UNIVERSITY OF CAPE COAST

TEACHERS' PERCEPTION ON THE IMPLEMENTATION OF THE PRIMARY SCHOOL MATHEMATICS CURRICULUM

PAUL DZOMEKU

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BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidates Signature: …….. Date: ……

Name: PAUL DZOMEKU

Index Number: PT/MTS/20/0007

Supervisors' Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature: ……. Date……

Name: MR. BENJAMIN YAO SOKPE

ABSTRACT

This study investigates the perception of teachers regarding the implementation of the primary school mathematic curriculum in the Poase Cement Circuit, in the Kadjebi district. The research employed a sequential exploratory design. 6 teachers were selected using a purposive sampling method to collect qualitative data through a semi-structured interview. Results from the interview were analyzed thematically. A survey was conducted on 51 teachers to collect quantitative data using a modified Stages of Concern Questionnaire of the Concerns–Based Adoption. Results were analyzed through descriptive analysis, including mean and standard deviation calculations. The key findings of the study indicated that teachers were generally aware of the curriculum implementation, but expressed inadequate knowledge about its implementation. Teachers admitted that the new curriculum personally affected them and believed it facilitated faster and more innovative student learning. However, the lack of textbooks and other teaching and learning materials hindered effective curriculum implementation. Additionally, teachers perceived an increase in their workload due to the new curriculum. Based on the findings, several recommendations were made. First, there is a need for comprehensive teacher training programmes to enhance teachers' understanding and proficiency in implementing the new curriculum. Second, efforts should be made to provide adequate textbooks and materials to support effective teaching and learning. Finally, strategies to manage and alleviate the increased workload on teachers should be explored, such as collaborative planning and resource sharing.

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DEDICATION

This work is dedicated to my spiritual parents Bishop Sebastian Amenya and Rev. Dr. Mrs. Priscilla Amenya

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

The significance of mathematics cannot be underestimated. It plays a crucial role in today's world, capturing the attention of nations worldwide due to its contributions to technological advancements and societal improvements when its principles are applied. As we look at more recent research, (Mereku, 2019) highlights how the progress in technology and overall national development has prompted changes in educational curricula. Many countries now strive to align their curricula with those of more advanced nations. In a similar vein, (ÖZÜDOĞRU, 2021) argues that the recent revision of the Turkish curriculum stems from the recognition that many countries are advancing, necessitating a review of Turkey's curriculum to keep pace.

In Ghana, the National Council for Curriculum and Assessment (NaCCA) has implemented a new curriculum for basic schools. (Ministry of Education , 2018) outlines that the curriculum aims to contribute to national development priorities and global sustainable development goals. Moreover, it emphasizes the importance of mathematics and science as the foundations of technology in our modern world. Consequently, mathematics takes precedence in the curriculum reform, aligning with the vision of Ghana becoming a mathematics-friendly country, as stated by Dr. Yaw Adutwum, the Minister of Education.

In achieving the goals of national transformation and successful implementation of the new curriculum, teachers play a pivotal role. Extensive research by (Desimone, 2002) and (Spillane & Callahan, 2000) underscores the significance of teachers in curriculum reform. (Blignaut, 2007; Haney,

Lumpe, Czerniak, & Egan, 2002) assert that teachers' opinions, perceptions, and approaches are integral to the success of educational reorganization. Teachers' perceptions are crucial as they determine the extent to which they comprehend and embrace the new curriculum, as well as their ability to effectively communicate it to others. Therefore, the perception of teachers holds immense importance in realizing the objectives of the new standard-based curriculum.

Background of the Study

The curriculum is "the plans made for guiding learning in schools, usually represented in retrievable documents of several levels of generality, and the implementations of those plans in the classroom; those experiences take place in a learning environment that also influences what is learned". for (Glatthorn, 1987)p.1. Saylor, Alexander, & Lewis (1981) also had the same opinion when they argued the curriculum is "a plan for providing sets of learning opportunities for persons to be educated" (p.8). These researchers believe the curriculum is not just what is to be taught but what the plan and the procedure for teaching it is. This, therefore, makes the curriculum a relevant tool in the whole educational process, since a very good plan will result in a good building. Au (2012) stated that before designing any curriculum reform we should think about these questions: "What kinds of children do we want in this world? What kinds of consciousness and action do we want to encourage in them and have them develop? The answers of these question will lead us to the more specific question: What kinds of educational environments do we need to support the development of these kinds of students?" (p.56). Au's approach has been a central feature that drives most curriculum change.

Curriculum change is also referred to as educational reform. For (Fullan & Pomfret, Research on Curriculum and Instruction Implementation, 1977) and Fullan, (1982) curriculum change is the general improvement and changes to the existing curriculum. They went further to state that these changes are a result of the changing demands in society and the world at large. Many researchers have argued that education has been the tool to change society (Shiundu & Omulando, 1992; Otunga, Odero, & Barasa, 2011). According to Otunga, Odero, and Barasa (2011). Curriculum change is important and relevant at any level of development in a country's growth. Ünsal, Cetin, Korkmaz, & Aydemir (2019) argued that curriculum change affects almost the entire structure of the educational process, they further stated that the curriculum change affects the teacher, students, textbook, and all other things needed to make the teaching and learning successful.

The curriculum in Turkey experience changes from a shift from the behaviourist learning theories to the constructivist theory in 2005. The change led to modification in the dimensions of the curriculum including the assessment and evaluation process, aims and objectives, the content been thought, the roles and roles of teachers and students. (Akpınar & Aydın, 2007). Still, in the 2012-2013 academic year, the curriculum was change to make up with the new educational structure. That is the 12years of compulsory education; the 4+4+4 system. The new educational system demanded a new English language curriculum since the teaching of the language starts from grade two instead of grade four (Özüdoğru, 2017). Moreover, there were changes made in the aims and objectives, content, teaching and learning

process, and the assessment and evaluation. (Deveci, 2018; İlhan & Aslaner, 2019; Karaman & Karaman, 2019)

The curriculum was revised in 2017 because of the need to meet with the needs of the times and the changing needs of individuals and society (Ministry of National Education (MoNE), 2017b). Values education was mentioned in all curricula (MoNE, 2017b). The 2017 programmes are run for one year only. After revising the 2017 curriculum based on stakeholder comments, the new curriculum began to be implemented in the Turkish education system in the 2018-2019 school year (MoNE, 2017b). In the 2018 curriculum, values education has been further clarified in all curricula by selecting 10 core values, including, fairness, relationship, uprightness, self-discipline, persistence, endurance, esteem, love, accountability, nationalism and assistance". Having in common is a tectonic approach, the subject curricula have brought about a number of changes. For example, comparing the elementary and junior high school English programmes in 2013 and 2018, it can be seen that the 2018 programme copies many parts of the 2013 programme and has some slight modifications in subjects, how to set goals below. different titles and ratings. and evaluation (Acar, 2019). In addition, the software and communication technology curriculum for elementary school from grade 1 to grade 4 was introduced and for the first time this subject started to be applied voluntarily from grade 1 (Ministry of National Education (MoNE), 2018). In this programme, the concept of synthetic computer thinking problem solving and coding appeared for the first time. In addition, it is reported that the curriculum of the Turkish language course does not make a clear difference, but that the new curriculum is more convenient and flexible

with the listed learning area goals. listed under fewer subheadings (Bıçak & Alver, 2018; Yazar, 2019). Ozudogru (2021) argues that it is important for Turkey to implement a new agenda given the changing needs of the world and the country's goal to keep pace with this growth. Ozudogru (2021) explains that the new change in the Turkish curriculum will help improve the country and also help the country keep pace with modern means of development.

Trinidad and Tobago also launched a new curriculum in 2014 that will allow secondary school students to learn entrepreneurship (Mathura, 2019). The Ministry of Education in Trinidad and Tobago explained that the new curriculum was necessary because it will provide an avenue for the Caribbean countries to escape the cycles of dependency. They also explain that the new curriculum was relevant because it will allow students to start a business and maintain a profitable business (Mathura, 2019).

Teachers have been described as the key competencies of the curriculum change. (Smith & Desimone, 2003); (Spillane and Callahan, (2000), and a lot more researchers agree that teachers play an important part in the implementation of curriculum reform. Teachers' perception is one central and important component of the whole curriculum change. It is relevant because it deals with the teachers' beliefs, understanding, and interpretation of the new curriculum. The perception of teachers allows them to interpret the curriculum the way they see it. It also allows them to pass on what they understand to the students they are teaching. Therefore, for the success of every new curriculum, teachers need to have the right perception of the curriculum. This will enable them to achieve the target set out in the curriculum.

In Ghana, the curriculum has seen a major change throughout the educational system. In 2012 the Ministry of Education designed a curriculum that was used in the teaching and learning in the country, these lasted close to a decade before the change in 2019. There was a lot of criticism leading to the change, (Avenuegh.com, 2019) some of these include;

1) Overload of Cotent: the National Council for Curriculum and Assessment (NaCCA) argued that the broad nature of our curriculum presents an educational challenge. There are too many curriculum goals to teach in the time available for teaching and testing.

2) Too much emphasis on passing exams/teaching exams: In this regard, NaCCA stated that the evaluation system fails to provide sufficient data on what improvements can be made in teaching and learning, and the preparation of learners to pass the exam, that is, there is too much emphasis on teaching about exams.

3) Poor learning outcomes: This is an overwhelming failure rate for students taking major exams such as BECE and WASCE. Therefore, the main reason behind the new curriculum is to change the structure and content of the education system from simply passing exams to building character, developing values, being educated, confident and thinking critically. It was a desire to shift to creating citizens. Also, to address existing curriculum challenges and ensure that national curriculum content is internationally comparable.

In 2019, a new primary school curriculum was introduced. The new standard-based curriculum is designed differently than the old objective-based curriculum. The standards-based curriculum is categorized into the following areas: "Strands": This is the main area/section of content that you will study.

Sub- strand: Which are the themes within each thread that the content is organized in. 'Content standards" are the level of knowledge, skills, and attitudes that learners are expected to achieve at certain stages of their education. "Indicator": These are the distinct deliverables or milestones that learners must demonstrate each year in order to meet content standards expectations. "Exemplars": ssupport and guidance that articulates the expected outcomes of the indicators and suggests what teaching and learning activities can be done to support the facilitator in delivering the curriculum (Ministry of Education, 2018)

The National Pre-Tertiary Education Curriculum framework explained that the new standard-based curriculum will consider Basic School from KG to SHS, unlike the former Objective-Based curriculum which considers Basic school from KG to JHS. It also emphasizes that end of term examination which was written by all classes in the old curriculum will now be written by only basic 2, 4, 6, and JHS 2 and it will be a standardised test. Also, primary schools will now study Mathematics, English, Science, Computing, Ghanaian Language, History, Our World Our People, Physical Education, Religious and Moral Education, and Creative Arts, unlike the Objective Based Curriculum which didn't include History and Our World Our People (Ministry of Education , 2018)

These changes in the curriculum brought a lot of questions to teachers, some of these questions has to do with new procedure in delivering the new curriculum, the actual difference between the old curriculum and the new curriculum, since some of the content remains the same. These questions have brought about conflicting views and perceptions about the new curriculum,

especially the mathematics curriculum implementation. The researcher hopes to explore these various conflicting views to understand teachers' perceptions of the new mathematics curriculum. The researcher believes this is the right time to conduct this research since teachers have had a feel of the new curriculum and are now in a better stand to answer questions regarding their experience with the curriculum. Also, if the right answers are provided to these questions, they will result in the effectiveness of the curriculum implementation and also the new curriculum achieving its intended purpose.

Statement of the Problem

Teachers are very important in the implementation and success of any educational reform (Smith & Desimone, 2003; Spillane & Callahan, 2000). The teacher's perception of the curriculum is how they regard, understand, and interpret the curriculum. The teacher's beliefs, attitudes, and perceptions of the new curriculum are very monumental if the curriculum reform is to be effective and successful (Blignaut, 2007; Haney et al., 2002).

A lot of countries around the world have reformed their curricula owing to the growing demand for change around the world and also the development other countries are achieving as a result of their curriculum (Dagher & BouJaoude, 2011). Ozudorgu (2021) argued that teachers' perception of the new Turkish curriculum was important if the goals of the curriculum change is to be achieved. His study went further to suggest that teachers had a neutral view of the curriculum change and that they didn't see the difference in their 2005 curriculum as compared to the recent curriculum, which he suggested in-service training is to be provided for teachers to see the distinction between the old and the new curriculum. This is very applicable in

our case in Ghana if the relevance of the curriculum is to be achieved. Mathura (2019) also argued that the Ministry of Education and the Caribbean Examination Council are to review their professional development in Trinidad and Tobago since their study came up with findings that assume teachers did not know about the curriculum change in their country. It therefore, encourages the Ministry to do a lot of work on training teachers if the desired success of the curriculum change is going to be achieved.

In Ghana, (Aboagye & Yawson, 2020) in their study of teachers' perception of the new curriculum demonstrated that teachers find the new curriculum important and useful but contain a lot of workload for the teachers. They argued that teachers should be involved in the planning of the curriculum, not only the policymakers. The researcher believes the timing for his research was at a point where teachers knew very little about the new curriculum and therefore may not be able to express their best opinion on the curriculum.

This study, therefore, focuses on the teacher's perception of the primary school mathematic curriculum in the Poase Cement Circuit.

Research Objective

The study sorts to find out teachers perception on the implementation of the primary school mathematics curriculum. It also seeks to find out the challenges teachers face in delivering the primary school mathematic curriculum and also find out teachers expectation of the future mathematics curriculum. According to Kirk and McDonald (2001), teachers' perception and how they interpret a new curriculum is crucial to the reform process.

Research Questions

The following research questions guided the study.

1. How do teachers perceive the implementation of the primary school mathematics curriculum?
2. What concerns do teachers express regarding the delivery of the primary school mathematics curriculum?
3. What expectations do teachers hold for future mathematics curricula in primary schools?

Significance of the Study

Findings from this study will help educators and policymakers identify areas that needs improvement, ensuring that the curriculum aligns with the educational objectives which will enhance the quality of mathematics education in Ghana. Also, the findings will help policymakers make informed decisions to refine the mathematics curriculum, address deficiencies, and tailor professional development programmes to support educators more effectively. Again, this study can serve as a starting point for further studies, creating a continuous cycle of evaluation an improvement in curriculum implementation.

Delimitations

The study was limited to the perception of teachers in the primary school mathematic curriculum and not all the subjects in the curriculum. Also, the research was conducted in the Poase Cement Circuit and not beyond using only the primary school teachers in the public schools.

Limitation

According to Best and Kahn (2006), limitations are conditions beyond the researcher's control that limit the completion of a study. Some of the study limitations are:

1. Teachers' perception of being branded as not knowledgeable therefore giving wrong answers
2. Some teachers' negative attitudes towards change therefore describing the whole change process as bad.

Organization of the Study

The research is divided into five chapters. The first chapter provides an introduction to the research. Research background, problems, research objectives, research questions, research significance, and research limitations and delimitations were considered. In Chapter Two, we discussed the relevant literature. It covers the theoretical framework of the course and conceptual framework. Chapter Three dealt with the methodology used to carry out the project which includes: study design; population; sampling and sampling techniques; instrumentation; validity and reliability of means; Chapter Four described the results of the research. Chapter Five summarizes the findings, draws conclusions, and presents recommendations based on the findings.

CHAPTER TWO

LITERATURE REVIEW

The literature review covered the Social Cognitive Theory (SCT), curriculum change and teachers' perception. It also looked at mathematics curriculum change and implementation of the mathematics curriculum, and some barriers associated with mathematics curriculum change. The review looked at the Concerns-Based Adoption Model and finally, literature on local environment and on curriculum change and teachers' perceptions.

Theoretical Framework

Social Cognitive Theory (SCT)

Albert Bandura's Social Cognitive Theory (SCT) has been extensively studied and applied across various domains, including education (Pajares, 1996; Tschannen-Moran & Hoy, 2001). In the context of primary school mathematics curriculum implementation, SCT offers a valuable framework to understand how teachers' perceptions are shaped, influenced, and guide their instructional practices. Bandura introduced SCT in the 1960s, expanding on his Social Learning Theory (1977) to incorporate cognitive processes and social interactions in explaining behaviour. His seminal works have been instrumental in understanding how individuals acquire new knowledge, skills, and behaviours through observation, imitation, and self-regulation (Bandura, 1977; Bandura,1986).

Key Concepts of Social Cognitive Theory

SCT presents several key concepts relevant to understanding teachers' perceptions and their impact on curriculum implementation:

1. **Observational Learning:** Bandura's theory underscores the role of observational learning or modelling in shaping behaviour. Teachers' perceptions of the mathematics curriculum may be influenced by observing colleagues, administrators, and professional development sessions (Bandura, 1977).
2. **Self-Efficacy:** Central to SCT is the concept of self-efficacy, which refers to teachers' beliefs in their ability to effectively implement the curriculum. Teachers with higher self-efficacy are more likely to exhibit persistence, effort, and adaptability when faced with challenges in curriculum implementation (Bandura, 1986).
3. **Vicarious Learning and Social Influence:** Teachers' perceptions can also be shaped by observing the experiences of their peers. Vicarious learning through colleagues' successes or struggles in implementing the mathematics curriculum may impact teachers' confidence and beliefs about their own capabilities (Bandura, 1986).

Applications of Social Cognitive Theory to Mathematics Curriculum Implementation

In the context of primary school mathematics curriculum, SCT can provide valuable insights:

1. **Professional Development and Support:** Bandura's theory suggests that teachers' perceptions can be influenced by the support received from administrators and professional development programs. Targeted interventions aiming to enhance teachers' self-efficacy and modeling effective practices could positively impact their perceptions ((Bandura, 1997; Tschannen-Moran & Hoy, 2001).

2. **Teacher Beliefs and Classroom Practices:** Understanding teachers' perceptions influenced by SCT can help identify how their beliefs about the mathematics curriculum influence instructional practices, engagement strategies, and student learning outcomes (Pajares, 1996).
3. **Collaborative Learning Environments:** Bandura's SCT emphasizes the importance of social interactions. Creating collaborative learning environments among teachers, sharing successful strategies, and providing opportunities for collective efficacy can positively influence teachers' perceptions and implementation of the mathematics curriculum (Tschannen-Moran & cMaster, 2009)

Incorporating Albert Bandura's Social Cognitive Theory into the investigation of teachers' perception of the implementation of the primary school mathematics curriculum offers a robust framework. Bandura's concepts of observational learning, self-efficacy, and social influences provide valuable insights into understanding how teachers perceive, adapt to, and implement curriculum changes, thus influencing student learning outcomes.

Curriculum Change and Teachers' Perception

Au (2012) states that the following questions should be kept in mind before creating a curriculum: "What kind of children do we want in this world? What perceptions and behaviours do we want to encourage and thrive in them? leads to the question. What type of educational environment do we need to support the growth of these types of students?" (p.56). According to McCutcheon (1995), the curriculum is what students have the opportunity to learn under the auspices of the school; the content the school provides. For Remillard (2005) the curriculum is the framework of the subject, and

textbooks can be part of the curriculum. According to Glatthorn (1987) curriculum is "plans developed to guide learning in schools, often presented in materials that are accessible at some level of generalization, and implement these plans in the classroom; these experiences taking place in a learning environment also influence what is learned" (p.1). This explains the new mathematics curriculum that has been noted and is expected to be implemented in the classroom.

Curriculum change is also referred to as educational reform, development, and innovation. These are general improvements and changes made to the existing programme (Fullan & Pomfret, 1977; Fullan, 1982). Education as a tool used to shape society, especially mathematics education, can never have a perfect curriculum for all ages as society changes (Shiundu & Omulando, 1992. ; Otunga, Odero, & Barasa, 2011). According to Otunga, Odero, and Barasa (2011), curriculum change is important and relevant at any level of development in the development of a country. This explains the relevance of curriculum change in Ghana.

For Remillard (1999) curriculum change is very complicated when it comes to teachers. For Wedell (2009), curriculum change policy in Ontario Canada is a collaborative effort of all stakeholders; local educational leaders, educators, parents, organizational leaders, students/learners, and the wider community. He also says that for change to be successful, it is important to ensure that the perception of change is correct and that is what will ensure the success of the programme change. Fullan (2007) explains that school leaders can be seen as those who face tremendous pressures and conflicts because they are caught between teachers and decision-makers, but the truth is that the

teacher faces more pressure than any other stakeholder because he has no way of being transferred from what he knows to help learners. They are in charge of the learners' future and that is a more difficult task. Flores (2005); Harris & Graham (2019); Unsal, et al., (2019) agree that the teacher is the implementer of the curriculum, so the feelings, thoughts, attitudes, and perceptions of the teacher cannot be ignored if the curriculum is to be successful.

Mathematics Curriculum Change

Studying the mathematics curriculum is important because it is closely related to literature such as textbooks and to the constant changes and reforms of recent decades (Remillard, 2005). However, mathematics teachers may be hesitant to introduce a new curriculum because they feel they are already qualified (Christou, Menon & Philippou, 2004). Teachers believe they continue to recognize that the new mathematics curriculum is grounded in their knowledge, but the new mathematics programme focuses on teachers as facilitators rather than informants. Manouchehri and Goodman (1998) add that mathematics today is more than just content, it is about connecting ideas, a skill most teachers have never used in their entire careers. At the same time, Ernest (1989) suggests that not only do teachers need to be prepared for new approaches, but they also need to teach autonomously. Studies on mathematics teachers' concerns have important pedagogical implications, and interest-based learning models are one of her tools used (Christou et al., 2004).

Consider changing the peak shape of the current syllabus to improve performance. Noyes et al. (2013) in their study found that the UK national curriculum, particularly mathematics, did not meet the developmental needs of students and needed to be changed. It was too short to reach. On the other

hand, new approaches to mathematics education do not always yield good results. A study of several mathematics courses conducted by Wiles and Bondi (2014) found that half of them took new mathematics courses. Curriculum approach, the other half use traditional mathematical methods. Diversity or differences between the two approaches and new entrants to the curriculum do not always lead to better results in comparison. What surprised the authors was the very low percentage of teachers using computers and manipulations with new approaches.

Implementation of Mathematics Curriculum Change

The implementation of a curriculum refers to the way teachers utilize particular resources within the curriculum to guide and evaluate student learning. In contrast, the design of a curriculum provides teachers with mentoring recommendations, lesson plans, scripts, and assessment choices that are related to various objectives. This design emphasizes uniformity so that teachers can effectively implement and sustain the curriculum structure to achieve different objectives, as highlighted by Wiles and Bondi (2014). Coordinating the curriculum between the same and subsequent grades provides consistency that supports learning goals and expectations to facilitate student preparation and growth (Tweedie & Kim, 2015). Understanding teachers' beliefs and concerns can provide insight into the successful implementation of the curriculum. McNeil, Katsh-Singer, Gonzalez-Howard, and Loper (2016) and Rakes and Dunn (2015) support this notion by addressing the influence of teachers' beliefs about specific science curriculum goals. McNeil et al. (2016) teachers' beliefs play a substantial role in shaping educational decisions. Recognizing the significance of teachers' perceptions, it

becomes imperative to actively engage in understanding their perspectives. By proactively educating ourselves about teachers' beliefs and perceptions, we can enhance the curriculum implementation process. This proactive approach allows us to address any concerns or misconceptions, align instructional strategies with teachers' perspectives, and create a supportive environment for effective curriculum delivery. Ultimately, by valuing and incorporating teachers' perceptions, we can optimize the implementation of educational initiatives and promote positive outcomes for both educators and students. McNeil et al, (2016) recommendation prepares teachers to address their perceptions and opinions of the new curriculum. and how to work with Professional Development (PD), especially in professional development, where teachers need to fully understand their goals and give them time to try out new curricula in classes that support learning. There is a clear need for teacher understanding and efficiency in implementing new curricula, especially when these factors affect student learning. For curriculum innovation to be credible, teaching practices must be aligned with the specific learning goals of the curriculum. Phillips, Ingrole, Burris and Tabulda (2017).

Curriculum implementation has many components, including the provision of the curriculum through resources and educational practices. In addition, teacher preparation to implement the curriculum also plays an important role (McNeill et al., 2016). In particular, Causarano (2015) found this through a study evaluating the quality of mathematics education in urban schools and its impact on student-teacher relationships. Their findings confirmed that teachers need to have good knowledge of the curriculum in order to improve classroom practice.

According to MacDonald, Barton, Baguley and Hartwig (2016), the quality of teacher presentation is crucial for effective content delivery. MacDonald et al. (2016) further emphasize the importance of quality teaching and participation, suggesting that professional development programmes should aid teachers in delivering a given curriculum. However, problems with curriculum implementation may arise from issues with the curriculum itself, as noted by Caropreso, Haggerty, & Ladenheim (2016). Bell (2015) examines the strengths and weaknesses of English grammar curricula at the United States of America and finds that while the curriculum is generally sound, it lacks educational guidance that would help teachers understand it enough to effectively teach the lessons. Bell also highlights the importance of proper training in facilitating the confident implementation of a new curriculum, a sentiment echoed by Caropreso, Haggerty and Ladenheim (2016) and McNeill et al. (2016). Bell identifies a lack of training and understanding of the curriculum as a barrier to accurate content delivery to students, which can impede their growth and learning, as previously shown by Causarano (2015).

Vennebo & Ottesen (2011) argued that changing curricula, especially mathematics curricula, is a time-consuming and complex act. Remillard (1999) argues that politics must start with teachers, as they directly implement the curriculum. For Taylor (2013), applying a participatory approach to curriculum and training course design increases participant effectiveness. That way, instead of just listening to others decide what to learn and what to teach, they will say what they want to learn about the new curriculum, he explained. Remillard (2005) states that collaboration among teachers and the design process are critical to the effectiveness of curriculum change. McCutcheon

(1995) suggested that counselling before and after curriculum changes is very important and can be done individually or in groups. Remillard (2000) observed two mathematics teachers applying a new mathematics curriculum. We know that many factors can affect a teacher's performance before the actual textbook. Content knowledge and how to communicate it. This research was driven by the idea that learning from a 'teacher' is a very important step in educational change. Furthermore, there is no point in changing the paper syllabus if the teacher has not developed the skills to teach the new content and has the wrong perceptions and attitudes towards the syllabus (Christou et al., 2004).

The study concluded that "Teacher learning is a critical step in educational change. Moreover, there is no point in switching from paper-based courses if teachers do not develop the skills to teach new content (Christou et al., 2004). Teacher preparation means encouraging teachers to read (Remillard, 1999; Remillard, 2000). Reading all materials, not just textbooks, is important to assimilate the new curriculum. Student performance, external sources, and textbooks (Remillard, 1999). Reading to learn also leads to a better understanding of the curriculum and how students learn (Remillard, 2000).

The introduction of the new curriculum faces obstacles. A major concern for teachers when adopting a new curriculum is that it may not be accepted by parents, and teachers often prefer their own way of teaching. Traditional Mathematics (Manouchehri & Goodman, 1998). Additionally, the fixed version of the programme makes it difficult for schools to adopt. When planning your programme, keep in mind that each school has its own unique

situation. As such, programmes need some flexibility to allow schools to adapt Moreover, resilience and flexibility should take place in the political arena. Branson, Hofmeyr, & Lam, (2015) in a study of relationships among elementary school teachers in the implementation of new curricula, argued that the involvement of leaders in curricular changes can create resistance and tension on the part of teachers. Personal involvement is inevitable. Therefore, teachers must be evaluated and encouraged by school leaders to minimize this resistance.

The Concerns-Based Adoption Model (CBAM)

The model used by educational leaders to assess innovation is the Concern-Based Adoption Model (CBAM), which examines how those most affected by change respond to new initiatives (Hord, Rutherford, Huling-Austin, & Hall, 1987). Developed by a team of researchers at the Center for Research and Development in Teacher Education at the University of Texas at Austin in the 1970s and 1980s, this model considers change to be a process, rather than an event, and acknowledges that it takes time to effect change. The focus of change should be on individuals, rather than organizations, as change is a highly personal experience and individual perceptions have an impact on outcomes. In terms of innovation, individuals undergo different stages emotionally and with skill. To ensure effective implementation of innovation, those responsible for change processes must use customer-centric diagnostic/prescription models and provide personalized support for talent development, while working adaptively and systematically (Hall & Hord, 2020).

The CBAM model contains three main tools used for the collection of related data: Innovation Configuration (IC), Stages of Concern (SoC), and Level of Use (LoU),

Innovation Configuration (IC): The Innovation Configuration is a map that clearly shows what constitutes a quality implementation. It serves as an example to guide and focus employee efforts.

Stages of Concern (SOC): The Stages of Concern includes surveys, interviews, and candid feedback to help leaders determine employee attitudes, perceptions, and beliefs about new programmes or initiatives. With this knowledge, leaders can take action to address an individual's specific concerns.

Level of Use (LoU): The Level of Use interview tool helps you determine how well your employees are using the programme, both individually and collectively. Levels vary from unused to advanced usage. Combining this information with innovation configuration and first-hand observations helps employees effectively implement new programmes.

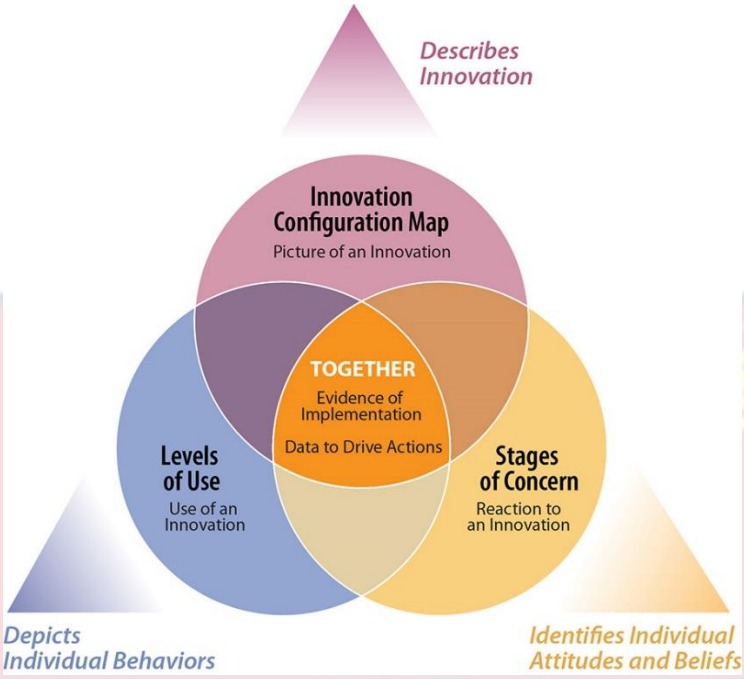

Figure 1: The Concern-Based Adoption Model
Source: (Hall and Hord, 2020)

The primary instrument employed by the Concern-Based Adoption Model is the SoC questionnaire, which is utilized to gauge teachers' perceptions and concerns regarding the innovations they may be tasked with implementing (Hall & Hord, 2001). The SoC surveys enable the evaluation of seven levels of concern:

Awareness: whether participants are aware or concerned about the new innovation.

Informational: whether participants know more about the new innovation.

Personal: whether participants are affected personally by the new innovation.

Management: some challenges associated with implementing the new innovation.

Consequences: how the new innovation affects others. Collaboration: whether participants are working with others for the success of the innovation.

Refocusing: whether participants have new ideas that might work better. (Hall & Hord 2001).

For the purposes of this study, levels of concern were used to examine teachers' perceptions and concerns or challenges in implementing primary school mathematics curricula. For this study, we have redefined the procedure and linked it to the study as follows:

Awareness: Teachers' awareness of the of the primary school mathematics curriculum.

Informational: Teachers express their perception about having the right information or understanding regarding the implementation of the primary school mathematics curriculum.

Personal: Teachers' express their concerns about how the primary school mathematic curriculum affects them personally.

Consequences: Teachers express their perceptions on how the primary school mathematics affects the students.

Concern: Teachers have expressed concerns and challenges regarding the implementation of the new elementary school mathematics curriculum. Teachers now express concerns about details of organization and implementation, and overcoming difficulties. Time requirements are he one of the most important control factors that make teachers skeptical of adopting innovation.

The collaboration and refocusing have been left out because it does not help answer the research questions.

The researcher believes the teachers perception and their challenges or concerns about the implementation of the new primary school curriculum will help understand their expectation of a future curriculum.

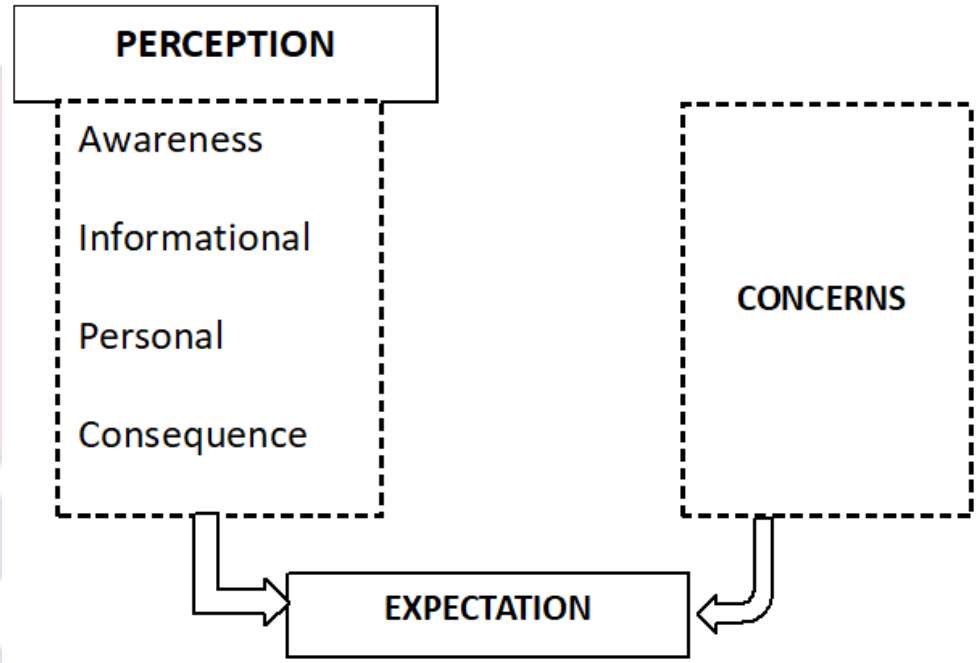

Figure 2: Conceptual Framework

According to Bryk et al. (2015), Fullan (2001), and Fullan (2006), there are various approaches to scientific change and continuous improvement. Concern-based deployment models have been widely used in educational institutions and have strong foundations. CBAM was used in Texas to understand how teachers are recruited and to support increased implementation of a district-wide character development programme (Hollingshead, 2009). Research on professional development in New Zealand (Saunders, 2012; Haines, 2018) and Lesotho (Khoboli & O'Toole, 2012) has also been conducted in relation to changes in Australian vocational education programmes and science curricula. Since its creation in the 1970s, the founders of the CBAM model have conducted field studies related to the

science of change (Hall, Loucks, Rutherford, & Newlove, 1975; Hall & Loucks, 1977; Hall, Dirksen, & George, 2013; Hall, 2013; Hall & Hord, 2020). The CBAM approach is rooted in change science, and its principles for change include that change is a personal and time-consuming process, not a product, and that events and changes require a system-wide effort (Hall & Hord, 2020). Hall and Hord also identified CBAM as an intervention that promotes desirable change when introduced in environments that support change and discourages it when it is not supported (Hall & Hord, 2020). By combining change principles and interventions, successful sustainable change can be created.

Empirical Review

Teacher Attitudes and Beliefs: Several studies (Aidoo, 2018; Atiemo & Nyamah, 2019) highlight that teachers in Ghana generally acknowledge the importance of the mathematics curriculum in fostering critical thinking and problem-solving skills. However, concerns exist regarding the curriculum's alignment with students' needs, limited resources, and challenges in adapting the curriculum to diverse learning contexts.

Perceived Challenges in Implementation: Empirical evidence (Amankwah, 2017; Adu-Gyamfi, Osei, & Ansah, 2020) suggests that teachers encounter various challenges in implementing the mathematics curriculum. These include inadequate instructional materials, large class sizes, insufficient teacher training, and time constraints. Teachers express concerns about their capacity to effectively implement the curriculum due to these challenges.

Professional Development Needs: Studies (Owusu-Ansah, 2016; Darko & Addei, 2020) indicate that teachers in Ghana express a need for continuous

professional development to enhance their pedagogical skills and content knowledge in teaching mathematics. Lack of adequate training and support impacts their confidence and ability to implement the curriculum effectively.

Support Systems and Perceived Efficacy: Research (Acheampong & Moi, 2018; Ampofo & Baah, 2021) highlights the role of support systems, including school leadership and collaboration among teachers, in influencing teachers' perception of implementing the mathematics curriculum. Positive support structures contribute to higher teacher efficacy and more favorable perceptions of curriculum implementation.

The empirical review demonstrates that teachers in Ghana perceive the implementation of the primary school mathematics curriculum as crucial for student learning outcomes. However, challenges such as resource constraints, inadequate training, and support systems significantly impact their perceptions and efficacy in implementing the curriculum effectively.

Based on empirical evidence, there is a need for targeted interventions focusing on:

- Providing comprehensive and ongoing professional development opportunities for teachers to enhance their pedagogical skills in teaching mathematics.
- Addressing resource deficiencies by providing adequate instructional materials and support systems to facilitate effective curriculum implementation.
- Creating collaborative environments that encourage teacher collaboration, sharing of best practices, and supportive leadership to improve teacher efficacy and perceptions

CHAPTER THREE

METHODOLOGY

Overview

In this section, the methods utilized for gathering and analysing the necessary data for the study are discussed. The chapter closely evaluates the study's design, the groups being studied, the process of selecting participants and how they were chosen, the tools utilized, their accuracy and consistency, the techniques used for gathering information, and the procedures for analysing the data.

Research Design

The researcher is interested in investigating the perception of teachers and the implementation of the primary school mathematic curriculum in the Poase Cement Circuit. The study employs the sequential exploratory of the mixed-method design. Sequential exploratory is first collecting qualitative data then followed by the quantitative data from the analysis of the qualitative data. (Creswell, 2014). For this research, the qualitative research, first explored the views of participants on their general perception and how they are implementing the primary school mathematic curriculum and some concerns they have with the implementation. The data was then analyzed and results were used to build the instrument that fit the phenomenon of interest to the researcher as well as the Stages of Concern Questionnaire of the Concerned Based Adoption Model (CBAM) which was used in the follow-up quantitative phase. Creswell, (2014) and Tashakkori & Teddlie (2010) argues that this approach helps find out if data collected from a few people from the

qualitative phase can be generalized to a large sample using the quantitative method.

A sequential exploratory method was used because it enhances the researcher's understanding and knowledge of the subject under study. In addition, we can flexibly respond to changes that accompany the progress of research. Again, the costs are usually low compared to other methods. On the one hand, it helps lay a foundation for research that leads to further research. Exploratory research also helps other researchers identify possible causes of problems. You can investigate this further to identify the most likely cause of the problem. Sequential exploratory methods have all these advantages, but have some drawbacks. Most importantly, provide qualitative data. Therefore, interpretation of such information may be judgmental and biased. This study design was suitable for the study as it helped the researchers to draw meaningful conclusions after generalizing the findings at the quantitative stage.

Population

According to Amedahe (2002), a population is a group of cases that satisfy specific criteria. Therefore, in this study, the term population refers to all individuals who are part of the study. The research aimed to include all teachers in the Poase Cement circuit located in the Kadjebi district of the Oti region of Ghana. The accessible population consisted of teachers from all public primary schools in the Poase Cement circuit in Kadjebi district. The reason for selecting public primary school teachers was that the study focused on primary schools. Additionally, there was only one private school in the circuit, and teachers were not permanent employees at the private school,

making it difficult for them to provide adequate responses according to the school's proprietor.

In all, a sample of 51 teachers from ten primary schools in the Poase Cement Circuit was selected for the study. The 51 teachers consisted of 26 males and 25 females. The figure represents 85% of the total teachers in the circuit. The ages of teachers ranged from 23 – 59. Almost all the teachers have attained Diploma in Basic Education.

Sampling Procedure

Data were collected in two phases, qualitative and quantitative

Purposive sampling was employed in the qualitative phase to select participants who can provide in-depth insights and diverse perspectives on the implementation of the mathematics curriculum. Six teachers were be selected based on the following criteria:

- Variety in Experience Levels: Selecting teachers with varying years of experience (novice to experienced) in teaching mathematics to capture different perspectives on curriculum implementation (Creswell & Plano Clark, 2018)
- Representation of Different School Types: Ensuring representation from different types of schools (urban, rural, public,) to understand how the curriculum is implemented across diverse settings (Creswell, 2014).
- Specialization in Mathematics Education: Choosing teachers who specialize or have a keen interest in mathematics education to obtain focused and insightful opinions about the curriculum (Johnson & Onwuegbuzie, 2004)

- Geographical Distribution**:** Including teachers from different communities within the circuit to encompass diverse geographical perspectives on curriculum implementation (Cohen, Manion, & Morrison, 2018)

According Guest, Bunce, & Johnson (2006), in qualitative research, data saturation, where no new information emerges, is usually achieved after interviewing around five to six participants. Thus, selecting six teachers can potentially yield comprehensive and in-depth insights into teachers' perceptions of curriculum implementation.

In the quantitative phase, a census was conducted to gather data from all teachers involved in teaching mathematics across a specific educational district or region in Ghana. This approach will provide a comprehensive understanding of teachers' perceptions, allowing for a detailed analysis of the entire population rather than a sample. It will ensure a comprehensive data collection**,** that is a census approach will ensure that data from all mathematics teachers within the chosen district or region are included, providing a complete picture of teachers' perceptions (Creswell, 2014). Also, it will increased representativeness: By including the entire population of mathematics teachers, the findings will be more representative and allow for generalizations about the perceptions of all teachers within the specified area (Cohen, Manion, & Morrison, 2018). Again, it will reduced sampling bias: a census approach eliminates sampling bias and ensures that every teacher's perspective is considered, regardless of school type, experience level, or geographical location within the chosen district or region (Creswell & Plano Clark, 2018).

Data Collection Instruments

The study utilized two instruments - a semi-structured interview guide (Appendix A) and a questionnaire (Appendix B) to answer the research questions.

The semi-structured interview was used because it gives In-depth Exploration: Semi-structured interviews allow for open-ended questioning, enabling participants to express their perceptions, experiences, and opinions regarding the mathematics curriculum implementation in detail (Creswell & Poth, 2018). It also offers flexibility to explore emerging themes or ideas during interviews, ensuring that the interview process is adaptable to participants' responses and allows for probing follow-up questions (Berg, 2009). Again, through semi-structured interviews, researchers can delve deeply into individual teachers' perspectives, gaining nuanced and context-specific insights that might not be captured in closed-ended instruments (Creswell & Creswell, 2017). Furthermore, engaging in semi-structured interviews allows for building rapport with participants, fostering a comfortable environment for teachers to share candid views, contributing to the validity and authenticity of data collected (Fontana & Frey, 2005). Then, this method permits exploration of diverse viewpoints among teachers regarding the curriculum, facilitating a comprehensive understanding of varying experiences and challenges (Bryman, 2016)

The questionnaire was employed because it offer standardized questions, allowing for uniform data collection from a large number of respondents. This standardization facilitates comparisons and statistical analyses for quantitative assessment (Creswell & Creswell, 2017). It is

efficient and cost-effective, enabling the collection of data from a large sample size within a reasonable timeframe (Dillman, Smyth, & Christian, 2014). Closed-ended questions in questionnaires provide quantitative data, allowing for statistical analysis, frequencies, correlations, and comparisons to draw quantitative conclusions (Bryman, 2016). Also, through the census approach using questionnaires, findings can be generalized to the entire population of mathematics teachers, providing a broader understanding of perceptions across the target region or district (Babbie, 2016). Then, questionnaires minimize researcher bias in data collection as responses are standardized and do not rely on interpretations by the researcher, increasing objectivity (Creswell & Poth, 2018).

The semi-structured interview was used to gather qualitative data from teachers regarding their perceptions of the new elementary school mathematics curriculum and their concerns about its implementation. The questions asked during the interview focused on the teachers' awareness of the new curriculum, their opinions on curriculum changes, the requirements for its implementation, and how it would affect them personally, the organization and details of implementation, and their concerns about overcoming difficulties and how it would impact student learning. Moreover, the interviewees were also asked to provide suggestions for improving the curriculum's effective provision. The content of the interview questions was reviewed and validated by two experts from the Department of Mathematics and ICT Education, and the researcher made necessary adjustments based on their feedback.

Questionnaires

A Seven–point Likert Scale ranging from 1 – 2 – Not true of me now; 3 – 4 – 5 Somewhat true of me now; 6 – 7 very true of me now, was used.

The Questionnaire was an adopted Staged Concern Questionnaire (SoCQ) for concern-based adoption models (Hall & Hord, 2020).

The questionnaire provided an opportunity for teachers to express their perceptions of the curriculum, their concerns and difficulties with the primary school mathematics curriculum.

Five themes were advanced from the analysis of qualitative data. Awareness, Information, Personal, Consequences, Concerns.

Awareness: this theme describes teachers consciousness and awareness of the primary school mathematics curriculum. The Table 1 describes the statements on the questionnaire that shows teachers awareness and involvement of the primary school mathematic curriculum and their respective question numbers on the questionnaire.

Table 1: Questionnaire on Awareness

Qst No.	Statement
2	I am worried about other major curriculum
8	I am not worried about the primary school mathematic curriculum at this time.
15	I am busy with other things outside the primary school mathematics curriculum
16	I have little time to think about the primary school mathematics curriculum
21	Currently unable to direct attention to the primary school mathematic curriculum due to other priorities

Informational: - This theme was concerned with how teachers indicate their knowledge of the primary school mathematics curriculum, their knowledge of the effect, and the requirements for use of the curriculum. Also, it looked at how teachers were interested in learning more about the new curriculum. Five questions were adapted from the SoCQ to help analyze this theme. Table 2 describes statements on the questionnaires on how teachers are well informed and their knowledge of the primary school mathematics curriculum. And their respective numbers on the questionnaire.

Table 2: Questionnaire on Informational

Qst No.	Statement
4	My knowledge on the implementation of the primary school mathematic curriculum is very limited.
10	My understanding of the primary school mathematic curriculum is very limited.
11	My knowledge of the resources available with the implementation of the primary school mathematic curriculum is very limited.
19	I am very interested to find out what will be required to implement a new primary school curriculum in mathematics in the near future.
25	I want to know how the primary school mathematic curriculum is better than the previous curriculum.

Personal: - This theme was concerned with how the primary school mathematic curriculum affected teachers personally. His/her part in decision-making, personal commitment, financial burdens, time, and other things that involve him/her personally. Five questions were adapted from SoCQ to help analyse this theme. Table 3 describes statements on the questionnaire that shows how the curriculum affects the teacher personally. It also shows the respective question numbers on the questionnaire.

Table 3: Questionnaire on Personal

Qst. No.	Statement
5	The new curriculum affects me personally
9	The implementation of the new curriculum imposes financial burden on me.
13	I spend a lot of time working on the primary school mathematics curriculum.
20	A lot of energy and information is required each day for class preparation than in the previous curriculum.
23	The role has change with the implementation of the primary school mathematics curriculum.

Consequence: The focus of the discussion was how the primary school mathematic curriculum would affect students. Considerations include the relevance of innovation to students. Evaluation of student performance, including grades and skills. Changes needed to improve student performance. We have taken five questions from the SoCQ to help analyse this topic. Table 4 describes statements on how the primary school mathematic curriculum affects students. It also shows their respective question numbers on the questionnaire

Table 4: Questionnaire on Consequence.

Qst No.	Statement
1	Student's attitudes towards the primary school mathematics concerns me.
7	How the primary school mathematic curriculum affects students is something I am concerned about.
14	I evaluate the impact I have on students in the implementation process.
17	Students are improving well with the primary school mathematics curriculum.
22	Students feedback help me to change the implementation of the primary school mathematics curriculum.

Concerns: this theme deals with teachers' issues on the difficulties they have with the implementation of the primary school mathematics curriculum. Five questions were adapted from the SoCQ to help analyse this theme. Table 5 shows statements on the Likert Scale on concerns of teachers on the implementation of the primary school mathematics curriculum.

Table 5: Questionnaire on Concern

Qst No.	Statement
3	Not having enough time to prepare myself for class for each is my concern.
6	There is conflict of interest between my responsibilities and my interest in the implementation process.
12	I am unable to manage the primary school mathematic curriculum requires due to the unavailability of resources
18	I spent a lot of time working on academic related problems related to the primary school mathematics curriculum.
24	Coordination of tasks and people is taking too much of my time

Participants were also asked for general information such as age, gender, length of teaching, and highest level of education.

Validity and Reliability

Validity describes how true the conclusions of a study are (Creswell, 2008). Validity is a measure of the extent to which research results are efficiently presented regardless of whether the experimental reality or the structure designed by the researcher is correct (Patton, 2002). Validity measures performed in this study were based on these notions of validity concepts.

The semi-structured interview guide and questionnaire underwent a rigorous validation process. Content validation was ensured by subjecting these instruments to thorough scrutiny by a panel of experts comprising teacher educators and experienced researchers in the field of mathematics education. These experts assessed the relevance, appropriateness, and comprehensiveness of the questions in capturing various dimensions of teachers' perceptions regarding the curriculum. Before final approval, the validated instruments were submitted to an academic advisor at the University of Cape Coast. This expert in educational research methodology critically reviewed the instruments to ensure they aligned with the study's objectives and exhibited reliability in capturing pertinent information related to teachers' perceptions of the mathematics curriculum. A pilot test was conducted with two experienced teachers who had substantial teaching experience in different circuits. These teachers were chosen for their diverse backgrounds and expertise in primary school education. The pilot interviews aimed to evaluate the clarity, relevance, and effectiveness of the interview questions in eliciting detailed and meaningful responses about the challenges, successes, and suggestions regarding the mathematics curriculum implementation.

Ensuring the validity of research instruments and procedures is essential as it directly impacts the credibility and trustworthiness of the study's findings. By rigorously validating the instruments through expert scrutiny, verification, and pilot testing with experienced teachers, the study aimed to enhance the accuracy and reliability of the data collected. Valid instruments increase the likelihood of accurately capturing teachers' perceptions, thereby

strengthening the overall validity of the study's conclusions and contributing to the advancement of knowledge in the field of education.

This questionnaire is a modification of the Stages of Concern Questionnaire (Hall & Hord 2020) and shows high reliability across all stages. Table 6 describe the internal reliability some of the themes for the stages of concern questionnaire. The table describes the alpha values for the selected themes. Table 7 describes the test-retest correlations of some of the themes of the stages of concern questionnaire. The table describes the alpha values obtained from the test retest of the themes.

Table 6: Coefficients of Internal Reliability for the Stages of Concern Questionnaire

Stages	Awareness	Informational	Personal	Concern	Consequence
Alpha	0.64	0.78	0.83	0.75	0.76

Source: (George, Hall, & Stiegelbauer, 2006)

Table 7: Test-Retest Correlations on the Stages of Concern Questionnaire

Stages	Awareness	Informational	Personal	Concern	Consequence
Alpha	0.65	0.86	0.82	0.81	0.76

Source: (George, Hall, & Stiegelbauer, 2006)

This alpha values from table 6 and 7 makes the questionnaire very reliable and valid. (Creswell, 2008)

Ethical Issues

Firstly, the researcher (Appendix C) obtained approval from the Supervisor (Appendix D), the Department of Mathematics and ICT Education, UCC (Appendix E) and UCC Institutional Review Board (IRB) (Appendix F) for both interviews and questionnaire. Then with the permission of the supervisor, carried out the interview. The researcher conducted the interview himself. He established confidentiality by holding the interview in a conducive

place to avoid intrusion and also using codes to represent names of participants.

The researcher administered the questionnaires to the teachers himself. The researcher explained the purposes of the study and promise them their responses will be kept confidential. The researcher met teachers in each school and guided them on how to answer the questionnaire.

In obtaining informed consent from participants, the researcher developed a consent form that clearly explains the purpose of the study, the data collection methods, and the participants' rights. The form also included information on confidentiality, voluntary participation, and the right to withdraw from the study at any time. The participants were asked to sign the consent form before the start of the study.

To ensure that the participants fully understand the study's purpose and their role in it, the researcher also provide a verbal explanation of the study and answer any questions the participants had. The informed consent was obtained before any data was collected, and the participants had the opportunity to ask questions or seek clarification before signing the consent form.

The administration of informed consent was done separately from data collection to ensure that the participants have ample time to read and understand the consent form without feeling rushed or pressured. The researcher also ensured that all participants were aware that their participation in the study is entirely voluntary and that they have the right to withdraw from the study at any time without penalty.

Data Collection Procedure

To collect data, the researchers conducted semi-structured interviews in person. Before the interviews, the Department of Mathematics and ICT Education provided the researchers with a letter of introduction. During the interviews, the researchers prioritized the confidentiality and safety of the participants by explaining the survey's purpose and allowing them to express their thoughts freely.

The questionnaire was administered by the researcher himself. The researcher sent the introductory letter to all the schools he collected data before administering the questionnaires. The researcher gave the questionnaires to teachers to allow them to have enough time to complete. He did this throughout all the primary schools in the circuit. Copies were left behind for respondents who were not present to complete it and the researcher went back for it.

Data Processing and Analysis

Data from two sources have been carefully and consistently investigated.

Thematic analysis techniques (Braun & Clarke, 2006) were used to collect and analyse the qualitative data, which involved recording various topics and themes in addition to the research questions. Afterward, the quantitative data collected through questionnaires were analysed using the Statistical Programing for Social Sciences (SPSS) tool. The items were categorized based on the research questions, and descriptive statistics such as frequencies (percentages), mean, and standard deviation were calculated for each category of research questions one and two. Finally, the results were

interpreted. Research question three was analysed using deductive analysis, where the data were read and a concept his theme or model was derived through the interpretation of the data by the researcher (Thomas, 2006). This approach is used to generalize teacher expectations from already collected data.

Chapter Summary

The chapter focused on the method of design and how the study was conducted, the instruments used for the study was interview and questionnaire. Since questionnaires were distributed during the rainy season it posed a lot of challenges since the weather was not favourable on some days, therefore, delaying the research.

CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

The primary objective of this research was to investigate how a new mathematics curriculum for primary schools was perceived and implemented in the Poase Cement Circuit of Kadjebi District, Oti Region, Ghana.

In this chapter, the main focus is on presenting and discussing the findings obtained from the data collected. Both qualitative and quantitative analyses of the data collected through interviews and questionnaires were conducted. Six respondents were invited to participate in semi-structured interviews, from which various themes were extracted, and the responses from the questionnaires were also subjected to further quantitative analysis.

The discussion is centered on two main areas: i) The background information of the teachers, which includes their gender, years of experience, age, class, and highest educational qualification. ii) The findings related to the research questions that guided this study.

To guide this research, the following research questions were formulated:

1. How do teachers perceive the implementation of the primary school mathematics curriculum?
2. What concerns do teachers express regarding the delivery of the primary school mathematics curriculum?
3. What expectations do teachers hold for future mathematics curricula in primary schools?

Bio-Data of Teachers in the Circuit

Information about the background of teachers who were sampled for the study covered their gender, age, class, years of teaching, and their highest teaching qualification.

Table 8 shows the number of male and female respondents who participated in the study.

Table 8: Sex of Teacher

Gender	Frequency	Percentage
Male	26	51
Female	25	49
Total	51	100

Table 8 presents the participation rates of male and female respondents in the study. Out of the total 51 teachers who took part, 26 were male, accounting for 51%, while 25 were female, accounting for 49%. This indicates that there is not much of a difference in the number of male and female teachers in the circuit, which is a positive outcome. Additionally, this balanced distribution guarantees that the viewpoints of both genders are equally represented in the study.

Table 9 shows age distribution of teachers in the circuit.

Table 9: Age of Teachers

Age	Frequency	Percentage
21-25	4	7.9
26-30	13	25.6
31-35	16	31.4
36-40	9	17.6
41-45	2	4.0
46-50	4	6.0
51-55	0	0
56-60	3	6.0
Total	51	100

From the table, four teachers representing 7.9% were in the 21 – 25 age categories. There were 13 (25.6%) of the teachers falling in the 26 – 30 years category, while 16 (31.4%) were in the 31 – 35 years category. In all as many as 38 representing 74.6% fall within the 26 – 40 years category. In addition, nine (16%) of them were with ages above 40 years but less than 60 years. The mean age of the sampled teachers in the circuit was calculated to be 35.14 years with a standard deviation of 5.68. This implies that most of the teachers in the circuit are young and active. The age distribution suggests that the views of teachers from the entire age spectrum in the circuit have been solicited culminating in a balanced perspective.

Table 10 shows the number of years teachers have been teaching.

Table 10: Years of Teaching Experience

Teaching Experience	Frequency	Percent
Less than 1 year	5	9.8
1-2 years	6	11.8
3-4 years	4	7.8
5-6 years	4	7.8
7-8 years	3	5.9
9-10 years	18	35.3
Above 10 years	11	21.6
Total	51	100.0

From the table, five teachers out of the 51 sampled teachers, representing 9.8% have less than one year teaching experience. Six teachers (11.8%) have one to two years teaching experience. Also, four teachers (7.8%) have taught between three to four years. Four teachers (7.8%) have five to six years teaching experience. Three teachers (5.9%) have seven to eight years teaching experience. 18 teachers representing 35.3% have been teaching for nine to 10 years. And 11 teachers (21.6%) have above 10 years of teaching

experience. It is realised from the table that as many as 36 (70.6%) teachers in the circuit have over five years teaching experience. Only 15 (29.4%) of teachers have been teaching for less than five years. This means that most of the teachers in the circuit have taught both the old and new curricula and therefore experienced enough to express their concerns in both the old and new curricula.

The diagram gives a clearer view of the teaching experience of teachers in the circuit.

Table 11 shows the highest teaching qualification of teachers in the circuit.

Table 11: Highest Educational Qualification

Qualification	Frequency	Percent
Certificate	5	9.8
Diploma	32	62.7
Degree	14	27.5
Total	51	100.0

The table 11 shows that most teachers in the circuit have at least the basic qualification to teach. Out of the 51 sampled teachers only five teachers representing 9.8% are teaching with certificate. These five teachers include National Service Personnel. 32 teachers representing 62.7% have diploma and 14 teachers representing 27.5% have degree.

Findings Related to the Research Questions

The Likert scale questionnaire of 25 items was designed from various themes collected from the analysis of the interview. These themes were linked to the research questions.

Research Question 1: How do teachers perceive the implementation of the primary school mathematics curriculum?

Awareness

The awareness aspect dealt with teachers' awareness of the primary school mathematics curriculum. When teachers were asked whether they are aware and concerned about the new curriculum, these are some responses from the interview

"Yes am involved in it and think it's a good thing to bring it."

"Yes I am concerned with the new maths curriculum because I am teaching it"

"I think I am more concerned about the new maths curriculum because my salary depends on it."

"I don't concern myself with this whole curriculum because I don't understand anything in the curriculum"

The statements above show teachers are aware of the primary school mathematics curriculum.

Table 12 shows the results of data collected from teachers using the Likert Scale on their awareness of the primary school mathematics curriculum.

Table 12: Results of Data on Awareness Theme

Qst No.	Statement	Not true of me now (1 – 2)	Somehow true of me now (3 – 4 – 5)	Very true of me now (6 – 7)
2	I am worried about another major curriculum	45 (88.2%)	6 (11.8%)	0 (0%)
8	I am not worried about the primary school mathematic curriculum at this time.	45 (88.2%)	6 (11.8%)	0 (0%)
15	I am busy with other things outside the primary school mathematics curriculum	44 (86.3%)	7 (13.7%)	0 (0%)
16	I have little time to think about the primary school mathematics curriculum	37 (72.5%)	14 (27.5%)	0 (0%)
21	Currently unable to direct attention to the primary school mathematic curriculum due to other priorities	37 (72.5%)	14 (27.5%)	0 (0%)

N=51

Source: Field Survey (2023)

According to the data presented in Table 12, the results indicate that a majority of respondents (88.2%) do not currently express concerns about another curriculum, suggesting that they are primarily focused on the primary school mathematics curriculum. In contrast, a smaller percentage of participants (11.85%) acknowledged that they have some level of concern regarding another curriculum. It is worth noting that none of the respondents reported being very concerned about another curriculum. These findings imply that the implementation of the primary school mathematic curriculum is a significant priority and source of concern for most teachers. It underscores their dedication and attention towards ensuring a successful adoption and integration of the curriculum into their teaching practices.

The findings from the survey indicate that a majority of the respondents (88.2%) do not currently have any concerns about the primary school mathematics curriculum. This implies that the majority of teachers feel confident and are not worried about the curriculum at this time. On the other hand, a smaller proportion of participants (11.8%) admitted that they have some level of concern about the new curriculum. However, none of the respondents indicated that they are fully worried about it. Overall, these results suggest that the majority of teachers are generally optimistic and not burdened by worries regarding the primary school mathematics curriculum, highlighting a positive outlook and confidence in their ability to effectively implement and teach the curriculum.

The survey results indicate that a majority of teachers (86.3%) do not consider themselves busy with other things outside the primary school mathematics curriculum. This suggests that the majority of teachers are able to allocate their time and prioritize their focus on the curriculum, without being significantly burdened by other responsibilities. Conversely, a smaller percentage of respondents (13.7%) acknowledged that they have some level of busyness with other matters outside the curriculum. Notably, none of the participants indicated that they are heavily occupied with such matters. These findings imply that most teachers are able to manage their time effectively and maintain a dedicated focus on the primary school mathematics curriculum. It demonstrates their commitment and ability to allocate adequate attention and effort towards teaching and implementing the curriculum effectively.

According to the survey results, it appears that the majority of teachers (72.5%) suggests it is not true of them now regarding the statement that they

spend little time thinking about the primary school mathematics curriculum. In contrast, a smaller proportion of respondents (27.5%) admitted that it was somehow true for them. Interestingly, none of the participants indicated that it was very true for them. These findings suggest that most teachers actually dedicate a considerable amount of time to contemplate the primary school mathematics curriculum. This emphasizes the importance teachers place on understanding and engaging with the subject matter, indicating a strong commitment to providing quality education in mathematics.

The survey results reveal that majority of teachers (72.5%) do not feel that other priorities prevent them from focusing on the primary school mathematics curriculum. Conversely, a smaller percentage of respondents (27.5%) acknowledged that there were some instances where other priorities did hinder their attention to some extent. Interestingly, none of the participants indicated that other priorities strongly impede their ability to focus on the curriculum. This suggests that most teachers are able to manage and prioritize their responsibilities effectively, allowing them to dedicate sufficient attention to the new mathematics curriculum. It highlights their commitment to ensuring a quality education for their students by actively engaging with and addressing the requirements of the curriculum.

Table 13 describes the quantitative analysis of the data collected on the awareness of the teachers on the primary school mathematics curriculum. Responses to statements regarding awareness in the questionnaire were grouped together and analysed. The mean and standard deviation values were computed using the SPSS software. A mean value between 1 – 2 means statement are not true regarding them. A mean value of 3 – 5 means statement

is somehow true of them now and a mean value of between 6 – 7 means statement is very true of them now.

Table 13: Analysis of the Awareness Theme

	N	Mean	Std. Deviation
Unawareness	51	1.7725	.4964
Valid N (listwise)	51		

Teachers were to show how much the statement is true about them regarding their unawareness of the primary school mathematics curriculum. From Table 13, there is a mean value of 1.7725 which indicates the statements are not true regarding them at the moment. The mean value shows teachers are aware of the new primary school curriculum and the standard deviation value of .4964 indicates how close their responses are. This means teachers in the circuit are aware of the primary school mathematic curriculum and they believe that they are involved with the implementation process.

Informational

The issues of Informational was concerned with teachers' knowledge of the primary school mathematics curriculum, their knowledge of the effect, and the requirements for use of the curriculum. Also, it looked at teachers' interest in learning more about the new curriculum. When they were asked if they had adequate information about the primary school mathematics curriculum, these are some responses from the interview;

"I am more interested in knowing about it because I have little knowledge of the curriculum"

"There are lots of requirements and it's difficult to teach with so little information"

"I do not think I can boldly say I know everything about the mathematics curriculum."

"I sort of know about the new curriculum (sort of; because I know little about it)"

The statements from the interview seems to suggest that teachers do not have adequate information on the implementation of the new primary school mathematic curriculum.

Table 14 shows the results of data collected from teachers using the Likert Scale on teachers' perception of the information they have regarding the implementation primary school mathematics curriculum

Table 14: Results of Data on Informational Theme

Qst No.	Statement	Not true of me now (1 – 2)	Somehow true of me now (3 – 4 – 5)	Very true of me now (6 – 7)
4	My knowledge on the implementation of the primary school mathematic curriculum is very limited.	19 (37.3%)	23 (45.1%)	9 (17.6%)
10	My understanding of the primary school mathematic curriculum is very limited.	4 (7.8%)	23 (45.1%)	24 (47.1%)
11	My knowledge of the resources available with the implementation of the primary school mathematic curriculum is very limited.	4 (7.8%)	8 (15.7%)	39 (76.5%)
19	I am very interested to find out what will be required to implement a new primary school curriculum in mathematics in the near future.	4 (7.8%)	11 (21.6%)	36 (70.6%)
25	I want to know how the primary school mathematic curriculum is better than the previous curriculum.	2 (3.9%)	5 (9.8%)	44 (86.3%)

N=51

Source: Field Survey (2023)

The findings from Table 14 indicate that a proportion of teachers (45.1%) suggest that it is true of them to having limited knowledge of awareness of the primary school mathematic curriculum to some extent. On the other hand, 37.3% of respondents suggesting that it is not true about them. Only a minority (17.6%) believe that the statement is very true of them, indicating a high level of awareness regarding their limited knowledge. These findings emphasize the need for additional training and support to enhance teachers' understanding and confidence in teaching the new curriculum effectively.

The survey findings indicate that a number of teachers (45.1%) perceive their understanding of the primary school mathematic curriculum as somewhat limited, while a higher percentage (47.1%) believe their understanding is very limited. Only a small minority of teachers (7.8%) do not consider their understanding to be limited. These results underscore the need for support and professional development initiatives to enhance teachers' comprehension and proficiency in teaching the new curriculum effectively.

The survey findings show that the majority of teachers (76.5%) suggest its true of them that they would like to know about the resources available if they choose to adopt the primary school mathematics curriculum. A smaller percentage of teachers (15.7%) suggest it is somehow true of them regarding the statement, indicating a moderate level of interest. Only a minority of teachers (7.8%) suggest it is not true off them regarding the statement, suggesting a lower level of interest in exploring the available resources. These results emphasize the significance of providing teachers with comprehensive

and accessible resources to support their implementation of the curriculum and cater to their varying levels of interest and needs.

The survey results reveal that the majority of teachers (70.6%) suggest its true of them that they would like to know about the immediate requirements for using the primary school mathematics curriculum. A smaller percentage of teachers (21.6%) suggest its somehow true of them regarding the statement, indicating a moderate level of interest. Only a minority of teachers (7.8%) suggests it is not true of them now, suggesting a lower level of interest in knowing about the immediate requirements. These findings underscore the importance of providing teachers with clear and accessible information regarding the requirements for implementing the new curriculum, as the majority of teachers express a strong desire to be informed in this regard.

In conclusion, the survey findings indicate that a majority of teachers (86.3%) suggests it is true of them that they would like to know how the primary school mathematic curriculum is better than what was used before. A smaller proportion of teachers (9.8%) suggests it is somehow true of them regarding the statement, indicating a moderate level of interest. Only a minority of teachers (3.9%) suggests it is not true of them regarding the statement, suggesting a lower level of interest in understanding the improvements of the new curriculum. These results highlight the strong inclination among teachers to gain insights into the benefits and advancements offered by the new mathematics curriculum compared to the previous one.

Table 15 describe the quantitative analysis of data collect on whether teachers have adequate information on the primary school mathematic

curriculum through the questionnaire. Responses to statements regarding informational in the questionnaire were grouped together and analysed. The mean and standard deviation values were computed using the SPSS software.

Table 15: Analysis of Informational Theme

	N	Mean	Std. Deviation
Informational	51	5.1451	1.0523
Valid N (listwise)	51		

In the questionnaire, teachers were to show whether it was true they needed adequate information regarding the implementation of the new primary school curriculum. From the table, the mean value of 5.1451 means that the statements are somehow true of them. This means teachers still need information or are not well-resourced with adequate information regarding the implementation of the primary school mathematics curriculum. The standard deviation value of 1.0523 indicates teachers closely agree with these statements. Almost all teachers in the circuit believe they are not well informed about the implementation of the primary school mathematics curriculum. the training organized for them before the implementation of the new primary school curriculum was not adequate to help them with the implementation.

Personal

The personal component was concerned with how the primary school mathematic curriculum affected teachers personally. Their part in decision-making, personal commitment, financial burdens, time, and other things that involve them personally. When teachers were asked how the curriculum affected them personally, these are some of the responses from the interview.

“It involves a lot of workloads”

"It needs a lot of preparation before going to deliver a lesson"

"It put a lot of financial burden on you because you need to search for more information before going to class to teach"

The results show that teachers are affected personally on serval level in the implementation process.

Table 16 shows the data collected from teachers on how the primary school mathematic curriculum affects them personally.

Table 16: Results of Data on Personal Theme

Qst. No.	Statement	Not true of me now	Somehow true of me now	Very true of me now
		(1 – 2)	(3 – 4 – 5)	(6 – 7)
5	The new curriculum affects me personally	6 (11.8%)	23 (45.1%)	22 (43.1%)
9	The implementation of the new curriculum imposes financial burden on me.	11 (21.6%)	15 (29.4%)	25 (49.0%)
13	I spend a lot time working on the primary school mathematics curriculum.	8 (15.7%)	15 (29.4%)	28 (54.9%)
20	A lot of energy and information is required each day for class preparation than in the previous curriculum.	6 (11.8%)	14 (27.4%)	31 (60.8%)
23	My role has change with the implementation of the primary school mathematics curriculum.	3 (5.8%)	24 (47.1%)	24 (47.1%)

N=51

Source: Field Survey (2023)

Based on the data presented in Table 16, it can be observed that a proportion of teachers (45.1%) expressed that the statement regarding the new

curriculum affecting them personally is somehow true of them. Additionally, a considerable number of teachers (43.1%) suggests it is true of them regarding the statement, indicating that they feel a significant personal impact from the new curriculum. Conversely, a small minority of teachers (11.8%) suggests it is not true of them regarding the statement, suggesting that they do not perceive the new curriculum as personally affecting them. These findings highlight the varying degrees of personal impact experienced by teachers due to the implementation of the new curriculum.

According to the survey results, majority of teachers (49.0%) suggests it is true of them regarding the statement that the implementation of the new curriculum imposes a financial burden on them. A considerable percentage of teachers (29.4%) also expressed that the statement is somehow true for them. On the other hand, a smaller proportion of teachers (21.6%) suggests it is not true of them regarding the statement, indicating that they do not perceive the implementation of the new curriculum as imposing a financial burden on them at present. These findings highlight that a substantial number of teachers feel the financial impact of implementing the new curriculum, indicating the need for additional support and resources to alleviate the perceived burden

Again, the survey findings indicate that a majority of teachers (54.9%) suggests it is true of them regarding the statement that they spend a significant amount of time working on the primary school mathematics curriculum. Additionally, a considerable percentage of teachers (29.4%) expressed that the statement is somehow true for them, suggesting they dedicate a notable portion of their time to the curriculum. On the other hand, a smaller proportion of teachers (15.7%) suggests it is not true of them regarding the statement,

indicating that they do not perceive themselves as spending a significant amount of time on the new curriculum currently. These results highlight that a significant number of teachers invest considerable time and effort in working on the primary school mathematics curriculum.

Also, the survey results indicate that a majority of teachers (60.8%) suggests it is true of them regarding the statement that a lot of energy and information is required each day for class preparation compared to the previous curriculum. Additionally, a considerable percentage of teachers (27.4%) expressed that the statement is somehow true for them, suggesting that they perceive a moderate level of energy and information required for class preparation. On the other hand, a smaller proportion of teachers (11.8%) suggests it is not true of them regarding the statement, indicating that they do not find the current curriculum to demand a significant amount of energy and information for daily class preparation. These findings highlight that a significant number of teachers feel that the primary school mathematic curriculum requires substantial energy and information for effective class preparation.

Finally, according to the survey results, a substantial number of teachers (47.1%) believe that their role has changed with the implementation of the primary school mathematics curriculum, stating that the statement is very true for them. An equal proportion of teachers (47.1%) expressed that the statement is somehow true, indicating a moderate level of agreement regarding the change in their role. On the other hand, a small minority of teachers (5.8%) suggests it is not true of them regarding the statement, stating that it is not true for them, suggesting that they do not perceive a significant change in their

role. These findings highlight that a significant number of teachers acknowledge a shift in their role with the introduction of the new curriculum, signifying the importance of understanding and adapting to new expectations and responsibilities.

Table 17 describes the analysis of quantitative data collected on how the primary school mathematic curriculum affects the teachers personally. Responses to statements regarding personal in the questionnaire were grouped together and analysed. The mean and standard deviation values were computed using the SPSS software.

Table 17: Analysis of Data on Personal Theme

	N	Mean	Std. Deviation
Personal	51	4.9373	1.2416
Valid N (listwise)	51		

In the questionnaire, teachers were to show how true the new primary school curriculum affects them personally and their perception of their involvement with the primary school mathematics curriculum.

From the table 17, the mean value of 4.9373 means the curriculum affects them personally. that the curriculum involves lots of workloads, that is they need to prepare from different sources before going to teach in class. And because of the unavailability of resources, they have to spend a lot to get materials and other resources to help them in the delivery of lessons. This puts financial burdens on them. This situation could further widen the academic disparity between private basic schools which are a bit more resourced and their government basic school counterparts in the circuit.

Consequence

The consequence section of the study analysed the effects of the primary school mathematic curriculum on the immediate environment of students. Factors taken into account included the appropriateness of the innovation for the students, assessment of student performance such as grades and skills, and the necessary adjustments required to enhance the outcomes of the students. During interviews, participants were asked how the primary school mathematic curriculum has impacted the students, and their responses were recorded.

"It allows students to contribute more in class"

"It makes students find mathematics interesting"

"Students are fast developing creativity, innovation, communication, and problem-solving skills"

"It helps students to learn faster"

"Because students are used to the old methods of solving some questions, some of the new methods confuse them"

The responses to the interview questions suggested the primary school mathematic curriculum is having a positive impact on the students.

Table 18 shows data collected from teacher on how they perceive the new primary school mathematic curriculum affects students.

Table 18: Results of Data on Consequence Theme

Qst No.	Statement	Not true of me now (1 – 2)	Somehow true of me now (3 – 4 – 5)	Very true of me now (6 – 7)
1	Student's attitudes towards the primary school mathematics concerns me.	2 (3.9%)	16 (31.4%)	33 (64.7%)
7	How the primary school mathematic curriculum affects students is something I am concerned about.	6 (11.8%)	15 (29.4%)	30 (58.8%)
14	I evaluate the impact I have on students in the implementation process.	2 (3.9%)	5 (9.8%)	44 (86.3%)
17	Students are improving well with the primary school mathematics curriculum.	1 (2.0%)	12 (23.5%)	38 (74.5%)
22	Students feedback help me to change the implementation of the primary school mathematics curriculum.	18 (35.3%)	16 (31.4%)	17 (33.3%)

N= 51

Source: Field Survey (2023)

The survey results from Table 18 indicate that a majority of teachers (64.7%) suggests it is true of them regarding the statement that they are concerned about students' attitudes towards the primary school mathematics curriculum. A significant percentage of teachers (31.4%) expressed that the statement is somehow true for them, indicating a moderate level of concern. On the other hand, a small minority of teachers (3.9%) suggests it is not true of them regarding the statement, stating that it is not true for them, suggesting that they do not perceive student attitudes towards the new curriculum as a

significant concern. These findings highlight that a majority of teachers prioritize and are actively concerned about the attitudes of their students towards the new mathematics curriculum.

The survey findings indicate that a majority of teachers (58.8%) suggests it is true of them regarding the statement that they are concerned about how the primary school mathematic curriculum affects students. Additionally, a significant portion of teachers (29.4%) expressed that the statement is somehow true for them, suggesting a moderate level of concern. Conversely, a small minority of teachers (11.8%) suggests it is not true of them regarding the statement, stating that it is not true for them, indicating a lack of significant concerns regarding the impact of the new curriculum on students. These results highlight that a majority of teachers prioritize and actively express concerns about the effects of the new mathematics curriculum on their students.

Again, according to the survey results, a large majority of teachers (86.3%) suggests it is true of them regarding the statement that they evaluate the impact they have on students during the implementation process of the primary school mathematics curriculum. Additionally, a small percentage of teachers (9.8%) expressed that the statement is somehow true for them, suggesting a moderate level of agreement. On the other hand, a minority of teachers (3.9%) suggests it is not true of them regarding the statement, stating that it is not true for them, indicating that they do not perceive evaluating their impact on students as a significant part of the implementation process. These findings highlight that a majority of teachers actively assess and reflect on their impact on students while implementing the new curriculum.

The survey results reveal that a majority of teachers (74.5%) suggests it is true of them regarding the statement that students are improving well with the primary school mathematics curriculum. A significant percentage of teachers (23.5%) expressed that the statement is somehow true for them, suggesting a moderate level of agreement. On the other hand, a small minority of teachers (2.0%) suggests it is not true of them regarding the statement, stating that it is not true for them, indicating a different perception of the students' improvement with the new curriculum. These findings highlight that a majority of teachers perceive that students are experiencing positive progress and improvement with the implementation of the new mathematics curriculum.

The survey results indicate that a significant number of teachers (33.3%) suggests it is true of them regarding the statement that students' feedback helps them in changing the implementation of the primary school mathematics curriculum. A considerable proportion of teachers (31.4%) expressed that the statement is somehow true for them, suggesting a moderate level of agreement. On the other hand, a notable percentage of teachers (35.3%) suggests it is not true of them regarding the statement, stating that it is not true for them, indicating a different perspective regarding the impact of student feedback on changing curriculum implementation. These findings suggest that while a substantial number of teachers value and consider student feedback in modifying the implementation of the new curriculum, there are also teachers who do not perceive it as a significant factor in their decision-making process.

Table 19 is the analysis of quantitative data collected on how the primary school mathematics affects the students. Responses to statements regarding consequence in the questionnaire were grouped together and analysed. The mean and standard deviation values were computed using the SPSS software.

Table 19: Analysis of Consequence Theme

	N	Mean	Std. Deviation
Consequence	51	5.3137	1.0516
Valid N (list wise)	51		

In the questionnaire, teachers were to indicate how true the statement was about them if the new primary school curriculum affected the students. From table 19, the mean value of 5.3137 suggests teachers perceive the new primary school curriculum as somehow true of affecting students. The standard deviation value of 1.0517 shows how close teachers' responses are to each other. Teachers believe with the inception of the curriculum; students learn faster and better. They believe if all the concerns are met it will greatly improve the learning standard and subsequently improve the performance of pupils, especially in mathematics. Some teachers believe that even though there is a conflict in the learning of the new and the old curriculum considering the method of implementation, with time students will get used to the new ways of learning and also be impacted by it.

The foregoing analyses indicate teachers are aware of the primary school mathematics curriculum, but they do not have the adequate knowledge to implement the curriculum, they believe the curriculum affects them personally, especially time and financially, and to a large extent affects students learning. In spite of these challenges, teachers in the circuit can

foresee the advantages of the new curriculum for pupils. Their responses show that the curriculum is assisting pupils to understand mathematics concepts more easily with the cascading effect of heightened interest in the subject.

Research Question 2: What are some of the concerns teachers have in delivering the primary school mathematics curriculum?

The research question two involves the concerns teachers have in the implementation of the primary school mathematics curriculum. These concerns can also be described as challenges or difficulties teachers face in the implementation process. Data was collected using both interviews and questionnaires. This research question was grouped under the concern theme after the analysis of the qualitative research.

Concern: this involves how the individual uses the curriculum and his/her perception of the implementation process and the challenges that come with the implementation. When teachers were asked during the interview about some concerns or challenges, they have with the implementation of the primary school mathematics curriculum, these are some of the responses from the respondents:

"It is always difficult to prepare yourself well for class every day because of the workload of the curriculum"

"There are no test books and other teaching and learning materials so it is difficult to teach"

"Because I little knowledge in the curriculum it makes it difficult to for me to implement it."

"The new curriculum involves a lot of work"

"It is very demanding to implement"

"It is time-consuming"

"It is difficult to blend both the old and the new curriculum to teach students"

"It involves lots of preparation before going to the class they teach."

"Lack of textbooks makes it difficult to teach"

"Everything now is technology and I do not know anything about technology"

These responses from the interview reveals that teachers have some concerns or challenges they face in delivering the primary school mathematics curriculum.

Table 20 shows the quantitative data collected from teachers on some concerns and challenges they face in implementing the primary school mathematics curriculum.

Table 20: Results on Teachers Concerns of the Implementation of the Mathematics Curriculum

Qst No.	Statement	Not true of me now (1 – 2)	Somehow true of me now (3 – 4 – 5)	Very true of me now (6 – 7)
3	Not having enough time to prepare myself for class for each is my concern.	0 (0%)	8 (15.7%)	43 (84.3%)
6	There is conflict of interest between my responsibilities and my interest in the implementation process.	0 (0%)	3 (5.9%)	48 (94.1%)
12	I am unable to manage the primary school mathematic curriculum requirement due to the unavailability of resources	0 (0%)	4 (7.8%)	47 (92.2%)
18	I spent a lot of time working on academic related problems related to the primary school mathematics curriculum.	0 (0%)	5 (9.8%)	46 (90.2%)
24	Coordination of tasks and people is taking too much of my time	0 (0%)	4 (7.8%)	47 (92.2%)

N = 51

Source: Field Survey (2023)

According to the findings from Table 20, none of the teachers it is not true of them regarding the statement that they do not have enough time to organize themselves each day for class. A small percentage of teachers (15.7%) expressed that the statement is somehow true for them, indicating a moderate level of agreement. The majority of teachers (84.3%) suggests it is true of them regarding the statement, stating that it is very true for them, highlighting the significant time constraints they face in organizing themselves for daily classroom activities. These results emphasize the high demand on teachers' time and the challenges they encounter in managing their daily responsibilities and preparation for class.

The survey results indicate that none of the teachers it is not true of them regarding the statement that they are not concerned about the conflict between their interests and their responsibilities. A small percentage of teachers (5.9%) expressed that the statement is somehow true for them, suggesting a moderate level of agreement. The majority of teachers (94.1%) suggests it is true of them regarding the statement, stating that it is very true for them, highlighting their significant concerns regarding the potential conflict between their personal interests and their professional responsibilities. These findings suggest that the majority of teachers are aware of and acknowledge the potential challenges and conflicts that may arise between their personal interests and their duties in the classroom.

Based on the survey results, none of the teachers it is not true of them regarding the statement that they are not concerned about their inability to manage all that the new primary school curriculum requires due to the unavailability of resources. A small percentage of teachers (7.8%) expressed

that the statement is somehow true for them, suggesting a moderate level of agreement. The majority of teachers (92.2%) suggests it is true of them regarding the statement, stating that it is very true for them, indicating their significant concerns regarding the challenges they face in managing the requirements of the new curriculum due to resource limitations. These findings highlight the teachers' awareness of the potential limitations posed by resource constraints and their concerns about effectively managing the new curriculum within those limitations.

The survey results indicate that none of the teachers it is not true of them regarding the statement that they are not concerned about the time spent working with academic problems related to the new curriculum. A small percentage of teachers (9.8%) expressed that the statement is somehow true for them, suggesting a moderate level of agreement. The majority of teachers (90.2%) suggests it is true of them regarding the statement, stating that it is very true for them, highlighting their significant concerns regarding the amount of time they spend dealing with academic problems associated with the new curriculum. These findings emphasize the teachers' awareness of the time demands and challenges they face in addressing academic issues and highlights their concerns about allocating sufficient time to effectively tackle these problems in the context of the new curriculum.

The survey results indicate that none of the teachers it is not true of them regarding the statement that the coordination of tasks and people is not taking too much of their time. A small percentage of teachers (7.8%) expressed that the statement is somehow true for them, suggesting a moderate level of agreement. The majority of teachers (92.2%) suggests it is true of

them regarding the statement, stating that it is very true for them, highlighting their significant concerns about the substantial time commitment required for coordinating tasks and managing people in their teaching responsibilities. These findings underscore the teachers' awareness of the time-intensive nature of coordinating tasks and people and emphasize their concerns about the potential impact on their overall workload and efficiency in managing their teaching responsibilities.

Table 21 is the analysis of quantitative data collected on the concerns of teachers in the implementation of the primary school mathematics. Responses to statements regarding each concern in the questionnaire were grouped together and analysed. The mean and standard deviation values were computed using the SPSS software.

Table 21: Analysis of Concern of Teachers on the Implementation of the Mathematics Curriculum

Statements	Mean	Standard Deviation
Not having enough time to prepare myself for class for each is my concern.	5.98	.616
There is conflict of interest between my responsibilities and my interest in the implementation process.	6.35	.658
I am unable to manage the primary school mathematic curriculum requires due to the unavailability of resources	6.47	.703
I spent a lot of time working on academic related problems related to the primary school mathematics curriculum.	6.51	.784
Coordination of tasks and people is taking too much of my time	6.73	.666

N = 51

Source: Field Survey (2023)

In the questionnaire, teachers were to indicate how true it was about them regarding the concerns they have in implementing the primary school mathematics curriculum.

Table 16 show teachers it is very true they do not have enough time to organize themselves each day for class. A mean value of 5.98 and a standard deviation of 0.616 suggest most with this concern. The low standard deviation means the participating teachers in this study agree with and are very much affected by the fact that preparation time for lessons is very much limited. The result suggests this is due to the new way of delivering lessons which involves the students learning themselves with a guide from the teacher. This places a demand on the teacher to prepare well before going to class.

Also, the mean value of 6.35 and standard deviation of 0.658 suggest that it is very true that there is a conflict between their interest and their responsibility. The results indicate this is the result of the new demand on the teacher to get a promotion and licensing.

Most teachers also believe it is very true of them that due to the unavailability of resources, they are not able to manage all that the primary school mathematics requires. A mean value of 6.47 and a standard deviation of 0.703 suggest this interpretation. The results indicate this is a result of the textbooks and other teaching and learning materials that were not available for use.

The survey results indicate that teachers strongly believe it is true for them that they spend a significant amount of time on academic problems related to the primary school mathematics curriculum. The mean value of 6.51 and the standard deviation of 0.784 suggest a high level of agreement among

the respondents. This finding can be attributed to the substantial demands placed on teachers in terms of curriculum preparation and their personal interests, such as career advancement and meeting their own individual needs. The results highlight the significant time commitment required by teachers to address academic challenges and emphasize their motivation to excel in their teaching profession.

In response to the statement coordination of tasks and people is taking too much of their time, the mean value of 6.73 with standard deviation of 0.666 suggests that teachers truly agree with this concern. The results suggest this concern is due to the blending of various activities and pupils before and during teaching.

This concern has caused some sort of negative impression on the implementation of the primary school mathematics curriculum, particularly the unavailability of resources and teachers not having enough knowledge about the primary school mathematics curriculum. If these needs are met the intent of the curriculum will be met since teachers have agreed that the curriculum has had a great impact on pupils' learning and performance.

Discussion of Findings

The study used 51% of males and 49% of female teachers which indicates a fairly balanced population of teachers. According to Hansen and Diana (2018), it is very important to have a balance in the population of male and female teachers, particularly in STEM because it helps tackle the needs of both genders by their respective teacher counterparts.

Statistics regarding teachers' age in the circuit indicated that a lot of the teachers were young and active. Teachers younger than 40 years make up

over 80% of the total population of teachers in the circuit. This is a good indication that teachers in the circuit are young and active and can help do the work well with a lot of energy (Adedeji, Olayinka, & Tope-Ajayi, 2019)

On years of teaching experience, 70.6% of the teachers have taught for at least five years. This result indicates that most teachers in the circuit have experienced both the old and the new curriculum. This means most teachers in the circuit will need a lot of in-service training and a lot of information to master the implementation of the primary school mathematics curriculum.

Also, on teacher qualifications, the circuit boasts over 90% of teachers with degrees and diplomas in education. This percentage shows a high quality of teachers in the circuit.

Research question 1 was concerned with how teachers perceive the implementation of the primary school mathematics curriculum.

The results shows that teachers were aware of the introduction of the primary school mathematic curriculum introduction and they believed it was necessary and good. This is important because awareness of innovation before its implementation is important to the success of the innovation. Afolabi (2019) indicated that awareness leads to success.

The results further reveal that even though teachers attended workshops to help them understand and have information about the new mathematics curriculum, it did not give them the adequate information they needed for the implementation of the primary school mathematics curriculum. Feedback from the teachers on the workshops should be incorporated into the planning of subsequent workshops to address the concerns of teachers about the curriculum. Teachers' information for the implementation process is

crucial for the success of the innovation (Hall and Hord, 2020). According to Ozkan (2016) teachers' knowledge of the curriculum is the key success of the curriculum. Oneonta (2022) argued that before a teacher implements a curriculum, he/she should have "Content knowledge that relates to the truth claims of professional and interpretive communities (professional organizations) and that can explain why these accepted truth claims are justified." Possibly must have knowledge of relevant educational content. Second, the teacher must also have 'curriculum knowledge'. It relates to a series of programmes designed to teach a particular subject or a particular level of subject. All these kinds of knowledge should be developed by teachers before the implementation of the curriculum. Most teachers agreed that they were not sufficiently informed and knowledgeable about the implementation of the new elementary school mathematics curriculum, so they should take the necessary steps to ensure that they have the correct information and knowledge. This increases the success rate of curriculum implementation. Organizing in-service training with experienced facilitators significantly improves teachers' information about the implementation process (Junejo, Sarwar, & Ahmed, 2017)

Teachers agreed the curriculum affects them personally. Indicating that the primary school mathematics places a lot of workloads on them, most likely as a result of them not having the right information about the implementation of the curriculum. Teachers should be made aware of the additional demands this curriculum imposes on their time, mental effort, and their overall health. School timetables could be redesigned to take into consideration these new demands. Again, teachers will have to be psyched about the delivery of the

new curriculum so they do not become prejudicial or negatively stereotyped concerning the demands it places on them.

Also, teachers believe the primary school mathematic curriculum places a financial burden on them. citing the late release of textbooks for the new curriculum which compel many of them to purchase textbooks out of their own financial resources to keep teaching and learning going. Also, teachers spend money on accessing some of the Continuous Professional Development (CPD) workshops. Teachers in far places in the circuit also reported that they spent a lot on transportation for the mandatory workshops. Financial support for teachers in the Poase-Cement circuit for the workshops will go a long way in assisting teachers. A study conducted by Spector (2020) on the link between teachers' financial anxiety and job performance showed that "financial anxiety has a real impact on teachers' attitudes and behaviour". Again Schwartz (2018) argued that teachers who experience financial stress on average are likely to miss 1.6 more days of school than their peers, "and they are also less likely to say they want to be teachers again". Most teachers in the circuit explain they experience this financial burden as a result of the high demand for the primary school mathematics curriculum, the provision of resources that are not available yet, and also the demand for them to pay for other education-related issues like the demand-driven workshops for their licensing.

If measures are not put into place, these financial burdens can affect teachers' attitudes and behaviour greatly and also affect their turnover in schools. If the financial demand on the teachers due to the new curriculum is so significant, the policymaker will have to commit resources to it in order not

to defeat the purpose for which the curriculum was designed. In the case where teachers lack the ability to provide the resources needed to fulfil the requirements of the new mathematics curriculum, they may seek alternative but similar and cost-effective approaches to satisfying the resource requirements until such time that resources will be made available to them. Parents can also support by providing some activity-based materials for their wards to lessen the financial impact on the schools and teachers. The new curriculum should not be abandoned altogether by teachers because of its financial implications.

Again, teachers also believe the new primary school curriculum allows them to learn new things before being able to teach in class. The new method of student-centered education, which allows students to ask a lot of questions demands the teacher to learn to be able to meet the needs of students in the class. Yussif (2022) confirmed that teachers must be "prepared" to be able to effectively implement child-centered teaching practices.

Finally, teachers believe the new curriculum is having a positive impact on the development of the students. The interview and the questionnaire results indicated teachers believe that the new approach to teaching the new primary school curriculum makes it easier for students to understand the mathematics being taught. It allows students to be more creative and interactive. Teachers believe the primary school mathematic curriculum allows pupils to learn at a faster pace and also learn more on their own. Therefore, regarding the students' improvement, teachers believe the curriculum is the best option to go with. This outcome, although preliminary is very encouraging considering the fact that mathematics is one of the topics

most feared by Ghanaian basic school students. The researcher recommended that teachers continue to engage students more on this new method of teaching since it gives them the space they need to be creative and innovative with mathematics. This recommendation can be helpful to pupils as this curriculum is student-focused.

The research question two looked at some concerns teachers have regarding the implementation of the primary school mathematics curriculum. From the data gathered through the interview and the questionnaire, it is evident through the qualitative and quantitative analysis that:

Firstly, teachers are not having adequate time to prepare themselves for class each day. Teachers complain about the availability of time to prepare effectively before going to class each day. They tie this concern to the preparation needed in all other subject areas before going to class each day. Tamir (2020) asserts that good teaching is widely related to preparation before the actual teaching. A lot of researchers agree teacher preparation is integral to effective teaching, student achievement, and the success of the curriculum (Cochran-Smith and Zeichner, 2005; Greenberg, McKee, and Walsh, 2013; Noell, Burns, & Gansle, 2018; Cory, Li, Matthew, & Tan, 2017)

Even though research suggests that effective preparation leads to improvement in curriculum delivery, Jordana and Sonnemann (2022) argued that about 92% of teachers do not have enough time to prepare effectively for the classroom teaching job. This is also true for Ghanaian primary school teachers since almost all teachers in Ghanaian public schools, teach as class masters and therefore teach all subjects in the class. Jordana and Sonnemann (2022) suggested in their study that teachers should be allowed to teach their

subject of expertise to reduce the stress of preparing for all other subjects before going to class each day. If this method is applied in our education the researcher believes it will greatly influence the effective teacher delivery of the primary school mathematics curriculum.

If the system of subject teaching cannot be implemented now at the basic school level to aid teachers in preparing adequately for lessons, then the number of subjects being taught by class masters per day should be reduced. Effective preparation and delivery are negatively affected if the teacher has to teach almost all the subjects every day. It can also get very monotonous both for teachers and pupils alike. This approach has other benefits such as improving the confidence of pupils, giving chance to reserved pupils to also contribute to academic discussions and activities in groups as well as building in them the ability to tolerate each other's views.

Also, teachers believe the concern between their interest and responsibility is taking a toll on them in the delivery of the primary school mathematics curriculum. According to Serva (2021) conflict of interest in education "is a situation in which your primary responsibility to a student is compromised by competing priorities. Conflicts of interest can range from unknowingly allowing another priority to affect one's judgment, to intentionally violating a school policy for personal gain." Teachers in the circuit complained the new educational policy comes with a lot of demands on the teacher, issues of teacher licensing and attendance of workshops are the main issues raised as the reason for not being able to work effectively on the implementation of the new curriculum.

The new curriculum comes with Continuous Professional Development (CPD) workshops for teachers. According to the National Teaching Council, Continuous Professional Development is "a process by which teachers maintain and enhance their knowledge, skills, and experiences as they work after any initial training" (NTC, 2022). Ghana is not the only country making use of the Continuous Professional Development module to train its teachers. (Mwila, et al., 2022) informs that various countries in the Southern African Development Community (SADC) are either implementing CPD policies for their teachers or are at various stages of designing them. Only a few countries including Eswatini and Lesotho do not have CPD for their teachers. They however have other in-service training education for their teachers. They found that financial constraints are keeping some of the countries from implementing CPD and concluded that the CPD programme is critical for teacher professional growth.

In Ghana, teachers are mandated to attend workshops both online and in person to be able to accrue points in their license portal which will enable them to renew their licenses in their subsequent years. These workshops are expected to be attended multiple times during the term. Most teachers spend much time resolving these issues to the detriment of their responsibility. This has greatly affected the free flow of the implementation process since teachers are new to this educational policy and have to spend much time on other personal interests to the detriment of teaching pupils.

Again, findings from the study revealed that teachers are concerned with the unavailability of resources which makes it difficult to manage all that the primary school mathematics requires. A lot of researchers (Rachel, Ngao,

Naftali, and Nyonges, 2015; Maffea, 2020; Njoroge, 2019; Melioge, 2021) all assert that the unavailability of resources is the major setback in curriculum implementation and effective lesson delivery. As Aedo (2015) suggested, not just the unavailability or lack of resources, but the quality of resources are the two main issues challenging education in Romania. These issues are similarly true in Ghana. they have not been provided with educational resources, ranging from textbooks, audio, visual, and audio-visual resources. This they all agree is the major concern they have in the delivery of the primary school mathematics curriculum. This is a major challenge since they are dealing with new approaches and in some instances new topics and therefore without the textbooks and other relevant materials like the teachers' guide, it will be very difficult for them to effectively implement the primary school mathematics curriculum. Apart from textbooks, teachers may need other resources such as computers in the teaching of mathematics to expose pupils to the modern trends of mathematics. Such technological resources are however expensive for teachers to afford. The researcher believes if stakeholders of education could work so teachers can get these materials and teaching resources in time, it will effectively improve the teaching and learning of the new curriculum, as agreed by Melioge (2021).

Also, the study reveals teachers spend a lot of time working on academic related problems of the new curriculum, which they believe is a major challenge of the implementation of the primary school mathematics curriculum. Teachers in the circuit explain they spend a lot of time preparing for academic related issues such as going for workshops to build their Continuous Personal Development (CPD) points which is a requirement for

promotion now. Some teachers also explain they need to spend time going to extra classes since it is needed for the effective implementation of the new primary school curriculum. The researcher believes if stakeholders in education can find other alternatives to the promotion of teachers and not mainly focusing it on attending workshops, it will make teachers relax a bit to implement the primary school mathematics curriculum. With respect to the ICT training though, teachers should embrace the idea because going forward, ICT is going to be more integral not only in mathematics education delivery but in all other subjects at all levels.

The study again found that the coordination of tasks and people take too much time, which affects the delivery of the primary school mathematics curriculum. Wang & Cheng (2019) in their study of factors affecting teachers' curriculum implementation indicated that if the coordination of tasks and people become too much it greatly affects the time used for the actual teaching. The situation in this study suggests the same concern teachers have with the implementation of the new curriculum. The new curriculum demands the teacher to use a lot of resources in his/her teaching. The unavailability of these resources makes it difficult for the teacher and coupled with the coordination of the students and other stakeholders make it more difficult and time-consuming for them to adequately implement the new primary school curriculum. Wang and Cheng (2009) suggested teachers should be allowed to work at their own pace with few distractions from outside. This affords them much time in the implementation of the curriculum.

Research question three looked at teachers' expectation in future mathematics curricula.

The data collected from both qualitative and quantitative methods, as well as the analysis of research questions one and two, were used to deductively analyze research question three. Based on the perceptions of teachers and their concerns regarding the implementation of the new curriculum, the researcher has concluded that:

Firstly, teachers would greatly appreciate receiving adequate information about the curriculum before its implementation. This would enable them to understand how and what to implement. Hall and Hord (2020) also agree that providing information about the curriculum is a crucial part of curriculum implementation and is necessary for its success. In addition, teachers' understanding of the curriculum is essential for its successful implementation. Teachers will greatly appreciate it if they are prepared adequately before the curriculum implementation. Because the curriculum always has something new, it will be very prudent to focus on the teacher so that the real knowledge and intention of the curriculum are met. This must be done before the implementation process starts. Details of the curriculum must be known to the teachers before its implementation.

Also, the implementation process will be very effective and successful if adequate resources are provided before and during the implementation. These resources make it easier for teachers to implement the curriculum without major challenges like having to prepare for resources before coming to class which wastes their time. Aedo (2015) agrees that the abundance of resources and their quality helps in the delivery of lessons in the classroom. Issues of the provision of teaching and learning materials have been a major issue in the Ghanaian educational sector (Nyavor, 2020). Research work has

revealed that the provision of teaching and learning materials can improve the delivery of lessons in the classroom (Mithans & Grmek, 2020; Read, 2015).

The study also found that teachers believe the new curriculum is having a positive impact on the pupils, their ability to learn fast and have a creative mind is on the rise when using the new curriculum. According to Sharna (2022) developing creativity in students allows them to think independently and think creatively in the future, which is what Ghana needs as a country to be able to solve its numerous problems. Therefore, teachers will be expectant to see a curriculum that is able to develop much more creative minds and innovative minds. For James (2018), the only way to change the world in new ways is through creativity, therefore it is very important that the new mathematics curriculum to be developed introduce more ways to develop this value in pupils.

Chapter Summary

In chapter four, the study results were presented and discussed, based on the analysis of both qualitative and quantitative data. The findings showed that teachers were aware of the primary school mathematics curriculum, but lacked sufficient information on its implementation. The study also found that the curriculum had personal effects on teachers, including financial implications and extra preparation time. On the other hand, the new curriculum had a positive impact on students, promoting critical thinking and innovation. However, the study revealed some concerns that teachers had regarding the implementation of the new curriculum. These concerns included lack of time for preparation, conflicts between interests and responsibilities, insufficient resources, and coordination challenges. The discussion of these findings led to the recommendation of necessary solutions.

CHAPTER FIVE

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

Overview

This chapter provides an overview of the research and highlights the main findings. In addition, we outline recommendations and measures for further research.

Summary of the study

The primary aim of this research was to investigate how teachers perceived the implementation of a new mathematics curriculum in primary schools located in Poase Cement District, Kadjebi District, Oti Region, Ghana. To accomplish this goal, a sequential exploratory research design was employed. The research began by collecting qualitative data using semi-structured interviews, followed by quantitative data using questionnaires. Targeted sampling was used to select six interview participants, while survey methods were utilized for collecting questionnaire responses.

There were 61 teachers in the circuit at the time of data collection, and the number included National Service Personnel. 51 teachers were accessible for the data collection.

A questionnaire was used to assess the perception of teachers in the circuit. All teachers who took part in the study answered the same questions. The variables in the questionnaire were teachers' awareness of the curriculum, their perception of information on the curriculum, their perception of how the curriculum affects them personally, their perception of how the primary school mathematic curriculum affects the pupils, and also some challenges or

concerns they have with the implementation of the primary school mathematics curriculum.

The data was analysed using both qualitative and quantitative methods, and the key findings are summarized as follows.

Summary of key Findings

The investigation resulted in the findings:

1. The majority of teachers (70%) lack sufficient understanding of the primary school mathematics curriculum.
2. A study suggests that the new curriculum affected teachers personally.
3. Teachers believe the new primary school curriculum helps pupils to learn faster and more creatively
4. The study revealed that majority of teachers (92.2%) have expressed concerns about the inadequate availability of teaching and learning materials in the school to support the curriculum implementation.
5. The study revealed that teachers (84.3%) face challenges in organizing themselves for daily classes due to the extensive preparation required by the new primary school curriculum.
6. Majority of teachers (90.2%) revealed that they spent time working on academic related problems before implementing the primary school mathematics curriculum.
7. The study revealed that there is a conflict between teachers' personal interests and their professional responsibilities.

Conclusion

The study sought to explore how teachers perceive the implementation of the primary school mathematic curriculum in the Poase Cement Circuit of

the Kadjebi District in the Oti Region of Ghana. Based on the findings, it can be concluded that while teachers have knowledge about the new curriculum, they lack sufficient information on how to implement it. Additionally, the study revealed that teachers are burdened with the financial responsibility of acquiring textbooks and other teaching materials due to the unavailability of such resources, which puts a strain on their finances. Furthermore, despite the lack of understanding of the primary school mathematics curriculum, teachers still believe that it positively impacts students and has the potential to improve the quality of education in the country if properly implemented. The study also indicated that the financial burden placed on teachers due to the lack of teaching and learning materials has created a conflict between their personal interests and professional responsibilities. Therefore, the study recommends that education stakeholders should provide schools with adequate teaching and learning materials to facilitate the smooth implementation of the new primary school curriculum.

Recommendations

Based on the conclusions derived from the study that aimed to investigate teachers' perception of the implementation of the primary school mathematic curriculum in the Poase Cement Circuit, the following recommendations are put forward:

1. To ensure successful implementation of the primary school mathematics curriculum, it is essential that teachers have a thorough understanding and knowledge of the curriculum. Therefore, it is recommended that the District Directorate take steps to provide teachers in the Poase Cement Circuit with the necessary information

and training on the implementation of the curriculum. Experts in the field should be enlisted to provide adequate training to teachers, which will enhance their effectiveness and help to produce good students.

2. Also, because teachers believe they do not have enough time to organize themselves adequately for class each day, it is recommended that the Ghana Education Service draws up a new structure where teachers will teach subject-specific in primary schools. This will greatly improve the preparation time and also help in a successful delivery.
3. It is also recommended that the Ministry of Education together with NaCCA should adequately train teachers before the implementation of a new curriculum. Enough time should be spent on the training of teachers since they are at the center of the success or failure of the curriculum.
4. Teachers believe the new curriculum is having a positive impact on pupils, it is therefore recommended that the District Directorate follow up on inspection to make sure every school is keeping up with the growth in the circuit.
5. NaCCA should make a follow-up with all teachers to make sure they are implementing the actual thing they intended to implement.

Suggestions for Further Research

In order to effectively implement the new curriculum, the following suggestions are put forward for further studies:

1. The study should be replicated for other circuits in other regions to effectively know if it's a nationwide problem of teachers not having adequate knowledge of the implementation of the curriculum.
2. Studies should be carried out in other subject areas to find out teachers' perceptions of those subject-specific areas

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APPENDICES

Appendix A

Interview Guide

INTERVIEW GUIDE FOR INVESTIGATING TEACHERS' PERCEPTION ON THE IMPLEMENTATION OF THE PRIMARY SCHOOL MATHEMATIC CURRICULUM IN THE POASE CEMENT CIRCUIT

1. Are you aware of the Primary school mathematics Curriculum?

2. What is your concern about the change in the curriculum and the requirements for its implementation?

3. How does the Primary school mathematic curriculum affect you personally?

4. What are your concerns over the organization and details of implementation and overcoming of difficulties?

5. What are your concerns about how the New Mathematics Curriculum affects students learning?

6. How do you corporate with other teachers to learn more about the curriculum?

7. What are some challenges and difficulties you face in delivering the Primary school mathematics curriculum?

8. What are some suggestions you have to improve for the effective delivery of the Primary school mathematics curriculum?

Appendix B

Questionnaire

QUESTIONNAIRE ON INVESTIGATION OF TEACHERS' PERCEPTION ON THE IMPLEMENTATION OF THE PRIMARY SCHOOL MATHEMATIC CURRICULUM IN THE POASE CEMENT CIRCUIT

The purpose of this questionnaire is to determine what teachers who are using the primary school mathematic curriculum are concerned about at various times during the adoption process.

Each item is to be rated according to the concerns you have, in varying degrees of intensity, on a scale of 1 to 7.

Please respond to the items in terms of **your present concerns,** or how you feel about your involvement or potential involvement with **this** innovation.

Thank you for taking the time to complete this task.

Part One: Bio-Data

Kindly tick the box ☑ provided and fill the space

1. **SEX**: Male ☐ Female ☐

2. **NUMBER OF YEARS IN TEACHING**:

Less than 1 year ☐ 1 – 2 years ☐

3 – 4 years ☐ 5 – 6 years ☐

7 – 8 years ☐ 9 – 10 years ☐

Above 10 years ☐

3. **CLASS**:

KG ☐ BS 1 ☐ BS 2 ☐ BS 3 ☐

BS4 ☐ BS 5 ☐ BS6 ☐

4. **AGE** ……..……...

5. THE HIGHEST LEVEL IN EDUCATION……..……

PART TWO: CONCERNS

Kindly indicate your concern by circling on a scale of 1 – 7

1 2	3 4 5	6 7
Not true of me now	Somewhat true of me now	Very true of me now

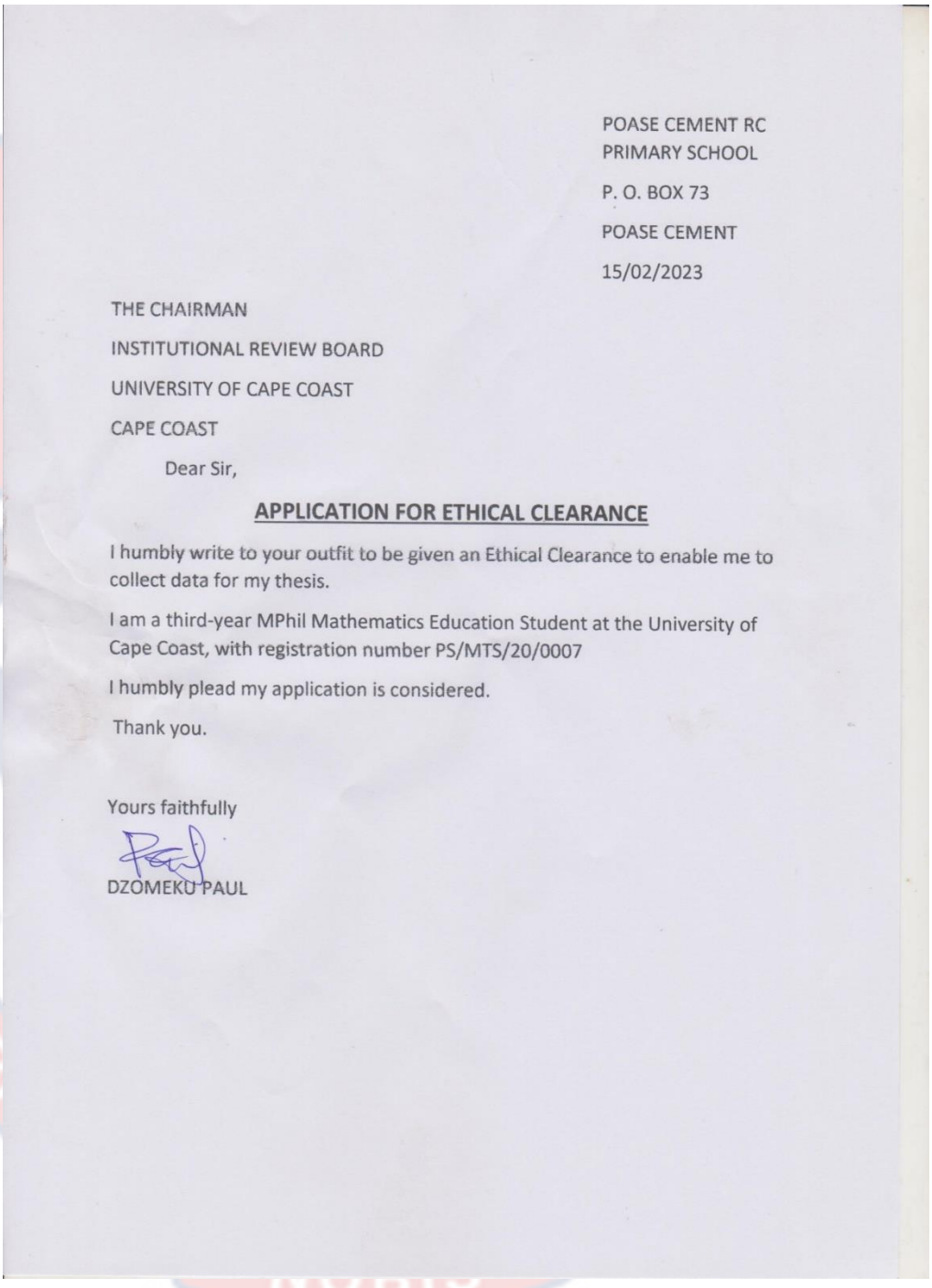
1	I am concerned about students' attitudes towards the primary school mathematics curriculum.	1	2	3	4	5	6	7
2	I am more concerned about another curriculum.	1	2	3	4	5	6	7
3	I am concerned about not having enough time to organize myself each day.	1	2	3	4	5	6	7
4	I have very limited knowledge of the primary school mathematics curriculum.	1	2	3	4	5	6	7
5	I would like to know the effect of reorganization on my professional status.	1	2	3	4	5	6	7
6	I am concerned about the conflict between my interests and my responsibilities.	1	2	3	4	5	6	7
7	I am concerned about how the primary school mathematic curriculum affects students.	1	2	3	4	5	6	7
8	I am not concerned about the primary school mathematic curriculum at this time.	1	2	3	4	5	6	7
9	I would like to know who will make the decisions in the new system.	1	2	3	4	5	6	7
10	I would like to discuss the possibility of using the primary school mathematics curriculum.	1	2	3	4	5	6	7
11	I would like to know what resources are available if we decide to adopt the primary school mathematics curriculum.	1	2	3	4	5	6	7
12	I am concerned about my inability to manage all that the primary school mathematic curriculum requires.	1	2	3	4	5	6	7
13	I would like to know how my teaching or administration is supposed to change.	1	2	3	4	5	6	7
14	I am concerned about evaluating my impact on students.	1	2	3	4	5	6	7

15	I am preoccupied with things other than the primary school mathematics curriculum.	1	2	3	4	5	6	7
16	I spend little time thinking about the primary school mathematics curriculum.	1	2	3	4	5	6	7
17	I would like to excite my students about their part in this approach.	1	2	3	4	5	6	7
18	I am concerned about time spent working with non-academic problems related to the new curriculum.	1	2	3	4	5	6	7
19	I would like to know what the use of the primary school mathematic curriculum will require in the immediate future.	1	2	3	4	5	6	7
20	I would like to have more information on the time and energy commitments required by the primary school mathematics curriculum.	1	2	3	4	5	6	7
21	Currently, other priorities prevent me from focusing my attention on the primary school mathematics curriculum.	1	2	3	4	5	6	7
22	I would like to use feedback from students to change the primary school mathematics curriculum.	1	2	3	4	5	6	7
23	I would like to know how my role will change when I am using the primary school mathematics curriculum.	1	2	3	4	5	6	7
24	Coordination of tasks and people is taking too much of my time.	1	2	3	4	5	6	7
25	I would like to know how the primary school mathematic curriculum is better than what we used to have before.	1	2	3	4	5	6	7

Thank you for completing the task

Appendix C:

Personal letter to the IRB



POASE CEMENT RC
PRIMARY SCHOOL

P. O. BOX 73

POASE CEMENT

15/02/2023

THE CHAIRMAN

INSTITUTIONAL REVIEW BOARD

UNIVERSITY OF CAPE COAST

CAPE COAST

Dear Sir,

APPLICATION FOR ETHICAL CLEARANCE

I humbly write to your outfit to be given an Ethical Clearance to enable me to collect data for my thesis.

I am a third-year MPhil Mathematics Education Student at the University of Cape Coast, with registration number PS/MTS/20/0007

I humbly plead my application is considered.

Thank you.

Yours faithfully

DZOMEKU PAUL

Appendix D:

Supervisors letter

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF MATHEMATICS AND I.C.T EDUCATION

Telephone: 0332096951
Telex: 2552, UCC, GH
Telegrams & Cables: University, Cape Coast
Email: dmicte@ucc.edu.gh

University Post Office
Cape Coast, Ghana

Your Ref:

Our Ref: DMICTE/P.3/V.1/0113

Date: 16th February, 2023

The Chairman
Institutional Review Board
University of Cape Coast
Cape Coast

Dear Sir,

REQUEST FOR ETHICAL CLEARANCE

I write to introduce Mr. Dzomeku Paul, with registration number PS/MTS/20/0007 an MPhil (Mathematics Education) student of the Department of Mathematics and ICT Education, College of Education Studies, University of Cape Coast.

As part of the requirement for the award of the master's degree, he is required to undertake research on the topic **"INVESTIGATING TEACHERS' PERCEPTION ON THE IMPLEMENTATION OF THE NEW PRIMARY SCHOOL MATHEMATICS CURRICULUM".**

I would be grateful if you could give him the necessary assistance he may need.

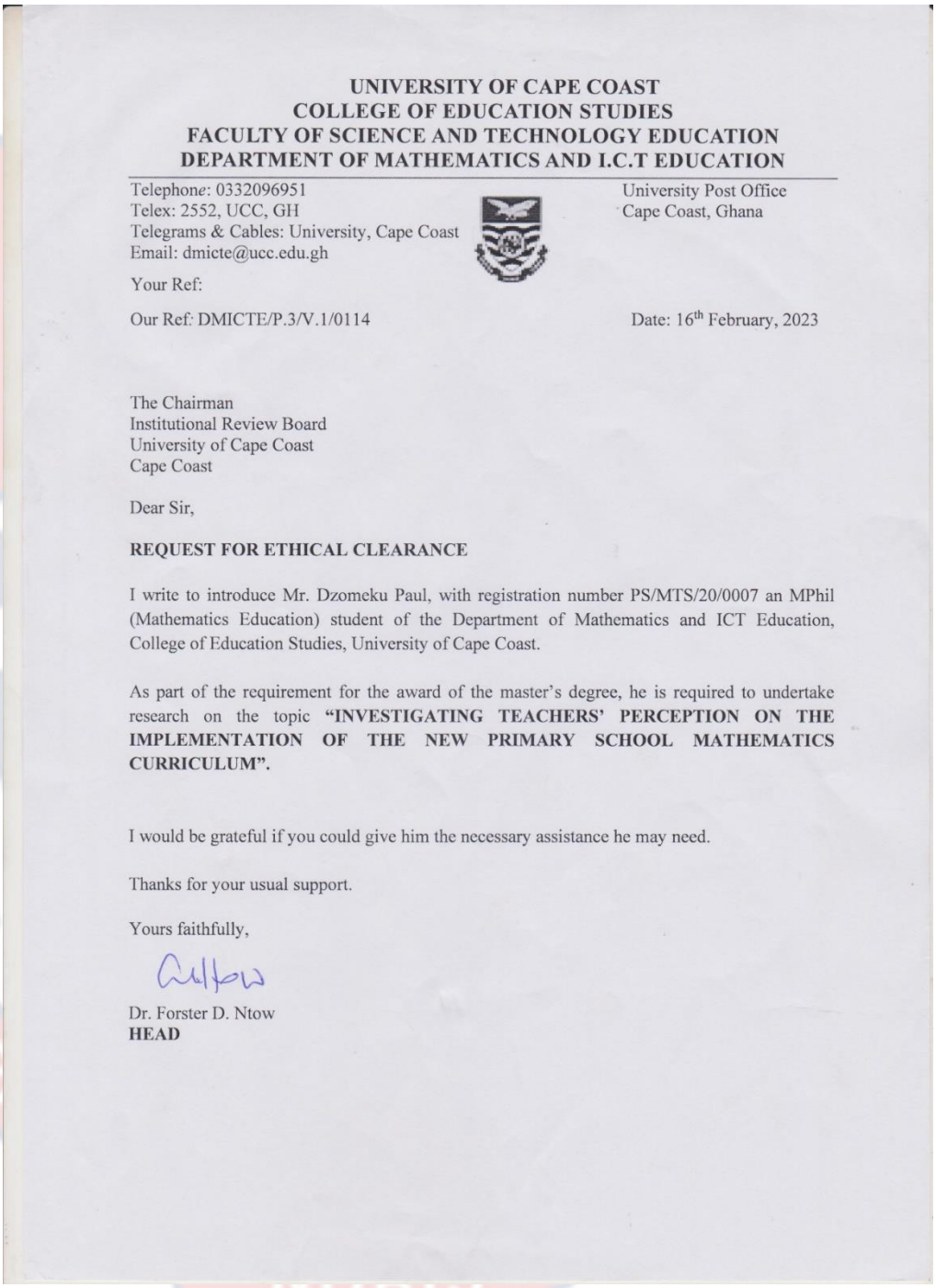
Thanks for your usual support.

Yours faithfully,

Mr. Benjamin Y. Sokpe
SUPERVISOR

Appendix E

Head of Department letter



UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF MATHEMATICS AND I.C.T EDUCATION

Telephone: 0332096951
Telex: 2552, UCC, GH
Telegrams & Cables: University, Cape Coast
Email: dmicte@ucc.edu.gh

University Post Office
Cape Coast, Ghana

Your Ref:

Our Ref: DMICTE/P.3/V.1/0114

Date: 16th February, 2023

The Chairman
Institutional Review Board
University of Cape Coast
Cape Coast

Dear Sir,

REQUEST FOR ETHICAL CLEARANCE

I write to introduce Mr. Dzomeku Paul, with registration number PS/MTS/20/0007 an MPhil (Mathematics Education) student of the Department of Mathematics and ICT Education, College of Education Studies, University of Cape Coast.

As part of the requirement for the award of the master's degree, he is required to undertake research on the topic **"INVESTIGATING TEACHERS' PERCEPTION ON THE IMPLEMENTATION OF THE NEW PRIMARY SCHOOL MATHEMATICS CURRICULUM".**

I would be grateful if you could give him the necessary assistance he may need.

Thanks for your usual support.

Yours faithfully,

Dr. Forster D. Ntow
HEAD

Appendix F

IRB Approval Letter

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 0558093143 / 0508878309
E-MAIL: irb@ucc.edu.gh
OUR REF: IRB/C3/Vol.1/0431
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0011497

19TH SEPTEMBER, 2023

Mr Paul Dzomeku
Department of Mathematics and ICT Education
University of Cape Coast

Dear Mr Dzomeku

ETHICAL CLEARANCE – ID (UCCIRB/CES/2023/26)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research **Investigating Teachers' Perception of The Implementation of The New Primary School Mathematics Curriculum.** This approval is valid from **19th September, 2023** to **18th September, 2024**. You may apply for an extension of ethical approval if the study lasts for more than 12 months.

Please note that any modification to the project must first receive renewal clearance from the UCCIRB before its implementation. You are required to submit a periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithful

Kofi F. Amuquandoh
Ag. Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST