

PERCEPTION OF TEACHERS AND STUDENTS ON FACTORS AFFECTING STUDENTS' INTEREST IN MATHEMATICS IN SENIOR SECONDARY SCHOOLS IN GWOZA LOCAL GOVERNMENT AREA, BORNO STATE, NIGERIA

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Abstract

This study was conducted to ascertain the perceptions of mathematics teachers and students on different factors affecting and enhancing students' interest in mathematics in public senior secondary schools in Gwoza local government area, Borno State. A descriptive survey design was adopted. Four research questions were answered in the study. The total population for the study was 3,544, and 346 were sampled which consisted of 22 mathematics teachers and 324 SSII students from eight schools. The instrument used for collection of data consisted of a 20-item self-developed questionnaire titled "Perception of Teachers and Students Questionnaire (PTSQ)". The instrument was validated by three experts, and a reliability coefficient of 0.84 was obtained after a pilot test of the instrument using the split-half and Spearman-Brown Prophecy Formula methods. The findings revealed that poor mathematics background, anxiety and phobias, and unqualified teachers are among the factors affecting students' interest in mathematics. Effective use of various teaching methods and strategies, instructional materials, and proper career guidance are among the ways of enhancing students' interest in mathematics. It was then recommended that the government train the existing teachers and provide adequate teaching materials in schools.

Keywords: teachers, perception, students' interest, anxiety, attitude, Mathematics phobia.

Introduction

Mathematics is a universal, utilitarian subject that is required by everyone to some point in their lives. It is an essential part of the curriculum in all countries around the world. It is an interdisciplinary language and tool that is regarded as a fundamental part of the formal educational system (Roy, 2011). Odusoro (2002) affirmed that the knowledge of science remains incomplete without mathematics. Mathematics is now much more than arithmetic and geometry; it is a diverse discipline that deals with scientific data, measurements, and observations, inference, deduction, and proof, and mathematical models of natural phenomena, human behavior, and social systems (Sunita, 2019).

Teachers are an essential component of all aspects of education, so the importance of teachers in an educational setting cannot be overstated. According to Fakeye (2012), teachers should do everything possible to help students satisfy their deficiencies, because an inner

motivation for knowledge will not develop until the basic needs are met. Since teachers serve as integral parts of teaching and learning and are prepared to meet students' interests in learning. The perception of teachers on students' interest in learning occurs when teachers explored all possible ways through the process of impacting mathematical skills to students with the high level of expectations that students are more likely to demonstrate high academic achievement (Iris, 2012). Terna and Innocent (2017), opines that there is some improvement in students' achievements in mathematics, most secondary school students often dread and show negative attitudes towards mathematics, and the trends in their achievements in the senior secondary school certificate examinations are also a source of worry to the stakeholders.

For one to have proper satisfaction with his or her ambition, there is a need to have an interest in that thing so that you can work towards ways of achieving it. Abimbola and Abdullahi (2019) defines interest as the feeling that one has when he or she wants to know or learn about something. This implies that for teaching and learning of mathematics to be effective, the teacher and students should be concerned, committed, and as such should focus on proper teaching and learning exercises. The rate of interest among students give them chances to perform many mathematical activities that leads to higher scores in their achievement (Nwafor, 2014). The lack of interest in mathematics by students can be attributed to many factors, such as lack of proper orientation of students about the prospects of mathematics, poor teaching methodology, lack of proper instructional materials for effective teaching and learning of mathematics, and lack of qualified teachers, as opined by Ohuche cited in Terna & Innocent (2017).

In addition, Ihechukwu and Ugwuegbulam (2016) pointed out that issues affecting students' lack of interest in mathematics today include teaching approach, inability to solve mathematical problems, non-application of existing instructional resources, and poor teacher-student relationships, lack of a good learning environment, poor students' mathematics background, and lack of motivation on the part of both teachers and parents. A skillful and very knowledgeable teacher has the potential to make the learning of mathematics more meaningful to the students (Public Agenda, 2000 as cited in Graham & Fennell, 2001). Sa'ad et al (2014), added that a shortage of trained mathematics teachers, inadequate teaching facilities, lack of funds to purchase necessary equipment, poor quality of textbooks, large class sizes, lack of teachers' motivation, lack of mathematics laboratories and libraries, poor coordinated supervisory activities, incessant transfer of teachers, and the negative role of public examinations in the acquisition of mathematics knowledge are among factors that affect students' interest in mathematics.

Moreover, Goolsby (2013) argued that, the qualification of a teacher is both 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 improvised materials in teaching students' mathematics concepts, principles, or ideas which their counterpart (an unqualified mathematics teacher) cannot do. This suggests that students' interest in mathematics is dependent on the qualifications of the mathematics teacher. By using the right instructional strategies when educating the students, a skilled mathematics teacher can spark their interest in the subject and guarantee their success. In any subject, a key factor affecting that subject is the effectiveness of the teachers (Akinoso, 2011).

Therefore, engaging qualified mathematics teachers who are equipped with various instructional strategies for teaching mathematics enhances students' interest in learning

mathematics. This is possible through the teacher's use of his or her instructional strategies, a well-trained mind, and skills, which invariably remove tension from the students' subject-matter learning. A proficient mathematics teacher effectively reinforces mathematical concepts, ideas, and principles using a variety of mathematics games and creative teaching resources. Through integration of the aforementioned factors in the teaching and learning processes enhances students' interest in mathematics.

Statement of the Problem

The fear of mathematics by students is persisting and has greatly affected their performance in both internal and external examinations. It also causes many students to develop a negative attitude towards mathematics that hinders the learners from focusing and concentrating during instruction. It tends to make learners nervous, especially during the time of a test or examination. As a result, students might not perform well in class. Therefore, persistent problems of students' lack of interest in mathematics have prompted the researchers to determine the perception of mathematics teachers and students on some factors affecting students' interest in mathematics and to ascertain ways of enhancing students' interest in mathematics in Gwoza local government area, Borno State. This will help in taking necessary actions towards reducing the causes of such factors in the teaching and learning of mathematics in order to have brighter future generations in the fields of mathematics, science, and technology for economic growth and national development.

Anigbo (2016) investigated factors affecting senior secondary school students' interest in mathematics. A sample of 210 Senior Secondary School one (SSI) students in five selected public schools in Enugu and Obollo Afor Education zones in Enugu State were selected. The sampling technique used was multi-stage sampling. Data collected were analyzed using the Pearson Product-Moment correlation statistic and frequency count and percentage. Results showed that the teacher factor, student factor, instructional strategy, mathematics anxiety, and infrastructural problems correlate positively with students' interest in mathematics, while class size and government factors correlate negatively with students' interest in mathematics. Nevertheless, the seven factors have significant relative effects on students' interest in mathematics.

In another study conducted by Ieren and Eraikhuemen (2017) on teachers' and students' perceptions of factors influencing the interest of students in mathematics in secondary school in Makurdi, Benue State. The population of the study was all mathematics teachers and 83,520 students and the sample for the study was 525 students and 75 teachers. Information was gathered through a survey using a questionnaire. The interest and academic achievement were investigated by the result of the quality of teachers, instructional materials, teaching methods and some other items to determine their level of interest in mathematics. Descriptive statistics were utilized to examine how various factors affected the interest and performance of the students. The study's findings showed that a variety of factors had a detrimental effect on pupils' mathematics ability. These included: lack of qualified mathematics teachers, lack of motivation, poor teaching methods and lack of interest on the part of the students or poor attitudes of students towards mathematics.

Objectives of the Study:

For the purpose of this study, the following objectives were raised:

1. To ascertain students' perceptions on factors affecting students' interest in Mathematics in public secondary schools in Gwozaocal Government Area, Borno State.

2. To ascertain teachers' perceptions on factors affecting students' interest in Mathematics in public secondary schools in Gwoza Local Government Area, Borno State.
3. To examine students' perceptions on ways by which Students' Interest in Mathematics in Public Secondary Schools in Gwoza Local Government Area, Borno State can be enhanced.
4. To examine the teachers' perceptions on ways by which Students' Interest in Mathematics in Public Secondary Schools in Gwoza Local Government Area, Borno State can be enhanced.

Research Questions

In line with the above objectives, the following research questions were raised:

1. What are students' perceptions on factors affecting students' interest in Mathematics in public secondary schools in Gwoza Local Government Area, Borno State?
2. What are teachers' perceptions on factors affecting students' interest in Mathematics in public secondary schools in Gwoza Local Government Area, Borno State?
3. What are students' perceptions on ways by which Students' Interest in Mathematics in Public Secondary Schools in Gwoza Local Government Area, Borno State can be enhanced?
4. What are teachers' perceptions on ways by which Students' Interest in Mathematics in Public Secondary Schools in Gwoza Local Government Area, Borno State can be enhanced?

Methodology

This study adopted a descriptive survey design, the population for the study were 3,544, which includes 22 mathematics teachers and 3,522 senior secondary school II (SS II) students from all the eight public senior secondary schools in Gwoza Local Government Area, Borno State. The data were analysed using simple percentage and percentage mean. From the population, a sample of 346 was selected using research advisors table 2006 which consists of 22 mathematics teachers and 324 SSII students and was proportionately spread across all the eight schools under study. The instrument used for data collection was self-developed questionnaire titled "Perception of Teachers and Students Questionnaire (PTSQ)". The questionnaire consists of two sections: Section A and B. Section A contained 10 items which were to determine the perceptions of mathematics teachers and students on the factors affecting students' interest in mathematics, and section B also contained 10 items which were to ascertain mathematics teachers' and students' perceptions on the ways of enhancing students' interest in mathematics in public secondary schools in the Gwoza Local Government area, Borno State. The responses were collected and analysed using two options; Agree and Disagree.

The instrument was validated by three (3) experts, two from the study area and one from the Department of Science and Vocational Education, Usman Danfodiyo University, Sokoto. The reliability coefficient of 0.84 was obtained after a pilot test of the item using the split-half and Spearman-Brown Prophecy Formula methods. The researchers personally visited all the schools under study and administered the instrument to the sampled population and the data was analyze using frequency count, percentages and percentage mean.

Results

Research Question One: What are students' perceptions on factors affecting students' interest in Mathematics in public secondary schools in Gwoza Local Government Area, Borno State?

Table 2

Factors Affecting Students Interest in Mathematics.

S/N	Items	Agreed	Disagreed
1	Students poor mathematical background	252(78%)	72(22%)
2	Teaching of mathematics by unqualified teachers	234(73%)	90(27%)
3	Use of corporal punishment by mathematics teachers	216(67%)	108(33%)
4	Teachers' negative attitudes towards their duty	224(69%)	100(31%)
5	Large class syndrome (above the standard)	198(62%)	126(38%)
6	Students' mathematics Anxiety	252(77%)	72(23%)
7	Truancy among students	144(44%)	180(56%)
8	Students' association with bad peer groups	144(45%)	180(55%)
9	Development of mathematics phobia by students	263(81%)	61(19%)
10	Not doing home works/assignments by students	216(67%)	108(33%)
Percentage mean (\bar{x})		66.3%	33.7%

Table 2 showed the responses of the students on the factors affecting students' interest in mathematics in public senior secondary schools. Item 1 indicated that 78% of the respondents agreed while 22% disagreed with the statement. Item 2 indicated that 73% of the respondents agreed while 27% disagreed. Item 3 indicated that 67% of the students agreed but 33% of them disagreed with the statement. For items 4, 5, 6 and 7, about 69%, 62%, 77%, and 44% agreed with the statements, while 31%, 38%, 23%, and 54% disagreed with the statements in table 2 respectively. Also, for items 8, 9 and 10, about 45%, 81%, and 67% of the students agreed with the statements as factors affecting students' interest in mathematics, while 55%, 33%, 19%, and 33% of the students' responses disagreed with the statements respectively. Generally, the total percentage mean of the respondents in Table 2 indicated 66.3% agreed and 33.7% disagreed with all the ten items as factors affecting students' interest in mathematics. Research Question Two: What are teachers' perceptions on factors affecting students' interest in Mathematics in public secondary schools in Gwoza Local Government Area, Borno State?

Table 3

Factors Affecting Students' Interest in Mathematics by the Mathematics Teachers

S/N	Items	Agreed	Disagreed
1	Students poor mathematical background	16(73%)	6(27%)
2	Teaching of mathematics by unqualified teachers	14(63%)	8(37%)
3	Use of corporal punishment by mathematics teachers	13(59%)	9(41%)
4	Teachers' negative attitudes towards their duty	14(64%)	8(36%)
5	Large class syndrome (above the standard)	15(68%)	7(32%)
6	Students' mathematics Anxiety	14(63%)	8(37%)
7	Truancy among students	19(86%)	3(14%)
8	Students' association with bad peer groups	10(45%)	12(55%)
9	Development of mathematics phobia by students	9(41%)	13(59%)
10	Not doing home works/assignments by students	13(59%)	9(41%)
Percentage mean (\bar{x})		62.1%	37.9%

Table 3 showed the responses of the mathematics teachers on the factors affecting students' interest in mathematics in public senior secondary schools. Item 1 indicated that 73%

of the respondents agreed while 27% disagreed with the statement. Item 2 indicated that 63% of the respondents agreed while 37% disagreed with the statement. Item 3 indicated that 59% of the students agreed but 41% of them disagreed with the statement. For items 4, 5, 6 and 7, about 64%, 68%, 63%, and 86% agreed with the statements, while 36%, 32%, 37%, and 14% disagreed with the statements in table 3 respectively. Also, for items 8, 9 and 10, about 45%, 41% and 59% of the mathematics teachers agreed with the statements as factors affecting students' interest in mathematics, while 55%, 59%, and 41% of the students' responses disagreed with the statements respectively. Generally, the total percentage mean of the respondents in table 3 indicated 62.1% agreed and 37.9% disagreed with all the ten items as factors affecting students' interest in mathematics.

Research Question Three: **What are students' perceptions on ways by which Students' Interest in Mathematics in Public Secondary Schools in Gwoza Local Government Area, Borno State can be enhanced?**

Table 4:

Different Ways of Enhancing Students' Interest in Mathematics.

S/N	Items	Agreed	Disagreed
1	Effective use of variety of teaching methods and strategies	263(81%)	61(19%)
2	Effective use of instructional materials	213(66%)	111(34%)
3	Proper use of reinforcement by teachers	209(65%)	115(35%)
4	Impact of Socio-economic background of parents	263(81%)	61(19%)
5	Influence of Students' learning Style in class.	191(59%)	133(41%)
6	Involving students in classroom activities	241(75%)	83(25%)
7	Good student-teacher relationship	223(69%)	101(31%)
8	Availability of learning material in schools	184(57%)	140(43%)
9	Conducive learning environment	266(82%)	58(18%)
10	Career Guidance	219(67%)	105(33%)
	Percentage mean (\bar{x})	70.2%	29.8%

Table 4 shows students' responses to different ways of enhancing students' interest in mathematics in public senior secondary schools in the study area. Item 1 indicated that 81% of the respondents agreed, while 19% disagreed. The responses in item 2 show that 66% agreed while 34% disagreed, and 65% of the respondents agreed with the item but 35% disagreed with the statement. Item 4 indicated that 81% agreed while 19% disagreed with the statement. Item 5 also shows that 59% of the respondents agreed with the statement, while 41% disagreed. Likewise, item 6 shows that 75% of the respondents agreed while 25% disagreed with the statement. Item 7 indicated that 69% of the respondents agreed with the statement; however, 31% of them disagreed with it. Items 8, 9 and 10 in table 3a indicated that 57%, 82% and 67% of the respondents agreed with the statements, while 43%, 18% and 33% of them disagreed with the statements, respectively, as ways of enhancing students' interest in mathematics in secondary schools. The percentage mean of table 4 shows that 70.2% of the respondents agreed and 29.8% disagreed with all the items. This shows that the majority of the respondents considered the items as ways of enhancing students' interest in mathematics.

Research Question Four: **What are teachers' perceptions on ways by which Students' Interest in Mathematics in Public Secondary Schools in Gwoza Local Government Area, Borno State can be enhanced?**

Table 5:

Teachers Response on Ways of Enhancing Students' Interest

S/N	Items	Agreed	Disagreed
1	Effective use of variety of teaching methods and strategies	14(63%)	8(37%)
2	Effective use of instructional materials	19(86%)	3(14%)
3	Proper use of reinforcement by teachers	17(77%)	5(23%)
4	Impact of Socio-economic background of parents	16(72%)	6(28%)
5	Influence of Students' learning Style in class	5(23%)	17(77%)
6	Involving students in classroom activities	19(86%)	3(14%)
7	Good student-teacher relationship	15(68%)	7(32%)
8	Availability of learning material in schools	14(63%)	8(37%)
9	Conducive learning environment	20(91%)	2(9%)
10	Career Guidance	14(64%)	8(36%)
	Percentage mean (\bar{x})	69.3%	30.7%

Table 5 shows mathematics teachers' responses to different ways of enhancing students' interest in mathematics in public senior secondary schools in the study area. Item 1 indicated that 63% of the respondents agreed, while 37% disagreed. The responses to item 2 show that 86% agreed while 14% disagreed, and 77% of the respondents agreed with item 3 but 23% disagreed with the statement. Item 4 indicated that 72% agreed while 28% disagreed with the statement. Item 5 also shows that 23% of the respondents agreed with the statement, while 77% disagreed. Likewise, item 6 shows that 86% of the respondents agreed while 14% disagreed with the statement. Item 7 indicated that 68% of the respondents agreed with the statement; however, 32% of them disagreed with it. Items 8, 9 and 10 in table 3a indicated that 63%, 91% and 64% of the respondents agreed with the statements, while 37%, 9% and 36% of them disagreed with the statements, respectively, as ways of enhancing students' interest in mathematics in secondary schools. The percentage mean of table 5 shows that 69.3% agreed and 30.7% disagreed with all the items. This shows that the majority of the respondents considered the items as ways of enhancing students' interest in mathematics.

Discussion

This study examined the perceptions of mathematics teachers and students on the factors affecting and enhancing students' interest in mathematics in public senior secondary schools in Gwoza Local Government Area, Borno State. The finding of research question one & two revealed that poor mathematics background of students, unqualified mathematics teachers, negative attitudes of teachers towards their duties, mathematics anxiety and phobia among students, association of students with bad peer groups, use of corporal punishment by teachers, large class syndrome, truancy by students, among others, are the major factors affecting students' interest in mathematics. As revealed by the percentage mean of students' and teachers' responses in tables 2 and 3, 66.3% agreed, 33.7% disagreed, and 62.1% agreed, 37.9% disagreed, respectively. This is in agreement with the findings of Anigbo (2016), who investigated factors affecting Senior Secondary School students' interest in mathematics and found that the teacher factor, student factor, instructional strategy, mathematics anxiety, and infrastructural problems correlate positively with the students' interest in mathematics, while class size and government factors correlate negatively with the students' interest in mathematics. This is also in agreement with the findings of Ieren and Eraikhuemen (2017),

which revealed lack of qualified mathematics teachers, a lack of motivation, poor teaching methods and instructional materials employed by the mathematics teachers, and a lack of interest on the part of the students or poor attitudes of students towards mathematics.

The finding of the research question three & four also revealed that the possible ways of enhancing students' interest in mathematics in secondary schools are the effective use of various teaching methods and strategies by mathematics teachers, the effective use of instructional materials in class, proper use of reinforcement, socio-economic background of parents, regular involvement of students in class activities, proper consideration of students' learning styles by teachers, and proper career guidance by mathematics teachers, creating a conducive learning environment, good teacher-student relationship, and availability of learning materials in schools. As revealed by the percentage mean of students' and teachers' responses in tables 4 and 5, 70.2% agreed, 29.8% disagreed, and 69.3% agreed, 30.7% disagreed, respectively. This finding is in agreement with the outcome of the work of Owora and Chika, (2019) they looked into the strategies for arousing students' interest in mathematics which revealed that among the strategies for enhancing students' interest in mathematics are appropriate use of instructional materials, good teacher/student relationship, parent's effort and motivations, awareness of career opportunities, teachers' personality, rewards and proper assessment method.

Conclusion

Today, mathematics has become the most essential aspect of national development. The emphasis should be placed on the need to equip students with vast knowledge of the subject as a tool for national and technological development. This study laid an emphasis on the perception of mathematics teachers and students on the factors affecting and enhancing students' interest in mathematics in public senior secondary schools. Based on the findings of this study, if all the aspects identified as the factors responsible for students' interest in mathematics are fully taken into consideration, such will drastically reduce the ecliptic menace of students' lack of interest in mathematics in schools especially at secondary school level as they prepared towards writing senior school certificate examinations (SSCE). Thus, such would allow them to be massively enrolled in schools and to University level, without much discrimination about the subject (Mathematics). It is therefore important for teachers and stakeholders to device all modalities that would motivate students in developing interest in learning mathematics.

Recommendations

Based on the findings of this study, it is necessary to make the following recommendations:

1. Workshops and seminars should be organized for mathematics teachers so that they can develop more experience towards their duties. In addition, school guidance and counselling officers should double their efforts in giving advice to students to reduce anxiety and phobia towards mathematics.
2. Mathematics teachers should also employ the use of instructional materials (improvised and non-improvised) properly in their daily teaching processes. In addition, government and non-governmental organizations should provide adequate teaching materials to attract learners to study mathematics. Teachers should also use positive rewards and reinforcement in class and should allow students to actively participate in classroom activities.

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