STUDENTS' PERCEIVED AREAS OF DIFFICULTIES IN SENIOR SECONDARY MATHEMATICS AND TEACHERS' VIEWS ON THE CAUSES OF IDENTIFIED DIFFICULTIES IN IKERE LGA, EKITI STATE

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Abstract

This study examined the perceived difficult topics in secondary school mathematics by students as well as the mathematics teachers' views of the causes of the identified difficulties in Ikere local Government Area of Ekiti State. This study employed the survey research design. The sample for the study was one hundred (100) SSS 3 students and twenty (20) teachers The study was guided by three (3) research questions and three (3) hypotheses. The instruments used for the collection of data were a 36-item questionnaire tagged "Difficult Concept Identification Questionnaire in Mathematics (DCIQM)" and "Mathematics Difficult Topic Assessment Questionnaire (MDTAQ)". The instruments were validated and the reliability established using the test-retest method. The data obtained were analyzed using mean with the criterion mean set at 2.5. Also, ANOVA statistic was used to analyze the three (3) hypotheses formulated for the study. The findings of the study revealed that students identified some mathematics topics (longitude and latitude, bearing, mensuration) as difficult. Based on the findings of the study, it was recommended amongst others that workshops should be organized to train mathematics teachers on the effectiveness and efficient strategies that should be adopted for the teaching of the identified difficult mathematics concepts.

Key words: Perception; difficult topics; students; teachers; mathematics.

Introduction

Mathematics is a useful tool in the society, with numerous applications more so in this technology age. No wonder mathematics remains a compulsory subject at both primary and secondary school levels, though not all the students are expected to become mathematicians, but because of its application in everyday life (Oladele, 2004). Thus, for a person to be able to function very well within his immediate environment, the knowledge of rudimentary mathematics is very necessary (Akanni,2015). So many opinions have been expressed on the meaning and importance of mathematics. It has been viewed as a basic tool in the development of science based knowledge such as technology, industry and even for sound analytical reasoning in daily living in a modern society such as ours (Babalola,1983).

Mathematics concepts are vast, interrelated and possess interconnected elements. The interrelationship of mathematical concepts are easily identified in the use of elementary operations of division, addition, subtraction, ratios, percentage, translation of word problems and use of symbols across mathematics discourse while the interconnected elements according to Robertson and Wright (2014) are discovery and analysis of pattern, logical reasoning applied to systems and recognition and explanation of the underlying links between these systems. This suggestion exposes the requisite knowledge that underlies difficulty or non-difficulty of mathematics as a subject. Students of low logical reasoning and analytical prowess would, therefore, find certain concepts difficult. These students would have visual of dyslexic-type of difficulty which would inhibit their perception of pattern. In contrast, students of high reasoning ability and high intelligence may show competence in handling some concepts in mathematics but may also view some concepts as difficult.

The purpose of mathematics in our secondary school curriculum cannot be over emphasized as there is no single and all-embracing answer to what mathematics is. Mathematics means many and varied things to different people in view of its universality and diversity. It is referred to as the language of science and technology; queen of science; science of counting; number; quantity and space; study of abstractions and their relationships, etc. Mathematics is the science of sizes and numbers of which arithmetic, algebra and trigonometry are branches. The encyclopedia of mathematics defines mathematics as the science of quantitative relations and spatial forms in the real world, being inseparably connected with the needs of technology and natural sciences. Thus, mathematics is a field of symbolic representation of ideas and relations. It can also be seen as an instrument for effecting a logical examination for the implementation of different ideas (Ruffell, Mason & Allen, 2008). It is a subject needed at all levels of our educational system, which involves calculations and useful in everyday life.

The National Policy on Education states that the broad aims of secondary education are preparation for useful living within the society and for higher education (N.P.E, 2004). The general objectives for secondary mathematics education drawn up by the federal ministry of education are as follows: to generate interest in mathematics and provide a solid foundation for everyday living, develop computational skills, develop precise, logical and abstract thinking etc.

The Nigerian mathematics curriculum is not only subject-centered, it is also learner-centered. It emphasizes meeting of learner's present and future developmental needs and interest. As such, the term "mathematics difficult concept" therefore, is not completely the inability of a student to obtain a pass mark in a collection of mathematics problems but constitutes a 'persistent hitch' and makes procedural approach to cognition of a mathematics concept a difficult task, all the time. It is important to note that while curriculum encompasses a wide variety of potential educational and instructional practices, educators often have a very precise, technical meaning in mind when they use the term.

Several studies on perception have been carried out by different researchers. While trying to compare the private and public schools student engagement and school effectiveness indicators, Adediwura, Oluwatosin and Ajeigbe(2008) found that significant difference existed between private and public schools students' perception of connectedness to teachers. Gender was found to have no significant influence on students' perception (Gongden, Gongden and Lohdip, 2011; Charles-Ogan & George, 2015; Etoboro & Fabinu, 2017)

The student's attitude towards a learning process whether innate or emulated, reshapes his behaviour in the classroom and an emotional disposition towards mathematics. Hart (1989) considered attitude towards mathematics from multidimensional perspectives and defined an individual's attitude towards mathematics as a more complex phenomenon characterized by the emotions that he associates with mathematics; his beliefs about mathematics and how he behaves towards mathematics. Closely connected to students' attitude is the teacher's attitude since there cannot be any classroom learning without the teacher. The disposition of the teacher to certain topics will affect the way such topics are taught and invariably, affect the way the students perceive such topics. According to Akanni (2015), teaching experience has a significant impact on the way teachers perceived mathematics concepts even though gender differences do not influence teachers' perception. This study is therefore aimed at identifying these difficult topics in senior secondary school mathematics curriculum as perceived by students and teachers in Ikere Local Government Area of Ekiti State.

Statement of the problem

Teaching and learning of mathematics depends to a large extent on teacher's own knowledge of the content and ability to adequately deliver the instruction to the students. Evidence from the studies reviewed shows that failure rate in mathematics at senior certificate examinations is high. This could be attributed to a number of factors; one of such factors is the students' perceived difficult topics in Mathematics. Perceptions of the learners make learning meaningful and help to improve teaching and learning activities. However, these advantages of students' perception and interest have not reflected in the education system because of the dearth of making mathematics teaching especially those difficult topics more interesting in our schools. Thus, the present study sought to determine the need for identifying the students' and teachers' perceptions of difficult topics in mathematics.

Research questions

The following research questions were raised to guide the study:

1. What mathematics concepts do students perceive as difficult in the senior secondary school mathematics curriculum?
2. What are the reasons for the perceived difficulties in mathematics by students?
3. What are the possible causes of the identified difficult mathematics concepts in the senior secondary school curriculum as perceived by the teachers?

Research hypotheses

Based on the above research questions, the following four hypotheses were formulated and tested at 0.05 level of significance.

H_{01}: There is no significant influence of students' gender on perception of difficult topics in the senior secondary school mathematics.

H_{02}: There is no significant relationship in the perception of difficult concepts in mathematics by private and public secondary school students.

H_{03}: There is no significant influence of teachers' teaching experience on the perception of possible causes of identified difficult concepts in the senior secondary school mathematics.

Materials and Methods

The study is descriptive research of survey type which worked strictly on the perception of difficult topics in secondary schools mathematics by students and the possible causes of the identified difficulties by teachers. It is a survey type which aimed at collecting data on and describing in a systematics manner, the characteristics, features or facts about a given population (Champion, 1970; Nworgu, 1991, 2006; Gay, 1996; Adeyemi, 2007).

Population

The population for the study consisted of all private and public secondary schools in Ikere Local Government Area of Ekiti State. The number of schools was sixteen (16) all together which involved six (6) private and ten (10) public secondary schools.

Sample and sampling techniques

A sample of one hundred (100) students and twenty (20) teachers was randomly selected from five (5) secondary schools. The five (5) schools were purposively selected from the sixteen (16) secondary schools. The analysis of number of sampled public and private secondary school students and teachers by sex in Ikere Local Government Area was presented in Table 1, the table shows that the sample for the study is definite (known) for both number of schools, students and teachers.

Table 1: Number of sampled public and private secondary school students and teachers by sex in Ikere Local Government Area.

Type	School students		School teachers		Total
	M	F	M	F	
Public schools	25	35	4	6	70
Private schools	20	20	5	5	50
Grand Total	45	55	9	11	120

Instrumentation

The instrument used for collection of data for the study was a 36-item questionnaire which was of two types: students' questionnaire and teachers' questionnaire. The students' questionnaire consisted of three sections. Section A was on background information of the respondents, section B measured the level of difficulty of mathematics concepts as perceived by the students which was on a 4-point Likert scale of Very Difficult, Difficult, Less Difficult and Not Difficult while Section C seeks response for the reasons for the topics perceived as difficult and was of a 4-point Likert scale of Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD). This questionnaire was based on the current national mathematics curriculum for senior secondary school and was tagged Difficult Concept Identification Questionnaire in Mathematics (DCIQM).

The teachers' questionnaire was tagged Mathematics Difficult Topic Assessment Questionnaire (MDTAQ) and consisted of two sections. Section A was on the background information of the respondents while section B measured the possible causes of the identified difficult concept. The instrument's face and content validities was assumed to have been determined by the State Ministry of Education while the construct validity and reliability was determined by the researchers using test-retest method, the result of the estimate was 0.73 and this index is considered high and significant enough for this kind of study since it corroborate with the Macintosh (1974) and Alonge (1989, 2004) who argued that reliability coefficient of any instrument should range between 0.50 – 0.85 and above.

The administered questionnaire were gathered and analyzed by the researchers with the aid of research assistants (The category of teachers employed in each school).

Data Analysis

The data collected for the study were analyzed using criterion mean of 2.5 for each item in both sections of the instrument and Analysis of Variance (ANOVA) statistic with SPSS version 20 was used to test the three hypotheses formulated at 0.05 level of significance.

Result and analysis

Descriptive analysis

Research question 1: What mathematics concepts do students perceive as difficult in the senior secondary school mathematics curriculum?

Table 2: Students' perception of difficult concepts in mathematics

Rating: VD = 4, D = 3, LD = 2, ND = 1 ; N=100

S/N	Topics	VD	D	LD	ND	Mean	Decision
1	Number Base system -Conversion of decimal fraction from other bases to base 10	60	45	60	40	2.05	Not difficult
	Application of number base in computer programming	100	120	40	15	2.75	Difficult
2	Modular arithmetic – Simple or basic operations	40	105	80	15	2.4	Not difficult
	Solving problems in standard form	80	90	70	15	2.55	Difficult
	Laws of indices and problems involving indices e.g. $a^x \times a^y = a^{x+y}$, etc.	60	105	80	10	2.55	Difficult
3	Logarithms– indices and logarithms	80	30	50	45	2.05	Not difficult
	Graphs of $y = 10^x$	160	30	58	21	2.69	Difficult
	Use of logarithm tables in calculations involving division powers and roots e.g. 214.3 x 3√308	104	24	20	56	2.04	Not difficult

	Solve problems related to capital market (Application of logarithms)	140	60	36	27	2.63	Difficult
4	Set theory – identify types of set	72	69	80	19	2.4	Not difficult
	Use of Venn diagram	40	75	70	30	2.15	Not difficult
5	Simple equations and variations. – problems involving inverse variation	200	60	20	20	3.0	Difficult
	Joint variation and application of variation	220	30	20	25	2.95	Difficult
	Simple equations and variations	120	30	80	20	2.5	Difficult
	Simultaneous equation	200	60	50	5	3.15	Difficult
	Quadratic equation	80	30	20	60	1.9	Not difficult
	Factorization of quadratic equation	240	24	40	12	3.16	Difficult
	One linear, one quadratics simultaneous equation	140	60	20	35	2.85	Difficult
	Forming quadratic equations with known roots	40	150	40	20	2.5	Difficult
	Solve word problems in quadratics equation	248	42	40	4	3.34	Difficult
6	Construction – Bisection of lines and angles	320	15	10	10	3.55	Difficult
	Constructing angles	160	60	60	10	2.9	Difficult
	Construction of equidistance points	240	45	30	10	3.25	Difficult
	Locus of moving points	180	45	44	18	2.87	Difficult
	Proofs of some basic theorems	132	60	40	27	2.59	Difficult

7	Trigonometric ratio –Solve problems involving use of sine and cosine formulas	184	30	30	29	2.73	Difficult
	Trigonometric ratios of 30°, 60° and 90°	212	57	72	4	3.45	Difficult
	Solving problems using trigonometric ratios.	280	30	30	5	3.45	Difficult
	Drawing graphs of sine and cosine of angles	232	42	40	8	3.22	Difficult
8	Mensuration – find length of arc practically	164	30	20	39	3.53	Difficult
	Determine perimeter of a circle, segments of circles	304	30	20	4	3.58	Difficult
	Length of arcs using formula	204	60	40	9	3.13	Difficult
	Area of a sector	172	45	62	11	2.9	Difficult
	Find area of triangle and area of circle	244	15	54	7	3.2	Difficult
	Relationship between surface area of a cone and sector of a circle	164	48	5	12	2.3	Not difficult
9	Statistics – construction of frequency distribution curve, histograms, bar chart and line graphs; pie chart	216	48	20	20	3.04	Difficult
	Frequency polygon (Ogive)	216	15	18	13	3.38	Difficult
10	Approximations – calculate percentage errors	184	60	42	13	2.99	Difficult
	Degree of accuracy	200	60	20	20	3.0	Difficult
11	Sequence and series – Arithmetic progression	160	60	50	15	2.85	Difficult
	Geometric progression	280	30	10	15	3.35	Difficult
	Practical problems on AP and GP	240	45	10	20	3.15	Difficult

12	Graphical solutions of quadratic and simultaneous equations	180	75	40	10	3.05	Difficult
	Gradient of a curve – Drawing tangents to a curve at a given point	212	60	20	17	3.09	Difficult
13	Inequalities, graphs and problems in inequalities. – Linear inequalities in two variables	288	39	16	7	3.5	Difficult
	Deducing maximum and minimum values of inequality graphs	176	60	60	6	3.02	Difficult
	Introduction to linear programming	240	90	10	5	3.45	Difficult
14	Mensuration II: chord and theorems: angles subtended at the centre, angles subtended by chords in a circle, angles in alternate segments	180	60	30	20	2.9	Difficult
15	Circle theorems – Angle at centre is twice that at the circumference – problems involving circle theorems	220	33	20	24	2.97	Difficult
16	Derivation of sine and cosine rule. – Bearings – angle of elevation and depression	320	15	10	10	3.55	Difficult
	Practical problems on bearings	264	30	40	4	3.38	Difficult
17	Measures of central tendency – mean, median, mode of ungrouped data. – definition of range, variance, standard deviation, practical application in capital market reports.	228	60	20	13	3.21	Difficult
	Areas of applications	180	75	20	20	2.95	Difficult
18	The concept of probability – practical example; list chance instruments (dice, coin, park of playing cards)	196	90	30	6	3.22	Difficult

19	Matrices and determinants – transpose of determinants	280	30	20	10	3.4	Difficult
	Solving simultaneous equations using determinants	208	60	30	13	3.11	Difficult
	Addition and multiplication of matrices	324	15	12	8	3.59	Difficult
20	Arithmetic of finance – simple and compound interest	296	33	16	7	3.52	Difficult
	Depreciation and rate of depreciation	180	60	20	25	2.85	Difficult
	Amortization	244	90	10	4	3.48	Difficult
	Problems in capital market using logarithm table	196	87	76	16	3.75	Difficult
21	Longitude and latitude – problems on longitude and latitude	168	54	44	18	2.84	Difficult
	Co-ordinate geometry of straight lines	276	42	14	10	3.42	Difficult
	Distance between points	200	45	40	15	3.0	Difficult
	Gradient and intercept of a straight line	228	60	38	4	3.3	Difficult

Table 2 above indicated that difficulty exists summarily in the students' assessment of the curriculum for mathematics. Some concepts, such as the application of number base system in computer programming($\bar{x} : 2.75 > 2.5$), drawing of graphs especially of $y = 10^x$ ($\bar{x} : 2.69 > 2.5$), drawing of graphs of sine and cosine of stated angles ($\bar{x} : 3.22 > 2.5$), problems involving inverse variations ($\bar{x} : 3.0 > 2.5$), joint variation ($\bar{x} : 2.95 > 2.5$), factorization of quadratic equation ($\bar{x} : 3.16 > 2.5$) and solution of one linear, one quadratic equations ($\bar{x} : 2.85 > 2.5$). In the study of geometry, students were faced with difficulties in understanding the concepts of the perimeter of a circle, length of arcs, segments of a circle and generally on mensuration ($\bar{x} : 3.53 > 2.5$). More so, problems involving mathematical relationship between surface area of a cone and sector of a circle ($\bar{x} : 3.58 > 2.5$) and arithmetic processes involving estimation to the degree of accuracy.

Furthermore, students find problems involving Arithmetic and Geometric Progression difficult ($\bar{x} : 2.85 > 2.5$) and ($\bar{x} : 3.35 > 2.5$) respectively in spite of understanding how to tackle some practical problems involving Arithmetic Progression (AP) and Geometric Progression (GP)

successfully. The students also had difficulties with the tackling of problems on drawing of tangents and gradient of a curve ($\bar{x} : 3.09 > 2.5$) and introduction to linear programming ($\bar{x} : 3.45 > 2.5$). Proof of theorems involving chord ($\bar{x} : 2.97 > 2.5$) and circle theorems constituted some difficulties for the students.

About 66% of the students have difficulties on how to prove that the angles at the centre of a circle, is twice that which it subtends at the circumference of the circle, problems involving bearing, angles of elevation and depression; derivation of sine and cosine rules. Students could easily solve problems involving mean, median and mode for ungrouped data but the application of measures of central tendency involving range, variance and standard deviation (SD) constituted a serious difficulty to learners ($\bar{x} : 3.21 > 2.5$).

They also had same difficulty in solving simultaneous equations involving determinants, and addition and multiplication of matrices ($\bar{x} : 3.59 > 2.5$). A lot of students are not familiar with the concepts of Amortization, depreciation and other arithmetic of finance such as problems in capital market using logarithm table ($\bar{x} : 3.48 > 2.5$). Solving problems involving longitude and latitude was assessed as difficult ($\bar{x} : 2.84 > 2.5$) while they also considered probability as difficult ($\bar{x} : 3.22 > 2.5$). It means that students reasoning abilities, problem solving process and exposition to concepts in school certificate examination is quite low and if students' difficulties in these concepts are not remarked, it could constitute a poor performance and eventual lack of interest in the subject area at the long run.

Research question 2: What are the reasons for the perceived difficulties in mathematics by students?

Table 3: Reasons for perceived difficulties in mathematics by students
Rating: SA = 4, A = 3, D = 2, SD = 1 ; N=100

S/N	Reasons for perceived difficulties	SA	A	D	SD	$\bar{X}$	Decision
1	I do not have interest in mathematics because it involves a lot of calculations	144	54	40	26	2.64	Agree
2	The teaching method of my mathematics teachers makes me to hate mathematics	140	60	36	27	2.63	Agree
3	The use of instructional materials in mathematics class motivates me to learn mathematics	72	69	80	19	2.4	Disagree
4	The learning environment affects students' academic performance	120	75	30	30	2.55	Agree
5	The use of confusing language in mathematics hinders effective learning of mathematics	40	90	70	25	2.25	Disagree

Table 3 above showed that students have reasons for perceived difficulties in mathematics. Students agreed with items 1, 2, and 4. The items that students disagreed with were items 3 and 5. The agreement or disagreement was based on the criterion mean of 2.5. From the findings, it is obvious that students do not have interest in mathematics because it involves a lot of calculations. Students agreed that the learning environment affects students' academic performance. They also agreed that one of the reasons why they perceived some concept difficult was that learning environment affects students' academic performance.

Research Question 3: What are the possible causes of the identified difficult mathematics concepts in the senior secondary school curriculum as perceived by the teachers?

Table 4: Possible causes of the identified difficult mathematics concepts in the senior secondary school curriculum as perceived by the teachers

Rating: SA = 4, A = 3, D = 2, SD = 1 ; N=20

S/N	Perceived difficulties causes	SA	A	D	SD	$\underline{X}$	Decision
1	Inadequate number of mathematics teachers in the school	20	30	6	2	2.9	Agree
2	Non completion of mathematics scheme of work	40	6	10	3	2.95	Agree
3	Teachers do not relate mathematics concepts to real life activities	36	30	2	0	3.4	Agree
4	Teachers deliberately skip some mathematics concepts	16	27	10	2	2.45	Disagree
5	Dominant use of discussion teaching method by teachers	24	9	10	6	2.45	Disagree
6	Some mathematics concepts that do not interest me	20	24	6	4	2.7	Agree
7	Insufficient problem solving in some mathematics concepts	40	9	10	2	3.05	Agree
8	Non–marking and correction of assignment to find out students strengths and weaknesses in mathematics concepts	12	21	8	6	2.35	Disagree
9	I study mathematics after classroom teaching	32	15	8	3	2.9	Agree
10	I have the belief that mathematics is difficult	8	21	10	6	2.25	Disagree

Table 4 above showed that teachers have knowledge of some of the factors that can cause mathematics concepts to be difficult. Teachers agreed with items 1, 2, 3, 6, 7, and 9. The items that teachers disagreed with were items 4, 5, 8, and 10. The agreement and disagreement was based on the criterion mean of 2.5. From the findings, it is obvious that mathematics teachers in

schools teach, give assignments to students, mark and correct the assignments. Students put effort on their own to study mathematics after classroom instruction. Despite all these, students still struggle with some mathematics concepts which are termed difficult. Sufficient problem solving and use of researchable teaching strategies should be employed by teachers.

Hypotheses testing

H_{01}: There is no significant influence of students' gender on their perception of difficult topics in the senior secondary school mathematics.

Table 5: ANOVA analysis of students' gender and their perception of difficult topics in the senior secondary school mathematics.

Groups	Sum of squares	df	Mean squares	F_{cal}	F_{tab}	Decision
Between groups	6.70	1	2.26	2.32	3.92	Not Significant
Within groups	62.21	99				
Total	68.91	100	2.14			

P<0.05 df = degree of freedom

From table 5 above, the F-calculated value (2.32) is less than the F-table value (3.92) at 0.05 level of significance. This showed that there was no significant influence of students' gender on perception of difficult topics in the senior secondary school mathematics, hence the null hypothesis was upheld at P<0.05.

H_{02}: There is no significant relationship in the perception of difficult concepts in mathematics by private and public secondary school students.

Table 6: ANOVA analysis of the perception of difficult concepts in mathematics by private and public secondary school students.

Groups	Sum of squares	df	Mean squares	F_{cal}	F_{tab}	Decision
Between groups	36.51	1	3.10	4.71	3.92	Significant
Within groups	52.11	99				
Total	88.62	100	1.72			

P<0.05 df = degree of freedom

From table 6 above, the F-calculated value (4.71) is greater than the F-table value (3.92) at 0.05 level of significance. This showed that there was significant relationship in the perception of difficult concepts in mathematics by private and public secondary school students, hence the null hypothesis was not upheld at P<0.05.

H_{03}: There is no significant influence of teachers' teaching experience on the perception of possible causes of identified difficult concepts in the senior secondary school mathematics.

Table 7: ANOVA analysis of teachers' teaching experience on the perception of possible causes of identified difficult concepts in the senior secondary school mathematics.

Groups	Sum of squares	df	Mean squares	F_{cal}	F_{tab}	Decision
Between groups	3.01	1	2.17	3.72	4.38	Not Significant
Within groups	12.15	19	1.10			
Total	15.16	20				

P<0.05 df = degree of freedom

From table 7 above, the F-calculated value (3.72) is less than the F-table value (4.38) at 0.05 level of significance. This showed that there was no significant influence of teacher's teaching experience on the perception of possible causes of identified difficult concepts in the senior secondary school mathematics, hence the null hypothesis was upheld at P<0.05.

Discussion

The study revealed that significant influence of student's gender on perception of difficult topics in the secondary school mathematics did not exist. This implies that gender has no influence on the students' perception of difficult concepts in mathematics in secondary schools. This is in agreement with Fennema (2000) who posited that the difference between female and male learning of mathematics is not significant in their perception as they moved into adolescence.this is also consistent with Etoboro & Fabinu. The finding of the study was also supported by Jimoh (2010) who asserted that students' gender and school location have no influence on their perception of difficult topics in mathematics curriculum, while school nature influenced perception of mathematics topics.

However, the finding revealed significant relationship in the perception of difficult concepts in mathematics by private and public secondary school students. This implies that students in private and public schools view the perceived difficult topics in mathematics the same way. This

is at variance with findings of Adediwura et al (2008) who posited that significant difference existed between public and private schools students' perception of connectedness to teachers.

Also, the findings of the study revealed that significant influence of teachers' teaching experience on the perception of possible causes of identified difficult concepts in the senior secondary school mathematics existed. This implies that teachers' perception of difficult topics in mathematics is dependent on teaching experience. It was further revealed in the study that teachers' perception correlate positively and depends significantly on teachers' teaching experience. This is in line with findings of Akanni (2015) who posited that significant difference existed between teacher's experience and teacher's perception of concept difficulty in mathematics

Conclusion

The study vividly showed that mathematics students perceived more than half of the mathematics topics as difficult although the difficulty varies from concept to concept as perceived by the students and that students are aware of the factors that can contribute to the concept difficulty. It also showed that teacher's perception is influenced by the experience gained over a period of time.

Recommendations

Based on the findings of this study, the following recommendations were given:

Mathematics teachers should abstain from concept skipping and endeavour to complete the scheme of work by relating the teaching of mathematics to students' daily activities through sufficient problem solving.

Mathematics teachers and students should be encouraged to attend seminars, workshops and conferences so as to expose them to new findings in mathematics.

Professional bodies like Mathematics Association of Nigeria (MAN) and National Educational Research Development Council (NERDC) should come with better recommended textbooks in mathematics that will assist teachers and students to overcome the difficulties they experience in the teaching and learning of mathematics.

Mathematics teachers should be encouraged to do frequent revision exercises with their students in order to enhance students' mastery/retention of various knowledge and skills gains in previous lessons.

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