STUDENTS' ATTITUDINAL DEVELOPMENT TOWARDS MATHEMATICS CONCEPTS IN ODEDA LOCAL GOVERNMENT AREA OF OGUN STATE, NIGERIA

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Abstract

Mathematics is important in achieving success among students in Nigeria and within any sector/system. This study investigates students' attitudinal development towards mathematics concepts in Odeda Local Government Area of Ogun State, Nigeria. Descriptive and inferential statistics were used to analyse the data collected. The study was conducted using one hundred and fifty (150) Senior Secondary School (SSS3) students who were randomly selected across the Local Government area of Ogun State. The instrument was validated by two experts in the field. The result showed that 36.0% of the respondents were above 19 years of age, while above half (54.7%) of the respondents were male and majority (62.7% and 34.0%) of the respondents acknowledged to be practicing Christians and Islamic religion. Majority (65.3%) of the students' has positive attitude towards mathematics as a subjects. Student's t-test shows that there was no significant difference between the attitude of male and female students' toward mathematics as a subject in the study area. It is concluded that majority of secondary school students sampled have positive attitude towards mathematics and the study recommended that Mathematics seen as a profession only meant for a male domain should be discouraged by parents, teachers and counsellors in secondary schools and encourage female in pursuing career in mathematics.

Keywords: Student; Attitude, Development, Mathematics, Concepts, Odeda.

Introduction

The knowledge of mathematical application and skills is an essential tool in every individual life and society as a whole. Studies have shown that series of factors influence students' performance in mathematics and students' attitudes towards mathematics has been consistently studied. Often, the studies on relationship between students' attitudes and the students' academic performance show a positive relationship (Mohd, Mahmood, and Ismail, 2011). Students' attitudes

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towards mathematics are a major factor that might influence the performance of the towards mathematics (Tahar, Ismail, Zamani and Adnan, 2010; Tezer and Karasel, 2010). The competence gained in the study of Mathematics is widely used in all spheres of human life. Mathematics plays a key role in shaping how individuals deal with the various spheres of private, social, and civil life (Anthony and Walshaw, 2009). This justifies the obligation of the study of the subject by all students who go through basic and secondary education in most countries Nigeria inclusive. Mathematics is therefore seen as a core subject at these levels of education in Nigeria.

Attitude as a concept is concerned with an individual's way of thinking, acting and behaving. It has very serious implications for the learner, the teacher, the immediate social group with which the individual learner relates, and the entire school system. Attitudes are formed as a result of some kind of learning experiences students go through. This is mimicry, which also has a part to play in the teaching and learning situation. In this respect, the learner draws from his teachers' disposition to form his own attitude, which may likely affect his learning outcomes (Yara, 2009). He stated that teachers with positive attitude towards Mathematics were inclined to stimulate favourable attitudes in their pupils. This immediately puts the teacher in the spotlight as one whose attitude, expressed in their behaviour, has a telling effect on students. Teachers' attitude and beliefs play a very significant role in shaping classroom practices (Bolhuis and Voeten, 2004). The knowledge of mathematics among student has been known as an essential tool in every society. It is an instrument that can be used for daily activities in order to overcome the difficulties faced. Most countries regard mathematics as the foundation for scientific and technological knowledge which is a very important instrument for political, socio-economic, scientific and technological development (Nekang, 2016). Mathematics is one of the compulsory subjects recommended by the General Certificate of Education (GCE), West Africa Examination Council (WAEC) and other bodies in the Nigeria. Attitude is concerned with an individual's way of thinking, acting and behaving. Negative and positive attitudes are formed throughout the learning experiences students undergo (Yara, 1999). Teacher attitudes and beliefs play a pivotal role in shaping classroom practices in general and students performance in particular (Bolhuis and Voeten, 2004). Research studies have concluded that, most Mathematics teachers are impatient, unfriendly, coercive and limit their teaching to computation. These attitudes sometimes depict negative dispositions that induce tendencies of fear, anxiety and stress in students (Harbor-Peters, 2001). Previous studies have indicated a significant relationship between student attitude and performance in Mathematics in other countries but this study examines the topic in Nigeria.

Akinoso (2011) viewed mathematics as the basis for science and technology and the tool for achieving scientific and technological development. It may be in consideration of these and other vital usefulness of mathematics that Federal Government of Nigeria made it a core and compulsory subject at all the levels of 9-3-4 system of education in Nigeria (i.e 9 stands for Basic primary school Pry 1 -6 and JSS 1-3, 3 stands for Senior Secondary School and 4 stands for Tertiary Institutions) as contained in the National Policy on Education (Federal Republic of Nigeria 2004) which still remains the rallying point for all educational objectives in Nigeria. Due to this, mathematics has been considered as one of the most important core subject in a school curriculum. More mathematics lessons are likely to be taught in schools and colleges throughout the world than any other subject (Orton,

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Orton, and Frobisher, 2004). However, the standard tests and evaluations reveal that students do not perform to the expected level. The student under achievement in mathematics is not just a concern for particular country but has become a global concern over the years (Pisa, 2003). Due to this and several other factors, students have different attitude towards mathematics. Many factors have been identified in literature as reasons associated with students' lack of interest in learning mathematics. These include Students' factor, teachers' factor, mathematics self-concept and self-efficacy, class size, government factor, infrastructural problem, instructional strategy, among others (Akinoso, 2011, Goolsby, 2013).

Teachers have been universally accepted as one of the most important component of education (Sikora, 1997). And a competent teacher is sure to affect the educational outcomes of his or her students in many positive ways. Umoren and Ogbodo (2001) pointed out that emotional stability is one of the needed competencies of the teacher. Teachers should be emotionally stable in order to change the attitudes under their control. Specifically, Goolsby (2013) attributed factors influencing students' mathematics interest to attitude towards success in mathematics, confidence in learning mathematics, perception of teacher attitude, mathematics anxiety, and Locus of control. According to Idigo (2012), factors associated with mathematics interest include, students' factor, teachers factor, mathematics anxiety, government, lack of infrastructural facilities, lack of instructional materials and problem of large class size. Moreover, qualification of a teacher is the assurance of the teacher's impulse as well as the determinant of his knowledge, attitude and instructional strategy. A qualified mathematics teacher can easily use different approaches/methods, styles, illustrations, examples, and improvise materials in teaching students

mathematics concepts, principles or ideas which his counterpart (unqualified mathematics teacher) cannot do. The Nigeria nation and other nations of the world have shown tremendous concern about the poor performance of students in Science and Mathematics. This poor performance of students in Mathematics in Nigeria a country that needs Mathematics for its development deserves the total attention of educational planners, teachers and researchers in Nigeria for a possible turnaround of the poor performance of students in Science and Mathematics. However, this problem is not peculiar to Nigeria. Even the developed nations have similar worry and concern. For Nigeria, a developing country that needs Science and Technology for its development, the poor performance of students in Science and Mathematics and worse still, the very insignificant proportion of students who choose Mathematics as a course of study after secondary education have turned the concern of the government and people of Nigeria into anxiety. This situation does not favour Nigerian's move towards developing a science and technology culture. Poor achievement in mathematics may be traceable to students' lack of interest in studying the subject. Several factors (teacher, student, mathematics self-concept, self-efficacy class size, government, instructional strategy and infrastructural problem) may have been identified as potentially affecting students' mathematics interest. It is to this end that the researchers developed the interest, to investigate students' attitudinal development towards mathematics concepts in Odeda Local Government Area of Ogun State, Nigeria.

1.2   Research Questions
In designing this study, the following research questions were formulated;
1. What are the students' attitudes toward mathematics as a subject in the study area?

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2. Is there any difference between the attitudes of male students and their female counterparts toward mathematics as a subject in the study area?

1.3 Objectives of the study
1. determine the students' attitudes toward mathematics as a subject in the study area.
2. There is no significance difference between the attitudes of male students and their female counterparts toward mathematics as a subject in the study area.

2.0 Methodology
2.1 Population and Sample Size
The target population for this study comprised of senior secondary school three (SSS 3) science students in Odeda Local Government Area of Ogun State. Stratified random sampling technique was used to select five (5) senior secondary schools comprises of (three public and two private schools). Simple random sampling technique was employed to select a total of thirty (30) SSS 3 science students (male and female) from each of the participating schools. Altogether, 5 schools and 150 students were involved in the study.

2.2 Research Instrument
In order to collect data, the Students' Attitude to Mathematics Questionnaire (SATMQ) was employed by the researcher. The questionnaire was adopted from Amatobi and Amatobi (2020). The questionnaire has 24 items with a five-point Likert-scale of 'Strongly agree', 'Agree', 'Undecided', 'Disagree' and 'Strongly disagree'. The students were asked to respond to the items by choosing any of the five responses on the scale.

2.3 Validity of the Instrument
For the purpose of this study, both the face and content validity of the instrument were ensured. To ensure validity of the instrument, the initial draft of the instrument was scrutinized by experts in questionnaire and content construction who checked for all non-technical flaws in the instrument. Such inputs enhanced a thorough validation in order to ensure that the instrument actually measured what it was intended to measure in relation to the research hypotheses. The

final version of the instrument was trial tested on a sample of 30 students who were not part of the real study sample, in Abeokuta North Local Government Area of Ogun State. The data collected showed that the students did not have problems responding to the items in the questionnaire.

2.4 Reliability of the Instrument
In computing the reliability of this research instrument, Cronbach's alpha was utilised in estimating the α reliability coefficient. The Cronbach's alpha reliability of the instruments was 0.75. The construct, content and criterion related validities were found to be adequate.

2.5 Data Collection and Analysis
The necessary data for this study were obtained from 150 students selected from 5 secondary schools in the Odeda Local Government Area of Ogun State. The questionnaires were distributed to the students in their various classrooms during the school hour.The data collection lasted for 5 days. After collection of data, all the questionnaires were fully responded to by the students. The data were analysed using frequency and percentage as well as student t-test.

3.0 Result and Discussion

3.1 Socio-economic characteristics of the student
Results in Table 1 shows that m 34.0 % of the respondents were within the age range of 17 – 19 years old, while 36.0% of the respondents were above 19 years of age and 30.0% of the respondents were between 14 – 16 years of age in the area sampled for the study with the mean value of 18years among the student sampled. This implies that the respondents sampled still had youthful strength. Results indicate that above half (54.7%) of the respondents were male, while 45.3 % of the respondents were female. This implies that there are more male respondents than female respondents in the study area. Results also shows that majority (70.7%) of the respondents has household size less than 3, while 24.0% of them has household size between 4 – 6 and few (5.3%) of the

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respondents has above 6 household size as at the time of this study. Finding also reveals that majority (62.7%) of the respondents acknowledge to be Christians, while 34.0% were practicing Islam and remaining 3.3% were Traditionalist among the students sampled for this study. This means that all the notable three religions were being practicing by the student sampled.

Table 1: Distribution of respondents based on their personal characteristics (n = 150).

Variables	Frequency	Percentages (%)	Mean
Age (years)			
14 – 16	45	30.0	
17 – 19	51	34.0	18.17
Above 19	54	36.0	
Sex			
Male	82	54.7	
Female	68	45.3	
Religion			
Christianity	94	62.7	
Islamic	51	34.0	
Traditional	5	3.3	
Household size			
Less the 3	106	70.7	
4 – 6	36	24.0	
Above 6	8	5.3	

3.2 Students' attitudes toward mathematics as a subject in the study area.

Result in Table 1 shows that students' has positive attitude towards mathematics as a subjects with 65.3% while neutral attitude towards mathematic was 20.0% and negative attitude towards mathematics as a subject accounted for 14.7%. It can therefore be established that the attitude of the students towards mathematics as a subject is positive in the study area. The finding also agreed with Olusola and Rotimi (2012) who reported that students have positive attitude towards the study of physics in College of Education. However, the finding of this study is against the findings of Akale (1990), Eze (1996) and Habour-Peters (1997) who reported that Nigerian students' negative attitude towards science is responsible for their low enrolment in the science subjects in secondary schools. It is also against the findings of Aghenta (1982) which showed that Nigerian students have negative attitude towards science. Some of the factors that influence attitudes of students towards mathematics are teaching materials used by teacher, teachers' classroom management, teachers' content knowledge and personality, teaching topics with real life enriched examples, other student's opinions about mathematics courses (Yilmaz, Altun and Olkun, 2010), teaching methods, reinforcement (Papanastasiou, 2000), receiving private tuition (Köğce et al, 2009), teachers' beliefs towards mathematics (Cater and Norwood, 1997) and teachers' attitude toward mathematics.

Fig 1: Overal attitude of students' towards mathematics

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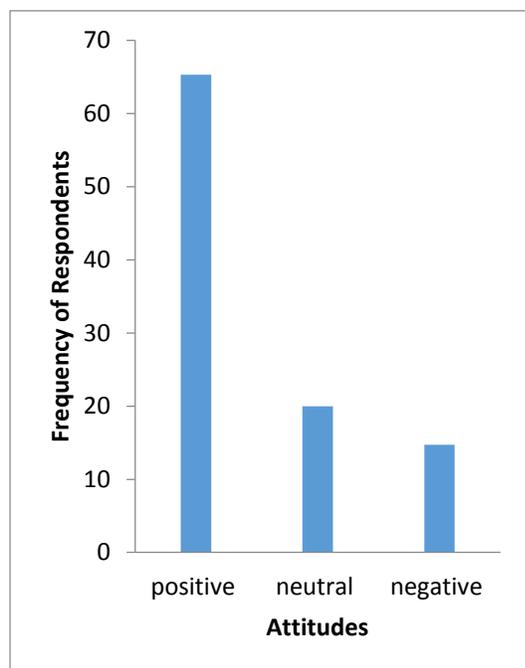
There is no significance difference between the attitudes of male students and their female counterparts toward mathematics as a subject in the study area.

The result in Table 2 showed that t-calculated for male and female students' attitude toward mathematics was 0.32 which is less than the t-table value of 1.78 at 0.05 level of significance. The result was therefore not significant hence the null hypothesis (Ho) was not rejected. This showed that there was no significant difference between the attitude of male and female students' toward mathematics as a subject in the study area. This finding is in line with the findings of Adebule (2002) who stated that there was no significant difference between the attitude of male and female students towards mathematics. This finding is also in arrangement with Adebule and Aborishade (2014) in their study and reported that both male and female students have almost the same attitude towards

science. However, this finding disagreed with the finding of Oloyede (1984) who indicated that male students have positive attitude and perform better than their female counterparts. It is also against the findings of David *et al.,* (2013) who reported that male students developed more positive attitudes than their female counterparts.

Table 2: Student t-test summary for male and female students' attitude toward science

Gender	N	Mean	Std. Deviation	Std.Error Mean	df	t_{calc}	$t_{critical}$
Male	85	67.3421	10.16332	1.42093	148	0.32	1.78
Female	65	65.5210	9.87434	1.50234			

Conclusion and Recommendations
From the findings of this study, it was concluded that majority of secondary school students sampled have positive attitude towards mathematics. Also, both male and female students have almost the same attitude towards mathematics as a subject. Findings from this study suggest that students with positive attitude towards mathematics perform better than those with negative attitude on the subject. This suggests that gender difference does not have a major influence on student's achievement in mathematics. Most students of both genders who had positive attitude towards mathematics performed better on the subject. Finally, there is no disparity in the attitudes of students towards mathematics based on sex.

Recommendation
With reference to the findings of this study, the following recommendations are considered important for the current education system;
1. Female students should not be avoided from choosing and offering mathematics as a career in life.

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2. Mathematics as a profession for a male domain should be discouraged by parents, teachers and counsellors in secondary schools.
3. Teachers and other stakeholders in Nigeria's education industry should organize periodic seminars and workshops for students, parents, teachers and school administrators designed to promote positive attitudes towards mathematics.
4. The teachers should endeavour to make mathematics teaching interesting, taking into consideration individual differences in ability, background and attitudes matter to student development.
5. Effort should be made by parents, teachers and governments to maintain and increase the positive attitude of students towards mathematics in secondary schools across the state.

References

Adebule, S. O. and Aborisade, O. J. (2014). Gender Comparison of Attitude of Senior Secondary School Students towards Mathematics in Ekiti State, Nigeria. *European Scientific Journal* vol.10, No.19. pp 1-8.

Adebule, S.O. (2002): Development and validation of an Anxiety rating scale in mathematics for Nigerian secondary schools. Unpublished Ph.D Thesis of the University of Ado-Ekiti, Nigeria.

Aghenta, J. A. (1982). Why there are not science applicants for university admission in Nigeria. *Journal of Science Teachers Association of Nigeria* 20(2) 90 – 99.

Akale, M. A. G. (1990). Teacher and student factors in the implementation of science, technology and mathematics curricular objectives of the 90s. STAN 31st Annual Conference Proceedings. pp.(107-112).

Amatobi, V. E and Amatobi, D. A (2014). The influences of gender and attitude differences to students' achievement inmathematics in Nigerian secondary schools: a case study of Comprehensive Secondary School Amurie-Omanze in South Eastern Nigeria. *American Journal of Research Communication.*vol 1 1-8

Anthony,G., and Walshaw, M. (2009). Characteristics of effective teaching of Mathematics: A view from the West. Journal of Mathematics Education, 2(2), 147-164.

Bolhuis, S. and Voeten, J. M. (2004). Teachers' conception of student learning and own learning: Teachers and teaching, Theory and Practice, 10(1), 77-98.

Cater, G. S., and Norwood, K. S. (1997). The relationship between teacher and students" belief about mathematics. School science and mathematics, 97(2), 62-67

David, O. E., Okorn, O. Koko E. Bessong, F. (2013). Attitude of Science Students towards Science Teaching In Cross River State, Nigeria. *Journal of Education and Practice.* Vol.4, No.5, pp 121-134. www.iiste.org.

Eze, H. O. (1996). Psychological aspects of teaching and learning science and mathematics. *Journal of Technology Education.* 1(1) 138-143.

Harbour-Peters, V. F. (1997). Researches in mathematics, science and technology education in Nigeria. In G.C. Obodo (Ed.). Stress and crisis in science and technology education in Nigeria. Pp. (87-110). Enugu: Rejoint Publications Limited.

Kogce, D., Yıldız, C.,Aydın, M. and Altındag, R., (2009). Examining Elementary School Students" Attitudes towards Mathematics in Terms of Some Variables, Procedia Social and Behavioral Sciences, 1(1), 291-295.

Mohd, N.; Tengku Mahmood, T.F.P.; Mahmood, T.; Ismail, M.N. (2011). Factors that influence students in mathematicsachievement.Int. J. Acad. Res.2011,3, 49–54.

Nekang, F. (2016). Principles and practice of mathematics education in Cameroon. Yaounde: NEC Cameroon.

Oloyede, O. E (1984): Branding programmed instruction companied with other materials for learning mathematics by Nigerian

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Secondary School students. An Unpublished M.A. Ed thesis, University of Ife, Ile-Ife.

Olusola, O. O. and Rotimi, C. O. (2012). Attitudes of Students towards the Study of Physics in College of Education Ikere Ekiti, Ekiti State, Nigeria. American International Journal of Contemporary Research. 2(12) 1-4.

Papanastatsiou, C. (2000). The effect of attitudes on mathematics outcomes. Paper presented at the 9th International Congress of Mathematics Education (ICME-9). Tokyo.

Tahar, N. F., Ismail, Z., Zamani, N. D., andAdnan, N. (2010). Students" Attitude Toward Mathematics: The Use of Factor Analysis in Determining the Criteria. Procedia-Social and Behavioral Sciences, 8, 476–481.

Tezer, M. and Karasel, N. (2010). Attitudes of primary school 2ndand 3rdgrade students towards mathematics course. Procedia Social and Behavioural Sciences, 2, 5808-5812

Yara, P. O. (2009). Relationship between teachers' attitude and students' academic achievement in Mathematics in some selected Senior Secondary Schools in South-western Nigeria. European Journal of Social Sciences, 11(3), 364-369.

Yilmaz, C., Altun, S. A. and Olkun, S. (2010). Factors affecting students'attitude towards math: ABC theory and its reflection on practice. Procedia Social Science and Behavioural Sciences, 2, 4502-4506.