO<sub>1</sub> is not rejected. This implies that there is no statistically significant mean difference between the teachers’ knowledge of arrangement of equipment and material in the Mathematics laboratory and the competence possessed by the teachers in the arrangement of equipment and materials in Mathematics laboratory. This further conforms with the result in table 1.

**HO<sub>2</sub>:** There is no statistically significant mean difference between the teachers’ knowledge of safety rules in Mathematics laboratory and the competence possessed by the teachers in the use of safety rules while handling Mathematics laboratory.

**Table 6 – t-test Test of Hypothesis 2**

	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)	Decision
				Lower	Upper				
Questionnaire_Responses - Observation_Ratings	.28000	.34737	.13129	-.0412	.60126	2.133109	6	.077	NS

**NS = Not Significant**

In table 6, the significance value of .077 is greater than probability level of .05, therefore, the  $H_{O2}$  is not rejected. This implies that there is no statistically significant mean difference between the teachers' knowledge of safety rules in Mathematics laboratory and the competence possessed by the teachers in the use of safety rules while handling Mathematics laboratory.

**HO<sub>3</sub>:** There is no statistically significant mean difference between the teachers' knowledge of maintenance of equipment and materials; and the competence possessed by the teachers in maintaining equipment and materials in the Mathematics laboratory.

**Table 7 – t-test Test of Hypothesis 3**

	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)	Decision
				Lower	Upper				
Questionnaire_Responses - Observation_Ratings	.56167	.30525	.12462	.24133	.88201	4.507	109	.006	S

**S = Significant**

In table 7, the significant value of .006 is less than probability level of .05, therefore the  $H_{O3}$  is rejected. This implies that there is statistically significant mean difference between the teachers' knowledge of maintenance of equipment and materials; and the competence possessed by the teachers in maintaining equipment and materials in the Mathematics laboratory.

**HO<sub>4</sub>:** There is no statistically significant mean difference between the teachers' knowledge of record keeping and the competence possessed by the teachers in keeping record in the handling of Mathematics laboratory.

**Table 8 – t-test Test of Hypothesis 4**

	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference		T	Sig. (2-tailed)	Decision
				Lower	Upper			
Questionnaire_Responses - Observation Ratings	1.02667	.45461	.18559	.54959	1.503	5.532	.003	<b>S</b>

***S = Significant***

Similarly, table 8 shows that the significant value of .003 is less than the probability level of .05, therefore, the  $H_{O4}$  is rejected. This implies that there is statistically significant mean difference between the teachers' knowledge of record keeping and the competence possessed by the teachers in keeping record in the handling of Mathematics laboratory.

### **Discussion of the Findings**

The result of this study shows that there is no significant difference between the Mathematics teachers' knowledge of arrangement of equipment and material in the Mathematics laboratory; and the competence they possess in the arrangement of equipment and materials in Mathematics laboratory. Similarly, this study shows that there is no difference in Mathematics teachers' knowledge of safety rules in Mathematics laboratory and the competence possessed by them in the use of safety rules while handling Mathematics laboratory. This implies that the knowledge of arrangement of equipment and material; and safety rules in Mathematics laboratory, as claimed by Mathematics teacher, was efficiently demonstrated by them. These findings agree with the finding of Ude (2011) which asserts that computer education teachers were knowledgeable and competent in the use of computer based instructional materials. With this signage in theoretical and practical knowledge, students' performance will be greatly enhanced and the assertion of Kurumeh and Uhon (2012) will be upheld. That is, "for a nation such as Nigeria, to aspire towards scientific and technological development, there is need to pay due attention to theoretical and practical mathematical knowledge". Buttressing this point, Kennedy and Krause (2007) asserted that education system needs to be challenged to provide the teacher's knowledge and skill (competencies) on the use of technology (Mathematics laboratory) for teaching and learning purpose.

On the other hand, the result of this study shows that there is difference between the Mathematics teachers' claimed knowledge of maintenance of equipment and materials; record keeping; and the competencies possessed by the teachers in maintaining the equipment/materials and keeping record in the handling of Mathematics laboratory. This implies that there is a gap in the theoretical and practical knowledge of the teachers in these regards. The findings give credence to what Obi, Abugu and Ayogu (2018) found in a study on relationship between mathematical knowledge and technological development. They

established that mathematical knowledge and skills (competencies) had moderate significant relationship. This accounts for too many half-baked Mathematics teachers in the school system. Similarly, Iloekwenie (2007), in a study on the extent of utilization of basic science process skills (BSPS) by teachers in teaching primary science, found that none of the BSPS was utilized to a large extent. The study further established that the primary teachers do not even know the BSPS, and that leads to poor performance of the children in sciences.

## Conclusion

From the above discussions, the following conclusion can be drawn:

1. Mathematics teachers possess considerable competencies in the arrangement of equipment and materials in the handling of Mathematics laboratory.
2. Mathematics teachers possess considerable competencies in the use of safety rules while handling Mathematics laboratory.
3. Mathematics teachers do not possess the competencies of maintaining equipment and materials in the Mathematics laboratory as they claimed to possess.
4. Mathematics teachers do not possess the competencies of keeping record, in the handling of Mathematics laboratory as they claimed to possess.

## Recommendations

Based on the findings of this study, the following recommendations are made:

1. That much emphasis should be placed on practical Mathematics in collages of education and teacher training institutions so as to give prospective teachers solid foundation, not just on theoretical knowledge, but also on necessary skills and competencies in practical knowledge.
2. Various school board authorities should, often times, conduct seminars on the use of Mathematics laboratory in the teaching of difficulty subjects in Mathematics.
3. More importantly, more Mathematics laboratory should be provided by the state government, especially to those schools that are yet to get any.
4. Finally, examination bodies should make Mathematics laboratory, in secondary schools, a prerequisite, just like other science laboratories, for approving any school, as centre for senior school external examinations.

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