Overview of Students' Topic Difficulties in Mathematics: A Case Study of Federal College of Forestry, Ibadan, Oyo State, Nigeria

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ABSTRACT

This study seeks to find out the belief and opinion of students on topic difficulties in mathematics, where Federal College of Forestry, Jericho, Ibadan, Oyo State, Nigeria serves as a case study. The study postulated some research questions and hypothesis. One hundred two (102) questionnaires were administered among ND I and ND II students of the college. Random sampling was used to distribute the questionnaire among the students. The research instrument used was questionnaires and the data were analyzed using Chi-square, t-test, frequency, and percentages.

The study revealed the factors that affect student's view of topic difficulties in mathematics include anxiety, interest, mathematics teacher and nature of the subject among other factors. Statistical analysis revealed that there was significance difference of respondents to whether there exists enough teaching/learning materials in mathematics, the level of significance of probability was 0.004. It was also discovered that there was no significant difference on whether mathematics is considered as one of the difficult subjects and therefore the hypothesis stated that mathematics is not considered as one of the difficult subjects was rejected and hereby concluded that mathematics is considered as one of the difficult subjects.

(Keywords: education, student views, overview, topics, difficulties, mathematics)

INTRODUCTION

The usefulness of mathematics as a subject, which is the basis of many other subjects, cannot be over emphasized. Going through the history of mathematics, it was invented in Egypt about 5000 years ago by priests because they had leisure time and there was need at that time to measure land at the bank of the Nile for farmers. With that, Geometry was invented, it was called Earth measurement at that time.

Many have come to observe that mathematics as a subject permeates the spectrum of human activities either directly or indirectly but most importantly in science and technology. It can be said that mathematics is the key to all aspects of human development. Mathematical tools such as game theory and decision theory have been applied to human science where one seeks to make choice and coalition on some rational and systematic basis.

A layman's view of the word mathematics probably gives s very simple meaning, which reflects the use of numerical values and its arithmetic operations. However, the meaning of mathematics is just not merely restricted to arithmetical operations but can be more broadly defined. However, many people do not seem to be very interested in talking about mathematics and the way mathematics will be learned (Nishikawa, 2017). It is very hard for the public to even name well-known mathematicians. It also seems difficult for the public and even students to distinguish clearly between mathematics with other science-based subjects (Sam, 2002).

The uniqueness of mathematics and the reluctance of people to go in-depth about mathematics seem related to the way they perceive and believe what mathematics is all about. In learning environments, students' belief might propagate the idea for achievement and smoothness of learning. Student belief in mathematic measurement were adapted from Vllerand, et al. (1992). All over the world, it is a

claimed fact that despite its' importance, Mathematics is the most dreaded of the school subjects.

Proclus (412-485), the Pythagorean, considered all mathematical sciences to be divided into four parts, one half, the marked off as concerned with quantity, the other half with magnitude. A quantity can be considered in regard to its character by itself or in its relation to another quantity, magnitude as either stationary or in motion.

According to American Heritage Dictionary, Mathematics is the study of measurement, properties and relationship of quantities using numbers and symbols. Webster New Collegiate Dictionary defines mathematics as the science of number and their operations, interrelations, combinations, generalization, abstraction, space configuration and their structure, measurement and transformation.

Students' belief about Mathematics originated from experience which comprises of cognitive and effective dimension (Rosas et al., 2012). In addition, Mcleod (1992) has suggested four categories of students' beliefs such as thinking that mathematics is difficult or that it is based on rules. The second categories beliefs about self, includes self-confidence in learning mathematics and attributions for success and failure in mathematics. The third category belief about teaching; includes beliefs about what a teacher should do to help a student learn mathematics. Mcleod's fourth category includes the beliefs that mathematics learning is competitive and that parents and others outside the school have a significant influence on one's mathematics learning. Thus, teaching and learning of mathematics is essential as it is one way of preparing learners to become scientifically and technologically sound. It is therefore a pre-requisite for admission into tertiary institutions (Kimball et al., 2013).

Beliefs about mathematics can be constituted as beliefs about the nature of mathematics. Beliefs about their competence and beliefs about their respective lecturers (Aguilar et al., 2012). The dimension of belief about self refers to their performance in mathematics and when their interest of mathematics started. Within the students' beliefs about social context restricted to the belief about nature of mathematics could be broad to the utility aspect of mathematics (Mcleod, 1992).

It is evident that what the lecturer does in the classroom influences students' beliefs about mathematics. It is also evident that what lecturers' belief about mathematics and the methods of teaching mathematics influences what they do in the classroom and their beliefs may be translated into students' beliefs (Carter and Norwood, 1997).

Although, generally, most people agree with the importance of mathematics in daily life and its usefulness in careers, but these people are very reluctant to talk about mathematics. In Malaysia, the interest of mathematics among school children is in decreasing mode. Lim (2002) reported that research done by Lee et al. (1999) found that science and non-science students' ratios have deteriorate from 31:69 in 1986 to 20:80 in 1993. It is a drop of 11% in number of students taking science-based subjects. The most common reason as quoted by 58% of 76 form 4 students and 59% of 489 form 6 students for not choosing science subjects was the poor foundation in science and mathematics. The lack of confidence towards the interest in mathematics raised concerns from all related parties.

Past research revealed how students' beliefs shape their cognitive domain in the learning processes. A study done by Lester et al. (1989) shows how belief about their nature of mathematics and mathematical learning and problem solving determined how one chooses to approach a problem and which techniques and cognitive strategies will be used.

RESEARCH METHODOLOGY

Research Design

A survey research was conducted using self-response questionnaire administered to students of the Federal College of Forestry. The respondent for this study were randomly selected from ND I and ND II, Fifty-five students were selected from each class. One hundred and ten (110) Questionnaires were administered but only one hundred and two (102) were retrieved.

The instrument used is structured questionnaires, which comprises of two sections. Section A requested for demographic information of the respondent while section B contains a Likert-scale questionnaire, stating the student perception of topic difficulties in mathematics

based on factors such as the teaching methods, availability of study materials, textbooks, and so on.

Method of Data Analysis

The responses from the questionnaire were analyzed and the results contained were then discussed. Frequency and percentages were used in analyzing the research questions. Also the goodness of fit-test (Chi- Square) and T-test were used.

RESULTS

Hypothesis 1: There are not enough teaching/learning materials in mathematics.

Table 1 shows the Chi-square calculated, found to be 12.08 at d.f = 2 while the critical value was found to be 5.99. The chi-square calculated was greater than $\chi^2_{0.05}$ critical, rather the significance of probability was 0.004. Hence, the null hypothesis is rejected which stated that there are not enough teaching/learning materials on mathematics and we hereby conclude that there are enough teaching/learning materials for the teaching of mathematics.

Table 1: Respondents Reply to Know Whether There Exists Enough Teaching/Learning Materials in Mathematics.

Group	Size	DF	χ^2 Cal	χ^2 Table	Significance of P
Agreed	60	2	12.08	5.99	.004
Disagreed	42				

Hypothesis 2: Mathematics is not considered as one of the difficult subjects.

Table 2a shows the response of respondents, it shows that 35.29% of the respondents strongly agree that mathematics is difficult, while 18.3% of them strongly disagree, 23.47% agree and 19.61% disagree.

Table 2b shows that χ^2 calculated is 18.65 at d.f. = 2, while the critical value was found to be 5.99. The χ^2 calculated was greater than χ^2 tabulated at probability level of 0.05 the significance of probability was 0.000. The implication or effect of this is that it is less than 0.05 and it is therefore rejected, the null hypothesis earlier stated that "mathematics is not considered as one of the difficult subjects" and hereby concluded that mathematics is considered as one of the difficult subjects.

Table 2a: Frequency Percentage Analysis of Respondents Showing that Mathematics Is Difficult.

Strongly Agree		Agree		Disagree		Strongly Disagree	
Freq.	%	Freq.	%	Freq.	%	Freq.	%
36	35.29	27	26.47	20	19.61	19	18.63

Table 2b: Respondents Showing that Mathematics Is Difficult.

Group	Size	DF	χ^2 Cal	χ^2 Table	Significance of P
Agreed	63	2	18.65	5.99	.000*
Disagreed	39				

Hypothesis 3: There is no significant difference in students' belief of topic difficulties in mathematics according to the gender.

Table 3 shows that t-calculated was found to be 0.114 at df =2, while the critical value is found to be 1.99. The t-calculated was less than t-critical value at probability level of 0.05 or significance of probability was 0.29. The implication of this is that since it is greater than 0.05, the null hypothesis earlier stated is therefore accepted. It is therefore concluded that the students' perception of topic difficulties in mathematics according to their gender does not have any significance on the difficulties of mathematics or better say gender of the respondents did not have effect on the difficulties of the subject (Mathematics).

Table 3: Students Perception of Topic Difficulties in Mathematics According to the Gender.

Variables	N	DF	Mean	Sd	t Calc	t-critical	Significance of P
Female	52	2	54.5	5.83	0.114	1.99	0.29
Male	50		54.1	5.69			

Hypothesis 4: There are no other problems contributing to the topic difficulties in mathematics.

Table 4 shows the anxiety rates at 44.1% thereby indicate that anxiety had low significant effect on the students' perception difficulties in mathematics. The frequency percentage analysis also show that the students interest rated at 56.9% thereby posing average significant effect on the students' opinion of topic difficulties in mathematics. The table also shows that the mathematics lecturers' effect rates at 84.3% had a high significant effect on the students' perception of difficulties in mathematics. Also, course content had a high significant effect on the students' perception on topic difficulties in mathematics.

Contributing Factors	Frequency	Percentage
Anxiety	45	44.1
Interest	58	56.9
Mathematics Teacher	86	84.3
Course Content	98	96.1

DISCUSSION OF RESULTS

This research work intends to find out students' belief or opinion of topic difficulties in mathematics, which is mainly a case study of Federal College of Forestry, Jericho, Ibadan, Oyo State. The study reveals the following findings:

That there are enough teaching/learning materials for the teaching of mathematics, since chi-square calculated was found to be 12.08 at d.f = 2 while critical value was 5.99, it can be seen that χ^2 calculated is more than χ^2 tabulated. This implied that there are enough teaching/learning materials for the teaching of mathematics. This fact can be supported by Cobb and Yackel (1998), which stated that for proper and effective learning of mathematics, there should be enough teaching and learning materials, also Mcleod (1992) support this by saying that mathematics teachers should be provided with required teaching and learning materials.

The study also revealed that mathematics is considered as one of the most difficult subjects. Since chi-square calculated was greater than chi-square tabulated and also greater percentage of 35.29% of respondents agree that mathematics is one of the most difficult subjects. This finding can be backed by Mcleod (1992) that some category of students believe that mathematics is a difficult subject in that it is based on rules.

Furthermore, this study revealed that the students' perception of topic difficulties in mathematics according to their gender does not have any significance on the difficulties of mathematics since t calculated is less than t tabulated.

CONCLUSION

In conclusion, since appropriate analysis showed that there are enough learning tools in the school for studying mathematics, analysis showed that the students interest in studying mathematics is a difficult course/subject, it can be concluded that anxiety and interest are of average significance on the students opinion on the learning of mathematics while efficient and available mathematics lecturer alongside the course content are of high significant effect on the student perception of topic difficulties in mathematics.

RECOMMENDATIONS

The following recommendations were made based on the following findings to students, lecturers, schools and government.

Students should develop the right attitude towards the learning of the subject by making up their minds to enjoy the subject and see it as fun instead of it regarding it as being tedious. Lecturers on their own part should teach the students according to the scheme/syllabus. The students should be properly taught, and they should be made to further engage in practices by themselves.

Schools should purchase the scheme and make it readily available (current issues/editions). Relevant textbooks for references should be made available for the teacher to teach. Also, schools should assist the teachers in provision of instructional materials and mass mobilization campaign, career talk, and excursion should be organized to improve students' attitude to the subject. Additionally, Government should endeavor to employ qualified lecturers to help students learning processes and they should fund education adequately with provision of a good and adequate learning environment.

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