

# Students' Perception and Academic Performance in Mathematics in Secondary Schools in Handeni District – Tanga, Tanzania

Rehema Sufiani Kalla, Kiggundu Zaharah Faridah, Kayindu Vincent

Kampala International University, Uganda, East Africa

DOI: <https://doi.org/10.47772/IJRISS.2023.7484>

Received: 03 April 2023; Accepted: 18 April 2023; Published: 14 May 2023

## ABSTRACT

This paper presents part of a wider study on Student's perception and performance in Mathematics in secondary schools of Hendeni District, Tanzania. Using data collected from 100 respondents, the paper reports that there is a statistical significant relationship between students' perception and their performance in Mathematics. In other words, the students who perceive Mathematics to be a hard subject are more likely to perform poorly than their counterparts who perceive it to be a simple subject. Though other factors, as per the oral informants (such as teacher-student ratio, poor school facilities, inadequate Mathematics text books and the methods of teaching Mathematics) also accounted for students' poor performance in Mathematics, their contribution was minimal. The study recommended the need for school managers and classroom teachers to build the self-esteem of students to develop a feeling that they have the capacity to perform all subjects excellently.

**Key words:** Students' perception; academic performance; Mathematics

## INTRODUCTION

Mathematics is a fundamental branch of science that represents the study of basic concepts of numbers, space and quantity as well as application of these concepts in the fields of physics and engineering. Mathematical research demonstrates the interaction between various disciplines of theoretical and applied mathematics. It also combines the concept of statistics, computational science, population genetics, operations research, cryptology, econometrics, theoretical physics, and actuarial science. Mathematics can also be applied in a broad spectrum of fields ranging from agriculture, space research, medicine, meteorology, biology and zoology.(Olatunde, 2009.), argues that, most pronounced factor that influence teaching and learning of mathematics is attitude, which as a concept is concerned with an individual's way of thinking, acting and behaving Moreover, 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.

In Latin America, Attitudes are formed as a result of some kind of learning experiences and may also be learned simply by following the examples or opinion of teachers, parents and learning situation. According to (José Antonio de la Peña, Centro de Investigación en Matemáticas (CIMAT) (co-coordinator), 2014) et al, on the report of challenges facing mathematics in Latin America and Caribbean countries, it states that Central America is in a critical time in its mathematical development. There are various national and regional activities that will improve mathematics education at all levels.

Several countries are beginning masters' programs in mathematics (applied, educational, statistics and pure) and there is a project to create a regional doctorate by Central American University Higher Council with support from Abdus Salam International Centre for Theoretical Physics also Several countries are also creating mathematical societies to coordinate efforts and link with other international organizations such as international mathematical union.

Central America is making a transition from mathematics teaching at the undergraduate to master's level, which brings along with it an interest in research.

In sub-Saharan Africa according to (Bethell, George & World Bank sources, ., 2016.) countries in sub-Saharan Africa (SSA) will need to boost performance in the Science Technology, Engineering and Mathematics (STEM) subjects if they are to realize their full potential in a competitive global market increasingly shaped by the use of new technologies. Sierra Leone as one of west African country found in Sub-Saharan Africa and also less developed country, Mathematics is seen by society as the foundation of scientific and technological knowledge that is vital in social economic development of the nation. Because of this, mathematics is a compulsory subject at both primary and secondary levels in Sierra Leone. Mathematics is also used as a basic entry requirement into any of the prestigious courses such as medicine, architecture and engineering among other degree courses. Despite the important role that mathematics plays in society, there has always been poor performance in the subject at public examinations (Gegbe, B.Sundai& Sheriff, 2015)

Tanzania as one among the East African countries, immediately after gaining political independence in 1961, proclaimed ignorance, diseases; and poverty as her scourges of development. The country has experienced high expansion of public and private secondary education since early 1990's through Structural Adjustment Program (SAPs). The rate of expansion of secondary schools was not proportional to the quality of education delivered as observed from the National Examination results. According to the Education curriculum of Tanzania, mathematics is a core subject that every student is studying at both primary and ordinary secondary education (ETP, 1995). The performance of mathematics subject are poor for many years where by many students (more than 80%) failed mathematics subject every year during form four national exams (NECTA).

In Handeni district, records culled from the performances of many form-four students revealed that a sad total of 60% obtained F mark, about 24% obtained D mark, 10% obtained C, 4% obtained B mark while just 2% obtained A mark. In point of fact, the failure of students in Mathematics subject contributed with little or no financial support from parents to offer books and tuition fees, absence of competent academic personnel, high incidence of expulsion and lack of infrastructural facilities. Some schools are not equipped with basic amenities needed to enhance children's desire to learn. Factors such as dilapidated classrooms, poor supply of electricity, inadequate water supply and lack of sanitary measures hinder many children's access to quality education. Meanwhile, these demerits are largely associated with many public schools in Handeni district because the government hardly funds them with the infrastructural equipment which can pave the way for sound education Mbuya (2016).

### Statement of the Problem

Despite the significance of mathematics as a core subject in many education systems and its interrelation with other fields of study such as physics, chemistry and geography, there has been continuous low performance of the subject by most secondary school students in many parts of the world both developed, Tanzania being inclusive (Kayindu and Asiimwe, 2020). Mbuya (2006) identified factors which lead to poor performance of mathematics subject in Tanzania as little or no financial support from parents to offer books and tuition fees, absence of competent academic personnel, high incidence of expulsion and lack of infrastructural facilities, as well as perception. These assertions were however not based on empirical studies. This study was therefore carried out to fill that gap.

## REVIEW OF THE RELATED LITERATURE

Perception is very important in all aspects of life. A good perception will create good performance, while **a negative perception will affect the individual performance.** In the school setting, the students' perception

on a subject usually depends on what they usually hear other people say about that subject. If many people usually talk negatively about a subject by lamenting how hard it is, students are more likely to perceive that subject as a hard one and the end result will be poor performance in it.

teacher student ratio, improved facilities, inadequate maths text books Several studies have concluded that classrooms as well as schools are important and that teacher and classroom variables account for more variance than school variables (scheerens & Vermeulen, 1989). Schmidt et al (1999) in their comparison of achievement across countries using Third International Mathematics and Science Study (TIMSS) data reported that classroom level differences accounted for a substantial amount of variation in several countries including Australia and the United States. Recent work on classroom and school effects has suggested that teacher effects account for a large part of variation in mathematics achievement. In the United Kingdom, a recent study of 80 schools and 170 teachers measured achievement growth over the period of an academic year, using start of year and end of year attainment data.

A number of Australian studies have also pointed to teachers having a major effect on student achievement. In a three-year longitudinal study of educational effectiveness known as the Victorian Quality Schools Project, Hill and his colleagues (Hill, 1994; Hill & Rowe, 1996; Hill et al., 1996; Rowe & Hill, 1994) examined student, class/teacher and school differences in mathematics and English achievement. Using multi-level modelling procedures to study the interrelationships between different factors at each level – student, classroom and school – the authors found in the first phase of the study that at the primary level 46 per cent of the variation in mathematics was due to differences between classrooms, while at secondary level the rate was almost 39 per cent. Further analyses showed that between-class differences were also important in examining student growth in mathematics achievement, and those differences in achievement progress located at the classroom level ranged from 45 to 57 per cent (p.w Hill, 1994) .

According to (Acharya, 2017) Student's related factor is one of the important aspects of high fail rate in mathematics plays vital role in a teaching learning process. Without student's interest in the teaching learning activities there is no possibility to achieve knowledge in subject matter. Student's achievement depends on their need, interest, practices and seriousness in subject matter. Students related factors include mathematics anxiety, prior knowledge of students and student's labor in learning mathematics. Mathematics anxiety is one of the important aspects of student's related factors in learning mathematics. Mathematics anxiety is a negative feeling to mathematics learning process. When examining student's problems in mathematics anxiety as a feeling of tension, apprehension, or fear that interfere the mathematics performance. Mathematics anxiety refers to forget and confidence in subject matter. It affects the students' mathematics learning process.

A study conducted by (Dr. Krishna Gopal Singha, Mrinmoy Goswami & Ranju Kr. Bharali, 2012) on various problems faced by the students and teachers in learning and teaching mathematics and their suggestive measures showed that many students. They are unable to understand the basic concepts of Mathematics and their technique due to various reasons. The problems that occur in the process of learning mathematics are relatively less in case of other subjects. Hence, for a common student mathematics becomes a tougher subject and consequently, they try to avoid it. Problems related to mathematics occur not only in case of students but also in case of teachers. It is seen that most of the mathematics teachers are not aware of alternative simple methods of teaching mathematics and different skills of solving the same problem.

Parents' support is one of the important aspects of parent's factors in studying mathematics. Parents who play a supportive role to their children learning and it is helpful for improvement of students' achievement and shaping the behavior of the students, Parents' support can play a vital role at all stages of education. Parent's support for their children's learning can make good achievement in education. School can benefit from positive partnership with parents by involving decision making process which affects students pass in

mathematics (Acharya, 2017).

According to (Ndalane, 2004), there is a very strong link between parents and school activities. The parents have a right to complain if they are not happy with the teacher. Disciplinary problems at school are reduced because at home, the learners are told what is wrong and what is right. The parents play an important role in the selection and the choice of subjects by their children. From the findings done by (Ndalane, 2004) It appears from the interviews that parents, particularly in townships, attend parent school meetings. In another study by the Department of Education (2000b), it was found that parent involvement in school matters contributes to the success of schools.

According to Middleton (1979) Study habit of students may be relevant to the prediction of grades in mathematics because it is possible that student's grade may be related to their study habits. That is, students with poor study habits may obtain lower grades on their examination than students with better study habits as the tool used to measure academic performance, in other side, study skills and learning approaches include, for example time management, using information resources, taking class note, communicating with teachers, preparing for and taking examination, and several other learning strategies also have high contribution in academic performance.

## METHODOLOGY

This study used descriptive correlation survey design to collect qualitative and quantitative data. The study was carried out in seven secondary schools among the students of Form Four. A total of 300 students provide quantitative data through filling a questionnaire, while four teachers provided qualitative data through oral interviews. Pearson's correlational coefficient Version 16 was used to analyze the influence of students' perception of Mathematics on their performance in it.

## FINDINGS AND DISCUSSION

On this research objective, it was found out that there is a statistical significant influence of students' perception of Mathematics and their performance in it as shown by the sig value of which is lower than the 0.05significance level which is usually used in Social Sciences.

The correlation was made by basing on students' national examination results for three consecutive years, 2019, 2020 and 2021 (table 1), students' self-report on their perception of the Mathematics subject (Table 2), as well as the table of correlation (Table 3).

The students' academic performance in Mathematics in Secondary Schools in Handeni District – Tanga, Tanzania is poor. This was interpreted as follows.

Grade	Interpretation
A-B	very good performance
C-	Good performance
D	Fair performance
E	Poor performance
F	Very poor performance

The students' performance in Mathematics in secondary schools of Handeni District – Tanga, Tanzania was assessed based on the national examinations results of the year 2019, 2020 and 2021. Those who scored A and B were perceived to have performed very well, hence very good performance; those who scored C were

perceived to have performed well, hence good performance; those who scored D were perceived to have performed fairly; those who scored E were perceived to have performed poorly; while those who scored F were perceived to have performed very poorly.

The performance of the learners is shown in table 1.

**Table 1: Percentage summary of Academic Performance in Mathematics in Secondary Schools in Handeni District – Tanga, Tanzania**

Grade	2019		2020		2021	
	N	%	N	%	N	%
A	20	6.67	18	6	11	3.67
B	39	13	24	8	15	5
C	63	21	52	17.33	50	16.67
D	87	29	82	27.33	78	26
E	60	20	91	30.33	87	29
F	39	13	53	17.67	49	16.33
<b>Total</b>	<b>300</b>	<b>100</b>	<b>300</b>	<b>100</b>	<b>300</b>	<b>100</b>

Source: Field Data (2023) from the National examination reports

Key: N – Number of candidates %- percentage of the total candidates in seven schools, Handeni District – Tanga, Tanzania that particular year

**Table 2: Students’ perception of Mathematics**

Item	N	%
I perceive Mathematics as a very easy subject	21	7
I perceive Mathematics as an easy subject	26	8.67
I perceive Mathematics as a Hard subject	104	34.67
I perceive Mathematics as a very hard subject	150	50
<b>Total</b>	<b>300</b>	<b>100</b>

Source: Primary data, 2023.

Table 2 shows that the majority of the students (50%) perceive Mathematics as a very hard subject, followed by 34.67% of the students who perceive it as a hard subject. Very few students consider it an easy subject (8.67%) or very easy subject (7%).

**Table 3: showing the influence of students’ perception on their performance in Mathematics in secondary schools of Handeni District – Tanga, Tanzania**

Variables correlated	r-value	Sig	Interpretation
Students’ perception of Mathematics Vs Students’ performance in Mathematics	.157	.048	significant influence

Source: Field Data (2023)



Table 3 reveals that the influence of students' perception of Mathematics on their performance in it is statistically significant. Indeed, this is supported by what is shown in table 2 whereby the majority of students perceive Mathematics as a very hard subject. This may account for their poor performance in the subject. For example, based on table 1, the majority of the students performed poorly, eg in the year 2021, majority of the students (29%) scored Grade E, followed by 26% of the students who scored Grade D. a relatively large number of students (16.33%) failed (scored Grade F. The same trend of events was realized in the year 2020 when the majority (30.33%) of the candidates scored E. followed by those who scored D (27.33%). Similarly, a relatively large number of students (17.67% ) failed with Grade F. In the earlier year of 2019, majority of the candidates (297%) tried and scored Grade D, followed by those who scored Grade C (21%). At least in 2019 students performed better than in 2020 and 2021.

Very few students (3.67%) scored Grade A in the year 2019 and those who scored A in 2020 were (6%). In 2019, those who scored Grade A were (6.6%). This is an indicator that the very few students who perceive Mathematics as a very simple subject as shown in table 2 are influenced to develop a strong self efficacy and hence perform very well in Mathematics (as table 1 shows).

Actually, the quantitative finding of this study was supported by qualitative data whereby the teachers stressed that there is no dull student; it is the individual perception of a subject which causes him/her to perform in a certain way. During oral interviews with teachers, they said that despite being a rural area, the students in the secondary schools of Handeni District are trying. One teacher said, "Honestly, there is a general perception among many people including parents who went to school, that Mathematics is a very hard subject. By mere seeing a Mathematical calculation, their faces grow dark. Many of such people's instill that in their children, so the children come to school when they already have a negative attitude towards Mathematics. As a consequence, the learners fail the subject". This shows that what we hear from others have a strong influence on our perceptions and our perceptions influence the way we perform tasks.

## Discussion

The results of the study unearthed that perceptions have a strong influence on performance. Learners' perceptions are usually developed through what they usually hear people say, teachers' relations with students, as well as the way teachers teach particular subjects. This builds or ruins their self-efficacy and finally influences academic performance. Self-efficacy beliefs have an influence on students' motivation to learn. Students with a weak self-efficacy belief are less willing to learn, cannot concentrate on Instructional tasks properly, do not want to confront difficulties or do not make efforts to overcome these difficulties (Bandura, 1993). Students' self-efficacy beliefs for learning could be improved as long as one has a clear idea about the sources of their self-efficacy beliefs and to what extent these sources influence their self-efficacy beliefs. Primary school students are at the very beginning of the process of education. Therefore, as long as they are provided with the opportunity and training to have high self-efficacy beliefs, they can be enabled to grow up to be self-efficient individuals that can overcome the problems they face in a successful way at the other educational stages or in their future life. Bandura (1997) argued that students' self-efficacy beliefs are formed in accordance with the information they obtain from four sources, namely performance accomplishments (enactive mastery experiences), vicarious experiences, verbal (social) persuasion and psychological states. Performance accomplishments refer to the consequences of students' performances in learning environments. Their successful experiences enable them to have positive self-efficacy beliefs while their unsuccessful experiences, not surprisingly, cause them to have negative self-efficacy beliefs (As cited in Arslan, 2012).

The findings of the current study are related to the study carried in Uganda and revealed that just as the saying goes that work without play made John a dull boy, even schools use extracurricular activities in their schools, such as games and sports as a way of motivating learners to love schooling. As they develop love for schooling, chances are high that they also develop the feeling that they can perform well in several

subjects; they develop a perception that all subjects are capable of being done/performed well (Kayindu and Asimwe, 2020). These findings however differ from the assertion of Kayindu (2017) who claimed that in the contemporary society, many youths perceive certain things to be easy, such as getting rich and such perception causes them to relax planning for their acquired money/wealth, working hard and some of them spend the money on womanizing and over drinking thinking that getting rich is automatic, which actually is not the case. In the same way, perceiving a subject to be easy can cause one to relax and hence take it for granted that he/she cannot fail it even if he/she does not struggle much, an unfortunate scenario which usually breeds failure. Related views are held by Krishna, Mrinmoy. Ranju and Barali (2012) and Aremu (2003).

Therefore, the findings of the current study have implications for practice, for instance, school managers and classroom teachers, as well as the parents need to build the self efficacy of the students so that they can believe in themselves as capable people. They must also cause these children to attend school and classes regularly and study hard. If this is done, learners' performance in Mathematics will improve.

## REFERENCES

1. Acharya, B. R. (2017). Factors Affecting Difficulties in Learning Mathematics by Mathematics Learners. Nepal: International Journal of Elementary Education.
2. Arslan, A. (2012). Predictive Power of the Sources of Primary School Students' Self-Efficacy Beliefs on Their Self-Efficacy Beliefs for Learning and Performance. *Educational Sciences: Theory & Practice* – 12(3).
3. Aremu, A. &. (2003). Causal evaluation of Academic performance of Nigerian learners. Nigeria: macmillan nigeria ltd
4. Best, J. W., and Kahn, J. (2006). *Research in Education*. Upper Saddle River: Prentice Hall, Inc.
5. Chave, F., and Nachimias, D. (1996), *Research Methods in the Social Sciences*, 5th Edition. New York: St Martin Press.
6. Creswell, J. W (2009). *Research Design, Qualitative, Quantitative and Mixed Approach* (3rd ed) Development, *Journal of the Faculty of Education*, No. 17: University of Dar-es-salaam.
7. Fraenkel and Wallen (2003), *Research practice and instrumentation*.
8. Gaxahi (1993), *Research instruments and their validity*.
9. Gegbe, B. Sundai. A and Sheriff .V. K. ( 2015). Factors Contributing to Students Poor Performance in Mathematics at West African Senior School Certification Examination (A Case Study: Kenema City,. sierra Leone: *International Journal of Engineering Research and General Science* Volume 3, Issue 2,.
10. Hersh, R. (1997). *what is mathematics, really* New york: oxford university press.
11. *International Journal of Research and Innovation in Social Science (IJRISS) |Volume IV, Issue I, January 2020|ISSN 2454-6186 www.rsisinternational.org Page 220*
12. Kayindu , V. and Asimwe, S. (2020). Extra-Curricular Activities as Predictors of Primary School Pupils? Academic Self-Efficacy in Kira Municipality, Wakiso District, Uganda. *International Journal of Research and Innovation in Social Science (IJRISS) |Volume IV, Issue I*.
13. Kayindu, V. (2017). *Religious and social perspectives of contemporary ethical issues: Implications to the educationists*. Amazon Publishers.
14. Krishna, G, S & Mrinmoy. G & Ranju Kr, Barali, (2012). Factors associated with poor performance of learners in mathematics and physical science in secondary schools in India schools.
15. Ndjalane, T. (2004). *The culture of teaching and learning in Japanese schools*. Paper presented 12th Annual Conference of the Southern African Association for Research in Mathematics, at the Science and Technology Education. Cape Town. South Africa.
16. Olatunde, P. (2009.). *Students Attitude Towards Mathematics and Academic Achievement in Some Selected Secondary Schools in Southwestern Nigeria. bauchi state, Ngeria: Science and Education Publishing*.