"Newly Qualified Mathematics Teachers' Perception on the Role of a Structured Mentoring Programme on Developing Their Self-Efficacy in Selected Secondary Schools in Kabwe District, Zambia."

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ABSTRACT

This study investigates the perceptions of Newly Qualified Mathematics Teachers (NQMTs) regarding the importance of a structured mentoring programme in enhancing their self-efficacy in selected secondary schools within Kabwe District, Zambia. Using an embedded mixed-methods approach, both quantitative (Teacher Self-Efficacy Scale, TSES) and qualitative (interviews, reflective journals) data were gathered and analysed. The results not only show that structured mentoring significantly boosts teachers' classroom management, lesson planning, and confidence, but also emphasise the significance of these outcomes for policy development in establishing sustainable mentoring models aimed at improving early-career teacher performance.

Keywords: Structured Mentoring, Perception, Self-efficacy, Newly Qualified mathematics teachers, Zambia

INTRODUCTION

The quality of education in any country largely depends on the competence and confidence of its teachers. Among the many factors that influence effective teaching and learning, teacher self-efficacy—the teacher's belief in their ability to plan, deliver, and manage teaching activities—plays a crucial role (Bandura, 1997). This is especially true for newly qualified teachers, who enter the teaching profession with theoretical knowledge but limited classroom experience. In Zambia, the challenges of classroom management, curriculum delivery, and student engagement are further intensified when it comes to teaching mathematics, a subject often seen as abstract and complex by students.

Newly Qualified Mathematics Teachers (NQMTs) often face pressure to meet performance standards with limited pedagogical support. While the Zambian Ministry of Education (MoE) and the Teaching Council of Zambia (TCZ) have recognised the importance of Continuous Professional Development (CPD), a process of ongoing learning and development to ensure teachers remain up-to-date and effective in their roles, and mandated it as a requirement (Musonda, 2023), its implementation has been inconsistent. Most CPD activities in schools focus on workshops or school-based meetings, while structured, one-on-one mentoring, especially for new teachers, is rare or informally conducted (Banja, 2020). Without formal mentoring frameworks, newly qualified teachers are often left to navigate classroom complexities primarily on their own, which can lead to reduced self-efficacy and higher attrition rates.

In response to these challenges, Zambia launched the Zambia Education Enhancement Project (ZEEP) between 2006 and 2011, with support from the World Bank and other partners. ZEEP aimed to strengthen the education system by introducing school-based professional development strategies, including teacher clusters, peer collaboration, and mentoring. Although the project made initial progress in building teacher capacity, it

lacked a sustainable structure and did not lead to the nationwide institutionalisation of mentoring practices. After external funding ended, many of the mentoring initiatives introduced through ZEEP were discontinued, but the informal culture of mentorship persisted.

The absence of a standardised and sustainable mentoring model in Zambia has left a significant gap, particularly in secondary school mathematics education. Teachers often rely on sporadic guidance from senior colleagues, and there is no system for monitoring progress, offering constructive feedback, or addressing emotional challenges faced by NQMTs. Given the cognitive demands of mathematics instruction and the importance of student-centred approaches, NQMTs require ongoing support to transform abstract mathematical knowledge into effective classroom practice.

International studies have shown that structured mentoring programmes can significantly boost teacher self-efficacy, especially when linked with clear objectives, regular feedback, and opportunities for reflection (Lyne, 2016; Phiri & Mwanza, 2021). However, most existing research in the Zambian context either lacks a subject-specific focus or does not include newly qualified mathematics teachers as a distinct group. This study aims to address that gap by examining the effect of structured mentoring on the self-efficacy of newly qualified mathematics teachers in Kabwe District.

Specifically, the study examines teachers' perceptions of the role of structured mentoring in developing their classroom confidence, management abilities, and instructional skills. It is grounded in Bandura's Social Cognitive Theory, which identifies four key sources of self-efficacy, namely, mastery experiences, vicarious learning, verbal persuasion, and emotional regulation. By integrating these principles into a structured mentoring programme, the study assesses whether such an intervention can positively shift NQMTs' self-efficacy.

Ultimately, the research provides empirical evidence to support the implementation of formal mentoring frameworks in Zambian schools and contributes to the broader discourse on teacher Preparation and retention in Sub-Saharan Africa. It offers insights into how targeted mentorship can transform the early teaching experiences of mathematics educators, improve classroom practices, and contribute to better student learning outcomes.

LITERATURE REVIEW

Theoretical Framework: Social Cognitive Theory (SCT)

This study is underpinned by Albert Bandura's Social Cognitive Theory (1986), which emphasises the role of social influence and personal agency in learning and behaviour. Central to SCT is the concept of self-efficacy, defined as an individual's belief in their capability to perform specific tasks successfully (Bandura, 1997). Bandura identified four primary sources of self-efficacy. These are Mastery experiences: Success in performing tasks builds confidence. Vicarious experiences: Observing peers succeed enhances one's belief in their abilities. Verbal persuasion: Positive reinforcement strengthens motivation. Moreover, Emotional and physiological states: Managing anxiety and stress enhances self-efficacy.

Structured mentoring aligns well with SCT as it offers NQMTs opportunities to engage in guided lesson delivery (mastery), observe mentors (vicarious learning), receive feedback (persuasion), and build confidence (emotional regulation).

Teacher Self-Efficacy

Teacher self-efficacy affects multiple aspects of classroom behaviour, including instructional planning, student engagement, and classroom management (Tschannen-Moran & Hoy, 2001). High self-efficacy leads to persistence in challenging situations, more effective teaching strategies, and better student outcomes. For

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NQMTs, self-efficacy is still developing, and the presence of structured support can significantly influence their belief in their abilities.

In mathematics education, self-efficacy is particularly important due to the abstract nature of the content and common misconceptions among students. Low teacher confidence can lead to ineffective teaching methods, reduced student motivation, and increased teacher attrition.

Mentoring and Its Impact on Teacher Development

Mentoring is a widely recognised support strategy for new teachers. According to Ingersoll and Strong (2011), teachers who receive mentoring are more likely to remain in the profession and perform better than those who do not receive mentoring. Effective mentoring includes orientation, classroom observation, feedback, and emotional support.

Structured mentoring, in contrast to informal guidance, is planned, monitored, and goal-driven. It includes clear objectives, timelines, tools (e.g., checklists, journals), and accountability. This approach ensures consistent experiences for all mentees and supports their holistic development.

Global Perspectives on Mentoring

Internationally, structured mentoring has shown strong outcomes. For instance, in Malaysia, Lyne (2016) found mentoring significantly improved instructional strategies and student engagement. In the UK, Hobson et al. (2009) emphasised the role of mentor-mentee relationships in fostering teaching confidence and reflective practice. In **Uganda**, Mugisha (2013) reported that systemic challenges—such as large class sizes—limited the success of mentoring, particularly in rural contexts.

These studies demonstrate that while mentoring is beneficial, its effectiveness is determined by its structure and context.

Mentoring in the Zambian Context

Zambia has adopted CPD through national policy (MoE, 2016), but mentoring practices remain largely informal. According to Banja (2020), most NQTs rely on ad hoc support from senior colleagues, without formal training or accountability. Phiri and Mwanza (2021) demonstrated that structured mentoring improved teacher competence and confidence; however, it lacked a subject-specific focus.

ZEEP (2006–2011) attempted to introduce structured mentoring through teacher clusters and resource centres but failed to sustain momentum after donor withdrawal (MoE, 2017). As a result, disparities in mentoring experiences persist across rural and urban areas.

Research Gaps

From the reviewed literature, the following gaps emerge:

- Most Zambian studies focus on general teacher development without addressing mathematics-specific challenges.
- There is limited empirical research on structured mentoring as an intervention for developing self-efficacy among NQMTs.
- No localised mentoring models have been validated for the Zambian context post-ZEEP.

This study contributes to the body of knowledge by addressing these gaps through an embedded design that captures both quantitative shifts in self-efficacy and qualitative perceptions of teachers in a mathematics-specific context.

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METHODOLOGY

Research Design

This study adopted an **embedded mixed-methods quasi-experimental design**. The quantitative component involved a pretest-posttest design with a control group, while the qualitative component captured in-depth perceptions of NQMTs who received the intervention. The embedded approach was chosen to enrich the quantitative findings with explanatory qualitative insights.

Study Site and Population

The research was conducted in Kabwe District, Zambia, focusing on newly qualified mathematics teachers (NQMTs) in selected secondary schools. Kabwe was selected because of its blend of urban and peri-urban schools and the presence of a considerable number of recently deployed mathematics teachers.

Sample Size and Sampling Methods

A total of **40 NQMTs** participated in the study. Purposive sampling was used to select the schools and participants based on accessibility and the presence of eligible NQMTs. The participants were randomly assigned to two groups:

- **Mentored group (Treatment)**: 20 NQMTs
- **Non-mentored group (Control)**: 20 NQMTs

Additionally, 10 experienced mathematics teachers were purposively selected and trained to act as mentors.

Research Instruments

1. **Teacher Self-Efficacy Scale (TSES)** – A 12-item instrument adapted from Tschannen-Moran & Hoy (2001), covering instructional strategies, classroom management, and student engagement, rated on a 9-point Likert scale.
2. **Structured Mentoring Observation Checklist** – Used by mentors to assess classroom performance.
3. **Weekly Reflection Journals** – Completed by mentees to record challenges, successes, and feedback.
4. **Semi-Structured Interview Guide** – Captured mentees' qualitative experiences post-intervention.
5. **Mentoring Evaluation Form** – Quantitative rating of the mentoring programme.

All instruments were reviewed for content validity by five education experts in mathematics education and teacher development.

Validity and Reliability

- The instrument is an internationally validated tool.
- Internal consistency was confirmed using Cronbach's alpha, with all three subscales scoring above 0.80.
- Sampling adequacy for factor analysis was checked using the Kaiser-Meyer-Olkin **(KMO)** test and **Bartlett's Test of Sphericity** on pretest data, confirming suitability.

Procedure for Data Collection

Phase 1: Pre-Intervention

- Research clearance was obtained from TCZ, MoE, and the University Ethics Committee.
- Mentors underwent a one-week training on effective mentoring, based on Bandura's SCT.
- Both groups completed the pretest TSES.

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Phase 2: Intervention (Weeks 3–12)

The mentored group received a structured mentoring programme comprising weekly activities aligned to the four SCT domains:

Week	Focus Area	SCT Domain
3–4	Lesson planning	Mastery Experience
5	Classroom management	Vicarious Learning
6	Student engagement	Mastery Experience
7–8	Independent teaching	Verbal Persuasion
9	Assessment design	Mastery Experience
10	Differentiation	Vicarious Learning
11	Stress management	Emotional Regulation
12	Feedback and reflection	Verbal Persuasion

Phase 3: Post-Intervention

- The TSES was re-administered to both groups as a post-test.
- Structured mentoring programme evaluation forms were completed.
- Semi-structured interviews were conducted with 10 mentored NQMTs to gather perceptions on the mentoring process.

Data Analysis

Quantitative data were analysed using SPSS.

- Descriptive statistics (means, SDs)
- Independent t-tests (pretest-post-test comparisons)
- ANOVA for group differences on key domains

Qualitative data were thematically analysed and triangulated with quantitative findings.

Ethical Considerations

- Informed consent was obtained from all participants.
- Confidentiality and anonymity were assured.
- The university ethics board and Kabwe District Education Office granted ethical approval

PRESENTATION OF THE FINDINGS

Research Question 3: What are the perceptions of Newly Qualified Mathematics Teachers (NQMTs) on the role of a structured mentoring programme in developing their self-efficacy?

Quantitative Findings – Evaluation Form

The structured mentoring programme was evaluated by 20 mentored NQMTs using a 5-Point Likert scale. Table 1 presents the mean scores for key components:

Key Area Evaluated	Mean Score (out of 5)	% Agreed/Strongly Agreed
The programme is well-structured and organised	4.2	90%
Enhanced teaching confidence	4.6	92%
Improved classroom management and teaching skills	4.4	88%

Key Area Evaluated	Mean Score (out of 5)	% Agreed/Strongly Agreed
Valued feedback and emotional support	4.5	90%
Reduced anxiety and isolation	4.3	85%

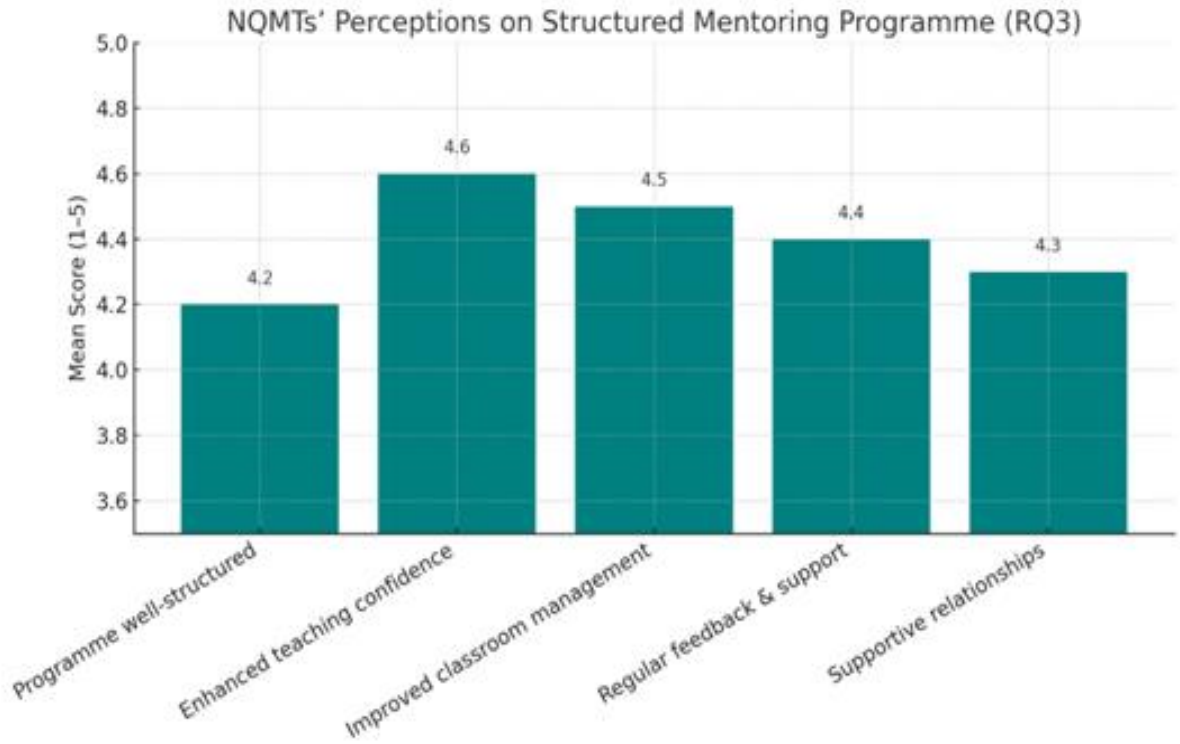

Figure 1: Mean scores (on a 5-point Likert scale) from NQTs' responses to the structured mentoring evaluation form. The results show high levels of satisfaction and perceived impact across key mentoring dimensions.

The chart displays the perceptions of newly qualified mathematics teachers regarding the structured mentoring programme, as captured through a post-intervention evaluation form. The findings reveal that: The programme was seen as well-structured and organised (Mean = 4.2). It notably enhanced teaching confidence (Mean = 4.6), the highest-rated area. Teachers also appreciated improved classroom management skills (Mean = 4.5) and valued consistent feedback and emotional suppor**t** (Mean = 4.4). Positive mentor-mentee relationships were also highlighted (Mean = 4.3), indicating emotional reassurance and professional growth.

These quantitative results support the qualitative data, reinforcing that structured mentoring positively impacted both instructional capacity and emotional readiness of NQMTs.

Qualitative Findings – Interview Themes

- Semi-structured interviews with 10 mentored NQMTs revealed four dominant themes:

Theme	Sample Quote	No. of Mentions
Increased teaching confidence	"I feel more confident teaching even tough topics."	7
Value of practical demonstrations	"Watching my mentor teach was eye-opening."	6
Supportive relationships	"I could ask my mentor anything; it reduced stress."	8
Usefulness of feedback	"The feedback helped me improve every lesson."	9

Figure 2: Dominant qualitative themes based on frequency of coded interview responses.

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Summary of RQ3 Findings

The results show that NQMTs perceived the structured mentoring programme as highly beneficial. They highlighted improvements in self-confidence, instructional quality, and emotional well-being. Quantitative ratings confirmed these perceptions, with over 85% agreement across all domains. Qualitative interviews reinforced this with vivid, experience-based testimony of the mentoring impact.

DISCUSSION OF FINDINGS

The findings from both quantitative and qualitative data indicate that Newly Qualified Mathematics Teachers (NQMTs) in Kabwe District perceived the structured mentoring programme as significantly beneficial in enhancing their self-efficacy. This is consistent with Bandura's (1997) **Social Cognitive Theory (SCT)**, which emphasises that mastery experiences, vicarious learning, verbal persuasion, and emotional regulation contribute to self-efficacy development. Each of these elements was integrated into the mentoring framework, which appears to have had a positive influence on the NQMTs

Improved Teaching Confidence

Quantitative data revealed a high mean score of 4.6 for enhanced teaching confidence. This aligns with Mugisha (2013), who noted that mentorship can counteract early-career teacher anxiety by providing structured support. The NQMTs in this study reported feeling more competent in lesson planning and delivery, an essential aspect of self-efficacy.

Interview responses reinforced this outcome, with 7 of 10 participants expressing that they felt more capable in managing classroom demands after being mentored. For example, one NQMT stated, *"I feel more confident teaching even tough topics."* This reflects **Bandura's notion of mastery experience**, where successful performance strengthens belief in one's capabilities.

Value of Feedback and Reflection

The importance of feedback was underscored both quantitatively (mean = 4.5) and qualitatively (mentioned by 9 out of 10 NQMTs). This supports findings by Phiri & Mwanza (2021), who observed that structured feedback is crucial for improving teacher practice in Zambia.

Mentorship in this study offered regular formative feedback, allowing teachers to adjust their methods and build confidence—a form of verbal persuasion emphasised in SCT.

Supportive Relationships and Emotional Regulation

NQMTs described the mentoring relationship as emotionally supportive. The mean score for reduced anxiety was 4.3, and 8 of 10 interviewees stated that having a mentor helped them manage stress. This aligns with **Bandura's fourth source of self-efficacy**: emotional and physiological states. It also supports Chikampa et al. (2023), who found that new mathematics teachers often face high stress due to the complexity of their subject.

Vicarious Learning through Observations

Observing experienced mentors teach was highly valued (mean = 4.4). One mentee remarked, *"Watching my mentor teach was eye-opening."* This highlights the role of vicarious learning in developing self-efficacy, where observing successful models fosters belief in one's abilities. Lyne (2016) similarly found that mentoring in Malaysia improved instructional techniques through lesson modelling.

Implications for Policy and Practice

These findings affirm the need for structured mentoring frameworks in Zambia, particularly for mathematics teachers who face abstract content and classroom complexity. The success of this program suggests that with proper training, mentorship can play a pivotal role in enhancing teacher self-efficacy, retention, and instructional quality.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study set out to explore the perceptions of Newly Qualified Mathematics Teachers (NQMTs) in Kabwe District regarding a structured mentoring programme and its role in enhancing their self-efficacy. The findings demonstrate that structured mentoring was highly valued and had a significant positive impact across multiple dimensions of teacher self-efficacy, including confidence in lesson delivery, classroom management, emotional regulation, and student engagement.

The mentoring programme, rooted in Bandura's Social Cognitive Theory (SCT), provided mastery experiences, observational learning, constructive feedback, and emotional support. As a result, mentees reported higher levels of teaching confidence, more effective classroom practices, and a greater sense of professional readiness.

Importantly, these outcomes suggest that informal and inconsistent mentoring practices, which are currently prevalent in Zambia, can be replaced by formal, sustainable structures that are more effective in supporting NQMTs, particularly in demanding subjects such as mathematics.

Recommendations

Based on the study findings, the following recommendations are made:

1. **Institutionalise Structured Mentoring**

The Ministry of Education and the Teaching Council of Zambia should develop and implement a national mentoring framework, with clear roles, timelines, and assessment tools for mentoring NQTs.

2. **Subject-Specific Mentoring**

Mentoring programmes should be subject-specific, recognising the unique challenges mathematics teachers face. Experienced math educators should be trained and supported as mentors.

3. **Scale the Programme Nationally**

The structured mentoring model employed in this study can be scaled and adapted for use in other districts and provinces to promote teacher effectiveness and retention.

4. **Continuous Monitoring and Evaluation**

Mentoring programmes should include built-in tools for ongoing assessment—such as mentor observation checklists, feedback forms, and reflective journals—to ensure sustained impact and improvement.

5. **Mentor Training**

Provide ongoing professional development for mentors, focusing on mentoring skills, emotional intelligence, and support strategies aligned with SCT.

CONTRIBUTION TO THE BODY OF KNOWLEDGE

This study makes several key contributions to the existing body of knowledge in teacher education, particularly in the context of Sub-Saharan Africa and Zambia:

1. **Contextualised Evidence for Structured Mentoring in Mathematics Education**

While global literature has documented the benefits of mentoring, this study provides locally grounded evidence showing how a structured mentoring programme tailored for mathematics teachers can significantly enhance self-efficacy. This fills a contextual gap, especially in low-resource and under-mentored educational systems, such as Zambia's.

2. **Operationalisation of Bandura's Social Cognitive Theory**

The study provides a practical application of Bandura's Social Cognitive Theory in a mentoring setting, highlighting how mastery experiences, vicarious learning, verbal persuasion, and emotional regulation can be effectively integrated into mentoring designs. This contribution to the theoretical literature illustrates how SCT operates in real-world school settings.

3. **Mixed-Methods Approach in Mentoring Research**

Through its embedded mixed-methods design, the study enriches methodological discourse by combining statistical validation with rich qualitative narratives, demonstrating how combining inferential data and participant voices offers a deeper understanding of mentoring outcomes.

4. **Policy-Relevant Insights for the Zambian Education System**

The findings offer practical implications for education policy makers, suggesting that a structured mentoring framework could be an effective CPD tool to address low teacher confidence and quality in mathematics instruction.

5. **Foundation for Future Research**

The study opens new areas for further exploration, such as the long-term effects of mentoring on student achievement, mentor training models, and mentoring in other subject areas, thus offering a platform for future empirical investigations.

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