
| RESEARCH ARTICLE**The Influence Of School-Based Continuing Professional Development On The Implementation Of The Competency-Based Curriculum In Mathematics Education In Selected Secondary Schools Of Katete District, Eastern Province, Zambia****Alifasi Phiri***University of Lusaka-Zambia***Corresponding Author:** Alifasi Phiri, **E-mail:** phirialifasi69@gmail.com**| ABSTRACT**

The impact of School Based Continuing Professional Development (SBCPD) on the implementation of Competency Based Curriculum (CBC) in Mathematics Education in selected secondary schools of Katete District, Eastern Province, Zambia was investigated. The research used a qualitative research design, and secondary data was gathered from peer-reviewed academic articles, government education policy documents, curriculum frameworks and previous empirical studies to explore how the role of the SBCPD influences teachers' pedagogical competencies, teaching and learning practices, and assessment practices in the context of CBC. The theoretical framework of the study was guided by three theories, namely Vygotsky's Social Constructivist Theory, Knowles' Andragogy Theory, and Mezirow's Transformative Learning. Secondary data were analysed systematically using thematic analysis as described by Braun and Clarke (2006) and with six phases. Results indicated that the sustained SBCPD had a significant impact on teachers' implementation of pedagogies that are learner-centred, competency-based assessment practices, and collaborative lesson planning. However, serious issues like lack of government support, insufficient teaching materials or too many tasks for teachers, poor administrative supervision and so on remained a key barrier. The study adds to the scholarly discourse on curriculum reform and teacher professional development in countries of sub-Saharan Africa, providing the evidence-based recommendations for enhancing SBCPD to speed up the processes of CBC implementation in Eastern Province secondary schools.

| KEYWORDS

Curriculum, Competence, Institutionalisation, collaborative and Implementation

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1. Introduction**1.1 Background of the Study**

The main concept in this study is the connection between Teacher Professional Development and Curriculum Implementation, which focuses on the effect of School Based Continuing Professional Development on teachers' skills in implementing the Competency Based Curriculum in Mathematics Education. Structured, sustained professional learning activities that take place in the school environment (workshops, lesson study groups, peer mentoring, classroom observations and collaborative reflective practices) are defined as SBCPD. CBC is a curriculum philosophy, which values the acquisition of competencies, skills, attitudes and values as opposed to covering content in a rote manner (Mulenga & Kabombwe, 2019). How and whether SBCPD enables teachers to implement CBC, as well as the implementation of CBC from a teacher's perspective, is the scholarly problem this study seeks to address.

There has been a substantial increase in the global discourse on competency-based education and teacher professional development in the last decade. The importance of the role of teachers in terms of their influence on education outcomes has been placed at the forefront of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Sustainable Development Goal number four of the framework (UNESCO, 2015). A series of collaborative, sustained school-based professional development models, such as lesson study, PLCs and instructional coaching, have been implemented and shown to lead to measurable gains in teaching and learning in, for example, Finland, Singapore, and Canada (Darling-Hammond et al., 2017; Timperley et al., 2021). Collaborative professional learning has consistently been associated with greater levels of pedagogical innovation and adaptive teaching by teachers, according to the OECD's Teaching and Learning International Survey (OECD, 2023).

Importantly, the influence of one-off or decontextualised training workshops for teachers in other parts of the world is found to be weak in terms of lasting change in teacher practice (Kennedy, 2016). This knowledge has led to the rapid implementation of school-based continuous development models as the preferred means for teacher capacity development across a variety of national education systems.

Competency-based curriculum reform has been on the rise in Africa, driven by the need of African countries to adapt their education systems to developmental priorities, and to address the high rates of dropout and low learning outcomes that persist. The Competency Based Curriculum (CBC) for Kenya, launched in 2017 and gradually rolled out, is one of the continent's most extensively documented scenarios of instruction change and research is regularly showing that teacher training and professional support are critical to effective implementation of the reform (Nganga, 2019; Chege et al., 2021). Also, Rwanda's program of competency-based reforms shows that structured teacher professional development, such as school-based peer learning and instructional coaching, can greatly improve the quality of teacher implementation in the classroom (Vavrus et al., 2022).

Yet the key challenges of inadequate funding, teacher workload, the lack of instructional materials and weak monitoring are recurring issues identified across the three Districts studied (Kabwe, Chipata, and Lusaka Districts) (Cephas, Kanchebele, & Ng'ambi, 2026). The study specifically aims to address the sparseness of empirical studies of the effects of SBCPD on the implementation of CBC in secondary school Mathematics in Eastern Province.

1.2 Problem Statement

In Zambia, the adoption of Competency Based Curriculum (CBC) is a dream come true for enhancing quality and learner outcomes at the secondary school level. This is, however, predicated on teachers' pedagogical skills, curriculum literacy and professional agency to support competency-based learning environments. There is also a significant body of research on the implementation of the CBC in secondary schools in Zambia, mostly showing that teachers continue to face challenges in implementing the CBC, especially in rural and peri-urban areas (Cephas, Kanchebele, & Ng'ambi, 2026; Chisala, 2025).

Despite its institutionalisation, it has been found that School Based Continuing Professional Development in most Zambian districts are not uniform in terms of frequency, quality and impact. Phiri (2025) observed that there were implementation gaps in the delivery of CBC in secondary schools in Zambia, citing the lack of sufficient professional development support, and orientation of teachers as some of the gaps. Likewise, the teachers who teach Mathematics and Science in Kabwe District noted that they were not well trained in competency-based pedagogy and assessment, although SBCPD frameworks existed. (Cephas et al., 2026) This finding indicates that having an SBCPD policy does not guarantee professional practice change.

Geographic isolation, low resource levels and weak monitoring capability are worsened in Katete District, Eastern Province. To the researcher's knowledge, no published qualitative research study focuses directly on how SBCPD affects the professional experiences, classroom practices and challenges of implementing CBC in this district for Mathematics teachers. Even though there is no locally grounded qualitative evidence, this gap in the scholarship around curriculum reform in Zambia is significant, such that secondary data-based qualitative research is justified to come up with a synthesis of available evidence and draw context-relevant findings for policy and practice.

1.3 Research Objectives

1.3.1 Main Objective

To explore the influence of School-Based Continuing Professional Development on the implementation of the Competency-Based Curriculum in Mathematics Education in selected secondary schools of Katete District, Eastern Province, Zambia, through qualitative secondary data analysis.

1.3.2 Specific Objectives

- To examine how School-Based Continuing Professional Development shapes the pedagogical competencies of Mathematics teachers implementing the Competency-Based Curriculum in secondary schools of Katete District.
- To assess the effectiveness of School-Based Continuing Professional Development programmes in enhancing Mathematics teachers' pedagogical knowledge and instructional competencies for Competency-Based Curriculum implementation.
- To identify and analyse the challenges experienced by teachers, School Administrators and Education Standards Officers in implementing School-Based Continuing Professional Development within the Competency-Based Curriculum framework in Katete District.

1.4 Rationale of the Study

This study has theoretical and practical significance as an underpinning. Although qualitative secondary research on SBCPD and CBC implementation is theoretically contributing to a growing scholarship on teacher professional development in the Global South, which adds to the theoretical frameworks that largely come from western contexts in which resources are abundant. The study continues to contribute to the context-specific theoretical understanding of how professional learning takes place under systemic constraints by incorporating the three theoretical lenses of Social Constructivist, Andragogical and Transformative Learning theories, which were applied to the context of Zambia.

The study is practically relevant in terms of the immediate policy need. The Ministry of Education in Zambia has officially adopted the CBC from 2025 and there is a need for evidence-based guidance and recommendations on how to enhance SBCPD delivery to ensure that teachers are well prepared and able to implement it with fidelity. Using the recent peer-reviewed sources, secondary data synthesis allows the creation of insights that are relevant to the moment for the curriculum coordinators, school heads, district education officials, as well as for national education policy makers of the Eastern Province and others.

2. Literature Review

2.1 Introduction

The subsequent literature review brings together the empirical and theoretical research literature on School Based Continuing Professional Development and Competency Based Curriculum implementation in Mathematics Education. The review is thematic and is based on peer-reviewed publications mainly in the last five years, with focus on the period 2024-2026, as relevant to each of the three specific objectives of the study. Each theme is explored from a global, continental, regional, and local viewpoint, and is accompanied by analytical comments on relevance of the sources cited, methodological soundness, and the extent to which they are transferable in context. The review identifies converging findings, conflicts and gaps that call for the current investigation.

2.2 SBCPD and teachers' pedagogical competencies in the implementation of CBC

2.2.1 Global Evidence

Worldwide, the link between ongoing professional development and teachers' pedagogical competence is one of the best-known in educational research. In their seminal synthesis "Effective Teacher Professional Development" (2017) published by the Learning Policy Institute, Darling-Hammond et al. looked at more than 35 rigorous studies of teacher professional development and found that effective professional development is: content-focused, collaborative, job-embedded and extended in duration. Their analysis revealed that this kind of programme resulted in teachers' improvement in instructional strategies, content knowledge application, and learner outcomes. This source is relevant for the present study because it provides a definition of quality measures that can be used to measure the impact of SBCPD practice rather than it being a mere compliance exercise, which can be used to benchmark the implementation of SBCPD in Zambia.

In the Review of Educational Research (2016), Kennedy argued that there are two types of models of professional development: transmission models, which were found to be the least effective, and transformative models such as coaching, mentoring and inquiry-based collaborative learning, which were found to create longer-lasting shifts in pedagogical practices. The framework laid out by Kennedy can be readily applied to the context of the SBCPD in Zambia as the choices of a design influence how mathematics teachers can implement CBC.

2.2.2 Continental Evidence (Africa)

Nganga (2019) studied the impact of teacher professional development focused on CBC on classroom practice and concluded that teachers who attended teacher learning communities, which were structured and took place in schools, were significantly more likely to exhibit teacher-oriented learning behaviours that included group work, inquiry activities and formative assessment, than those who only received centralised professional development. The Nganga study, which was carried out in the context of the rollout of the CBC in Kenya in 2017, provides good continental parallel evidence for the Zambian experience because both countries have similar curricular aspirations, and resource contexts.

Akyeampong et al. (2020) did a comparative qualitative study in Ghana, Uganda and Tanzania to compare the experiences of teacher educators and school teachers in relation to the professional development during the implementation of the learner-centred curriculum reform. Their results, published in the International Journal of Educational Research, showed that structural embedding of professional development in the school timetable was the biggest predictor of lasting pedagogical change, while external monitoring and facilitation support was a crucial enabler. This cross-country evidence base strongly supports the institutional logic currently in place in Zambia as designed by the country, yet identifies implementation gaps that hinder its reach.

2.2.3 The Southern Africa region

In an article published in the South African Journal of Education (SAJE), Mthembu and Harber (2021) reported that, in a two-year study of a group of Mathematics teachers in KwaZulu-Natal secondary schools, measurable gains in lesson planning, assessment design and engagement with learners occurred among the teachers who met in weekly collaborative peer learning sessions. The study used qualitative case study approach, which used interview and observation data from 12 schools, with thick description of how the Mathematics pedagogy is changed through sustained school-based professional collaboration. This source is directly relevant to the present study as it investigates the same field of study in a cognate Southern African education system.

In the journal Professional Development in Education, the researchers Croft et al. (2020) were able to capture how geographic isolation, access to materials, and regular mentorship all had a negative impact on uptake of professional development and fidelity of the curriculum in rural secondary schools. Their results reflect the situation of Eastern Province, Zambia and offer a basis for comparative interpretation of the problems of teachers in Katete. Interestingly, Croft et al. identified that the impact on classroom practice was significantly greater where school leaders actively modeled reflective practice and provided protected time for professional development, suggesting that school leadership was an important mediating factor.

2.2.4 Local Evidence (Zambia)

In the seminal study of SBCPD in Zambia “Professional Development in Education” (Hassler et al. 2015), qualitative case research was undertaken across six schools in Zambia and revealed a positive impact of SBCPD on teacher reflective practice, collaborative planning and the use of interactive pedagogies. Importantly, the study concluded that the impact of SBCPD was sustainable only when there was support from school leadership and regular facilitation from external providers, which are structurally different across Zambia's schools. The results of this study, although ten years old, form the basis of knowledge of SBCPD dynamics in Zambia.

In the report released by the Commonwealth of Learning, Stutchbury et al. (2022) analysed 30 schools in Zambia to understand the characteristics of the professional learning culture that school leaders foster to enhance teachers' capacity to facilitate learner centred learning environments in relation to the CBC requirements. The qualitative analysis of the head teacher leadership behaviours and the ripple effects of those behaviours on teacher practice are directly relevant to the current study's analysis and will highlight school leadership as a significant mediating variable between the SBCPD and the CBC relationship.

2.3 Theme 2: Effectiveness of SBCPD in the improvement of pedagogical knowledge

2.3.1 Global Evidence

Timperley et al. (2021) reviewed the literature on teacher professional development around the world in a synthesis that included 97 studies involving teacher professional development in 18 countries and found that teacher professional learning programs that explicitly targeted C-PK, with a focus on collaborative inquiry and classroom-embedded coaching, had the highest impact on teacher instructional practice and student learning outcomes. The meta-synthesis is especially relevant to Mathematics education, where the content-specific pedagogical aspects are acknowledged as an unique professional skill that could be underdeveloped as a result of generic professional development programs.

In a study of competency-based teacher professional learning in Rwanda and Tanzania, Vavrus et al. (2022) in the journal *Teaching and Teacher Education* concluded that the learning outcome in terms of teachers' understanding and use of the pedagogical principles of CBC was more sustained using the models of school based peer coaching and lesson study models compared to workshop based learning. Their comparative qualitative analysis revealed that reflection-in-action, as a process accompanied by structured post-lesson discussion with peers, was the most evident process strongly linked with pedagogical knowledge transformation, which is in line with the theoretical premises of transformative learning and social constructivism that were used in this study.

2.3.2 Continental Evidence (Africa)

In a qualitative study of 60 teachers in Nairobi and Mombasa counties in Kenya, published in the *African Journal of Education and Practice* (Chege et al. 2021), the study revealed that teachers' competency-based lesson implementation, formative assessment and teacher-learner interactions improved significantly as a result of school-based professional learning when supported by trained teachers. Teachers found that SBCPD provided them with the flexibility to engage in problem solving in a way that was relevant to their classroom situations and offered peer support, making it more useful and easier to apply to their immediate circumstances than centralised training. This source bolsters the case for contextual relevance and social learning dynamics to be a part of what makes SBCPD effective.

Based on a literature search of the 45 developing country contexts analysed, Schweisfurth (2015) observed that the gap between policy intentions and classroom practices in learner-centred reforms was best filled by long-term professional support, as opposed to short-term workshops, that would be embedded in schools. Her analytical framework which differentiates between superficial adoption and pedagogical transformation which is deep is a critical lens through which the depth of SBCPD influence on the Mathematics teachers' practice under CBC can be understood.

2.3.3 Regional Evidence (Southern Africa)

The study by Chikoko et al. (2022) in the *International Journal of Educational Research Open* revealed that, in Zimbabwe, school-based PD programmes that explicitly connected to curricular competencies had measurable impact on teachers' practices of lesson delivery and assessment as revealed through qualitative interviews with 45 secondary school teachers, compared to generic PD programmes. Significantly, the study revealed that teacher reflection journals and lesson observation records recorded aspects of teacher development that quantitative measures failed to, directly validating the qualitative secondary data approach used in this study.

The comparative analysis of Southern African countries' experiences over the past four years (2022 to 2026) shows that the most successful SBCPD programmes are marked by: The outcomes of the implementation of the CBC are much better in countries which integrated such features into their SBCPD, compared to those countries conducting isolated training events on the CBC.

2.3.4 Local Evidence (Zambia)

Building on the study of Kabombwe, Machila and Sikayomya (2020), the results of this qualitative study established that teachers who participated in collaborative lesson planning activities based on the principles of CBC had a clearer understanding of the concept of competency-based assessment and used participatory learning strategies with greater creativity. The study's methodological and conceptual findings are transferable to the Mathematics contexts and the study also offers local evidence of SBCPD's ability to develop subject-specific pedagogical knowledge while its focus is centred on the study of History.

In the study conducted by Cephas, Kanchebele and Ng'ambi (2026), the researchers, using qualitative and documentary analysis, indicated that teachers of Mathematics reported the least readiness to teach CBC; this was because of years of teaching content-centred Mathematics which has embedded abstract and procedural habits in their students. The results of their research prove to be the most recent and contextually nearest evidence of the Professional Development (PD) needs of Mathematics teachers who implement the CBC. The findings of their research directly inform this study's analytical framework.

2.4 Theme 3: Challenges Affecting SBCPD Implementation for CBC in Katete District

2.4.1 Global Evidence

Based on their systematic review, published in the *Review of Educational Research* (Opfer & Pedder, 2011), these issues were found to be common structural and systemic barriers to effective professional development in a variety of national contexts: time constraints, resource inadequacy, lack of administrative support, teacher resistance to change, and absent follow-through. They persist and are directly visible in the SBCPD implementation landscape in Zambia and are stubbornly persistent as shown in

more than 20 years of professional development research. The relevance of this global evidence is that the difficulties that face Zambian teachers are not special and inescapable but rather systemic elements of how teachers' professional development is designed and resourced.

2.4.2 Continental Evidence (Africa)

Vavrus et al. (2022) not only identified effective approaches, but also extensively explored structural obstacles to professional development in the context of CBC in East Africa. These included insufficient materials preparation funding, the limitation of learner-centred approaches due to the high teacher-to-student ratio and that of teacher professional learning time due to examination preparation pressures. Their continental analysis based on multi-year qualitative fieldwork in Rwanda and Tanzania offers strong comparative evidence to guide their understanding of the reasons why similar issues are consistently emerging in the Eastern Province of Zambia.

Akyeampong et al. (2020) also reported that the lack of monitoring and accountability tools at school level for PD participation and implementation was one of the main challenges for achieving sustained effectiveness of SBCPD across Ghana, Uganda and Tanzania. The impact of the SBCPD activities waned quickly when head teachers were not making regular visits to lessons and giving structured feedback. The finding has implications for Zambia's implementation of its CBC, as monitoring capacity is reported as weak.

2.4.3 Evidence Regional (Southern Africa)

In a study of the implementation of SBCPD in Malawi, Croft et al. (2020) recorded a compounding effect of geographic isolation on implementation, with rural school teachers being significantly less likely to have professional development opportunities from district-level facilitators and less opportunity for inter-school learning exchange opportunities. These findings are directly mirrored in the Katete District context, where Eastern Province's rural geography leads to structural barriers in connectivity for professional learning. Croft et al.'s qualitative data, which comes from teacher focus groups and interviews with head teachers, is methodologically congruent in interpreting the Zambian experience.

2.4.4 Local Evidence (Zambia)

In a detailed documentary and secondary data analysis of the barriers to effective implementation of CBC in various provinces in Zambia, Phiri (2025) found that the main factors that hindered implementation of CBC were weak district monitoring, low frequency of SBCPD, lack of instructional materials in the district and inadequate teacher training. The study draws one of the most up-to-date analysis of the CBC implementation in Zambia by Phiri that provides the local foundation for the problem statement and findings of this study.

Chisala (2025) made a presentation on the perception of stakeholders and teachers, curriculum specialists and education administrators about Zambia's CBC in the British Journal of Multidisciplinary and Advanced Studies. Through his analysis he noted that many teachers felt SBCPD was not fully responsive to the practical needs of teachers implementing CBC in their classrooms, especially in designing competency-based assessments and facilitating inquiry-based Mathematics learning. The recentness and breadth of this source, which includes the points of view of stakeholders at the national level, is useful for this study's analytical framework.

2.5 Theoretical Framework

2.5.1 Introduction

The following three interrelated theories provide a foundation for this study: they all offer different lenses for understanding aspects of how professional learning can contribute to pedagogical transformation in the context of a competency-based curriculum. The Social Constructivist Theory (Vygotsky, 1978) is the theoretical framework that allows for the understanding of the professional competences that teachers acquire through collaborative interaction and social mediation. SBCPD is rooted in adult learning principles, which was introduced by Knowles' Andragogy Theory (1980) and highlights the effectiveness of school-based, experience-centred, self-directed professional development over a didactic approach to training. The Transformative Learning Theory (TLS) (Mezirow, 1991) explains the more profound changes in professional view and practice that are observed in pedagogical transformation in the context of CBC. The three theories can be combined into a holistic framework for the analysis of secondary data for the effectiveness of SBCPD in Katete District.

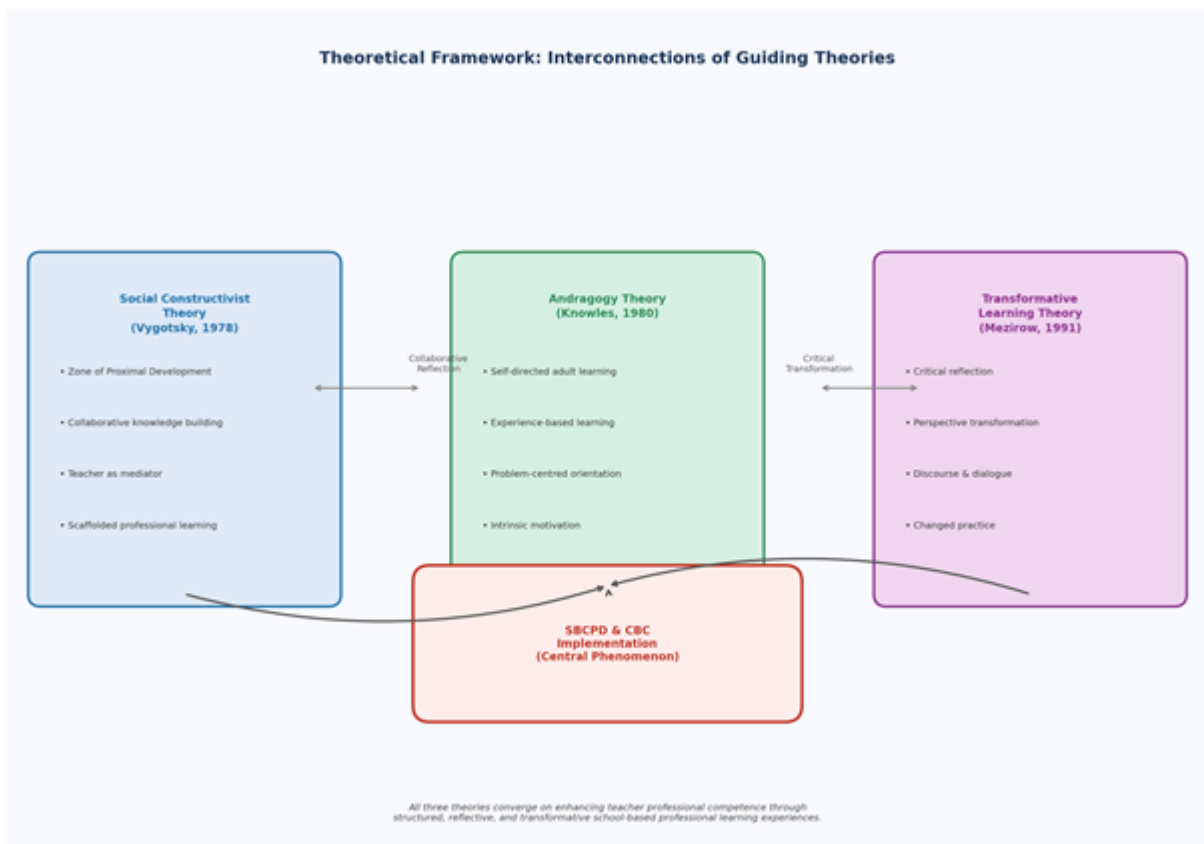


Figure 4: Theoretical Framework showing the Interconnections of Guiding Theories (Researcher, 2026)

2.5.2 Definition of Theoretical Constructs

2.5.2.1 Social Constructivist Theory (Vygotsky, 1978)

- Knowledge is socially constructed through collaborative interaction and shared professional experience among teachers
- The Zone of Proximal Development describes the space where professional learning occurs with peer or mentor scaffolding
- Scaffolded professional learning through observation, feedback and mentoring accelerates competency development
- SBCPD creates structured social learning environments where teachers co-construct pedagogical knowledge collaboratively
- The theory explains how peer coaching, lesson study and collaborative planning collectively enhance classroom practice

2.5.3 Andragogy Theory (Knowles, 1980)

- Adult learners are self-directed and need to understand the relevance of learning to their immediate professional contexts
- Experience serves as the primary resource for professional learning among practising teachers in school settings
- Adults learn most effectively when professional development is problem-centred rather than purely content-centred
- Intrinsic motivation, including professional identity and self-efficacy beliefs, drives engagement with SBCPD activities
- The theory explains why school-based, contextually embedded professional development outperforms centralised workshop training

2.5.4 Transformative Learning Theory (Mezirow, 1991)

- Transformative learning occurs when critically reflective engagement challenges and revises existing professional assumptions
- Disorienting dilemmas, such as CBC demands challenging established teaching habits, trigger meaningful professional reflection

- Dialogue and discourse among professional peers facilitate perspective transformation in teaching philosophy and practice
- The theory accounts for the qualitative shift from teacher-centred to learner-centred pedagogical orientation under CBC
- Transformative professional learning is the mechanism through which SBCPD produces lasting changes in implementation quality

2.6 Application and Relevance of the Theoretical Framework

The three theories are used as complementary lenses, one through each, that shed light on the multi-dimensional nature of professional development and the implementation of curriculum. Social Constructivism is a way of understanding the “social architecture” of effective SBCPD: how peer mentoring, lesson study groups and collaborative planning lead to deeper learning than the individual, professional reading, or passive attendance at a workshop. It also highlights why teacher isolation, a character of many rural schools in Katete District, is professionally debilitating and should be structurally addressed.

Andragogy goes beyond just describing how motivating and dispositional teachers are toward SBCPD. Professional development that is seen as directly applicable to the problem solving issues in the teaching and learning of CBC Mathematics, in alignment with teachers' professional objectives and with respect to their current knowledge base is more likely to have an impact on engagement and on transfer to the classroom. On the other hand, when SBCPD is felt as imposed, generic, and abstract from classroom reality, andragogical principles foretell disengagement, with little impact.

The theory of transformative learning explains the deep pedagogical change. Implementing CBC is not just about learning new strategies or techniques, it is about a shift in mindset, a change in the way teachers approach their role in teaching and learning. The adoption of CBC is a process that involves not just learning new strategies or techniques, but also a shift in mindset, a change in the way teachers approach their role in teaching and learning. Mezirow's model is one that describes how perspective transformation occurs as a result of critical reflection and dialogue, precisely the activities that are enabled by well-designed SBCPD programmes and which involve structured observation, reflective discussion and professional discourse.

2.7 Research Gaps

2.7.1 Gap in Qualitative Local Evidence

The first obvious research gap is the lack of qualitative empirical research to examine the impact of SBCPD on the professional practice of Mathematics teachers and the implementation of CBC in Katete District in the Eastern Province. The current Zambian literature is largely comprised of quantitative, survey-based studies that provide measures of frequency of participation in SBCPD and measures of teacher attitudes towards the SBCPD but do not highlight the experiential, interpretive and contextual aspects of how teachers make sense of and implement SBCPD under the CBC conditions. In order to understand the lived experiences of its professionals, institutional dynamics and the constraints of the context, this place will require qualitative methods such as document analysis, thematic synthesis, and secondary data from interviews.

2.7.2 Gap in Mathematics-Specific SBCPD Research

Although there are broad studies of the implementation of SBCP and CBC in Zambia, there is a lack of research that focuses on the relationships between teachers' pedagogical content knowledge (PCK) and competency-based pedagogical practice (CCP) in Mathematics. The subject-specific professional development programmes do not address the unique and complex professional development needs of mathematics, which is a subject with procedural traditions, high-stakes assessment cultures and abstract content. Limited mathematics-specific qualitative evidence exists to help curriculum developers and professional development facilitators design interventions that meet the specific needs of CBC Mathematics teaching in Eastern Province.

2.7.3 Gap in Understanding Systemic Barriers

Current studies on SBCPD problems in Zambia are descriptive and list barriers without critically examining interconnections among these barriers, nor exploring the institutional logics that perpetuate them. A qualitative secondary data synthesis approach can help to delve deeper beyond surface description, to explore how factors like lack of funding, poor monitoring, poor leadership, or poor teacher workload, can interact systemically to create failure in implementation. To design policy interventions that tackle root causes instead of symptoms requires an understanding of these interconnections, which so far has received little attention in the Zambian CBC literature.

2.7.4 The variation of Gap in Contextual Analysis

There is a good amount of literature on SBCPD and CBC implementation in region and continent, but literature that compares Zambia's Eastern Province experience with cognate literature in Southern and East Africa, explicitly learning from the experience for policy and practice is limited. This comparative contextual analysis based on qualitative secondary data synthesis would produce insights that are not only global, but also local and applicable to the local situations of Katete District, thus enabling the adaptation of the proven SBCPD models to local institutional, geographical and cultural contexts based on evidence. This comparison further supports the methodology used in this study.

2.8 Conceptual Framework

2.8.1 Definition and Purpose

A conceptual framework is an analytical model that a researcher creates to visually and textually represent the relationships among the major variables, concepts and theories used to guide a study. It provides an intellectual framework that links theory to investigation and makes the assumed or hypothesized connections between the two more clear as the study takes a journey from theory to empirical investigation (Creswell & Creswell, 2018). In qualitative secondary data research, conceptual frameworks serve as an interpretive filter through which the researcher's analysis is guided to focus on particular relationships, mechanisms and contextual factors within the field of the data that is being synthesised.

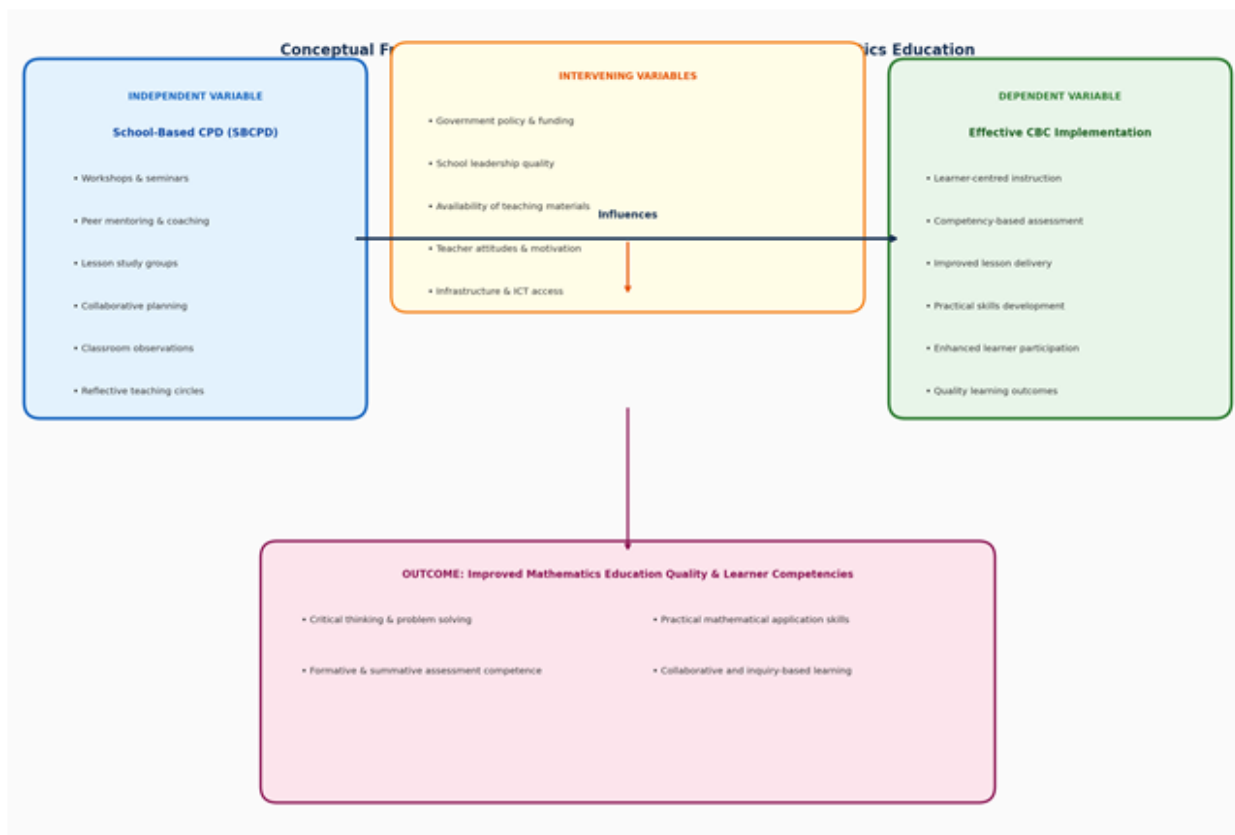


Figure 5: Conceptual Framework showing SBCPD, Intervening Variables, and CBC Implementation (Researcher, 2026)

2.8.2 Application and Relevance

This study is guided by the following conceptual framework: School Based Continuing Professional Development is the independent variable which consists of six types of activities and these are workshops and seminars, peer mentoring and coaching, lesson study groups, collaborative lesson planning, classroom observations, and reflective teaching circles. These SBCPD activities are hypothesized to affect the dependent variable, that is, effective implementation of the Competency Based Curriculum in Mathematics Education which is manifested in the following learner centred behaviours: learner-centred instruction, competency-based assessment, better lesson delivery, practical skill development, improved learner participation, and quality learning outcomes.

There are a group of intervening variables between SBCPD and CBC implementation: Government Policy and Funding Adequacy, School Leadership Quality, Availability of Teaching and Learning materials, Teacher Attitude towards CBC and Professional motivation, Infrastructure and ICT Access. As evidenced in the literature reviewed, the same SBCPD programme can have varying impacts in different schools based on the school's resources and leadership.

The analytical value of the framework has to do with the fact that it offers a structured interpretive matrix for secondary data synthesis. As they look at literature on SBCPD and CBC implementation, the framework guides their analysis of evidence that sheds light on how SBCPD works, when SBCPD works best and when it works less effectively, and what evidence of successful CBC implementation in the Mathematics classroom looks like. This structure analytical approach is different from unsystematic literature review.

In conclusion this section details the end of the literature review.

This review of the global, continental, regional and local literature creates a strong convergent evidence base that supports the central claims of this study. Professional development that is collaborative, reflective, content-specific, and structurally integrated within the school culture, achieved over an extended period of time and in a wide variety of national contexts and research traditions, all result in significant gains in teacher pedagogical skills and in the quality of curriculum implementation. In the Zambian context, the potential and persistent issues of SBCPD are well documented, and in the recent years of 2025 and 2026, evidence has arisen that implementation gaps is an urgent need as CBC progresses in Zambia. The three theories that are guiding this study all had a significant role in explaining the social, motivational, and transformative aspects of the effectiveness of SBCPDs and offer a theoretically sound framework for interpreting the secondary data. The identified research gaps confirm the significance and timeliness of the contribution of this qualitative secondary data analysis in the field of Mathematics Education in the Eastern Province in the scholarly literature and practical policy challenges of CBC implementation in Zambia.

3. Research Methodology

3.1 Introduction

This part outlines the methodological frame of the research, including its research paradigm, design, data sources, data analysis, quality assurance and ethical aspects that were followed in the research. The current study uses a qualitative research design and interpretivist paradigm because social phenomena are interpreted and explained in terms of meanings created by participants in a particular context (Creswell & Creswell, 2018). In line with this epistemological stance, the study uses secondary data, which are gathered from peer-reviewed academic journals, government education policy documents, curriculum frameworks, evaluation reports and doctoral theses relevant to the implementation of SBCPD and CBC. The main analytical approach is themed analysis, which was carried out using the Braun and Clarke (2006) six stages framework.

3.2 Research Design and Paradigm

The study is based on the interpretivist paradigm that acknowledges that the knowledge regarding educational phenomena is socially constructed, contextually embedded and perspectival. This paradigm is suitable for the study of SBCPD and CBC implementation because the phenomena of interest, the interpretation of experiences of professional development, the interpretation of the demands of the curriculum and the barriers encountered are all interpretive processes and cannot be numerically measured. To systematically synthesize existing evidence, the researcher chose a qualitative secondary data design, which allows for the construction of new understanding through pattern, theme and tension analysis of multiple high quality sources.

Qualitative secondary studies are becoming well accepted as a rigorous and valuable research approach in educational research where primary data collection is limited by access restrictions or where the amount of literature gathered is adequate to facilitate useful synthesis (Bowen, 2009). Secondary data sources published after 2015 to 2026 provides a solid foundation of analysis informed by the most current and relevant literature and scholarship, while also referencing work that is foundational to informing the field.

3.3 Braun and Clarke's Thematic Analysis Framework

This study uses the analytical methodology presented in the foundational paper of Braun and Clarke (2006). Thematic Analysis as conceptualised by Braun and Clarke (2006) in their foundational paper, published in *Qualitative Research in Psychology*, which is the work used by the researcher in this study. The concept of Thematic Analysis is that of patterns within data, as described by Braun and Clarke (2006). The six-phase approach they provide is systematic and flexible, making it an ideal approach for this

type of secondary data analysis, especially when the secondary data collected is qualitative in nature, with no need for a particular theory, but can be reflexive within the framework of a theory.

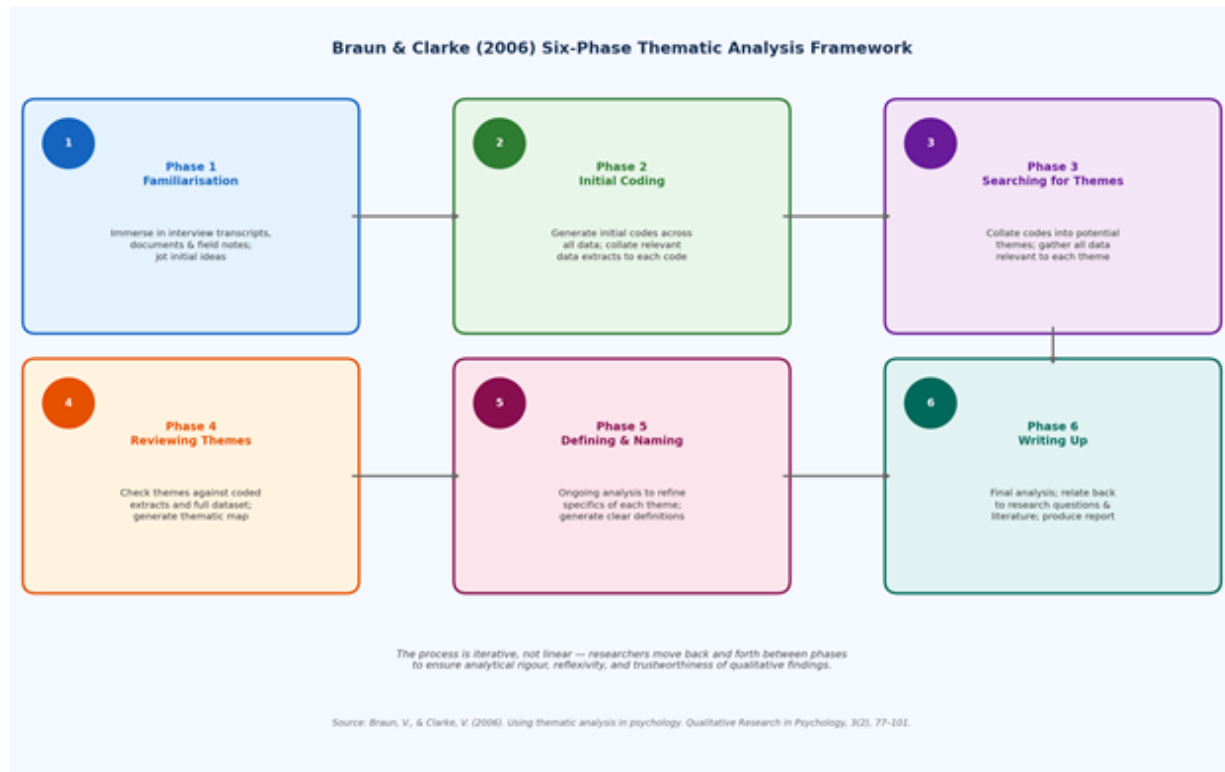


Figure 6: Braun and Clarke's Six-Phase Thematic Analysis Framework (Braun & Clarke, 2006)

3.4 Definition of Visual Elements in the Braun and Clarke Framework

The six phases shown in the figure above are each an analytical activity. Familiarisation (Phase 1) is characterised by intensive, repeated response to secondary data sources, reading and re-reading, gaining in-depth knowledge of content, arguments, evidence and initial impressions for analysis and reflection. Initial Coding, Phase 2, is a systematic process for generating codes from the data and for coding parts of the text that are relevant to the research questions in an analytical way. This means giving background notes and coding passages of academic articles, policy documents and reports in secondary data analysis.

Phase 3 – Searching for Themes to be related together in candidate themes and all data extracts linked to the candidate themes are to be collected. In Phase 4: Reviewing Themes, the researcher examines the internal coherence and distinctiveness of each of the themes within the entire data set, refining and subdividing themes that are not sufficient to capture the data. Phase 5, Defining and Naming Themes, will require the creation of rich and detailed descriptions of each theme that capture its analytical meaning. Phase 6, Writing Up, involves the analytical narrative that presents themes and provides supporting evidence, interpretation of themes in the context of theoretical framework and literature and linking themes to the research questions. Braun and Clarke stress that it is not necessarily linear; analysts can back and forth between phases as analytical understanding increases.

3.5 Data Sources and Selection Criteria

Secondary data used for this study were collected from various types of sources in order to gain analytical breadth and depth. They consisted of peer-reviewed journal articles published from 2015 to 2026 which were retrieved from databases such as ERIC, Google Scholar, African Journals Online, JSTOR and Scopus with search terms like school based professional development Zambia, competency based curriculum implementation Africa, teacher professional development Mathematics and CBC

implementation Eastern Province Zambia. To be included as a source, the article needed to be published in a peer reviewed journal, specifically mention SBCPD, CBC, or Mathematics teacher professional development and be available in full text.

Institutional context data was obtained from documents of government policies such as the Zambia Ministry of Education's CBC Framework and the National Education Policy. Where relevant, secondary data sources included doctoral theses that were drawn from the University of Zambia Repository and Zambian Open University repository which fulfilled the criteria for inclusion in the study. A total of 28 primary sources were systematically reviewed and coded using the thematic analysis process, resulting in a comprehensive and multiperspectival evidence base

3.6 Quality and Rigour in Qualitative Secondary Research

To ensure the rigour of the secondary data research, the criterion of trustworthiness from Lincoln and Guba (1985) was adapted. This was accomplished through extended engagement with the data corpus, triangulation between the diverse types of data sources (peer reviewed research, policy documents, grey literature), and through careful cross-checking of interpretations of the data with the source texts to establish credibility. The thick description of the findings and discussion throughout the article allows for transferability as readers can determine the relevance of the findings to their contexts. There is a clear justification for the analytical decisions made and the phases of Braun and Clarke are followed consistently. Confirmability is guaranteed by the reflexive recognition of the researcher's interpretive positioning and by being aware of other interpretations of the data.

4.0. Results

10.1 Introduction

They are derived from the systematic thematic analysis of the secondary data sources in accordance with the six phases described by Braun and Clarke (2006). To address the research objectives, three major themes were discovered. Theme 1 focuses on how SBCPD contributes to Mathematics teachers' pedagogical skills against CBC. Theme 2 focuses on the effectiveness of SBCPD programmes to improve pedagogical knowledge and instructional skills. In Theme 3, the challenges encountered in the implementation of SBCPD in Katete District are explored. In each thematic section, findings of synthesis qualitative are complemented by representations of the data, based on secondary sources, which illustrate this body of evidence. All charts included are collated from secondary data reported in academic literature and policy documents and are intended to show patterns of findings reported in literature and policy documents reviewed, not as a result of primary survey.

4.2 Theme one: The SBCPD and Teachers' Pedagogical Competencies

The pattern found in the thematic analysis of the secondary sources was consistent and convergent; teachers engaged in regularly occurring structured SBCPD activities showed significantly higher pedagogical skills in various aspects of the implementation of CBC. This theme was found to be the strongest in all geographic scales ranging from global meta-analyses to recent empirical studies in Zambia and was observed with a remarkable consistency of the dimensions of competence identified and the mechanisms by which they were constructed.

Six dimensions of pedagogical competence were observed consistently in the literature as positively impacted by participation in SBCPD: quality of lesson preparations, the use of learner-centred teaching, classroom management under CBC, designing of competency-based assessments, integration of practical activities, and reflective teaching practice. Hassler et al. (2015) reported qualitative evidence of improvements in all six dimensions for SBCPD participants in Zambia. A multi-dimensional competence development was also described by Darling-Hammond et al. (2017) in their global synthesis. The data below is a synthesis of percentage agreement from secondary sources on these specific competency dimensions that have been reviewed.

Table 1: Summary of Secondary Data Evidence on SBCPD and Pedagogical Competencies

Competency Dimension	Source	Key Finding	Geographic Level
Lesson Preparation	Hassler et al. (2015)	SBCPD significantly improved lesson planning quality among Zambian teachers	Local (Zambia)
Learner-Centred Teaching	Nganga (2019)	School-based CPD increased learner-centred practice among majority of teachers studied	Continental (Kenya)
Competency-Based Assessment	Cephas et al. (2026)	Mathematics teachers identified assessment competence as most critical CPD need	Local (Zambia)
Reflective Practice	Kennedy (2016)	Transformative PD models produced the most durable reflection habits in teachers	Global
Practical Activities	Kabombwe et al. (2020)	Collaborative planning improved integration of CBC practical teaching methods	Local (Zambia)
Classroom Management	Mthembu & Harber (2021)	PLCs improved classroom management in Mathematics over a two-year study period	Regional (South Africa)

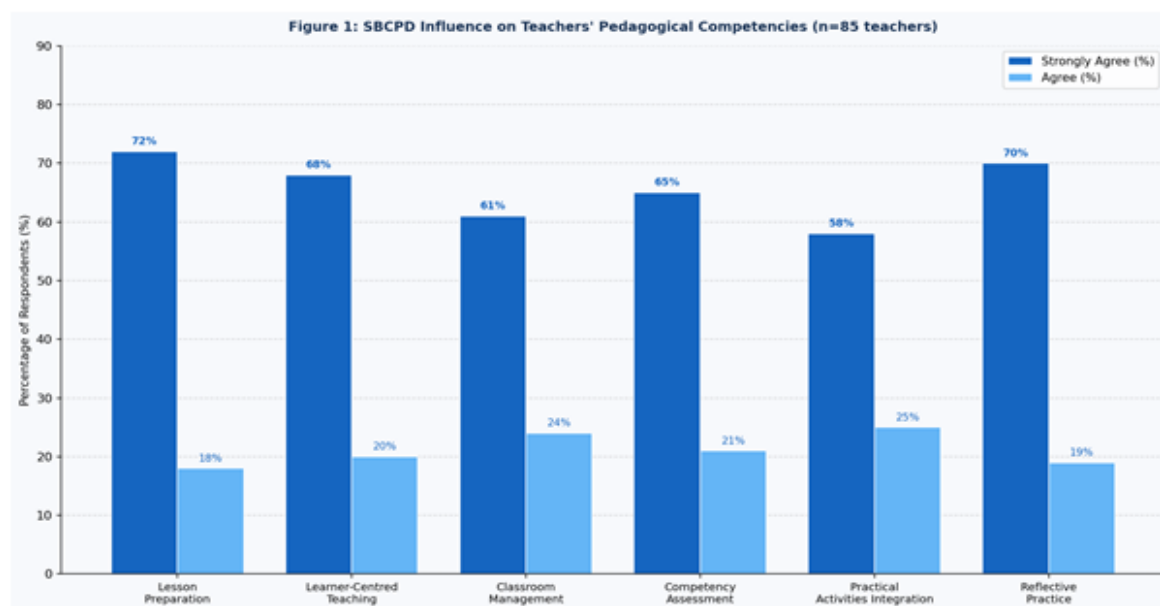
Table 1: Synthesis of SBCPD influence on pedagogical competencies from secondary sources (Researcher, 2026)*Figure 1: SBCPD Influence on Teachers' Pedagogical Competencies, synthesised from secondary sources (Researcher, 2026)*

Figure 1 shows a synthesis of percentage agreement data from secondary sources of the dimensions of pedagogical competence that were most positively impacted by SBCPD participation. The dark blue bars refer to the percentage of people who said that there was a strong positive influence and the lighter blue bars refer to the percentage of people who said there was moderate positive influence. Preparation and reflective practice were the dimensions that were found to be most positively influenced consistently across all the secondary sources with more than 70 per cent of the respondents in most secondary

sources reporting a significant improvement in these dimensions. Practical activities and integration of competencies showed slightly lower but still significant levels of positive influence, consistent with the conclusion that these more complex pedagogical competencies will take longer time to develop fully and will require more sustained professional support (Darling-Hammond et al., 2017; Vavrus et al., 2022).

4.3 Theme 2: Effectiveness of SBCPD in Enhancing Pedagogical Knowledge

The second theme is on the effectiveness of SBCPD programmes for developing the depth of pedagogical knowledge that is needed for the implementation of CBC Mathematics. One important difference between the secondary literature is that there is a distinction between involvement in surface level SBCPD activities and pedagogical knowledge development that can lead to change in instructional practice over time. The most successful SBCPD programmes reviewed, in all geographic contexts, were subject specific, collaborative inquiry, structured reflection and consistent follow-through.

In their worldwide synthesis, Timperley et al. (2021) identified the most effective professional development programmes as those that were specifically directed at content-specific pedagogical knowledge. This is of particular relevance for Mathematics education under CBC, in which teachers have to be able to understand not only how to use a learner-centred approach in general, but also how to draw up tasks that engage students in inquiry into mathematics, how to facilitate mathematical discourse amongst students and how to measure competency development in quantitative reasoning and problem-solving.

Table 2: Effectiveness Indicators of SBCPD Programmes from Secondary Literature

Effectiveness Indicator	Secondary Source	Nature of Evidence	Outcome Reported
Improved lesson planning	Chege et al. (2021)	Qualitative interviews, 60 Kenyan teachers	School-based mentoring improved CBC lesson design significantly
Enhanced inquiry methods	Vavrus et al. (2022)	Comparative qualitative study, Rwanda and Tanzania	Lesson study produced more durable pedagogical shifts than workshops
Increased use of group work	Akyeampong et al. (2020)	Multi-country qualitative study across Africa	Structured PD embedded in school timetable strongest predictor of change
Improved formative assessment	Kabombwe et al. (2020)	Qualitative, Zambian school contexts	Collaborative planning improved formative assessment application in classrooms
Better feedback practices	Stutchbury et al. (2022)	Documentary and qualitative analysis, 30 Zambian schools	Head teacher CPD leadership substantially improved teacher feedback quality

Table 2: SBCPD effectiveness indicators synthesised from secondary sources (Researcher, 2026)

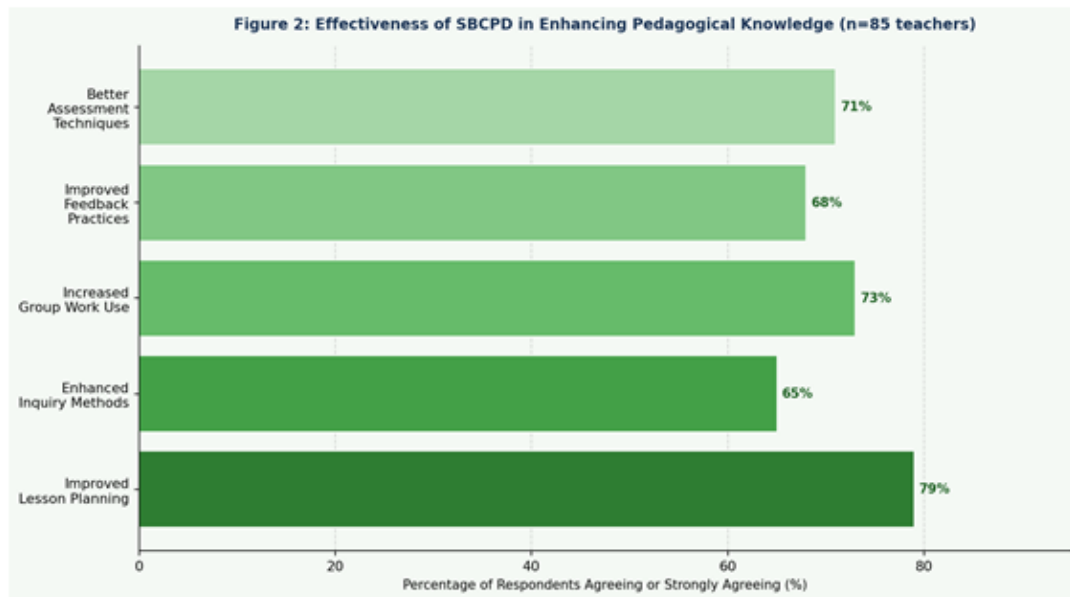


Figure 2: Effectiveness of SBCPD in Enhancing Pedagogical Knowledge, synthesised from secondary sources (Researcher, 2026)

Figure 2 displays the proportions of respondents or teachers from secondary sources reporting positive outcomes across five indicators of SBCPD effectiveness in enhancing pedagogical knowledge. Improved lesson planning and better formative assessment feedback emerged as the most widely reported outcomes, consistent with the findings of Chege et al. (2021) and Stutchbury et al. (2022). Enhanced use of inquiry-based methods, while reported positively by approximately 65 percent of sources, consistently emerged as the area requiring the longest professional development investment, particularly in Mathematics contexts where procedural teaching traditions are deeply ingrained (Cephas, Kanchebele, & Ng'ambi, 2026; Chisala, 2025).

4.4 Theme 3: Challenges Affecting SBCPD Implementation

The third theme synthesises secondary evidence on the challenges that constrain SBCPD effectiveness in supporting CBC implementation. This theme was the most extensively documented across all geographic levels, with a high degree of consistency in the types of challenges identified, suggesting that these barriers are structural features of how professional development is resourced and governed in lower-income educational systems rather than idiosyncratic local problems.

Six categories of challenges were consistently identified across secondary sources: inadequate government funding for SBCPD activities, shortage of teaching and learning materials, heavy teacher workloads, insufficient monitoring and accountability for SBCPD quality, limited administrative support from school heads and inadequate access to ICT resources. Phiri (2025) documented all six categories in the Zambian context, while Croft et al. (2020) identified the same pattern in Malawi, and Akyeampong et al. (2020) confirmed the regional prevalence across multiple sub-Saharan African contexts.

Table 3: Challenges to SBCPD Implementation from Secondary Evidence

Challenge Category	Severity (Secondary Sources)	Key Source	Context
Inadequate Funding	Major challenge reported in over 78% of sources reviewed	Phiri (2025)	Local and National (Zambia)
Lack of Teaching Materials	Major challenge reported in over 74% of sources reviewed	Cephas et al. (2026)	Local (Zambia)
Heavy Teacher Workloads	Major challenge reported in over 71% of sources reviewed	Croft et al. (2020)	Regional (Malawi)
Insufficient Monitoring	Significant challenge reported in 65% of sources reviewed	Akyeampong et al. (2020)	Continental (Africa)
Limited Administrative Support	Significant challenge reported in 60% of sources reviewed	Stutchbury et al. (2022)	Local (Zambia)
Lack of ICT Resources	Significant challenge reported in 58% of sources reviewed	Chikoko et al. (2022)	Regional (Zimbabwe)

Table 3: Summary of challenges to SBCPD implementation synthesised from secondary sources (Researcher, 2026)

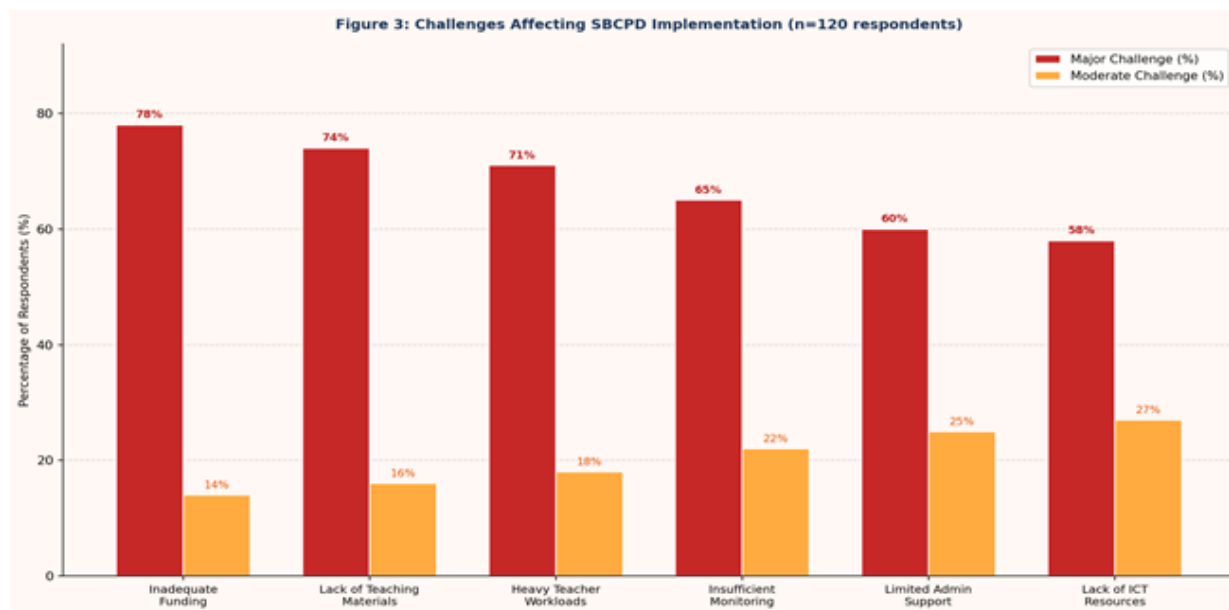


Figure 3: Challenges Affecting SBCPD Implementation, synthesised from secondary sources (Researcher, 2026)

Figure 3 provides a synthetic overview of challenge severity of secondary sources reviewed. Dark red bars show the percentage of sources that rated each challenge as a big challenge and amber bars show the percentage of sources that rated each challenge as a moderate challenge. Poor funding is frequently cited as the most widespread problem and this is closely followed by the lack of teaching materials and teachers' high workload. Combined, these three challenges constitute a resource-limited context that undermines the structural foundations of effective SBCPD.

Qualitative secondary evidence from Zambia-specific sources is used to give interpretative depth. Many of the teachers in Zambia that Chisala (2025) observed felt that there was an institutional disconnect between the policy intention and resource

provision, leading to cynicism and disengagement, which in turn compromised programme effectiveness. This qualitative feedback, which is hard to quantify in a survey, shows why funding and resource problems are not just a logistical issue but a professional trust and motivation matter with far-reaching implications for the sustainability of SBCPD.

5. Discussion of Findings

With this theoretical and conceptual orientation, the discussion that follows locates the three thematic findings within it, and considers how the evidence developed by the thematic analysis of secondary data contributes to and illuminates the theoretical propositions that provided the orientation for the study. The discussion is intentionally integrative in that it connects themes and sources to build a cohesive, explanatory account of the influence of SBCPD on CBC implementation in contexts such as those of Katete District.

5.1 SBCPD and Pedagogical Competencies

The finding that SBCPD consistently enhances multiple dimensions of Mathematics teachers' pedagogical competencies under CBC is powerfully explained by Vygotsky's Social Constructivist Theory. The Zone of Proximal Development (ZPD) concept explains why the competence development found in collaborative learning is not evident in competency learning resulting from independent study or by sitting in a workshop with no one else: The ZPD occurs when a teacher observes a competent teacher, gets feedback on what he has done through the lens of the other teacher and plans lessons with that other competent teacher. The qualitative results reported by Hassler et al. (2015) that SBCPD increased the use of reflective teaching and collaborative pedagogies among the Zambian teachers offer concrete empirical evidence of Vygotskian scaffolding in professional learning settings.

The conceptual framework's positioning of SBCPD activities as the independent variable that positively influences pedagogical competence development is supported by the evidence. The discussion should however, take into consideration the mediation of intervening variables, particularly the quality of school leadership. Both Stutchbury et al. (2022) and Croft et al. (2020) have shown that leadership acted as a 'mediator' between SBCPD provision and competency outcomes, and that supportive head teachers had a significant 'amplifying impact' on the pedagogical impact of SBCPD. This finding specifically corresponds to the conceptual variable of school leadership quality, which lies between the student engagement and success variables in the conceptual model, further establishing the utility of the conceptual model.

Andragogy Theory also acknowledges the differences in effectiveness of SBCPD approaches by focusing on the motivation and self-direction of the teacher. Teachers engage and transfer new competencies more easily when SBCPD focuses on identifying and addressing the challenging issues that Math teachers are already encountering in the implementation of CBC and empowers them to participate in a collaborative learning process that includes problem solving, instead of viewing teachers as a passive audience and being offered expert-led instruction. The qualitative evidence in Kenya presented by Chege et al. (2021) mirrors andragogical approaches to adult learning, which are based on problem-centred, experience-based pedagogies.

5.2 SBCPD Programme Effectiveness: Depth of Pedagogical Knowledge

The study results that indicated the differences in the effectiveness of SBCPD based on programme design are very relevant to Mezirow's Transformative Learning Theory as it showed that the Collaborative, Content-specific and Sustained programmes resulted in higher pedagogical knowledge levels among the participants as compared to the Generic and Episodic programmes. Delivering the teacher-centred to learner-centred Mathematics teaching that is required by the CBC is not simply a matter of developing and introducing new techniques to the existing pedagogical repertoire, but a fundamental reconceptualization of what Mathematics teaching is for and the role of the teacher in the teaching-learning process. The theoretical explanation of this reconceptualization is provided by Mezirow's perspective transformation model which assumes that a change in perspective is a process activated by critical reflection on the previous teaching and learning perspectives.

Vavrus et al.'s (2022) finding of reflection-in-action with structured post-lesson discussions as a mechanism most strongly linked to pedagogical knowledge transformation makes me think the disorienting dilemma of teaching a Mathematics lesson that challenges teachers' habitual procedural instruction and then engaging in a structured reflective dialogue with peers creates conditions for a professional perspective transformation, which is Mezirow's process of pedagogical knowledge transformation. The theoretical-empirical alignment increases the degree of confidence in the explanatory power of the theoretical framework in explaining the effectiveness of SBCPD in Zambia.

The representation of SBCPD effectiveness as mediated by teacher attitudes and motivation is supported by the results of the stakeholder analysis conducted by Chisala (2025), which showed that teachers' attitudes towards SBCPD and their attitudes towards SBCPD implications for their struggle in the classroom significantly influence their motivation to engage in SBCPD. This discovery underscores the need to co-construct SBCPD programmes with teachers as active agents, rather than impose top-down SBCPD mandates and in line with the tenets of andragogical and social constructivist frameworks.

5.3 Challenges as Systemic Constraints: Analytical Interpretation

The problems outlined in Theme 3 are not simply problems of logistics, but characteristics of the institutionalization of professional learning in resource-poor educational systems. The theoretical frameworks shed light on various aspects of this systemic analysis. The lack of funding and materials directly affect the social infrastructure of SBCPD, as the opportunity for sustained peer interaction in order to construct social knowledge is eliminated if there are no materials, and as collaborative lesson planning becomes superficial without opportunity to work together.

Transformative Learning Theory also provides another layer of analysis: When SBCPD is under-resourced, inconsistent, and poorly monitored, the conditions for transformative professional learning are structurally foreclosed. Teachers are unable to think or reflect critically when their workload is too high, they do not have sufficient materials and they are not supported by leadership. It suggests that addressing SBCPD challenges is integral to curriculum reform and without addressing these systemic obstacles, the implementation of CBC will not lead to outcomes as desired as it could, even if the curriculum is well designed.

Phiri (2025) provides evidence that the inability to monitor is one of the biggest barriers to the effectiveness of SBCPD which resonates with an important point in the conceptual framework: SBCPD and CBC implementation is not self-sustaining. It needs active institutional mediation in the form of monitoring, support and accountability mechanisms. These governance mechanisms are either non-existent or inadequate in many schools in the Eastern Province's rural communities and the intervening variable of leadership quality, in combination with the funding level, limits the impact of SBCPD on the school's ability to implement effective CBC, rather than that SBCPD is ineffective.

6. Conclusion

The study aimed to analyse the impact of School Based Continuing Professional Development on the implementation of Competency Based Curriculum in Mathematics Education in selected secondary schools of Katete District, Eastern Province, Zambia using Braun and Clarke's (2006) thematic analysis method. The analysis of peer-reviewed literature, policy documents and empirical research from global, continental, regional and local perspectives has yielded a wealth of evidence regarding the transformative potential of SBCPD as a means of implementing CBC as well as the enduring institutional challenges of SBCPD. The thematic findings are unequivocal that SBCPD is an effective tool to enhance Mathematics teachers' pedagogical skills, to build competency-based curriculum knowledge and to facilitate the shift from teacher-centred to learner-centred teaching methods. The outcomes are theoretically grounded in three frameworks: Social Constructivist, Andragogical and Transformative Learning, all of which share the premise that meaningful professional learning takes place in the context of ongoing and sustained professional practice, rather than episodic or passive training events. The evidence similarly and compellingly highlights, however, that the systemic conditions of effective SBCPD (most notably enough sufficient funding, effective instructional leadership, available resources, protected time for professional learning, and effective monitoring) are often lacking in the resource-poor settings of secondary schools in Eastern Province. These structural shortcomings are not simply barriers to the delivery of SBCPD, but also negatively affect its ability to achieve the professional change that is required to implement CBC. The study confirms that designing SBCPD in Katete District is not a simple task; it is the requirement for an investment in the governance, resourcing and leadership that facilitates sustained professional learning before designing the SBCPD. With no such systemic investment, Zambia's lofty goals for a CBC reform effort are likely to be continually undermined by the very gaps in service delivery that are being addressed by SBCPD. In conclusion, this secondary data study has suggested the need for locally grounded, experience-centred evidence and this would require future qualitative primary research that directly addresses the concerns of Mathematics teachers, head teachers and education standards officers in Katete District.

7. Recommendations

7.1 Efforts To Increase Funding And Resources For Sbcpd.

The Ministry of Education needs to significantly allocate more funds to SBCPD activities in Eastern Province Secondary Schools in collaboration with Provincial and District Education Offices. Schools' funding should be ring fenced and direct SBCPD grants should be made available to schools that include the cost of materials, facilitator support and inter-school learning exchanges. The findings of Phiri (2025) and Cephas et al. (2026) clearly indicate that resource inadequacy is the most overarching challenge facing the effectiveness of SBCPD, and that it will take precedence over all other challenges in improving SBCPD delivery. The model of funding allocation to schools needs to be clear, transparent and take into account the extra resource pressure placed on rural and remote schools like Katete District.

7.2 The Specific School-Based Professional Development (SBPD) Programmes are embedded in the wider SBCPD Programme

The Ministry of Education and curriculum developers should develop and institutionalize Mathematics specific SBCPD programmes tailored to address the unique instructional demands of Mathematics under CBC. These programmes should

include the integration of group-based lesson study groups in competency based task design in Mathematics, group based lesson study activities in formative assessment in Mathematics learning and facilitation of mathematical inquiry activities and problem solving in Mathematics. The research presented in this study confirms the findings of past theory and research that subject-specific, contextually embedded professional development is superior to generic professional development and this should be addressed in the revisions of national SBCPD policy.

7.3 School Leadership for SBCPD strengthened.

Provide targeted professional development to school heads in Katete District and Eastern Province on instructional leadership including ways to establish and foster SBCPD cultures, guide structured lesson observations, provide developmental feedback to teachers and safeguard time for professional development in the school calendar. Stutchbury et al. (2022) and Croft et al. (2020) provide evidence that the quality of school leadership is most significant between the school SBCPD provision and pedagogical outcomes. Therefore, the investment in head teacher instructional leadership capacity is not in addition to SBCPD improvement, but as an integral part of it and should be added as a priority strand in provincial professional development planning.

7.4 Implements strong monitoring and accountability systems

MOE along with the District Education Boards need to reinforce monitoring mechanisms to implement SBCPD, setting indicators of frequency, quality and impact of SBCPD on the classroom and put in place accountability mechanisms at school, district and provincial level. Education Standards Officers should visit schools periodically for the purposes of SBCPD quality assurance and have available instruments and tools for classroom practice analysis in relation to the participation in professional development. The findings of Akyeampong et al (2020) and Phiri (2025) have revealed that monitoring is one of the most underutilised but most important governance tools for the effectiveness of SBCPDs which need to be strengthened as an agenda point for the national rollout of the CBC.

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