ISSN: 2581-8651
Vol-5, Issue-6, Nov-Dec 2023
https://dx.doi.org/10.22161/jhed.5.6.7
Peer-Reviewed Journal

Journal of Humanities and Education Development (JHED)

Teachers Attitudes towards Pupils' Learning Mathematics Subject in Public Primary Schools in Misungwi District, Mwanza, Tanzania

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Received: 01 Oct 2023; Received in revised form: 03 Nov 2023; Accepted: 14 Nov 2023

Abstract

Mathematics plays a crucial role globally due to its significance in paving the way for the fields of science and technology. The study aimed to investigate teachers' attitudes towards pupils' Mathematics learning; and strategies that can be employed to enhance pupils' positive perceptions of Mathematics in the learning process. The study conducted in Misungwi District in Mwanza Region, focusing on public primary schools. The study was guided by social learning theory and employed a convergent parallel research design. A total of 210 respondents took part in the study, including 168 pupils, 28 teachers, and 14 head teachers. The study used questionnaires and interview guides. Data obtained from the study were analysed using the Statistical Package for Social Sciences (SPSS) version 20 for quantitative data, while qualitative data were coded, categorised, and analysed using thematic analysis. The study's findings revealed that majority of Mathematics teachers exhibited negative attitudes towards pupils, which contributed to the pupils' negative perceptions of Mathematics learning. The study recommends that fostering positive teacher attitudes to promote a favorable environment for learning Mathematics and highlights a range of strategies that can be implemented to improve pupils' positive perceptions of learning the Mathematics subject in public primary schools within Misungwi District.

Keywords*— *Academic, Education, Perception, Performance, Science

I. INTRODUCTION

Mathematics plays a crucial role globally due to its significance in facilitating the learning of science subjects, paving the way for the fields of science and technology. Poor performance in Mathematics is a significant issue currently plaguing the educational system. The problem of subpar Mathematics performance has far-reaching consequences, particularly in terms of pupils' career choices. In today's world, many careers demand a solid foundation in Mathematics. Adam (2003) argued, through research, that excelling in Mathematics requires a genuine interest in pursuing a career in this field. Moreover, poor performance in Mathematics may have implications for students' attitudes. This concern has prompted numerous researchers to investigate the perceptions of pupils regarding the Mathematics subject. In a study conducted in 2014 by Mutodi and Ngirande on South African pupils' perceptions of their mathematical achievements, it was found that perceptions about Mathematics are influenced by prior experiences and encompass both cognitive and affective components.

Mathematics plays a crucial role globally due to its significance in facilitating the learning of science subjects, paving the way for the fields of science and technology. As emphasized by Mazana *et al*., (2020), citing Maliki, Ngban and Ibu (2009), "science and technology have become central to world culture, and the significance of Mathematics in education should not be underestimated for any nation aspiring to remain competitive" (p. 2). However, the performance in Mathematics remains lower in primary schools, with some pupils opting not to pursue it when given the opportunity. Hagan *et al*., (2020) found that many students in Greece exhibited a negative perception of Mathematics, indicating a lack of interest in the subject. Pupils' perceptions of Mathematics matter in the USA because they can significantly impact their motivation and level of engagement in the subject, ultimately affecting their learning and performance

(Middleton *et al*., 2017). Pupils' perceptions are closely related to their attitudes. The way pupils interpret the subject leads to their attitudes toward it, and this, in turn, influences how teachers perceive individual students in relation to Mathematics. As Setapa *et al*., (2016) noted, "Teachers often assert in the classroom that a student's performance in Mathematics is linked to a negative attitude or laziness. Attitudes once formed, tend to be enduring and challenging to change" (p. 28). A student's attitude towards a particular subject significantly affects their performance. A positive attitude can enhance a student's learning experience (Kanafiah & Jumsdi, 2013; Setapa *et al*., 2016).

Each student brings a unique life story to their study of Mathematics, and these individual backgrounds influence their perceptions. These personal histories impact students' behavior in the classroom, their interactions with peers and teachers during mathematics classes, and their interpretation of their mathematical experiences (Mutodi & Ngirande, 2014). Mutodi and Ngirande further suggest that while students have unique backgrounds, there are also shared contextual elements within the same class. These factors include the instructor's demeanor, the quality of teaching and learning resources, and students' interests in Mathematics, their confidence levels, and their overall mastery of the subject. These common experiences in the classroom form the basis of shared experiences, affecting every student in the class. Moreover, these shared classroom experiences influence each student's individual experiences (p. 432). In Africa, according to research, more emphasis is placed on Mathematics than any other subject in the majority of countries. However, the Third Trends in Mathematics and Science Study (TIMSS) from 2004 (Hagan et al. 2020) indicates that academic performance in the subject has been low in Ghana and other parts of the continent. According to the findings of Hagan et al. (2020), "a crucial aspect of Mathematics subject is the way that students view the subject matter being taught and learned. Students' perceptions of Mathematics are strongly correlated with their learning outcomes.

In Tanzania, every student is required to study Mathematics as a core subject from primary education, as mandated by the Education and Training Policy (ETP) of 1995. However, similar to many other countries, Mathematics is not well-studied and performed in primary school final examinations, despite the fact that the majority of learners now study it as a compulsory subject. According to Mazana *et al*. (2020), Mathematics holds a significant weight in the curriculum and educational policies. Their study in Tanzania on students' Mathematics performance data and teachers' perceptions regarding the reasons behind students' poor academic performance in Mathematics reveals that many students struggle to comprehend Mathematics. This struggle is evident in their poor performance on final examinations.

Citing Bethell (2016), Mazana *et al*. (2020) comment that "Students' performance in Mathematics is consistently ranked far below the international average in Tanzania, as it is in many other sub-Saharan African (SSA) countries, thereby jeopardizing the country's economic competitiveness" (p.1). Researchers have attributed this pattern of poor Mathematics performance to several factors, including the absence of competent teachers, a shortage of qualified teachers for the subject in schools, insufficient teaching and learning resources such as books and teaching aids, teacher motivation issues, attitudes toward students and Mathematics, the use of ineffective pedagogical techniques, emotions in the classroom, and inadequate preparation for the curriculum and exams (Mazana *et al*., 2020).

II. LITERATURE REVIEW

Research suggests that teachers' attitudes in the classroom significantly influence their behaviors, and teachers with positive attitudes tend to create a supportive environment that addresses pupils' needs. Jarrah and Almarashdi (2019) findings indicated that teachers generally held positive perceptions regarding their competency to teach gifted students, while they predominantly held negative perceptions regarding the effectiveness of gifted programs. The study by Jarrah and Almarashdi (2019) emphasizes that teachers' negative attitudes can impact pupils, potentially causing them to lose motivation for better performance. Teachers often tend to influence their students with attitudes similar to their own. Therefore, if a teacher's attitude is negative or unfavorable to pupils, it may be transferred to the pupils, potentially affecting the effectiveness of educational programs. This aligns with Atnafu's (2014) study conducted in Addis Ababa, Ethiopia, which highlights the importance of teachers' attitudes toward the teaching profession. Atnafu (2014) asserts that "the attitude of teachers toward the teaching profession is crucial for teachers' performance and their students" (p. 61). The study indicates that teachers' attitudes toward teaching significantly affect students' learning, emphasizing the need for teachers to develop positive attitudes to enhance students' learning experiences.

Another study conducted by Okyere et al. (2019) revealed a significant relationship between teacher attitudes and pupil attitudes toward Mathematics. The study results demonstrated that teachers' positive attitudes fostered pupils' confidence, leading to the development of positive

attitudes toward learning Mathematics. These findings align with a study by Sanchal and Sharma (2017) who suggested that critical factors contributing to students' attitudes toward learning Mathematics include the school environment, teachers' beliefs and attitudes, teaching methods, and the students themselves. Th`is implies that if teachers hold negative beliefs and attitudes, pupils may also develop negative attitudes toward learning Mathematics. In contrast, when teachers maintain a positive attitude toward pupils' learning of Mathematics, pupils receive support and encouragement that motivates them to invest more effort in their studies. Good teaching leads to learning that results in the achievement of learning goals. Good teaching includes the use of learner–centered approach which allows the active participation of learners in the lesson. The learner-centered approach to teaching creates a learning environment suitable to learning and "promotes the highest levels of motivation, learning, and achievement for all learners" (Kurniati and Surya, 2017 p. 93).

Mathematics is widely recognized as the gateway to science and technology, playing a pivotal role in the economic development of any nation (Mazana et al., 2020). However, a significant portion of students in primary have consistently demonstrated poor performance in this subject on national examinations (Mazana et al., 2020). Despite numerous government initiatives in Tanzania aimed at enhancing the quality of Mathematics education, such as the Primary Education Development Program (PEDP) encompassing both PEDP I (2004) and PEDP II (2010), as well as curriculum updates to include teacher guides for competence-based teaching (URT, 2010), the academic performance of Tanzanian pupils remains unsatisfactory. In light of these concerning the study aimed to explore teachers' attitudes towards pupils' learning mathematics subject in public primary basing.

III. RESEARCH METHODOLOGY

The study was conducted in Misungwi District, one of the districts in the Mwanza region of Tanzania. The study applied a Convergent Parallel Research Design which involved conducting both quantitative and qualitative components simultaneously in the same phase, giving equal weight to both methods, analyzing the two components independently, and integrating the results to interpret the overall findings. This design allowed for the collection and independent analysis of both qualitative and quantitative data concurrently. The adoption of this design was driven by its capacity to provide a holistic analysis and a more profound understanding of the research problem. Purposive Sampling and Simple Random Sampling was applied. The Statistical Package for Social Science (SPSS) version 20 software was employed to process questionnaire responses specifically quantitative data and qualitative data underwent analysis using thematic analysis.

Findings of the Study

Teachers' Attitudes towards Pupils' Learning of Mathematics

The third objective was to investigate teachers' attitudes towards pupils' learning of Mathematics in public primary schools in Misungwi District. In order to obtain information for this study, a sample of 168 public primary school pupils was asked to explain teachers' attitudes towards pupils' learning of Mathematics. They were requested to respond to the question by providing an explanation. In responding to the question, the pupil respondents indicated that teachers had a negative attitude towards pupils' learning of Mathematics due to teachers' beliefs that their pupils had low ability in Mathematics.

For example, some of the pupils wrote,

> *"Majority of Mathematics teachers have negative attitudes towards pupils because most of them prefer to use abusive language to pupils during the teaching and learning process while few of them use polite language and help pupils during the process of teaching and learning. This causes pupils to despair and develop negative perceptions of teachers and the subject itself* "(Questionnaire: August 2023).

This implies that the majority of the Mathematics teachers despise pupils and use a language not suitable for them. This causes some of the pupils to despair, develop negative perceptions towards teachers, strategies used in teaching, and the subject itself, and as a result, they perform badly in the subject. Figure 1 presents their responses:

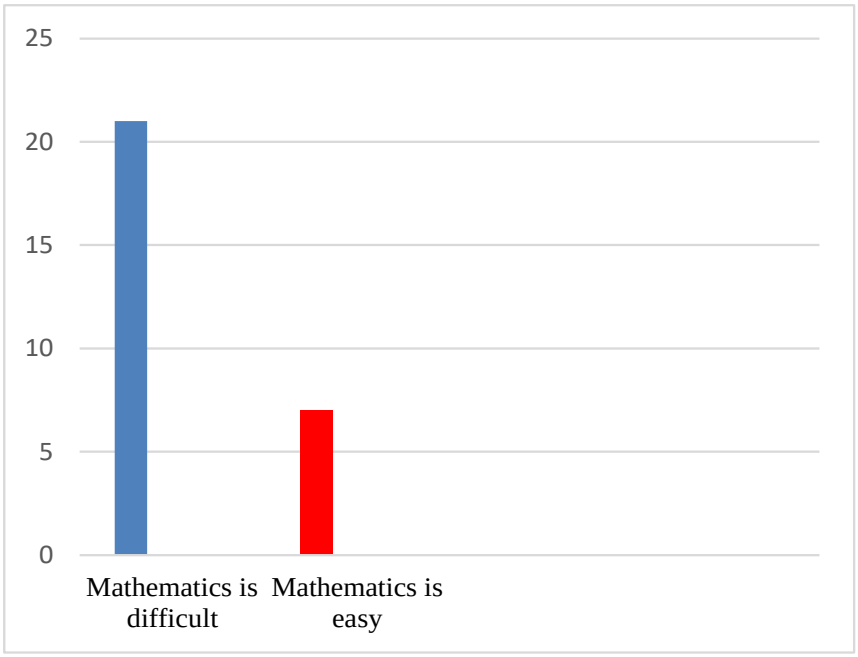

Fig.1: Teachers' Attitude towards Pupils Learning Mathematics

Source: *Field data 2023*

Moreover, through the use of open-ended questions, the findings from Figure 1.1 above show that 21 teachers (75%) said that pupils perceive Mathematics as a difficult subject. This belief makes the majority of the teachers relax in teaching Mathematics with the notion that it is a difficult subject for pupils, which is a negative perception of teachers towards pupils. Therefore, there is a need to conscientize teachers to develop a positive attitude towards pupils' learning Mathematics in primary schools.

For example, one of the teachers had the following to write:

> *"There are some of the pupils who make teachers enjoy teaching Mathematics, but the majority of the pupils cause Mathematics teachers to hate teaching that subject, and as a result, develop negative perceptions towards pupils. In fact, some of the pupils are dull; do not attract teachers to teach them or give them appropriate assistance; they dislike Mathematics"* (Questionnaire; T_1: August 2023).

The above quotation implies that teachers use the opportunity of pupils' dislike of Mathematics to develop negative perceptions towards their pupils and teach ineffectively without thorough preparations and teaching aids instead of preparing suitable strategies for teaching that attract learners, making them like the subject. This agrees with Kurniati and Surya (2017), who report that the teacher and the way of teaching are important factors that affect students, leading them to feel the need to learn and, as a consequence, affect the achievement of students in learning Mathematics, while Suntonrapot and Auyporn (2013) found that styles of students' learning and styles of teaching influence the student's cognitive, affective, and psychomotor skills, which consequently affect outcomes of learning.

Information collected from the head teacher during the interview seems to support the information which shows that heads of schools get a challenge of daily mentoring and directing teachers on how to communicate with pupils and assist them.

For example, one of the head teachers had the following to say:

> *"It is true that sometimes Mathematics teachers complain about their pupils' low ability in the subject. I must admit that some of the teachers despise pupils and treat them in a way that does not encourage pupils to like that subject. This is a challenge to most of the heads of schools because some of the teachers do not listen to*

the advice provided by head teachers" (HT_1: August 2023).

The above quotation indicates that teachers react negatively towards pupils who seem to have low ability in Mathematics. This discourages them more, leading to negative perceptions and poor performance in the subject.

Another head teacher respondent had the following to say about the same argument:

> *"Most teachers' findings suggest that teaching Mathematics is difficult because of negative perceptions from societies that fail to support the learning of their children and instead throw bad words at teachers. This causes teachers not to provide enough support to pupils, especially those who seem to be slow in the subject"* (HT_2: August 2023).

This implies that some of the teachers respond badly to parents to teachers and pupils' parents' failure to support their earning. It is not fair for teachers to behave that way towards pupils since they cause learners to hate teachers and the subjects they teach, leading to their bad performance.

The quotation above indicates that teachers contribute to the failure and dislike of Mathematics subjects because of the way they teach and respond to pupils because they believe that pupils have low ability in Mathematics. It seems that instead of encouraging pupils, teachers discourage them, causing them to develop a negative perception of teachers and their subject. This concurs with Dauda (2016) and Ampadu (2012), whose study results indicated that teachers' actions and inaction influence students' learning experiences either positively or negatively, since the majority of the participants reported that their learning experiences are to a large extent controlled by teachers. This reveals that the teacher and the teaching methodologies are important factors that affect the students' feelings of the need to learn and, as a consequence, their performance in learning Mathematics (Kurniati & Surya, 2017).

In general, the findings indicated that Mathematics teachers show a positive attitude towards a few pupils who seem to excel in Mathematics. To do this, teachers use encouraging language and provide support, which enables them to keep improving their performance in the subject. On the other hand, for the majority of the pupils who seem to be slow learners in Mathematics, teachers develop a negative attitude towards them. The negative attitude causes teachers to use discouraging language, which causes learners to hate teachers, the strategies they use in teaching the subject, and the subject itself, and as a consequence, pupils perform badly in the subject.

Strategies to Foster Positive Perceptions of Mathematics in the Learning Process

The fourth research objective was to identify the strategies that can be used to enhance pupils' positive perceptions of Mathematics in the learning process in public primary schools in Misungwi District. In order to collect data for this objective, a sample of 168 public primary schools' pupils was asked to choose one of the suggested strategies they thought could enhance pupils' learning of Mathematics. They were requested to respond to the question by putting a tick against one of the provided strategies, which are thought to enhance learning Mathematics. Table 1 presents their responses:

Table 1: Pupils' Responses on the Strategy Enhancing Learning of Mathematics Subject

Strategy	Frequency	Percentage
Provision of regular tests	9	5.4
Remedial classes	10	6.0
Use of learning aids like real things in teaching	57	33.9
Provision of more assignments	44	26.2
Provision of group work activities	48	28.5
Total	168	100.0

Source: *Field data 2023*

In order to enhance pupils' positive perceptions of Mathematics in the learning process, some strategies need to be carried out. The study findings from Table 1 above show that 57 pupils (33.9%) suggested the use of learning aids like real things in teaching and learning; 48 pupils (28.5%) mentioned the provision of group work activities; and 44 pupils (26.2%) suggested the provision of more assignments as strategies for enhancing pupils' positive perceptions of Mathematics in the learning process. Others, 10 pupils (6.0), suggested remedial classes, and 9 pupils (5.4%) of the pupil respondents suggested the provision of regular tests as a strategy that can enhance pupils' positive perception of Mathematics in the learning process. This implies that the majority of the pupil respondents mentioned the use of learning aids like real things in teaching and learning, the provision of group work activities, and the provision of more assignments as strategies that can enhance pupils' positive perception of

Mathematics in the learning process. In another language, we can say that pupil respondents suggested the use of learner-centred approaches as strategies for enhancing pupils' positive perception of Mathematics in the learning process.

In addition, a sample of 28 public primary school teachers was asked to choose one strategy they thought could enhance their learning of Mathematics. They were requested to respond to the question by putting a tick against one of the provided strategies that enhances learning Mathematics. Table 2 presents their responses:

Table 2: Teachers' Responses on the Strategy used to Enhance Learning of Mathematics

Strategy	Frequency	Percentage
Regular counselling to change pupils' -ve attitudes	9	32.1
Regular tests	3	10.7
Group work activities	4	14.3
Motivations to teachers and pupils	4	14.3
Learning aids in teaching and learning	8	28.6
Total	28	100.0

Source: *Field data 2023*

Table 2 shows that teachers 9(32.1%) accepted the use of regular counselling to change pupils' negative attitudes; teachers 8(28.6%) suggested the use of learning aids in teaching and learning; and teachers 4(14.3%) accepted that promoting group work activities enhances pupils' learning of Mathematics. Again, teachers 4(14.3%) accepted the provision of motivation to teachers and pupils, and teachers 3(10.7%) pointed out that the provision of regular tests is a strategy that can enhance pupils' learning of Mathematics. This implies that the strategies that can be used to enhance pupils' learning of Mathematics, as pointed out by teacher respondents, are the use of counselling to change pupils' negative attitudes towards Mathematics, the use of learning aids like images and real things in teaching and learning Mathematics, promoting group work, and providing motivation to teachers and pupils. If used correctly, these strategies can enhance pupils' attitudes towards learning Mathematics.

The data collected from head teacher respondents throughout the interview appears to support the data provided above. Information from interviews indicates that pupils should be provided with counselling, specifically those with a negative attitude towards Mathematics and other slow learners, the use of teaching aids during teaching and learning, and the provision of motivation to both teachers and pupils.

For instance, one of the head teacher respondents had the following to say:

> *"Having enough teaching and learning materials improves the teaching of Mathematics because it helps the pupils remember concepts through practical learning. Teachers should also establish subject clubs in order to build pupils mastery of Mathematics through working together with others. These can improve the teaching and learning of Mathematics subjects"* (HT_3: August 2023).

This implies that teachers should use teaching materials and aids like visuals, pictures, and real things and establish subject clubs, which deny learners the opportunity to learn by themselves in groups. These can change pupils' negative perceptions of Mathematics and thus help them to like the subject.

Additionally, another respondent expressed the following views:

> *"Teachers should consider all pupils as equal and, therefore, put aside their negative attitude towards some of the pupils so that they can provide suitable assistance to them all. Again, in teaching, teachers should apply learner-centred approaches accompanied by teaching materials and aids in order to attract the active participation of learners in the lesson. These can enhance pupils' positive perception of Mathematics in learning process"* (HT_4: August 2023).

The quotation above implies that teachers should first establish a good relationship with pupils, respond to them using polite language, and show them love. After that, when teaching, teachers should use learner-centred approaches in order to give pupils the opportunity to participate actively in the lesson. The learner-centred approach applied in teaching and learning processes should be accompanied by teaching resources and aids in order to attract the attention of pupils in the teaching and learning process. This concurs with Elçi's (2017, p. 100),

who comments that "Mathematics teachers' instructional approaches, roles, teaching methods, and attitudes towards Mathematics take an important role in this misunderstanding." In addition to that, Kurniati and Surya (2017, p. 93) reveal that good teaching leads to learning that results in the achievement of learning goals. Good teaching includes the use of a learner-centred approach that allows the active participation of learners in the lesson. The learner-centred approach to teaching creates a learning environment suitable to learning and "promotes the highest levels of motivation, learning, and achievement for all learners," while Kanafiah and Jumadi (2013) report that teachers should put all their efforts into increasing the use of teaching and learning materials and teaching aids to make the learning process easier to understand.

In general, the study findings identified a number of strategies for enhancing pupils' positive perceptions of Mathematics in the learning process. These strategies include the provision of regular counselling to change pupils' negative attitudes so they can participate fully in the learning of Mathematics, the use of learner-centred methods and techniques in teaching and learning, like the provision of group work activities to enable active participation of pupils in the lesson, the use of teaching materials in the teaching and learning process in order to attract learners' participation in the lesson, and the provision of more assignments in order to make learners busy with questions to get used to answering questions.

IV. CONCLUSION

The study concludes that a significant proportion of Mathematics teachers exhibit negative attitudes towards pupils. This is reflected in their use of inappropriate language, particularly directed at pupils identified as slow learners. Few teachers adopt a more supportive and polite approach. Furthermore, most teachers hold the belief that pupils view Mathematics as a difficult subject, leading to a relaxed teaching approach. Many teachers find teaching Mathematics challenging due to societal perceptions and their struggles to convey mathematical concepts effectively. Pupils, in turn, perceive Mathematics as difficult, influenced by teachers' complex calculation methods. Several strategies can enhance pupils' positive perceptions of Mathematics. These include the use of teaching aids, increased assignments, group work activities, regular tests, remedial classes, and counseling to address negative behaviors. Teachers can further employ strategies like motivation, providing learning materials, forming subject clubs, fostering a teaching spirit, and nurturing their own enthusiasm for Mathematics. These strategies have the potential to reshape pupils' perceptions of Mathematics and improve their learning experiences.

V. RECOMMENDATIONS

The Ministry of Education, Science and Technology and the President's Office, Regional Administration, and Local Government should prioritize teacher training programs that emphasize inclusivity. In addition, policymakers, educational managers, and planners should focus on enhancing courses related to guidance and counseling. These courses should empower Mathematics teachers and other educators to provide relevant guidance and counseling to pupils, particularly in addressing their attitudes towards specific subjects and the consequences of disliking them. School head teachers should play a pivotal role as counselors for Mathematics teachers and other educators. They can foster a supportive and positive environment within schools by promoting tolerance, discouraging the use of inappropriate language, and offering assistance to pupils in their educational journey. This holistic approach can contribute to a more conducive and effective learning environment.

ACKNOWLEDGEMENTS

This work was supported by the family members. I am grateful to my Parents, Wife and Children for their untiring support. Also, I would like to thank the Vice Chancellor for Research and Technology of St. Augustine University of Tanzania for supporting this study, as well as all respondents who participated in this study during data collection.

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