

The Effect of Mathematics Teachers' Attitudes on Learners' Performance in Mathematics: A Case Study of Five Selected Secondary Schools in Kaputa District of Northern Province of Zambia

Chikachi Cheelo

Master Of Education In Mathematics Education, Dmi St Eugene University

Abstract- This study explores the impact of mathematics teachers' attitudes on learners' performance in mathematics within five secondary schools in Kaputa District, Northern Province, Zambia. Using a mixed-methods approach, data were collected from 10 teachers and 200 learners through surveys, standardized tests, interviews, and classroom observations. The findings indicate a significant positive correlation between positive teacher attitudes and improved learner performance. Key influencing factors included professional development, school environment, and teaching experience. The study underscores the importance of cultivating positive attitudes among teachers to enhance student engagement, motivation, and achievement in mathematics.

Keywords- Mathematics education, teacher attitude, learner performance, motivation, Zambia, secondary schools.

I. INTRODUCTION

Mathematics holds a unique and foundational position in the curriculum of virtually every educational system across the globe. It is universally acknowledged as a core subject that not only fosters cognitive development and logical reasoning but also equips learners with essential problem-solving and analytical skills necessary for personal and professional success. Competency in mathematics underpins scientific and technological advancement, financial literacy, and informed decision-making—skills that are increasingly vital in the 21st-century knowledge economy. Despite its critical importance, mathematics continues to be one of the most challenging subjects for learners, with persistent patterns of underachievement observed across various educational contexts, particularly in developing countries.

In Zambia, mathematics has consistently recorded low performance levels in both internal and

national examinations. Reports from the Zambia Education Management Information System (ZEMIS) and the Examinations Council of Zambia (ECZ) reveal that mathematics is among the lowest-scoring subjects at the secondary school level. This trend has raised serious concerns among educators, policymakers, and stakeholders regarding the effectiveness of teaching methodologies, learning environments, and systemic support structures. Although several factors contribute to learners' performance in mathematics—including curriculum content, assessment practices, student motivation, and socio-economic background—emerging evidence points to the pivotal role of teachers' attitudes toward the subject.

Teacher attitude refers to the beliefs, perceptions, emotions, and predispositions that educators hold regarding their subject matter and their students' abilities to learn. In mathematics education, a teacher's attitude can significantly influence their instructional choices, classroom management strategies, and interactions with learners. Teachers

who display enthusiasm, confidence, and a belief in their students' capacity to succeed tend to create positive learning environments that enhance engagement and academic performance. Conversely, negative attitudes such as anxiety, disinterest, or low expectations may hinder student motivation and exacerbate existing challenges in understanding mathematical concepts.

This study focuses on understanding how mathematics teachers' attitudes influence learners' performance in mathematics in secondary schools within Kaputa District, Northern Province of Zambia. The choice of this focus area is informed by both empirical evidence and anecdotal reports suggesting that teachers' emotional and professional dispositions play a central role in shaping learner outcomes. While significant efforts have been made to improve mathematics education through curriculum reforms and infrastructure investments, insufficient attention has been paid to the psychological and behavioral dimensions of teaching, particularly teacher attitudes.

The study aims to contribute to this under-explored area by examining the correlation between teacher attitudes and learner performance, identifying factors that influence these attitudes, and proposing practical strategies to foster positive teacher dispositions. Through this investigation, the research seeks to offer evidence-based recommendations for teacher training institutions, school administrators, and educational policymakers to better support teachers and enhance the quality of mathematics instruction. By addressing teacher attitudes as a critical variable, the study not only advances scholarly understanding but also provides actionable insights that can drive improvements in learner achievement and overall educational quality in Zambia and similar contexts.

II. LITERATURE REVIEW

The literature identifies teachers' attitudes as crucial in shaping student motivation and academic outcomes (Yara, 2009; Stronge, 2018). According to

the Theory of Planned Behavior (Ajzen, 1991), attitudes influence behavioral intentions and actions, including classroom practices. Positive attitudes marked by enthusiasm, fairness, and belief in student capability—correlate with improved student engagement and academic success (Erdoğan & Özdemir, 2013). Conversely, negative attitudes reinforce math anxiety and low performance among learners (Hernandez-Martinez & Vos, 2018).

Theoretical Framework

The Theory of Planned Behavior (TPB) provides a theoretical framework for understanding the kind of relationship which is there between mathematics teachers' attitudes and learners' performance. According to the TPB, the behavior is influenced by many factors including: attitudes, subjective norms and perceived behavioral control. (Ajzen, 1991).

Educational researchers have expended time energy trying to unravel the possible causes of students' poor attitudes and performance in Mathematics. An area that has not been explored extensively is the influence of teacher attitudes on student attitudes towards the study of the subject. Research findings indicate that effective teachers facilitate learning by truly caring about their students' engagement and creating the right atmosphere that enhances student learning (Noddings, 1995). They have high yet realistic expectations about enhancing students' capacity to think, reason, communicate, reflect upon and critique their own practice, and they provide students with opportunities to ask why the class is doing certain things and with what effect (Watson, 2002). The relationships that develop in the classroom become a resource for developing students' attitudes and Mathematical competencies and identities. These resources are very essential to the learning of Mathematics.

Attitude as a concept is concerned with an individual's way of thinking, acting and behaving. It has very serious implications for the learner, the teacher, the immediate social group with which the individual learner relates, and the entire school system. Attitudes are formed as a result of some kind of learning experiences students go through.

This is mimicry, which also has a part to play in the teaching and learning situation. In this respect, the learner draws from his teachers' disposition to form his own attitude, which may likely affect his learning outcomes (Yara 2009). He also discovered that teachers with positive attitude towards Mathematics were inclined to stimulate favourable attitudes in their pupils. This immediately puts the teacher in the spotlight as one whose attitude, expressed in their behaviour, has a telling effect on students. Teachers' attitude and beliefs play a very significant role in shaping classroom practices (Bolhuis & Voeten, 2004).

Does teacher attitude towards teaching significantly predict student attitude towards the learning of Mathematics and enhance students' achievement?

Evidence of the relationship between teacher attitude and student attitude towards Mathematics have been anecdotal hence the need to undertake this study for practical evidence. Formation of Attitude Research has shown that formation of attitude is experiential. People form attitudes through their experiences in life. Social psychology explains how attitudes are formed using three major learning theories which are classical conditioning, operant conditioning and observational learning. Propounded by Ivan Pavlov, classical conditioning is a procedure for modifying behaviour in which repeated pairing of conditioned stimulus with an unconditioned stimulus leads to the development of a conditioned response (Ntim, 2010, Linero & Hinojosa, 2012).

Classical conditioning entails neutral stimuli that naturally elicit a response. Children, for instance, become fans of football clubs of their fathers. They grow up believing that those particular football clubs are the best and develop the same passion for the clubs. Hence, we form attitudes according to how we are conditioned or how our experiences condition us. B.F. Skinner's Operant Conditioning theory is a form of learning in which a response is made in anticipation of a stimulus. In operant conditioning, reinforcement increases the likelihood that behaviour will be repeated (Ntim, 2010).

Behaviours that are followed by positive consequences are reinforced and are more likely to be repeated than are behaviours and attitudes that are followed by negative consequences (Moris & Maisto, 2001). Operant conditioning requires the use of reinforcement and punishment. A case in point is if a child's mother smiles at her anytime she picks something up for her, the child begins to realize that it is good to be helpful and she is likely to repeat the behaviour. Conversely, if a mother screams at a child for picking up a puff of a piece of cigarette, the child will grow up having an unfavourable attitude towards smoking and probably those who smoke. This is due to the negative consequence of her action.

Summary

The literature reviewed in this study highlights a strong and consistent relationship between mathematics teachers' attitudes and learners' performance. It establishes that teachers' beliefs, emotions, and behaviours significantly influence the way learners perceive and engage with mathematics. Theoretical frameworks such as the Theory of Planned Behavior (Ajzen, 1991) explain that teachers' attitudes, shaped by subjective norms and perceived control, predict their teaching behaviours, which in turn affect learner outcomes.

Research findings emphasize that positive teacher attitudes—including enthusiasm, confidence, and a belief in students' potential—foster supportive learning environments, enhance learner motivation, and improve academic achievement in mathematics (Yara, 2009; Stronge, 2018). On the other hand, negative attitudes, such as anxiety, disinterest, or low expectations, can discourage students, increase mathematics anxiety, and result in poor performance (Kahveci, 2023; Araromi & Salman, 2020).

The literature also identifies instructional quality, teacher-student relationships, and classroom climate as critical mediating factors. Teachers who demonstrate fairness, maintain high expectations, and engage in continuous professional development are more likely to inspire confidence and a positive disposition towards mathematics among learners (Prickett, 2016; Chuang, 2014).

Further, learner-related factors such as students' attitudes, gender perceptions, and early mathematics experiences are discussed, showing how these are often shaped by teacher attitudes and classroom practices (Farooq & Shah, 2008; Zan & Martino, 2007). The importance of addressing classroom conditions, school resources, and teacher well-being is also highlighted as these factors significantly influence teachers' attitudes and ultimately, learners' academic outcomes (Toropova et al., 2021; Budhathoki, 2021).

In conclusion, the literature review supports the premise that teacher attitudes are a pivotal component of effective mathematics instruction. Improving these attitudes through targeted training, supportive school environments, and ongoing professional development is essential for enhancing learner performance in mathematics.

III. METHODOLOGY

Research Design

The study employed a combination of correlational and quasi-experimental designs. This dual approach allowed for statistical analysis of relationships between teacher attitudes and student outcomes,

as well as comparative insights between different classroom settings.

Sampling

Ten mathematics teachers and 200 learners from five secondary schools were selected using purposive and cluster sampling techniques.

Data Collection

- Surveys measured teacher attitudes and student perceptions.
- Standardized tests assessed learner performance.
- Classroom observations and semi-structured interviews provided qualitative depth.
- Data Analysis
- Quantitative data were analyzed using descriptive statistics, Pearson correlation, and linear regression. Qualitative data were subjected to thematic analysis via NVivo software.

IV. RESULTS

Relationship Between Teacher Attitudes and Learner Performance

A statistically significant positive correlation ($r = 0.67$, $p < 0.01$) was found between teacher attitude scores and learner test scores. Learners with positive-attitude teachers scored an average of 68%, compared to 48% for those with negative-attitude teachers.

Table 4.1: Teacher Attitude Scores and Learner Average Performance

Teacher ID	Teacher Attitude Score (1–5)	Attitude Classification	Average Learner Score (%)
T1	4.2	Positive	71
T2	3.9	Positive	69
T3	2.8	Negative	45
T4	3.5	Neutral	55
T5	4.1	Positive	70
T6	3.0	Negative	48

T7	4.4	Positive	73
T8	2.7	Negative	44
T9	3.8	Positive	68
T10	2.9	Negative	46

Influencing Factors

Interviews identified key factors shaping teacher attitudes

Table 4.3: Factors Influencing Teacher Attitudes (n = 10 Teachers

Factor	No. of Teachers Affected	Percentage (%)
Quality of pre-service training	8	80%
Participation in CPD workshops	6	60%
Availability of teaching resources	7	70%
Administrative support	5	50%
Teaching experience >10 years	6	60%

Professional development emerges as a critical mechanism for shifting teacher perspectives and

Learner Motivation and Perception

Students described positively-disposed teachers as “supportive,” “engaging,” and “inspiring,” correlating with higher motivation and independent study habits. Those taught by negatively-disposed teachers expressed confusion, boredom, and lack of interest.

improving classroom dynamics. The presence of role models and mentorship can reinforce effective practices and combat teacher burnout (Toropova et al., 2021; Budhathoki, 2021).

V. DISCUSSION

The study confirms the central role of teacher attitudes in student learning. Echoing previous research (Pianta et al., 2012; Ross, 1992), it reveals that emotional tone, belief systems, and pedagogical engagement deeply affect academic performance. Furthermore, institutional factors such as training quality and administrative support significantly influence these attitudes.

VI. CONCLUSION

Teacher attitudes profoundly influence learners’ mathematics performance in secondary education. Positive attitudes contribute to a motivational and cognitively rich environment, while negative dispositions hinder engagement and exacerbate math-related anxiety. Systemic improvements in teacher education, school support, and professional development are necessary to foster effective learning environments.

REFERENCES

1. Revamp teacher training curricula to include modules on attitudes, student psychology, and motivation.
2. Institutionalize CPD workshops focused on innovative pedagogies and mindset transformation.
3. Strengthen administrative support by ensuring adequate resources, feedback systems, and teacher recognition.
4. Encourage mentorship programs linking experienced, motivated educators with new or struggling teachers.
5. Enhance school environments to reduce teacher stress and support holistic teaching practices.