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Awareness and Availability of Instructional Media for Learning Mathematics by Public Secondary School Students in Benin Metropolis: Counselling Implication

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Abstract. This paper assessed the awareness and availability of instructional media for learning Mathematics by public secondary school students in Benin metropolis**.** Students in junior secondary schools from the three local government areas in the metropolis formed the population for the study. Three schools were randomly selected from each local government respectively, with fifty (50) students from each schools and this made up the sample for the study. A questionnaire titled Awareness of instructional media for learning Mathematics which was subjected to Cronbach alpha statistics with a reliability coefficient of 0.78 and a checklist titled: Availability of instructional media for Mathematics students were the instruments for the collection of data. The data collected were analysed using frequency count, mean, standard deviation and t-test. That, Mathematics students in the metropolis be enlightened on the instructional media that can aid their learning of Mathematics and parents/guardians should be encouraged to provide some basic instructional media were some of the recommendations.

Keywords: Awareness, Availability, Instructional Media, Mathematics, Benin Metropolis and Counselling Implication.

1. Introduction

Experts had always decried the poor performance of children on standard tests of Mathematics and science knowledge, by comparison with their peers from other nations (Else-Quest, Hyde, & Linn, 2010; OECD, 2010). The acquisition of basic Mathematics abilities is one pertinent goal for secondary school Mathematics curriculum in line with the objectives of the Federal Government of Nigeria as stipulated in the National Policy on Education (FGN, 2013). However, a major noticeable problem facing the education sector in Nigeria is the low level of the performance of secondary school students in both local and standardized examinations, especially with Mathematics as a subject. Despite all the efforts put in developing an acceptable general Mathematics curriculum, students' performance in the subject appears to be declining over the years.

There is a general impression that Mathematics is difficult by its very nature and because of this impression, majority of students have phobia for it (Ampadu, 2012; Ojimba, 2012; Saad, Adamu & Sadiq, 2014). The way many Nigerians feels, think and act towards the subject Mathematics has blindfolded them from realizing the benefits accruable from the knowledge and application of the subject. Some people even believed that Mathematics has no practical application outside the classroom settings so they abhor, hate and dislike the subject (Obodo, 2004). This is due to the fact that some teachers especially in this part of the world have not been able to teach the subject in such a way that understanding it becomes much easier, and as such effective teaching may be unavoidable without functional instructional materials to enhance innovative production in modern fields such as science and technology, among others (Idris, 2008). Instructional media is a vital educational resource in the educational industry, which could come in the format of Audio, Visual, Audio-Visual, among others (Fakomogbon, 2003 & Offorma, 2005).

Olanrewaju (2012) posited that when students learn with instructional media, both their cognitive and affective domain of learning are tasked which helps them maintain interest and keep their attention on what they are learning, as students remember better what they are taught with instructional media and it also encourage interaction and collaboration among learners. When instructional media are used in

instruction, it would make discovered facts glued firmly to the memory of students (Aina, 2013); and as such the benefit of using instructional media for Mathematics instruction cannot be over emphasized as it ranges from been able to personalize learning which can make learners learn at their own pace, to been able to give flesh to abstract concepts, improving the attitude of learners to making learning fun among others (Serhan, 2009). Instructional media which is concerned with all materials in audio, visual, audio-visual, multimedia, among others for facilitating learning (Fakomogbon, 2003; Jackson, 2003; Olanrewaju, 2003; Offorma, 2005), and could be used in motivating, assisting, directing, sustaining attention and bringing about self-learning, self-discovery and self-actualization.

Awareness is seen not only in the ability to know and understand, but also to locate, identify, retrieve, departmentalize, among others, materials around one to be harnessed and used for progress in a given society (Donlevy, 2009 & Jackson, 2003). Fakomogbon, Olanrewaju and Soetan (2015) in their study on Lecturers' Awareness and Utilization of Instructional Media in the State-Owned Colleges of Education in South-West Nigeria discovered that there was no significant difference in the awareness of Instructional Media of the lecturers based on of their sex. Bukoye (2019) asserted that almost 55% of Nigerian of children learn little from teacher due to non-availability of instructional materials, while few schools (35%) with instructional materials are noticed to be out-dated and irrelevant; while only 52% of schools in most state have classrooms with not enough space for displaying instructional material even where they are over able (Joseph, 2001). Thus, there is the visible gross inadequacy and underutilization of instructional materials necessary to compensate for the inadequacies of sense organs and to reinforce the capacity of dominant organs, therefore school teachers should try their possible best in the provision of locally made materials in substitution for the standard ones to promote their lessons (Ogbondah, 2008), since in schools in Nigeria Mathematics is a subject of choice offered by students across board.

Abdu-Raheem (2011) asserted that non availability and inadequacy of instructional materials are the major causes of ineffectiveness of the school system and poor performance of students in schools. Olayanju and Olosunde (2011), from their study on the availability of instructional materials in the teaching of primary Mathematics in basic schools, found that materials in the ten (10) schools used showed an average of 23.1 in each school while a sum of non-available materials in the ten (10) schools showed and average of 36.9 per school, meaning that about 30% of the instructional materials were available in each school and only two private schools have 50% of the materials. Oluwagbohunmi and Abdu-Raheem (2014) acknowledged that instructional materials are such used by teachers to aid explanations and make learning of subject matter understandable to students during teaching learning process. Instructional materials are objects or devices that assist the teachers to present their lessons logically and sequentially to the learners (Isola, 2010).

Instructional media includes all the physical and materials ways a teacher might use to carryout instruction in other to make students learn better and achieve their instructional objectives (Scanlan, 2003) these physical and material ways may include older materials such as chalkboards, hand-outs, charts, slides, overheads, real objects, and videotape or film, as well newer materials and methods such as computers, low-tech pencil, DVDs, magnetic board CD-ROMs, hi-tech tablets the Internet, and interactive video conferencing. Instructional media are the various materials that appeal to the five senses- seeing, hearing, touching, feeling and tasting which enhance teaching and learning (Nyame-Kwarteng, 2006). Therefore, in as much as there is the need for teachers to be encouraged to use the proper instructional Media as often as possible so that Mathematics can be simplified to learners and the perceived fear of the subject reduced if not totally removed, the awareness of the learners on the instructional media that can aid their learning of Mathematics have to be considered since some of this media is what could be used in our everyday living either for fun, recreation, work, among others. The researchers are of the opinion that the failure rate experienced by public secondary school students in Mathematics might not be unconnected with the lack of awareness and availability of basic Mathematics instructional media in schools as contributing factors to the poor performance of students in Mathematics, so as to proffer possible solutions and the way forward. Hence, this study seeks to investigate the awareness and availability of instructional media for learning Mathematics by public secondary school students in Benin metropolis.

2. Purpose of the Study

The purpose of the study was to determine awareness and availability of instructional media for learning Mathematics by public secondary school students in Benin metropolis and the need to counsel learners on the importance of the use of these media were available. This study was limited to students in junior secondary schools in Benin metropolis.

Research Questions

- Are students aware of instructional media for learning Mathematics?
- Is instructional media available for learning Mathematics in schools?
- Is there a difference in the awareness of instructional media for learning Mathematics by sex?

3. Hypotheses

One research question was hypothesised:

H_{01}: There is no significant difference in the awareness of instructional media for learning Mathematics by sex.

4. Methodology

The study adopted the survey research design in determining the Awareness and Availability of Instructional Media for Learning Mathematics in Benin Metropolis (Egor, Ikpoba Okha and Oredo local government areas).

Table 1: Sample of Secondary School Students from Benin Metropolis

	Name of school	Number of students sampled
1	Edo Boys Secondary School.	50
2	Iyoba Girls Secondary School.	50
3	Evbareke, Secondary School.	50
4	Western Boys High School.	50
5	St. Maria Goretti Secondary School	50
6	Niger college	50
7	Emotan Girls Secondary School	50
8	Ihogbe Secondary School.	50
9	Edokpolor Secondary School	50
Total		**450**

Table 1, shows the Sample of students randomly selected from three public secondary schools from the aforementioned local government areas that made up the metropolis (one all boys school, one all-girls school and one mixed school). From each sampled school, fifty (50) Junior Secondary School students were randomly selected making a total of one hundred and fifty (150) students per local government area and totalling four hundred and fifty (450) students from the three local government areas in the metropolis and these formed the sample of this study. The instruments used for the study was a check list and a questionnaire: The checklist titled "Availability of Instructional Media for Leaching Mathematics (AIMLM)" was developed by the researchers. It had nineteen (19) items which the researchers used to assess the availability of instructional media in the sampled schools by personally visiting the sampled schools and ticking the appropriate box to indicate which instructional media was available and which was not available. The second instrument a questionnaire titled "Questionnaire on Students Awareness of Instructional Media for Learning Mathematics" (QSAIMLM). The questionnaire was divided into two sections. Section A contains the personal data of respondents, and section B contains items that sought answers to questions on student's awareness of instructional media for learning Mathematics, the questionnaire had twenty two (22) structured items.

The research instrument was then subjected to both face and content validation through series of amendments made by experts in the Fields of Instructional Technology and Counselling Psychology. As for the reliability of the instrument, the student questionnaire was administered to 30 students who were part of the main study and subjected to Crombach alpha statistics with a reliability coefficient of 0.78. The researchers gave assistance to the respondents where necessary (i.e. any area of they needed clarification). When the respondents were done responding to all the research items, the researcher retrieved the questionnaire immediately. Mean and standard deviation was used to answer the research questions: 2.5 was used as the midpoint any item with a mean below 2.5 was interpreted as disagreement while items with mean of 2.5 or above was interpreted as agreement. As for the availability of instructional media, since nine schools were visited, which school had a percentage of 11.1% where the following was used for interpretation; 0% - 20% Not available, 21% - 40% moderately available, 41% - 60% available, whereas, 61% and above was seen as highly available. while t-test was used to test the hypothesis following the rule that whenever the calculated value of t is greater than the critical value, the null hypothesis is rejected and an alternate hypothesis is accepted. However if the calculated value is less than the critical value, the null hypothesis is accepted.

5. Results

Table 1: Mean and standard deviation of scores from participants on awareness of Instructional Media for Learning Mathematics in Benin Metropolis

QUESTIONNAIRE ITEMS	N	Mean	Std. D	Decision
Are you aware of text books for learning of Mathematics?	450	3.3022	.60602	Agree
Are you aware of Graph books for learning Mathematics?	450	2.7689	.74613	Agree
Are you aware of Mathematical set for learning Mathematics?	450	3.2311	.57792	Agree
Are aware of Calculators for learning Mathematics?	450	3.2222	.57370	Agree
Are you aware of Computers for learning Mathematics?	450	2.22089	.74971	Disagree
Are you aware of Marker/Black board for learning Mathematics?	450	3.2356	.59138	Agree
Are you aware of Modular Mathematics charts for learning Mathematics?	450	2.2711	.72947	Disagree
Are you aware of packs of fair coin for learning Mathematics?	450	2.5978	.78146	Agree
Are you aware of packs of fair die for learning Mathematics?	450	2.5911	.77942	Agree
Are you aware of ludo for learning Mathematics?	450	2.6000	.77258	Agree
Are you aware of Park of playing cards for learning Mathematics?	450	2.1844	.61113	Disagree
Are you aware of Models of shapes for learning Mathematics?	450	2.4156	.66287	Disagree
Are you aware of Models of angels for learning Mathematics?	450	2.4289	.64401	Disagree
Are you aware of Scale balance for learning Mathematics?	450	2.4126	.64586	Disagree
Are you aware of Number line chart for learning Mathematics?	450	2.7200	.61662	Agree
Are you aware of Basket full of balls of different colours for learning Mathematics?	450	2.1733	.67813	Disagree
Are you aware of print logarithm table for learning Mathematics?	450	2.5311	.74329	Agree
Are you aware of Models of cylinders for learning Mathematics?	450	2.4044	.65798	Disagree
Are you aware of Models of cube and cone for learning Mathematics?	450	2.4044	.65798	Disagree
Are you aware of Angel of elevation and depressions charts for learning Mathematics?	450	2.3044	.73307	Disagree
I know of Addition, subtraction, multiplication, division rule chart for learning Mathematics?	450	2.8044	.71695	Agree
I am aware of Circle fraction disk for learning Mathematics?	450	2.1489	.72349	Disagree

Table 1 shows that items one, two, three, four, six, eight, nine, ten, fifteen, seventeen and twenty a mean ranging from 2.53-3.30. This is an indication that the respondents alluded to the fact that they are aware of those instructional media used for learning Mathematics as their mean is above 2.50 which is the midpoint. However, the mean for items five, seven, eleven, twelve, thirteen, fourteen, sixteen, eighteen, nineteen, twenty and twenty-two are lower than the midpoint of 2.50 which indicates that learners in Benin metropolis are not aware of those instructional media for learning mathematic as depicted in Figure 1.

Figure 1:Disriptive of student's awareness of instructional media

Table 2: Availability of instructional media for Mathematics students in schools in Benin Metropolis

S/N	Instructional Materials	Available	Not Available	Decision
	Mathematics text books	8 (88.9%)	1 (11.1%)	Highly Available
	Graph note books	4 (44.4%)	5 (55.6%)	Available
	Mathematical set	3 (33.3%)	6 (66.7%)	Moderately Available
	Calculator	8 (88.9%)	1 (11.1%)	Highly Available
	Computer	1 (11.1%)	8 (88.9%)	Not Available
	Marker/ Black board	9 (100%)	0 (0%)	Highly Available
	Modular Mathematics charts	0 (0%)	9 (100%)	Not Available
	A pack of fair coin, die, ludo	2 (22.2%)	7 (77.8%)	Moderately Available
	Park of playing cards	3 (33.3%)	6 (66.7)	Moderately Available
	Models of shapes	2 (22.2%)	7 (77.8%)	Moderately Available
	Models of angels	2 (22.2%)	7 (77.8%)	Moderately Available
	Scale balance	4 (44.4%)	5 (55.6%)	Available
	Number line chart	2 (22.2%)	7 (77.8%)	Moderately Available
	Basket full of balls of different colours	3 (33.3%)	6 (66.7)	Moderately Available
	Large print logarithm table	0 (0%)	9 (100%)	Not Available
	Models of cylinders, cube and cone	1 (11.1%)	8 (88.9%)	Not available
	Angel of elevation and depressions charts	2 (22.2%)	7 (77.8%)	Moderately Available
	Addition, subtraction, multiplication, division rule chart	7 (77.8%)	2 (22.2%)	Highly Available
	Circle fraction disk	1 (11.1%)	8 (88.9%)	Not Available

Table 2 shows that of all the instructional media for learning Mathematics on the checklist, four (4) items which are items seven, fifteen, sixteen and nineteen representing 21% were not available. While nine (9) items which are items three, five, eight, nine, ten, eleven, thirteen, fourteen and seventeen representing 47% were moderately available. Two items (2) which are items two and twelve representing 11% were available. Finally, four (4) items which are, items one, four, six and eighteen representing 21% were highly available as depicted in Figure 2.

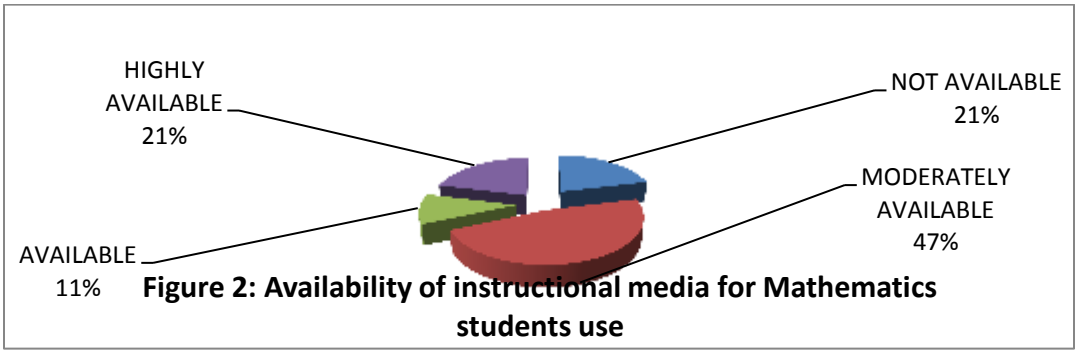

Figure 2: Availability of instructional media for Mathematics students use

Table 3: t-test on sex differences in the awareness of instructional media for learning Mathematics

Variable	No Exp.	X	SD	df	t-Cal.	t-Critical	Sig (2-tailed)	Decision
Male	229	56.9	5.28	448	-.347	-1.960	.741	H_0 Accepted
Female	221	57.07	4.96					

Table 3: showed a calculated value of -0.347 while the critical value is -1.960 at 0.05 alpha level. Therefore, the null hypothesis is accepted and this implies that there is no significant gender difference in the awareness of instructional media for learning Mathematics by Mathematics students in Public Junior Secondary Schools in Benin metropolis?

6. Discussion

RQ_1: The findings of the study reveal that of the twenty two items, the learners were aware of eleven of them while they were not aware of the other eleven: they were aware of textbooks, graph books, mathematical set, calculators, marker/black boards, pack of fair coin, pack of fair die, ludo, number line chart, logarithm table and addition, subtraction, multiplication and division rule chart whereas, they were unaware of computers, modular Mathematics chart, pack of playing card, model od shapes, model of angles, scale of balance, basket full of balls of different colours as an instructional media to teach Mathematics, models of cylinders, model of cube and cone, angel of elevation and depression charts and circle fraction disk. The findings also lends credence to Bukoye (2019) and Abdu-Raheem (2011) who asserted that almost 55% of Nigerian of children learn little from teacher due to non-availability of instructional materials, while few schools (35%) with instructional materials are noticed to be out-dated and irrelevant and that the inadequacy of instructional materials are the major causes of ineffectiveness of the school system and poor performance of students in schools. The researchers are of the opinion that if the instructional media were available in schools as stipulated the awareness level of students would have been higher that observed in this study and as such the relevant body deemed with the responsibility of providing instructional media in schools should do all within their power to provide more instructional media.

RQ_2: The study also found that that of all the nineteen (19) items in the checklist, Mathematics textbooks, calculators, marker/black board, addition, subtraction, multiplication and division rule chart were highly available, graph books and scale balance were available, mathematical set, a park of fair coin, die, and ludo, park of playing cards, models of shapes, models of angles, basket full of balls of different colours, angles of elevation and depression charts and number line charts were moderately available while modular Mathematics charts, large print logarithm table, models of cylinders, cube and cone, computer and circle fraction disk were not available at all. The findings lend credence to assertions made by Olayanju and Olosunde (2011), Bukoye (2019), Joseph, (2001) and Abdu-Raheem (2011), which asserted that almost 55% of Nigerian of children learn little from teacher due to non-availability of instructional materials, while few schools (35%) with instructional materials are noticed to be out-dated and irrelevant; while only 52% of schools in most state have classrooms with not enough space for displaying instructional material even where they are over able and that inadequacy of instructional materials are the major causes of ineffectiveness of the school system and poor performance of students in schools.

H_{O1}: In the study, it was also found that there was no significant difference by sex in the awareness of instructional media for learning Mathematics students in Public Junior Secondary Schools in Benin metropolis. The aforementioned assertion lends credence to Fakomogbon, Olanrewaju and Soetan (2015) who found no significant difference in the awareness of Instructional Media of the lecturers based on of their sex among State-Owned Colleges of Education in South-West Nigeria. This implies that the way awareness level of the recipient was the same irrespective of their sex status.

7. Conclusion

From the result of the study, it was concluded that secondary school students in Benin metropolis are not unaware of the instructional media that can be used to learn Mathematics. Across sex there is no difference in the awareness of instructional media for learning Mathematics, while some instructional media for learning Mathematics is present in Public Junior Secondary Schools in Benin metropolis, others needs to be provided by relevant bodies: the government, parents and guidance of students.

8. Counselling Implications

The counsellors could assist the teachers through programmes like; seminars, workshops and

sensitization talks on the importance of instructional materials in teaching-learning objectives. Such programmes could assist the teachers on how every teaching material could be effectively utilized in class room activities. The Counselling Association of Nigeria (CASSON) should encourage the government on the needs for the provision of relevant and quality materials for schools in the federation. This will go a long way to reduce the increased students' poor performance.

9. Recommendations

In the light of the findings of this research work, the following recommendations are proffered:

- The government through the federal and state ministry of education should set up monitoring unit to monitor and encourage the use of instructional materials by every teacher while teaching.
- The government should release enough money to all schools in the federation for the purchase of enough relevant and quality instructional materials for use.
- Teachers should be counselled on the need to seek for locally improvised instructional media that would assist learners during lessons.
- That further studies be carried out to ascertain the functionality of the instructional material present in schools during the studies.
- Although Students is Public Secondary schools in Benin metropolis are not totally unaware of the instructional media for teaching Mathematics, there is need the students to be enlightened on the instructional media that can best aid them in the learning of Mathematics. This can best be achieved when the teachers that teach Mathematics in these schools use these instructional media to teach every Mathematics class. This will not be possible if these instructional media are not provided in the schools in the metropolis.
- There are some basic instructional media for learning Mathematics that the parents/guardians of students who learn Mathematics at this level can provide such instructional media should be provided by the parents/guardians.
- Teachers can also the counselled or advised to improvise some of the instructional media that are not available so has to reduce if not remove the abstract nature of Mathematic.

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