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NEEDS ASSESSMENT OF PRIMARY SCHOOL PUPILS IN MATHEMATICS

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ABSTRACT

Primary education is the basic level and requires adequate attention for proper background in mathematics. This study probed primary pupils in order to elicit their needs in the teaching and learning of mathematics. A descriptive survey design was employed to unveil pupils' inherent difficulties in mathematics. Population consisted of primary 5 pupils' selected using stratified sampling technique. A questionnaire titled Needs Assessment of Pupils in Mathematics was developed and used to collect data. Data analysis was carried out through pictorial representation, mean and standard deviation. Findings revealed the preponderance of teacher factor in the hierarchy of needs of students in the learning of mathematics. It revealed that numerous examples are required to foster learning and the examples must relate to students daily life experience. It was recommended that teachers should provide more work examples in the teaching of mathematics to enhance students understanding.

Keywords: Needs, Assessment, Pupils, Primary School

INTRODUCTION

In any educational pyramid, primary school represents the foundation upon which the rest of the educational system is built. The objective of teaching at this level include among others, the ability to inculcate in children permanent literacy and numeracy (FRN, 2004). This justifies the role and place of mathematics in all human endeavours. Mathematical skills are required for organization and interpretation of data, transactions in business and for drawing meaningful conclusion in all human enterprise.

Mathematics serves to educate and prepare the child for the tasks involved in learning school subjects. It is versatile both as a language and a tool used for facilitating the acquisition of knowledge in all subjects. The pupil in primary school requires mathematics to interact meaningfully in the society and to further his education. Despite the significant contribution of mathematics to mankind, it is worrisome that mathematics at primary school level is faced with myriads of problems which included: students lack of interest (Igbokwe, 2001), misconception on its difficult nature (Adedayo, 2000) Research beam light has been pointed at the recurring poor performance overtimes. Findings have shown no significant improvements and general apathy (Obioma, 2005). These situation persists even till today (WAEC, 2010).

It is puzzling to ask the question: How truthful is it that mathematics is difficult? The question arose from the mindset that school pupils are talented and possess innate ability to learn (Akinade, 2007). There are cases of brilliant pupils who experience serious difficulties only in mathematics. What do these pupils need to overcome the perceived difficult nature of mathematics? Plethora of studies (Adeniran, 1999; Eniayeju, 1999 and Akinsola, 2000) have focused their search engine on possible factors militating against good performance in mathematics.

This study focused on teaching of mathematics, textual materials in mathematics, mathematics contents difficulties and students disposition to learning of mathematics.

Perkins and Tishman (1998) use the term disposition to refer to a predilection to exhibit a behavior under certain conditions. They suggest that dispositions involve sensitivity, inclination and ability. Sensitivity concerns awareness to the environment. Inclination concerns motivation or learning. Ability concerns capability to follow through appropriately. Bolaji (2005) in a study of the influence of students' attitude towards mathematics found that the teachers' method of mathematics teaching and his personality greatly accounted for the students' positive attitude towards mathematics.

Textbooks have remained significantly unchanged, and as with schooling of the past, contemporary schooling is characterized by a heavy dependence on textbooks (Chambliss & Calfee, 1998; Woodward, Elliott, & Nagel, 1988). The teaching of mathematics relies on textbooks more than any other subject (Johansson, 2006). Student textbooks are a mainstay in primary mathematics classrooms, and in many instances are used daily by the classroom teacher. Specifically, the beliefs a teacher holds about mathematics education potentially influences both how frequently textbooks are used, in addition to the manner in which they are used (Manouchehri et al., 2000; Stipek et al., 2001).

Knowledge of students' cognitions is seen as one of the important components of teacher knowledge, because, according to Fennema and Franke (1992), learning is based on what happens in the classroom, and thus, not only what students do, but also the learning environment is important for learning. Pedagogical content knowledge refers to the ability of the teacher to transform content into forms that are pedagogically powerful and yet adaptive to the variations in ability and background presented by the students (Shulman, 1987, cited in An, Kulm and Wu, 2004). According to Kahan, Cooper and Bethea's (2003) review, the researchers frequently conclude that 'students would learn more mathematics if their teachers knew more mathematics but content knowledge in the subject area does not suffice for good teaching. However, they also outlined that the content of pedagogical content knowledge is 'content-specific and at the same time goes beyond simple knowledge of mathematics therefore a mathematician may not posses it (Kahan, Cooper and Bethea, 2003).

It may be difficult however to capture these problems exhaustively without an insider's evaluation. An insider (in this case the pupils) knows where the shoe pinches and is in a better perspective to mention (content and pedagogical) his/her needs in mathematics for improved performance. This study was designed to elicit pupil's needs in mathematics for better performance and improvement.

METHODOLOGY

This is a descriptive-survey design employed to unveil pupils inherent difficulties in mathematics. Population consisted of all primary five (pry 5) pupils in Lagos State schools. Staff schools of the four tertiary institutions located in Lagos were selected by stratified sampling technique. These schools were; University of Lagos, Akoka, Lagos State University, Ojo, Adeniran Ogunsanya College of Education, Ijanikin and Federal College of Education, technical. The choice was informed by the availability of qualified, experienced and competent teachers in those schools. Teacher variables of qualification, experience and incompetence are therefore controlled and cannot act as confounding variables. Two hundred pupils of Staff schools were involved in the study.

A questionnaire titled Needs Assessment of Pupils in Mathematics (NAPIM) was developed and used to collect data. It consisted of thirty-items divided into four sections namely; teaching of mathematics, textual materials in mathematics, mathematics contents difficulties and students disposition to learning of mathematics. Teaching of mathematics bothered on teacher's pedagogical wherewithal and whether the teacher relates mathematical concept to real life experiences. Textual materials requested about the readability of mathematics books (worked examples, ease of comprehension and hints on challenging exercises). Mathematics content difficulties inquired whether students express any anxiety or phobia with alphabets and numerals, prone to errors and mastery of mathematics content. Students' disposition to learning found out about students study habit and study skills.

The questionnaire was validated among four primary school specialist teachers in mathematics. They were requested to check the simplicity and clarity of expression. They also ascertained the relevance of content to the teaching of mathematics at the primary school level. The questionnaire was thereafter subjected to peer reviews among the researchers. A split-half reliability co-efficient gave a value of 0.77.

The instrument was administered personally by the researchers. Efforts were made to explain to the pupils the purpose of the visit and were assured on strict confidentiality of all information supplied. Every question item was read to the pupils and detailed explanation provided on demand. All copies of the questionnaires distributed were retrieved. Data analysis was carried out through pictorial representation using bar chart and statistical tools of mean, standard deviation (SD).

RESULTS

Table I: Mean, Standard Deviation and Mean Rank of Students' Response.

S/N	Questions	Number	Mean	Standard Deviation	Mean Rank
1	Solving of numerous examples enhances my understanding	200	2	0	1
13	I love my mathematics teacher	200	2	0	1
12	Teacher positive comments encourage me to learn mathematics	200	1.99	0.0998	3
8	Hints should be provided for challenging exercises in the textbooks	200	1.98	0.1404	4
10	Teacher should encourage pupils to ask questions	200	1.98	0.1404	4

20	I restrict myself only to examples giving by the teacher	200	1.98	0.1404	4
21	I lose interest easily while solving problems not related to work examples	200	1.98	0.1404	4
3	I understand better when home work is related to work examples	200	1.97	0.1710	8
22	Seeking answers to problem I cannot solve has improved my knowledge of mathematics	200	1.965	0.1842	9
2	Relating concepts learnt to daily life experiences improves my understanding	200	1.96	0.1965	10
11	Teacher should give further explanation to pupils experiencing difficulties	200	1.96	0.1965	10
30	I prefer to solve problems relating to word problem	200	1.955	0.2078	12
24	I learn better when engaged in actual construction of objects	200	1.95	0.2185	13
14	The use of alphabets confuses me	200	1.935	0.2471	14
26	I do well when my parent assist me in doing my assignment	200	1.935	0.2471	14
18	I get demoralized where i can not solve mathematics problem	200	1.915	0.2796	16
29	I get discourage if i score zero in my class work	200	1.885	0.3198	17
16	I find it difficult to relate mathematics notations to real life experiences	200	1.79	0.4083	18
27	I learn better when my teacher make use of puzzle	200	1.76	0.4282	19
17	Sign notations is often confusing	200	1.68	0.4677	20
25	Use of concrete objects enhances my understanding of mathematics	200	1.615	0.4878	21
23	I get scared by people's comments that mathematics is difficult	200	1.61	0.4889	22
6	Enough work examples in textbooks stimulate my interest	200	1.605	0.4901	23
5	Lively mathematics classroom stimulate my interest	200	1.6	0.4911	24
7	Examples in textbooks are not easy to comprehend	200	1.6	0.4911	24
19	I engage in solving exercises in the textbooks without being asked to do so	200	1.6	0.4911	24
9	I don't have a mathematics textbook to practice with	200	1.595	0.4921	27
15	I am prone to computational errors	200	1.595	0.4921	27
4	Peer group discussions promote my understanding of mathematics	200	1.5	0.5013	29
28	I do well when my teacher make use of game to explain concepts	200	1.265	0.4424	30

Table 1 shows the preponderance of teacher factor in the hierarchy of needs of students in mathematics (1st, 3rd, 4th). It reveals further that pupils require numerous examples and that the examples should be related to daily life experience for proper understanding.

Pupils needs were categorized into four factors and the mean and standard deviation computed as shown in table II.

Table II: Mean of Needs Assessment of Pupils in Mathematics

	N	Mean	Std. Deviation
TEACHING OF MATHEMATICS	200	9.0450	0.7039
TEXTUAL MATERIALS	200	6.7850	1.0745
CONTENT DIFFICULTIES	200	16.8350	1.1243
STUDENTS DISPOSITION	200	21.5050	1.3599

Table II shows that students' disposition and content difficulties are two potent factors pupils need in mathematics for optimum performance.
These factors were pictorially arranged for clarity. Table II is depicted by the bar chart below.

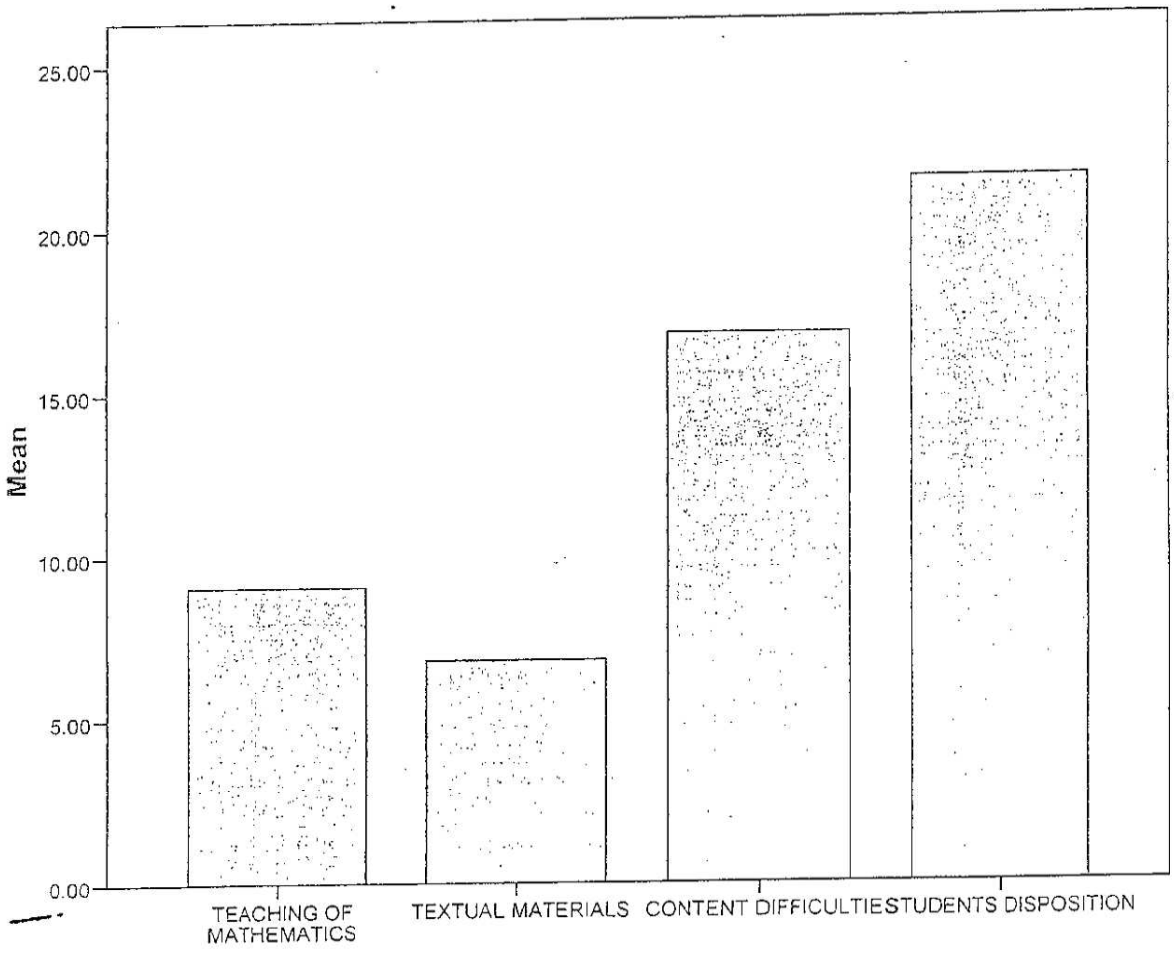

Figure I: Bar Chart Showing Students Needs Assessment in Mathematics

DISCUSSION OF FINDINGS

Findings of this study showed that 'mathematics learning needs' of pupils resided more at the corridor of the pupils. Study habit of pupils contributed more to their success in mathematics (mean rank 1st, 4th, 8th and 9th). For instance, pupils claimed by the popular ranking that studying of numerous worked examples enhanced their performance in mathematics. However, a cursory look at some selected mathematics textbooks revealed that fewer worked examples were contained in them. Provision of leading examples according to (Owolabi, 2004) improves students understanding of mathematical concepts. This becomes accentuated by the fact revealed in this study that students restricted themselves only to worked examples in the textbooks. At the primary school level students are essentially at the concrete operational stage where they are expected

to gain the abilities of conservation (number, area, volume, orientation) and reversibility. Their thinking is more organized and rational. They can solve problems in a logical fashion. These can be fostered where numerous worked examples are provided.

From literature teacher factor has remained a prominent factor influencing students achievement. The present finding alluded to this fact (mean rank 1st, 3rd, 4th and 19th). It implied that teachers should be mindful of their demeanor. This affective component has great influence on students' attitudes to learning of mathematics. There occurs a strong correlation between mathematics achievement and students attitudes.

Presentation and organization of the content in textual materials represent a militating factor in conceptual understanding of mathematics. In this study pupils revealed that they get confused when mathematical notations have no relevance to daily life experiences. Modern trend in teaching presupposes that abstractness on teaching should be eradicated because mathematics is real. Learners encounter and put to practice mathematical operations in all human endeavour. Recognizing this pre-requisite experience serves as a veritable premise upon which new learning experiences are built. This study reveals that teaching of mathematics is a dominant factor in determining student's performance in mathematics. This corroborates earlier findings (Igbokwe, 2001) where the influence of mathematics teacher was found to promote students achievement in mathematics. It is interesting to note that Igbokwe's (2001), finding was a reflection of the perspective of teachers whereas the present finding showed the view point of pupils. Correlate of findings from pupils and teachers perspectives is an indication of potency of the teacher, his pedagogical wherewithal and classroom managerial skills and other parameters of teachers' classroom effectiveness.

Another major findings of this study is the revelation that students' disposition and content difficulties to learning of mathematics constitute the greatest need for optimum performance. Studies (Obioma, 2005; Adedayo, 2000 and Akinsola, 2000) had revealed the positive influence of interest, attitude and readiness to learning.

CONCLUSION

This study revealed that learners' needs in mathematics are numerous. These needs reside at the corridor of the pupils, teachers and the content of mathematics textbooks. It is imperative to reiterate that pupils' factor is potent in determining achievement in mathematics. Classroom interactions should maintain equilibrium among these factors for meaningful learning.

RECOMMENDATIONS

a) Study corners should be created in every home and library in schools to stimulate students interest in reading.
b) More worked examples should be provided in primary mathematics.
c) Teachers need to improve their prestige. This can be achieved through proper dressing and improved pay-packets.
d) Mathematics presentation in textbooks and classrooms should reflect the daily life experiences of learners. This will eliminate the usual abstractness and confusion associated with the teaching and learning of mathematics.

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