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LEARNER SAFETY AT RISK: THE IMPACT OF UNQUALIFIED MATHEMATICS TEACHERS IN SOUTH AFRICA – A CRITICAL REVIEW (2014-2024)

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ABSTRACT

This comprehensive review aims to analyse the challenges and implications of placing learners under the supervision of teachers without mathematics qualifications, as highlighted in the literature from 2014 to 2024. The study examined the impact on learner performance, classroom management and safety, teacher confidence and efficacy, institutional policies and recruitment practices, and the role of professional development as a mitigation strategy. This study adopted a comprehensive literature review approach, synthesising findings from peer-reviewed publications between 2014 and 2024 to provide a holistic understanding of the issues surrounding unqualified mathematics teachers and their influence on learners' academic outcomes. The analysis reveals that teachers without formal mathematics qualifications often struggle to effectively deliver instruction, foster conceptual understanding, and maintain a safe and nurturing learning environment. This, in turn, can lead to poorer academic performance and a widening achievement gap between learners taught by qualified and unqualified teachers. The literature also highlights unqualified teachers' low confidence and self-efficacy challenges, which can hinder their ability to employ effective instructional strategies and engage learners actively. Institutional policies and hiring practices prioritising recruiting and retaining qualified mathematics teachers are crucial in addressing these systemic issues. The review further emphasises the importance of professional development and mentorship programmes as a key strategy to mitigate the challenges posed by unqualified mathematics teachers. These initiatives can help enhance teachers' content knowledge, pedagogical skills, and classroom management capabilities, ultimately improving learner outcomes. The findings of this study provide valuable insights for policymakers, educational institutions, and teacher education programmers in developing comprehensive strategies to address the challenges associated with the placement of unqualified mathematics teachers and ensure the academic well-being and safety of learners.

Keywords: Learners, performance, qualifications, teachers.

INTRODUCTION

This comprehensive review combines the literature available between 2014-2024 while discussing the issues and implications of placing learners under the supervision of teachers without mathematics qualifications. The study explored the impact on learner performance, classroom

management and safety, teacher confidence and efficacy, institutional policies and recruitment practices, and the role of professional development as a mitigation strategy. One of the education districts in the Eastern Cape province of South Africa has approximately 2700 intermediate phase mathematics teachers; out of that number, 1700 are not qualified to teach mathematics. This observation has led to a comprehensive literature review that gives advice to district officials on how to deal with such a dire situation.

Extensive education research has focused on teachers and the quality of learners' learning outcomes. One of the most interesting dimensions in this debate is how formal qualifications of teachers, especially in education and training programme courses, influence learners' performance, classroom activities, and other outcome areas.

Authors such as Darling-Hammond (2000) and Stronge (2007) have pointed out that poorly qualified teachers could also cause ineffective classroom practice regarding qualifications, content knowledge and academic skills, all critical for effective learner learning. Such observations support the perspective that teachers with formal qualifications, especially in their subject area, have an enhanced ability to nurture a protective and encouraging milieu, deliver effective teaching and ensure comprehension amongst their learners.

On the other hand, literature has also emerged to address and provide insights into the problems emanating from putting learners in the care of teachers without formal mathematics qualifications. Mupa & Chinooneka's (2015) study indicates that such teachers fail to achieve satisfactory levels of curriculum coverage, classroom management, and addressing the learners' learning diversity, thereby translating into learners' underachievement.

Objectives

The study focused on two objectives, namely:

- To evaluate the impact of teachers without formal mathematics qualifications on the academic well-being of learners.
- To analyse the implications of placing learners under the supervision of teachers lacking mathematics qualifications.

The two research questions have been used to guide the synthesis of the literature:

- How does the lack of formal mathematics qualifications among teachers impact the academic well-being of learners?
- What implications arise from placing learners under the supervision of teachers without formal mathematics qualifications?

Theoretical Framework

This study's theoretical framework is grounded in teacher quality and its influence on learner achievement. The key proponents of this framework are Darling-Hammond (2000) and Stronge (2007). Darling-Hammond (2000) emphasises teacher qualifications, content knowledge, and pedagogical skills in facilitating effective instruction and promoting learner learning. This perspective suggests that teachers with formal qualifications, especially in their subject, are better

equipped to create a safe and supportive mathematics learning environment, deliver high-quality instruction, and foster conceptual understanding among their learners.

Stronge (2007) further reinforces the importance of teacher quality, highlighting the impact of teachers' content knowledge, instructional strategies, and classroom management skills on learner outcomes. This theoretical lens suggests that unqualified teachers may struggle to effectively translate the curriculum, manage classroom dynamics and address the diverse learning needs of their learners, ultimately leading to poorer academic performances.
The advantages of this theoretical framework for the current study are:

- It provides a solid foundation for understanding the relationship between teacher qualifications and learner performance, classroom management, and safety.
- It allows for examining the challenges and implications of placing learners under the supervision of teachers lacking mathematics qualifications, as it emphasises the importance of subject-specific content knowledge and pedagogical skills.
- The framework supports exploring institutional policies, recruitment practices, and professional development as strategies to mitigate the challenges posed by unqualified mathematics teachers.
- The theoretical perspectives of Darling-Hammond (2000) and Stronge, Ward, Tucker, & Hindman (2007) are well-established in education and have been widely used in research on teacher quality and its impact on learner learning.

By adopting this theoretical framework, the current study can comprehensively analyse the challenges and implications of placing unqualified mathematics teachers and the potential strategies to address these issues and ensure learners' academic well-being and safety.

Research Approach

This study is literature-based in that it uses a literature review methodology drawing data from scholarly peer-reviewed South African, African and International publications published between 2014 and 2024 to critically analyse the problems and effects of placing learners with unqualified mathematics teachers.

Findings

There is a paucity of South African literature on how mathematics teachers without formal qualifications affect learners' performance. However, internationally, there is a clear understanding of the significance of employing qualified teachers to teach mathematics, which is not the case in some education districts in South Africa.
The discussion of this issue is centred on the two objectives presented earlier in this paper.

Objective 1: To evaluate the impact of teachers without formal mathematics qualifications on the academic well-being of learners.

Teacher qualifications and learner safety

The issue of formal qualifications of a teacher and a safe learning environment for learners has been extensively documented in the literature. Several other authors have pointed out the relationship between the qualification of a teacher and the creation of an enabling environment for learners (Guyassa, Olana & Disasa, 2021; Ekinci & Acar, 2019; Mukeredzi, 2016). Qualified educators are essential in ensuring that learning conditions are adequately met. They facilitate

proper teaching and learning and secure an orderly environment and diverse learner requirements, elevating learners' self-esteem, motivation, and performance levels. Emphasising qualified teachers underscores the need for strong hiring policies and professional development to ensure effective recruitment and professional development so that teachers can promote emotional and academic achievement among learners.

Research has shown that teachers with formal qualifications, particularly in mathematics, are better equipped to create a safe and nurturing classroom atmosphere and are more capable of ensuring a better and safer learning environment in the classroom (Guyassa et al., 2021; Ekinci & Acar, 2019). Powered by a deep understanding of the content, such subjects would have been able to predict and cross serious safety threats (Guyassa et al., 2021; Mukeredzi, 2016). In other words, with such training, they are given practical skills to control the class, build rapport with class members and what to do in case of any security breach (Ekinci & Acar, 2019; Mukeredzi, 2016).

However, other studies have revealed that teachers with no formal qualifications had problems providing a safe zone for learners (Liu, Jehng, Chen & Fang, 2014; Håkansson, 2015; Mukeredzi & Nyachowe, 2018). On the other hand, unqualified teachers appear not to have content and didactic skills, which would help predict any safety threats, thus endangering the well-being of the learners by increasing such threats (Liu et al., 2014; Håkansson, 2015). Besides, limited knowledge of learner development and classroom management strategies may result in a situation that is not safe and friendly for learners (Mukeredzi & Nyachowe, 2018).

These teaching credentials provide additional opportunities for teachers to ensure their learners' safety and overall learning, as indicated by the performance ratings (Guyassa et al., 2021; Ekinci & Acar, 2019; Mukeredzi, 2016). Investing in the professional development and support of unqualified teachers is crucial to mitigate the potential risks and challenges they may face in maintaining a safe and conducive learning environment (Håkansson, 2015; Podolsky et al., 2019; Bautista & Ortega-Ruíz, 2015). These issues are amenable to management and mentoring, which would improve the morale and motivation of learners and teachers so that effective learning and teaching can occur.

Academic outcomes and teaching competency

On the one hand, the relationship between a learner's conceptual development and academic performance and the realisation that the teacher has not been taught how to teach mathematics has received much attention in literature. Numerous researchers have pointed out the importance of the teacher's knowledge of content and how to teach it in succession to effective mathematics teaching and learner's learning (Diamond, Maerten-Rivera, Rohrer & Lee, 2014; Molise, 2021; Adeyemi, 2015).

Researchers have pointed out that deficit content knowledge and pedagogical knowledge of the teacher are hardly considered to inhibit the teacher's content delivery of the instruction (Diamond et al., 2014; Molise, 2021). On the contrary, with deficit mathematics qualification, most teachers find it challenging to transform the curriculum for the learners in a meaningful way, and their

learners' academic performance suffers as a result (Adeyemi, 2015; Saylor & Johnson, 2014; Evişen, 2021).

According to research, unqualified mathematics teachers likely remain unable to fathom aspects of mathematical explanation to repeatedly highlight aspects of learning that are often difficult for learners to understand and, consequently, likely to neglect the provision of adequate assistance (Adeyemi, 2015; Saylor & Johnson, 2014). Apart from this, being recently qualified for course instructions limits their capacity to apply various ways of teaching and effectively motivate learners in the processes of deep understanding of mathematical concepts (Evişen, 2021; Callingham, Carmichael & Watson, 2015).

The literature also indicates that the adverse effect of unqualified teachers on learners' academic performance and upon their conceptual understanding can endure for a considerable time and, thus, may contribute to the deepening of the differentiation between learners in cases when one is taught by a qualified while another is under an unqualified teacher (Diamond et al., 2014; Molise, 2021; Komba & Mwakabenga, 2020). Solving this problem requires a holistic strategy where targeted professional development, mentorship and institutional support are provided to improve the skills of untrained mathematics teachers (Chachar, Ullah & Ujjan, 2023). Unqualified teachers must be encouraged to register for the mathematics qualification to gain knowledge and skills to teach mathematics.

Professional development and support

There is a myriad of research that provides valuable insights concerning the importance of professional training and mentorship in addressing the issues confronting unqualified mathematics teachers and fostering their professional development (Håkansson, 2015; Podolsky, Kini & Darling-Hammonde, 2019; Bautista & Ortega-Ruíz, 2015). It has been demonstrated that well-conceived professional development programmes can improve unqualified teachers' content knowledge, pedagogical orientation and classroom management skills (Håkansson, 2015; Podolsky, et al., 2019).

These programmes enable such teachers to work with their peers, reflect on their practice, and learn and utilise research-based instructional strategies (Bautista & Ortega-Ruíz, 2015; Komba & Mwakabenga, 2020). This suggests that such programmes fill in the deficiencies of low competencies and empower teachers with instruments to promote better learner outcomes. However, successful implementation seems to depend on the structure and availability of these programmes, the integration within them, the consistent interaction with them, and the resources that are available to facilitate their objectives.

The capacity of unqualified teachers could also be improved by setting up mentorship programmes that could be coordinated by more experienced teachers (Podolsky et al., 2019; Chachar, 2023). Such programmes may enable the best practices to be inculcated, assist in reflective dialogue, and prepare unqualified teachers to comprehend better the discipline and the best teaching approaches (Olawale, 2024).

Moreover, the literature emphasises the need for sustained assistance and consortia within broader education ecosystems to deal with the problems that unqualified mathematics teachers face (Bautista & Ortega-Ruíz, 2017, Atmojo, 2021). This may include providing subject materials, ways to learn from others, or creating professional learning groups that seek enhancement and sharing of knowledge (Atmojo, 2021; Jorilla & Bual, 2020).

The studies conclude that mentorship is a viable method based on establishing human relations for professional growth. These programmes fill in the skill shortages more than utilise senior teachers but also foster an environment of lifelong learning and partnership. Nevertheless, their effectiveness depends on adequate planning and availability of the mentors, the mentees and the organisation to assist in continuity as well as definite evaluation.

Policy and institutional responsibility
In this section literature analyses the influence of educational policies and institutional measures in placing unqualified teaching staff and their implications on learner safety and academic achievement (Chachar, 2023; Olawale, 2024; Zhou & Liu, 2019).

Highlighted is the need for broader strategies focusing on recruiting, training, and retaining qualified teachers, particularly for the areas of mathematics with such a deficiency (Chachar, 2023; Olawale, 2024). This should involve a policy that defines what a teacher's qualifications should entail, facilitates their improvement, and guarantees effective selection and evaluation mechanisms to ensure that competent teachers take up teaching positions (Zhou & Liu, 2019; Pavlovs, 2024; Diana, 2023).

Also, institutional accountability greatly assists in alleviating the challenge of unqualified teachers. Educational institutions must put in place adequate systems and procedures for assessing teachers, emphasising the safety and welfare of the learners (Chachar, 2023; Olawale, 2024; Zhou & Liu, 2019). This could range from designing some robust teachers' performance appraisal systems to specific support and mentorship programmes aimed at assisting good performance or even re-adjustment of practice where safety and security have been compromised (Pavlovs, 2024; Diana, 2023).

In addition, the literature stresses the necessity of working together across the relevant stakeholders, including policymakers, educational institutions and the community, more specifically, in a bid to resolve the institutional problems associated with the deployment of unqualified teachers (Chachar, et al., 2023; Zhou & Liu, 2019; Diana, 2023). This may include mobilising funds for the preparation and development of teachers, developing links with teacher training colleges and educator recruiting, and engaging in activities to improve the employment and subsequent retention of skilled teachers (Zhou & Liu, 2019; Pavlovs, 2024; Diana, 2022).

In these terms, both educational policies and institutional measures, taken in a more violent comprehended manner, can be of great importance in the protection of learners' safety as well as their justice (Chachar, 2023; Olawale, 2024; Zhou & Liu, 2019).

This implies that ensuring that educational institutions are accountable is crucial when dealing with the issues posed by unqualified teachers. Constructive mechanisms such as teacher evaluations, mentorship schemes, and safety measures can enhance learners' achievement and safety. There is a need to work together with, amongst others, policymakers, schools and communities to ensure there are adequate resources, qualified teachers are trained and deployed, and policies and practices that guarantee the learners' safety and equity are holistic.

Objective 2: To analyse the challenges and implications of placing learners under the supervision of teachers lacking mathematics qualifications, as highlighted in literature from 2014 to 2024.

Impact on Learner Performance

The literature is rich with discussions of the adverse effects of teachers' low level of formal math qualifications on their learners' academic performance and understanding of concepts (Diamond et al., 2014; Molise, 2021; Adeyemi, 2015). Studies indicate that teachers who possess adequate content and knowledge of how to teach include methods that enhance the quality delivery of instruction, conceptual understanding, and learners' academic achievement, to mention a few (Diamond et al., 2014; Molise, 2021).

On the other hand, teachers who do not have formal qualifications in mathematics often have a hard time comprehending the mathematics curriculum, which leads them to apply it in a mechanical way which does not facilitate comprehension and use of the skills learnt, thus resulting in learners' poor performance (Adeyemi, 2015; Saylor & Johnson, 2014; Evişen, 2021).

These unqualified mathematic teachers tend to have insufficient knowledge of their subject matter and lack the skill to reason ahead of their learners' common errors. They fail to assist or scaffold their pupils to such understanding (Adeyemi, 2015; Saylor & Johnson, 2014). Furthermore, the scant aspects of pedagogical training received may also limit these teachers' implementation of a variety of teaching methods and techniques, making learners participate in lessons and facilitating their understanding of mathematical concepts (Evişen, 2021; Callingham et al., 2015).

The literature also observes that the adverse effect of an unqualified teacher extends towards the learners' comprehension and academic performance, and such adverse effect multiplies over some time, thereby increasing the difference in the performance of learners taught by qualified teachers against unqualified ones (Diamond et al., 2014; Molise, 2021; Komba & Mwakabenga, 2020). Dealing with this challenge calls for all-embracing mechanisms of professional development, mentorships, and support to the institutions to increase the skills of unqualified mathematics teachers (Chachar, 2023), which can eventually solve the challenge.

The available literature clearly states that the low formal qualifications of mathematics teachers are detrimental to the learners' performance and understanding of concepts. Such unqualified teachers have problems understanding the curriculum, resulting in a mechanical approach to the teaching, which is restrictively progressive for the learners. Because of limited knowledge of the content area and pedagogical training, effective scaffolding and various instructional strategies are not possible. These inadequacies are cumulative, so the performance gaps become wider after sometime. This is compelling evidence of the need for effective teacher professional development, mentorship and institutional support to improve teacher effectiveness.

Classroom management and safety

The literature has pointed out the inability of unqualified teachers to manage discipline and monitor and guarantee safety within the classroom, further reinforcing the learners' learning (Liu et al., 2014; Håkansson, 2015; Mukeredzi & Nyachowe, 2018). Literature indicates that the classroom management style is better for those formally qualified to teach the subject in focus than those not qualified (Guyassa et al., 2021; Ekinci & Acar, 2019).

They would have not only covered the content but also be well-informed across a range of other topics, preventing them from being sole-centred on the subject they teach, thus ensuring that safety is not overlooked (Guyassa et al., 2021; Mukeredzi, 2016). Their training also helps them to handle the class dynamics, promote good rapport between learners and teachers, and tackle incidents of safety in the classroom (Ekinci & Acar, 2019; Mukeredzi, 2016).

On the other hand, Liu et al. (2014), Håkansson (2015) and Mukeredzi and Nyachowe (2018) point to the fact that some teachers are not qualified in any formal sense, and this makes it hard for them to create an enabling environment for the learners. It is widely recognised that unqualified educators do not have the appropriate content and pedagogical skills to assess safety issues. Therefore, incidents that harm the learners are more prone to happen (Håkansson 2015; Liu 2014). Moreover, classroom and children's development are subjects they do not understand significantly, creating a less secure and enriched atmosphere for the learners (Mukeredzi & Nyachowe, 2018). The risks these teachers pose when let loose on learners are numerous and so the literature highlights that there must be a tangible commitment directed towards the training and development of these teachers (Håkansson, 2015; Podolsky et al., 2019; Bautista & Ortega-Ruíz, 2017).

Literature in this section highlights that unqualified teachers struggle to uphold classroom order or even security. This affects the learners' social problems and takes them away from their studies. Qualified and trained teachers greatly suspend the chaos or inactivity within the room. Unqualified teachers are deprived of the bare minimum of pedagogics, the knowledge of child development, and the assessment of safety, which pose a greater risk to the learners. Bolstering these deficiencies calls for rigorous training and developmental programmes.

Teacher confidence and efficacy

The studies have examined how the absence of a formal qualification affects the confidence and capability of teachers in handling mathematics instruction (Håkansson, 2015; Mukeredzi &

Nyachowe, 2018; Håkansson, 2015). Adequate confidence and self-efficacy, determined by an individual's sense of purpose and content mastery, can be critical determinants of a teacher's performance as well as the performance of learners (Diamond et al., 2014; Molise, 2021; Adeyemi, 2015).

On the other hand, inadequate qualifications mean they tend to have low confidence and low self-efficacy, compromising their effectiveness in teaching mathematics (Håkansson, 2015; Mukeredzi & Nyachowe, 2018). Such teachers might find it hard to answer learners' questions, manage the classes and help learners understand complex mathematical concepts developmentally (Adeyemi, 2015; Saylor & Johnson, 2014; Evişen, 2021).

It has been emphasised in the literature that inadequate confidence and low self-efficacy perceived by unqualified mathematics teachers results in reduced engagement, ineffective pedagogical approaches, and more focus on traditional and teacher-centred strategies (Håkansson, 2015; Mukeredzi & Nyachowe,2018; Håkansson, 2015). This, too, can harm learners' academic achievement and understanding of concepts (Diamond et al., 2014; Molise, 2021; Adeyemi, 2015). It is essential to consider the confidence and efficacy aspects of unqualified mathematics teachers in the available literature. These teachers are encouraged to participate in structured professional development programmes, mentorship schemes, and other support provided by the institution to develop their skills and confidence in teaching (Håkansson, 2015; Podolsky et al, 2019; Bautista & Ortega-Ruiz, 2015).

The literature in this section has shown that the lack of mathematics teaching qualifications diminishes the confidence and self-efficacy of teachers, which in turn discourages them from trying to instil understanding among the learners. Non-qualified instructors usually stick to the old-fashioned-teacher-centred methods, discouraging learner participation and achievement. To solve these problems, invest time in organised professional development, coaching, and institutional backing to develop knowledge, pedagogical skills, and confidence. Otherwise, learners' academic outcomes are at stake because of poor teaching approaches and improper engagement highlights in the classroom.

Institutional policies and recruitment practices

Educational policies and recruitment practices regarding the placement of underqualified teachers and how this affects learner outcomes have been noted in the literature (Chachar, 2023; Olawale, 2024; Zhou & Liu, 2019). It was observed from the research studies that policies should address recruitment, training, and retention of qualified teachers, especially in skills gap areas (Chachar, 2023; Olawale, 2024).

Such policies should set up mechanisms that would define teachers' qualifications, set up professional development strategies, and design strict and effective hiring and selection systems that are likely to result in the hiring of skilled teachers (Zhou & Liu, 2019; Pavlovs, 2024; Diana, 2023). Institutional accountability also helps to ease the problem of unqualified teachers. Educational establishments are also supposed to have appropriate mechanisms to address teacher

performance issues, emphasising the safety and well-being of the learners (Chachar, 2023; Olawale, 2024; Zhou & Liu, 2019).

If there is a systematic shortage of qualified teachers, it is essential to have the combined efforts of governments, education institutions and the society at large to resolve the recurring patterns that lead to the deployment of unqualified teachers (Chachar, 2023; Zhou & Liu, 2019; Diana, 2023). Among others, this could warrant allocating funds for the improvement and education of teachers, establishing connections with institutions that offer teacher education, and developing programmes to assist in the professional development of qualified personnel, especially in areas that have an acute lack of qualified teachers (Zhou & Liu, 2019; Pavlovs, 2024; Diana, 2023).
From a strategic standpoint, these things include the developmental policies and measures that the institutions should have to ensure the safety and academic orientation of the learners, considering the challenges caused by their unqualified teachers (Chachar, 2023; Olawale, 2024; Zhou & Liu, 2019).

Policies of education and recruitment significantly affect learners' achievements, especially concerning the vacancies left by unqualified teachers. It is suggested in the literature that there should be explicit policies outlining what constitutes the qualification of teachers, in-service training requirements, and strict employment policies to secure competent teachers. The responsibility of institutions and partnerships, including governments, institutions, and communities, is crucial in remedying supply-side problems. Some approaches include sponsoring teacher training, collaborating with training agencies, and improving continuing education programmes to help secure learners' safety, better teaching and improved learning outcomes.

Professional development as a mitigation strategy
The literature offers literature that emphasises the need for professional qualification courses in mathematics teaching practice and internships for unqualified teachers, particularly to form the persons who can alter the suffering of learners (Håkansson, 2015; Podolsky et al., 2019; Bautista & Ortega-Ruíz, 2015). Literature has documented evidence of the capacity of well-designed development programmes to engage unqualified teachers on subject content on pedagogics and their classroom interaction strategies (Håkansson, 2015; Podolsky et al., 2019).

Podolsky et al. (2019) and Chachar (2023) pointed out that mentorship programmes whereby experienced and trained teachers assist untrained ones can also be regarded as a practical intervention to the knowledge-skills gap of teachers. These programmes can help establish communities of best practices, engage in reflective conversations, and enhance subject content and teaching pedagogies among untrained teachers (Chachar, 2023; Olawale, 2024).

Moreover, the literature points out the necessity for continuous assistance and peer collaboration within the more significant education sector to overcome the challenges associated with unqualified mathematics teachers (Bautista & Ortega-Ruíz, 2017; Atmojo, 2021). Such assistance can include resources on the subject, access to learning from academic peers, and the creation of

professional communities that enable the learning and sharing of information (Atmojo, 2021; Jorilla & Bual, 2020).

Håkansson (2015), Podolsky et al. (2019) and Bautista & Ortega-Ruíz (2017) argue that by enhancing the professional training and support of unqualified mathematics teachers, educational institutions will help compensate for their deficits owing to the absence of formal qualification and empower them to create a conducive and safe learning environment for learners.

The body of literature highlights the professional qualification courses and internships as measures that compensate for the shortcomings of unqualified mathematics teachers. Well-designed development schemes may improve understanding of the subject content, teaching skills and tactics, and engagement structures. Support from more experienced teachers and cooperative colleagues builds networks of best practices, which enable reflexive talk and practice exchange. Ongoing organisational reinforcement, resource availability, and professional mutual support are critical to allowing unqualified teachers to set up safe, efficient, and interesting learning environments for the learners.

Conclusion

The scrutiny in this critical review has been focused on the other challenges and ramifications of oversight of learners by teachers who do not have formal qualifications in mathematics, as noted in publications from 2014 to 2024.

This research also addressed the learner's performance, the management and organisation of the learner and the classroom, the safety of the learner and the teacher's self-confidence and efficacy, the institution's policies, recruitment practices and professional development as an intervention measure.

Under this review, it has been established that when teachers perhaps lack adequate mathematics background training, they often find difficulty in teaching mathematics, in developing understanding and when it comes to creating a healthy and safe school culture. This assists in poorer outcomes and the increased risk of parents' learner imbalance, whereby learners who have qualified teachers teach do better than those who have unqualified teachers with a minimum allowance for all teens.

Literature also affirms that lower confidence and self-efficacy scores are challenges that unqualified teachers often experience, making them unable to use better teaching strategies and engage learners in active learning. Institutional policies, hiring practices, and the retention of qualified mathematics teachers are vital to these systemic concerns.

Other focuses of the study are professional development and mentorship programmes, which are said to be key to addressing the problems posed by unqualified mathematics teachers in some districts. Such a measure can assist in improving the teacher's understanding of the content, methods and classroom management techniques and, thus, enhance the learners' performance.

Recommendations

Based on the comprehensive review of the literature, the following recommendations are proposed to address the challenges and implications associated with placing learners under the supervision of teachers lacking formal mathematics qualifications:

Strengthen educational policies and institutional measures

Educational policymakers and institutions should prioritise implementing comprehensive policies that address the placement of unqualified mathematics teachers. These policies should establish clear standards for teacher qualifications, particularly in the subject areas they teach, and implement rigorous screening and evaluation processes to ensure the recruitment and retention of competent educators (Chachar, 2023; Olawale, 2024; Zhou & Liu, 2019).

Incentives and support should be provided for teachers to pursue professional development and continuous learning opportunities, enhancing their content knowledge, pedagogical skills, and classroom management strategies (Zhou & Liu, 2019; Pavlovs, 2024; Diana, 2023). Collaborative efforts between policymakers, educational institutions, and the broader community should be encouraged to address the systemic issues surrounding the placement of unqualified teachers and ensure learners' academic well-being and safety (Chachar, 2023; Zhou & Liu, 2019; Diana, 2023).

Invest in comprehensive professional development programmes

Educational institutions should invest in developing and implementing well-designed professional development initiatives that focus on enhancing the competencies of unqualified mathematics teachers (Håkansson, 2015; Podolsky et al., 2019; Bautista & Ortega-Ruíz, 2017). These programmes should improve teachers' content knowledge, pedagogical skills, and classroom management strategies, enabling them to deliver high-quality instruction and foster a safe and nurturing learning environment.

Mentorship programmes, where experienced and qualified mathematics teachers guide and support their unqualified colleagues, should be established to facilitate the transfer of best practices and support the professional growth of unqualified teachers (Podolsky et al., 2019; Chachar, 2023). Collaboration and knowledge-sharing within the broader educational community should be encouraged to address the challenges faced by unqualified mathematics teachers (Bautista & Ortega-Ruíz, 2017; Atmojo, 2021).

Improve teacher recruitment and retention practices

Educational institutions and policymakers should prioritise recruiting and retaining qualified mathematics teachers, particularly in areas with a shortage of expertise (Chachar, et al., 2023; Olawale, 2024). Competitive compensation and career advancement opportunities should be provided to attract and retain highly qualified mathematics teachers (Zhou & Liu, 2019; Pavlovs, 2024; Diana, 2022).

Collaboration with teacher education programmes should be strengthened to ensure a steady supply of well-prepared mathematics teachers with the necessary content knowledge, pedagogical skills, and classroom management capabilities (Zhou & Liu, 2019; Pavlovs, 2024; Diana, 2022).

Foster a supportive and collaborative learning environment
Educational institutions should encourage establishing professional learning communities that enable unqualified mathematics teachers to engage in reflective practice, share resources, and learn from one another (Bautista & Ortega-Ruíz, 2017; Atmojo, 2021). A culture of continuous improvement and ongoing support should be promoted within the institution to address the challenges faced by unqualified teachers (Bautista & Ortega-Ruíz, 2017; Atmojo, 2021).

Engagement with the broader community, including parents and stakeholders, should be fostered to garner support and resources for improving the quality of mathematics instruction and ensuring learners' academic well-being and safety (Zhou & Liu, 2019; Pavlovs, 2024; Diana, 2022).

By implementing these comprehensive recommendations, educational policymakers, institutions, and the broader educational community can work towards addressing the challenges and implications associated with placing unqualified mathematics teachers, ultimately ensuring learners' academic well-being and safety.

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