

# SUPERVISION PRACTICES AS QUALITY ASSURANCE FOR MATHEMATICS PRE-SERVICE TEACHERS IN ZIMBABWE

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**ABSTRACT**– The study sought to explore the supervision practices of mentors in Zimbabwean secondary schools in order to ascertain how they influence mathematics pre-service teachers' performance in a mathematics classroom. Most researchers seem to agree that the richness and value of teaching practice for the production of quality mathematics teachers is dependent on the quality of the mentor. However, although supervision is believed to be instrumental in shaping pre-service teachers' classroom performance, there is less agreement on whether this is workable in the real world of the classroom or has remained an intended goal of supervision. This is because the failure rate in secondary school mathematics remains unabated worldwide. The failure is normally ascribed to practitioner development and Zimbabwe is no exception to this trend. A mixed methods approach, based on an explanatory sequential design was used to depict the events and policies that shape the classroom supervisory practices, through questionnaires and interviews. The study found that most mentors lack adequate supervisory credentials, training and commitment. To achieve expert and prompt supervision, it is recommended that regular mentor work shopping and assessment of mentors' supervisory credentials be done before engagement, to enhance their supervisory skills.

**Keywords:** Supervision, Teaching Practice, mentors, pre-service teachers, supervision of pre-service mathematics teachers, teacher knowledge.

## 1. INTRODUCTION

This study is premised on the view that improvement in learning secondary school mathematics in the classroom is related to practitioner development (Jaworski, 2006). This paper therefore looks into the supervision practices of Zimbabwean school-based mentors as quality assurance for mathematics pre-service teachers on teaching practice. Kiggundu & Nayimuli (2009) aver that problems during teaching are unpredictable and unique and therefore pre-service teachers require mentors to direct them during teaching practice (TP). According to Kelly and Tannehill (2012), mentors are influential in shaping pre-service teachers' styles of teaching because they spend more time with them. Soylemez and Tuga (2014), also posit that supervision enables pre-service teachers to confront difficult situations during teaching practice (TP) and develop an understanding of students' knowledge and the manner in which they learn. In view of this, the duties of mentors, according to Kelly and Tannehill (2012), are to provide guidance and assistance as well as to foster habits and skills that enable pre-service teachers to recognise who they are in the profession and succeed as mathematics teachers. The mentor therefore works together with the mentee to pinpoint and establish the root of the problems experienced, and to suggest and recommend some teaching styles on particular topics. However, Hamaidi, et al. (2014) assert that very little is known about the nature of assistance pre-service teachers get from their mentors to achieve the intended goals of teaching, particularly mathematics. Previous research in this field has concentrated on what supervision can do to pre-service teachers' performance in the mathematics classroom but there is less agreement on whether this is workable in reality or has remained the intended goal of supervision without implementation. This is because the failure rate in mathematics, has persistently been poor in Zimbabwe (Kusure & Basira, 2012) and the world over (Kafata & Mbetwa, 2016). Goh and Blake (2015) aptly assert that students' achievement is measured by teacher quality. Hence the root cause of poor performance in mathematics may be traced back to teacher training. Supervision, which is part of teacher training of pre-service teachers on TP, is pivotal to teacher development as confirmed by Endeley (2014) who posits that the richness of TP is depended on the quality of the mentor. The focus of the study therefore, is to answer the question: How do the supervisory practices of Zimbabwean school-based mentors affect the mathematics pre-service teachers' development of mathematics knowledge

for teaching? The purpose of the study therefore points to the exploration of the supervisory practices of mentors and the impact of the practices thereof, on the mathematics pre-service teachers' performance in a mathematics classroom.

## **2. CONCEPTUAL FRAMEWORK**

This study was informed by the concept of "learning to teach". Sheaffer (2014) defines learning to teach as a service activity that guides pre-service teachers' learning. It is also viewed as a process of acquiring knowledge about teaching and then applying it in the classroom. Shulman (1986) references pedagogical content knowledge (PCK) and Ball et al. (2008) reference mathematics knowledge for teaching (MKT) as providing a conceptual framework for learning to teach mathematics. Shulman's (1986) PCK addresses the presentation of the subject matter using appropriate strategies of instruction and resources in a way that is understood by the learners. MKT by Ball et al. (2008) refers to what exactly teachers need to know and do in order to teach mathematics effectively. The main purpose of learning to teach is to improve the quality of education and classroom instruction (De Neve, Devos, & Tuytens, 2015). Learning to teach does not take place in a vacuum. The process of learning to teach is therefore influenced by schools in which pre-service teachers practise (De Neve et al., 2015). According to Kelly and Tannehill (2012) school-based mentors demonstrate skills as tools for learning to teach and this assists the pre-service teachers to visualise how they can incorporate these skills into their teaching. Through observing, imitating prescribed mentors and experimenting, pre-service teachers' learning to teach may be expedited. This paper therefore investigates the contribution of supervision practices to pre-service mathematics teacher knowledge for secondary school mathematics in Zimbabwe, as described by the concept of learning to teach.

## **3. LITERATURE REVIEW**

According to Range, Duncan and Hvidston (2013), Supervision of pre-service teachers is a process of assisting pre-service teachers in transitioning their formal knowledge into practical knowledge. According to Anumaka (2016), with reference to Teacher Education in Sub-Saharan Africa (TESSA), the role of mentors is therefore to equip student teachers with skills and competencies to enrich their classroom performance and enhance their professional functioning. It is necessary for the mentors to be well acquainted with those skills of supervision because they work closely with the student teacher in the field. To this end, Kelly and Tannehill (2012) are critical of mentors who lack expertise to guide pre-service teachers on teaching practice. According to Ball et al. (2008), several studies show that mathematics knowledge for teachers is thin and weak and this has impeded effective teaching. This implies that mentorship may be carried out by subject specialists who are better positioned to perform supervision activities (Evans et al., 2014). Maphosa, Shumba, and Shumba's studies (2007) however, reveal that some classroom-based mentors have the tendency of leaving the classes in the hands of the pre-service teachers without their assistance. In this regard, Soylemez and Tuga (2014) concur that the differences between the definitions of supervision and the actual practices may defeat the attainment of the objectives of teaching practice. The motivating factor behind such behaviour by mentors, as perceived by Hollins, Luna, and Lopez (2014) is that some mentors are appointed on traditional standards that require no other additional formal preparation except classroom experience. Whilst teaching experience is crucial and necessary to be a mentor, Kelly and Tannehill (2012) found that several years of teaching experience without formal preparation might not prepare classroom mentors to guide pre-service teachers during TP, since their supervision will be on a cut and try basis. According to Martin (1998), some classroom mentors are too prescriptive of pre-service teachers, hence they do not give them freedom to experience trial and error. Palsdottir et al. (2008) therefore recommend that pre-service teachers should be given opportunities to develop tools for teaching by learning to research on their own practices. This adventure by mathematics pre-service teachers may develop a sense of ownership of the mathematics knowledge for teaching gained in the process, hence commitment to teaching. Gan (2013) also asserts that some classroom mentors are not approachable when pre-service

teachers turn to them for advice. This may cause the pre-service teachers to feel isolated and frustrated. When experiences are sour, pre-service teachers are likely to generate survival skills where they only use effective and task-based teaching strategies when they are being observed by their mentors. A study by Kiggundu and Nayimuli (2009) revealed that some mentors do not trust their mentees and as a result, they are not willing to relinquish their classes to pre-service teachers, thereby leading to lack of confidence to teach in the pre-service teachers. Pre-service teachers also lose confidence when they receive regular negative comments from their mentors (Akhtar, 2014), which may affect their personalities and activities in the classroom. This suggests that teachers' colleges need to be vigilant and selective in terms of the schools they send their pre-service teachers to, for practice, based on how the respective mentors are privy to the formal demands of supervision. Hence, collaborative work between schools and teachers' colleges may be commendable. The purpose of this study therefore, is to ascertain, establish and confirm the mentors' supervisory practices in Zimbabwean mathematics classrooms and how these practices affect mathematics pre-service teachers' classroom performance.

## **4. METHODOLOGY**

### **4.1 Research Paradigm and Design**

The pragmatist paradigm was used to guide the selection of the mixed methods research design. The paradigm was opted for because it is a philosophy which believes that education should be practical and come through experience (Creswell et al, 2013). Since the study has an interest and agenda to establish whether the reality of mathematics teacher knowledge can be realised through supervision, it fits well into the tenets of pragmatism. In order to achieve the purpose of the study, the mixed methods design depicted the events, actions, attitudes and activities that shape the supervisory practices in a mathematics classroom.

### **4.2 Sampling and Data Collection Procedures**

Purposive sampling was designed to understand the participants' supervision experiences. The reason for using purposive sampling is best depicted by Kumar (2014) who avers that a researcher normally seeks participants who, in her opinion, have relevant information and are willing to share it. To this end, pre-service teachers and mentors who I thought would provide the desired information were purposefully sampled. A questionnaire was administered to 120 pre-service teachers on TP and another one was administered to 42 school-based mentors. Follow-up interviews were conducted with 22 pre-service teachers and 14 school-based mentors from the same group that answered questionnaires. The interviews focused on the TP activities and supervision practices of mathematics pre-service teachers and mentors respectively.

### **4.3 Data Analysis Procedures**

Descriptive statistics that include the frequencies, means, standard deviations and percentages were used to analyse the quantitative data. The responses to the questionnaires were presented on a 5 point Likert scale with SA (strongly agree) taking the highest score of 5. Open-ended questions were grouped into related categories and explained. The pre-service teachers and mentors' questionnaires were tested for reliability using the Cronbach's alpha coefficient. The coefficients were 0.850 and 0.758 respectively. According to Field (2005) a Cronbach's alpha above 0.7 indicates a strong estimation of reliability. This implies that the instruments had a relatively high internal consistency. Some of the categories that emerged from the qualitative data were; supervision practices of mentors and mentors' preparation for TP supervision. The qualitative data from the interviews was comprehensively presented, interpreted and explained. To meet the criteria of trustworthiness and credibility of the qualitative data, audio recordings that were transcribed into textual data were used.

- a. RESULTS, FINDINGS AND DISCUSSIONS
- b. 1 Supervisory Practices in the Classroom

The quantitative results illustrate that pre-service teachers were less positive about the assistance they received from their mentors. This was shown by the several mean scores below three on the Likert scale for each of the following, that is; assistance to plan for their work, choice of media, selection of appropriate teaching strategies, getting feedback on their classroom practices and opportunity to watch the mentor teaching. In agreement with this, the interview results also show that the supervision that pre-service teachers received was erratic and for others was completely absent. This is what student R3 articulated;

“I am not getting enough assistance from the mentor and I’m being told to attend to HOD classes when they are having a meeting. I had to ask for guidance from other maths teachers in the department.”

This explains why the pre-service teachers did not get adequate assistance from the prescribed mentors as shown by the quantitative results, since they were on their own most of the times. A2 had the view that the supervision was doing more harm than good to her. She expressed her views as follows:

“The fact that a mentor comes to assess me and then corrects me in front of the pupils, eish! The fact is, I don’t have anyone to supervise me. If I had a mentor, she would teach me every day before I go for a lesson and I wouldn’t make errors in front of the pupils. As you will be trying to work out a problem on the board for the pupils, the mentor raises her hand and corrects you then and there. It actually exposes me to the pupils.”

Pre-service teachers felt that some mentors intimidated and marginalised them and were acting unprofessionally towards them, which resulted in the pre-service teachers being constrained in their presence. The fact that pre-service teachers felt despised may instil fear and a lack of self-esteem in them. Among other complaints were limited time with mentors, rudeness, selfishness, busy and/or lazy mentors.

According to Hudson (2016), a sound relationship between pre-service teachers and their mentors underpins the entire process of supervision and assists pre-service teachers’ psychological development. Once the relationship has been constructed, trust will be built and a sense of achievement is experienced to teach successfully in the mathematics classroom. In view of these complaints by pre-service teachers, Gulamhussein (2013) argues that pre-service teachers need support, encouragement, reassurance, comfort and guidance from their mentors, thus, the mentor should always be ready to provide the necessary assistance. The responses from the interviews indicate that 81.8% of the pre-service teachers mentored by teachers in positions of responsibility, for example, HODs, were affected much in terms of supervision assistance.

Some pre-service teachers such as R4 were concerned about the negative comments that he received from the mentors, which he said “killed my zeal for teaching”. This confirms findings in the study by Akhtar (2014) which show that constant negative feedback can affect the students’ confidence levels and may affect their personalities. It also emerged from the pre-service teachers and school-based mentors’ interviews that colleges and schools sometimes make use of supervisors who are not mathematics specialists to oversee pre-service teachers’ work during TP. While this works in terms of workload management for colleges and school teachers, it was inappropriate for the pre-service teachers in terms of content feedback. Evans et al. (2014) thus argue that non-specialists lack expertise and confidence to assist the pre-service teachers in the mathematics content since they are insufficiently equipped to offer advice.

## 5.2 Mentors' Preparation for Teaching Practice supervision

Mentor preparation involves two aspects in this study, which are mentor training and mentor assessment. Mentor training involves mentors participating in staff development programmes in order to gain and improve their supervision skills. Mentor assessment involves a critical evaluation of the mentors' supervisory credentials before engaging them in classroom supervision.

**Training of mentors:** In response to the items in the questionnaire that addressed the issue of supervision training, mentor teachers revealed that training was inadequate. Their responses are illustrated in Table 1.

**Table 1 Mentors' views on TP supervision**

ITEM	N =	Disagree	Neutral	Agree
14. I have received enough training to be an effective supervisor	40	(8) 20%	(11) 27.5%	(21) 52.5%
15. I gained my skills and expertise in supervision through experience	39	(0) 0%	(7) 17.9%	(32) 82.1%

The results of the survey show that although 52.5% of the mentors received training for supervision, a significant number (20%) did not receive it. In addition, 82.1% gained their expertise to supervise pre-service students on teaching practice through experience and not through training. Hurrell (2013) however, explains that experience does not equate to expertise, implying that spending a number of years practising as a mentor or as a mathematics teacher does not mean being highly skilled in TP supervision. As a result of limited training, mentors supervise pre-service teachers through hit and miss, which may impede the pre-service teachers' efficiency to teach mathematics.

The above sentiments are confirmed by the mentors' interview results which showed that some of the mentors did not know what the colleges expected during supervision. When asked if they needed anything to improve their supervision skills, one of the mentors responded as follows:

"I should feel that colleges that are sending their students should come and talk to us as mentors so that they actually brief us on what they expect from their students. Sometimes you just get students, you don't know what the colleges will be looking for, and you just say, well may be they need this, and then that is what you are going to provide but if they had come and then briefed us on what they expect, then we also focus on those. Lack of such information actually lessens our efficiency to supervise...."

This suggests that failure to train mentors may result in pre-service teachers being supervised by people of limited capabilities. Ambrosetti (2014) believes that supervision skills are not intrinsic therefore, mistakes are likely to be repeated in the absence of proper training. The erratic training is worrisome as it is argued by Gulamhussein (2013) that any kind of professional development requires a significant amount of time. The fact that mentors in this study received sporadic training on TP supervision is therefore cause for concern.

**Assessment of mentors:** The analysis of data established that all mentors were appointed by their seniors to take on the role of mentor, sometimes without considering their mentorship credentials. The colleges, confirmed that pre-service teachers are just deployed into the schools without assessing mentors' supervisory credentials. The verification of the mentor qualifications seems to be the headmaster's prerogative in the school. The general assumption was that anyone with a teaching qualification was eligible to be a mentor. Due to lack of evaluation of the mentors' qualifications, it emerged in the study

that 10% (n=40) of the mentor participants had no teaching qualifications. Peters (2012) advises that colleges should address this perceived lack of attention to the assessment of mentors' supervisory qualifications, which is a fundamental area of teacher education. The issue of assessing mentorship credentials among mentors has not been explored much in literature, especially in Zimbabwe. The findings of this study suggest that the way mentors are selected and engaged for their roles needs some scrutiny and improvement.

## 6. CONCLUSION AND RECOMMENDATIONS FOR PRACTICE TO IMPROVE TP SUPERVISION

Based on the findings of this study, it can be concluded that school-based mentors of secondary school mathematics pre-service teachers in the Zimbabwean classrooms lack commitment and efficiency in their job as supervisors. The study found that the assessment of mentors' supervisory credentials and supervision training of mentors contribute to the means, tools and structures through which knowledge of mathematics teaching is shared with mathematics pre-service teachers during TP to facilitate "learning to teach". The paper therefore recommends that teacher training colleges in collaboration with practising schools need to ensure that in every aspect of pre-service teacher training, they conduct regular training and assessment of mentors' supervisory credentials before engagement to ensure that they are qualified for the job. That way, supervision skills are developed and only appropriate and well-qualified mentors would carry the task of supervision. In addition, mathematics pre-service teachers on teaching practice should be supervised by mathematics subject specialist teachers who are well positioned in terms of mathematics content related feedback. The paper also recommends that mentors need not be appointed but should volunteer their mentoring services because only then will they seek to fully understand the job they undertake uncompelled.

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