

**STUDENTS' ATTITUDES TOWARDS POST ORDINARY
LEVEL SECONDARY MATHEMATICS IN TABORA,
TANZANIA**

Neema Kainda*

Patrick A. Ndunguru*

Stelyus L. Mkoma**

Abstract:

Students' attitude towards mathematics has been a factor known to influence students' achievement in mathematics. The purpose of this study was to find out the students attitude towards mathematics at three selected secondary schools in Tabora Municipality, Tanzania. A questionnaire was administered to students and asked about their anxiety, confidence and enjoyment in mathematics. The results showed that males were more anxious compared to females whereas females' confidence in their ability and enjoyment tends to match with that of males'. This study recommend establishment of single-sex boarding schools as they provide courageous environment and bring positive attitude towards learning behaviour including in mathematics.

Keywords: Secondary students, Participation, Attitude, Mathematics, Gender

* Department of Education, Faculty of Science, Sokoine University of Agriculture, Chuo Kikuu, Morogoro, Tanzania.

** Department of Physical Sciences, Faculty of Science, Sokoine University of Agriculture, Chuo Kikuu, Morogoro, Tanzania.

1. Introduction:

Students' attitudes toward mathematics, learning mathematics and their implications for mathematics instruction have long been a common interest among mathematics educators. Attitude towards mathematics has been considered an important factor in influencing participation and success in mathematics (Manoah et al., 2011). Attitudes involve an engagement or avoidance aspect; hence positive attitudes toward mathematics facilitate students' learning of the subject, while negative attitudes hinder students' learning of mathematics (Durrani and Tariq, 2009). Students performing better in mathematics tend to hold positive attitudes toward the subject and feel confident in mathematics hence are likely to opt mathematics in advanced levels and tertiary education better (Tapia, 2004). Students enjoy mathematics class and reduce anxiety as they become more familiar with the instructional strategies and recognize the value of mathematics for job skills and personal business (Curtis, 2006).

In Tanzania, secondary schools students have poor performance in mathematics. The national form four examination results for 2004, 2005 and 2006 showed 70%, 77% and 76%, respectively of failing students in mathematics (NAOTA, 2008). The performance of girls students is poor compared to boys (Masanja, 2008); similar to what is reported by Female Education in Mathematics and Science in Africa (FEMSA) (O'Connor, 2000). Therefore efforts have been taken by various countries to improve teaching and learning of mathematics in Tanzania including formation of Mathematical Association of Tanzania (MAT) in 1945 and 1920. Few studies have been carried out on attitude of students towards mathematics and performance (Masanja, 2002; Olatunde, 2009, Kipronoh, 2011; Nyala, 2011). However, to date the performance of mathematics in Tanzania is poor (Best, 2010; NECTA, 2011). This study was therefore performed to assessing student's attitudes toward mathematics as a subject choice for their post ordinary level in secondary schools in Tabora urban district, Tanzania. The study attempted to assess which attitudinal variables towards mathematics by gender.

2. Materials and Methods:

The study was carried out at Tabora municipality in Tabora region located in Mid-Western part of Tanzania on the central plateau between latitude 4° - 7° S and longitude 31° - 34° E (Maganga, 2011). A structured questionnaire with closed and open questions was used to gather data and

were administered to and completed by 43 mathematics students. Students in Form IV (ordinary level education) choose the subjects they wish to study in high school (advanced level education) and here is where the lack of students participating in mathematics becomes evident. Students taking mathematics as one of their major subjects in advanced level studies from Tabora boys', Tabora girls' and Kazima high schools were surveyed in this study. These participating schools selected by a stratified random sampling frame and include a school for boys only, girls only and a co-education school. Descriptive statistics was used to analyse on students' views, perception of their confidence, enjoyment and anxiety in mathematics.

3. Results and Discussion:

3.1. Demographic characteristics

Table 1 represents the demographic characteristics of students according to their gender and comments on previous experience in mathematics. The number of students participated were 43, of which about 63% were females and 37.2% were males. Majority of students aged between 18-19 years. A large number of students (53.5%) attended classes which were over 60 students in their ordinary level education. About 56% of the students were having different teachers for mathematics each year who were mostly females (83.7%)

Table 1: Demographic characteristics and comments on previous experience in mathematics (n=43)

Characteristics	Frequency	Percentage
Gender		
Female	27	62.8
Male	16	37.2
Age		
below 18	10	23.3
18-19	31	72.1
20 and above	2	4.7
Number of students when in Form IV class		
< 40	6	14
40 and 60	14	32.6
> 60	23	53.5
Different teachers for mathematics each year in O-Level		

Characteristics	Frequency	Percentage
Yes	19	44.2
No	24	55.8
Your mathematics teachers were		
Mostly male	5	11.6
Mostly female	36	83.7
Mostly equal female and male	2	4.7

3.2. Anxiety

Both female and males students showed to feel anxious during mathematics class with slightly high percentage for males than females. Overall about 56% of the students were anxious with mathematics. Results show that 80% of boys and 42.9% of girls' students felt anxious in mathematic class. These results suggest that anxiety could be the variable which contributes to female students' negative attitudes towards mathematics.

Table 2: Percentage of students who felt anxious and non-anxiety in mathematics by gender (n = 43)

Variable	Male		Female		Total	
	Anxious	Not Anxious	Anxious	Not Anxious	Anxious	Not Anxious
Frequency	12	3	12	16	24	19
Percentage	80	20	42.9	57.1	55.8	44.2

3.3. Confidence

The results showed that students in the three secondary schools had confidence in mathematics. However, 68.8% of males and 51.9% of females classified themselves as they were good, 25% of males and 29.6% of females as average whereas 6.3% of males and 18.5% of females as poor in mathematics. Though 100% students were confident in mathematics subjects, about half of them classify themselves as they are not good in mathematics. Kipronoh (2011) reported lack confidence in mathematics for secondary schools in Bureti district in Kenya. About 81% of males agreed that boys are more confident in mathematics than females whereas 92.6% of females disagreed that males are more confident in mathematics than females. Despite these

findings showing that females saw mathematics as a less male domain subject, inferiority complex of girls, poor ideology, and differences in performance were reasons as to why males seem to be more confident compared to females.

Table 3: Students confidence and their classification in mathematics (%) by gender in different schools

Confidence in mathematics	*Tabora boys' (n=15)	*Tabora girls' (n=15)	*Kazima (n=13)	Total (n=43)	
				Female	Male
Confidence in mathematics					
Yes	100	100	100	100	100
No	-	-	-	-	-
Classification in mathematics					
Very good/good	66.7	66.7	38.5	68.8	51.9
Average	26.7	13.3	46.2	25	29.6
Poor/very poor	6.7	20	15.4	6.3	18.5
Boys more confidence in mathematics than girls					
Yes	80	6.7	15.4	81.3	7.4
No	20	93.3	84.6	18.8	92.6

*Secondary school

3.4. Enjoyment

The results of this variable showed that the majority of high schools students enjoyed mathematics. The overall percentages of enjoyment for student in mathematics were 100% for Tabora boys' and Tabora girls' secondary schools and 92.3% for Kazima secondary school. Females (100%) expressed that they enjoyed mathematics, in contrast to 96.3% of males. About half of the female and 7% of males' students agreed that boys enjoy more mathematics than females. The study revealed that males and females expressed similar feelings towards the subject. Though both males and females expressed enjoyment in studying mathematics, it was found that females in single-sex education school enjoyed more than females in co-education school. The suggested reasons for these results were that girls feel shy to ask questions during

mathematics class, lack of confidence, poor ideology and the tendency of girls to dislike subjects as they mostly classify it as difficult.

Table 4: Students who felt mathematics was enjoyable (%) by school and gender

Enjoyment in mathematics	*Tabora boys' (n=15)	*Tabora girls' (n=15)	*Kazima (n=13)	Total (n=43)	
				Female	Male
Enjoyable	100	100	92.3	100	96.3
Non enjoyable	-	-	7.7	-	3.7
Do boys enjoy more in mathematics than girls?					
Yes	46.7	13.3	7.7	50	7.4
No	53.3	86.7	92.3	50	92.6

*Secondary school

4. Discussion:

The results indicated that males were anxious during mathematics class compared to females which are consistent with the findings by Jones (2008) and Nyala (2011). Anxiety was the variable which contributes to students' negative attitudes towards mathematics. Females and males in single sex schools expressed more confidence in learning mathematics than those in co-education secondary school. Students in single sex education schools showed higher achievement and educational aspirations than their counterparts in co-education secondary school. Females' and males' students classified themselves as they are very good and good in mathematics. Our findings in this case are consistent with those reported by Nyala (2011) who found students in single-sex schools showed higher achievement in mathematics than in co-educational schools.

Both female and male students expressed enjoyment in studying mathematics and considered mathematics to be a male domain. But females in single-sex school showed to enjoy more in mathematics class hence more positive attitudes towards studying the subject than females in co-education. This indicates in single sex environments the students are positive in discuss the subject during class sessions. This implies that a single-sex environment is more academically friendly for female students and they would benefit better from such an environment.

5. Conclusion:

The findings from this study suggest that anxious, confidence and enjoyment are some of variables that influence students' attitudes towards mathematics. Different learning environments contribute to students' attitudes towards mathematics with single-sex schools to be more conducive for the achievement in mathematics than co-education schools. Here we suggest that when the learning environments are modified, females and males may respond equally in terms of attitude towards mathematics. The results of this study suggest students' attitudes towards mathematics are positive when exposed to good learning environment. However, we recommend encouragement and support to students from teachers and parents. Establishment of single-sex boarding schools should be encouraged as they may have positive attitude than day schools.

6. Acknowledgment:

Authors gratefully acknowledge the cooperation of the heads of schools, academic masters, mathematics teachers, and to students who willingly took part in this study. We also acknowledge special research funds granted to the first author from the Higher Education Students' Loans Board (HESLB) of Tanzania through Sokoine University of Agriculture (SUA).

References:

- Basic Education Statistics of Tanzania, BEST (2010): Regional data. Dar es Salaam. Ministry of Education and Vocational Training. Available from <http://www.moe.co.tz>
- Curtis, K.M. (2006): Improving students' attitudes: a study of mathematics curriculum innovation. PhD Dissertation. Kansas University. pp. 197.
- Durrani, N., Tariq, V. (2009): Relationships between undergraduates' mathematics anxiety and their attitudes towards developing numeracy skills and perceptions of numerical competence. Proceedings of ICERI2009 Conference. 16th-18th November 2009, Madrid, Spain.
- Jones, R.O. (2008): Students' participation in post-16 mathematics: a perspective from students in Wales. E-journal of the British Education Studies Association, 1(1): 71-78.

- Kipronoh, M.J. (2011): Attitudes towards learning and performance in mathematics among students in selected secondary schools in Bureti District, Kenya. Available from <http://hdl.handle.net/123456789/332>
- Maganga, F. (2011): Welcome to Tabora and Uyui. Available from <http://uyui.wordpress.com>
- Manoah, S.A., Chisikwa, F., Indoshi, L.O. (2011): Influence of attitude on performance of students in mathematics curriculum. *International Research Journals* 2(3): 965-981.
- Masanja, V.G. (2002): Report of the study on the causes for students' poor performance in mathematics at Jitegemee secondary school, Dar es Salaam, 2002.
- Masanja, V.G. (2008): Increasing women's participation in science mathematics and technology education and employment in Africa. Expert paper, presented in expert group meeting gender, science and technology. Paris France 28/9-1/2010.
- National Audit Office of Tanzania, NAOTA (2008): A performance audit report on schools inspection programme. Available from www.nao.go.tz
- National Examination Council of Tanzania (NECTA) (2011): Examination results, 2011.
- Nyala, J.I. (2011): Sex-differences in attitude towards mathematics of junior high school students in Ghana. Department of Mathematics Education .University of Education. Winneba. Ghana.
- O'Connor, J.P. (2000): Teachers are the problem in SMT, not girls. Female Education in Mathematics and Science in Africa (FEMSA). Nairobi. FAWE.
- Olatunde, P.Y. (2009): Students' attitude towards mathematics and academic achievement in some selected secondary schools in Southwestern Nigeria. *European Journal of Scientific Research* 36(3): 336-341.
- Tapia, M. (2004): The relationship of mathematics anxiety and gender. *Academic Exchange Quarterly*, 8(2).