UNIVERSITY OF EDUCATION, WINNEBA

TUTORS' IMPLEMENTATION OF THE NEW 4-YEAR B.ED. CURRICULUM FOR COLLEGES OF EDUCATION IN THE NORTHERN ZONE OF GHANA

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A thesis in the Department of Science Education, Faculty of Science Education, submitted to the School of Graduate Studies in partial fulfilment of the requirements for the award of the degree of Master of Philosophy (Science Education) in the University of Education, Winneba

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DECLARATION

STUDENT'S DECLARATION

I, **AARON DONKURUN**, declare that this thesis, with the exception of quotations and references contained in published works, which have been identified and acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

Signature: …….

Date: …….

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis by the University of Education, Winneba.

Name of Supervisor: **DR. ENERST NGMAN-WARA**

SIGNATURE: ……

DATE: ……

DEDICATION

This thesis is dedicated to my mother Madam Clothilda Donkurun and to the ever loving memory of my late father, Mr. Moses Donkurun.

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I am highly indebted to my supervisors, Dr. Ernest Ngman-Wara for his patience, encouragement, guidance and support throughout this academic exercise. I am deeply grateful to all tutors who participated in the study whose contributions made this work a success. To all authors whose works have served as a mirror for mine, I say bravo. To the lecturing body of the department of science education, thanks for your love, care and inspirations.

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GLOSARY

B.ED.	Bachelor in Education
BDE	Diploma in Basic Education
BECE	Basic Education Certificate Examination
CoE	College of Education
DFID	Department for International Development
DISE	Department of Integrated Science Education
ECE	Early Childhood Education
EP	Evangelical Presbyterian
ESIP	Education Strategic Investment Plan
GES	Ghana Education Service
G-PASS	Girls Participatory Approaches to Students Success
GTEC	Ghana Tertiary Education Commission
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
ICT	Information and Communication Technology
JHS	Junior High School
KG	Kindergarten
LOC	leadership-obstacle course
MoE	Ministry of Education
NAB	National Accreditation Board
NJ	Nusrat Jahan
NTECF	National Teacher Education Curriculum Framework
NTS	National Teachers' Standards

OCTP	On-Campus Teaching Practice
ORC	overcoming resistance to change
P1 – P6	Primary Class One - Six
PE	Primary Education
PTPDM	Pre-Tertiary Professional Development and Management
RCA	rand change agent
RME	Religious and Moral Education
SHS	Senior High School
SPSS	Statistical Package for Social Science
SSS	Senior Secondary School
TED	Teacher Education Division
TLMs	Teaching and Learning Materials
TTC	Teacher Training College
T-TEL	Transforming Teacher Education and Learning
UEW	University of Education, Winneba
UNESCO	United Nations Educational Scientific and Cultural organization

ABSTRACT

The study assessed College of Education (CoE) tutors' curriculum knowledge, classroom practices and impediments affecting the implementation of the new 4-year B.Ed. curriculum. The study was situated within four curriculum implementation models; fidelity model, overcoming resistance to change model (ORC), leadership-obstacle course model (LOC) and rand change agent model (RCA). The study followed explanatory sequential mixed-method design. 60 tutors (51 males and nine females) in public CoE participated in the quantitative phase of the study. Eight tutors (six males and two females) were purposefully selected for the qualitative phase of the study. Questionnaire, semi-structured interview and an observation checklist were used to collect data. The questionnaire was used to collect quantitative data and used to assess tutors' curriculum knowledge, classroom practices and also determine curriculum implementation impediments while a classroom observation checklist and interview guide were used to collect qualitative data and used assess classroom practices and impediments respectively. Quantitative were analyzed using descriptive statistics with the help of SPSS version 20 whereas the qualitative data was analyzed thematically. The study revealed that tutors have significant knowledge on the new 4-year B.Ed curriculum. Tutors' classroom practices largely concurred with the tenets of the new 4-year B.Ed. curriculum. Also, impediments affecting tutors in the implementation of the new 4-year B.Ed. curriculum include; inadequate teaching and learning resources and facilities such as teaching and learning materials, projectors, and internet access. Additionally, overloaded content to be covered within a short time frame and poor conditions of service were other impediments. Implications in relation to the success or failure of the new B.Ed. programm were made. The study made the following recommendations:

(i) The government through Ministry of Education should ensure that basic necessities such as school facilities, and teaching and learning materials are provided to all colleges for effective learning and implementation of the curriculum.

(ii) Colleges can have institutional initiatives to supplement government efforts in supplying shortage of teaching and learning materials, hiring part time teachers and financial initiatives to sustain themselves.

(iii) College should engage corporate organizations and alumni association to help in supplying the shortage of college necessities.

(iv) College tutors should adequately remunerated and incentivized so that they are motivated to give off their best

CHAPTER ONE

INTRODUCTION

1.0 Overview

This study explored CoE tutors' curriculum knowledge, classroom pedagogical practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. This chapter is the introductory section of the study. It focuses on the background to the study, the statement of the problem, rationale and the purpose of the study. It also discusses the significance and objectives of the study, the research questions, limitations and delimitations to the study and conclude with organization of the study.

1.1 Background to the Study

The performance of the education system and its impact on children's learning outcomes has been one of the critical issues of concern to Ghanaian citizens. Parents and other stakeholders in the field of education have expressed worries regarding the poor performance of pupils in the Basic Education Certificate Examination (BECE). Education in Ghana, more especially, at the basic level, has witnessed a downward trend in terms of academic outcomes. According to available records from 2006 to 2016, over 3,669,138 BECE candidates who sat for that examination out of which 1,562,270 (43%) of them failed to make the required grades, i.e., only candidates with aggregate up to 30 qualified for progression to any secondary, technical or vocational school (GES), 2016. Also, in 2017, a total of 36,849 candidates (8%) across the country were not placed into Senior High School (SHS) because they scored Grade 9 in either English or Mathematics or both. (Ansah, 2017). To this end, the Ministry of Education is focusing on improving the learning outcomes of all learners in schools through the

implementation of appropriate policy measures such as improving the quality of the teaching force through initial and continuing teacher development. The role of the teacher is so crucial that no nation can afford to ignore it. This is because, "Education is a condition for development and the teacher is the ultimate definer of its reality" (Adegoke, 2003).

Teacher education plays a crucial role in preparing individuals to facilitate the teaching and learning process in schools. In fact, the European Union (2012) determined that "within educational institutions, teaching professionals are the most important determinants of how learners will perform; and it is what teachers know, do and care about that matters."

Government of Ghana noted that, the success of all modern nations that had experienced extraordinary results in the formation of human capital and economic development such as Singapore, Finland, Korea, and Canada had demonstrated that the teacher was the single most important determinant of their success. For Ghana to be successful as a nation, it needs to prioritise the training of quality and motivated teacher, as it would only take a crop of well-trained and motivated teachers to deliver the educated and skilled workforce needed to transform the country's economy. (National Teacher Education Curriculum Framework, 2017)

Teacher education refers to the process of equipping individuals with knowledge, skills and attitudes required for teaching and developing children to become productive citizens. In Ghana, teacher education is defined as the type of education and training given to, and acquired by, an individual to make him or her academically and

professionally proficient and competent as a teacher. (National Teacher Education Curriculum Framework, 2017).

The philosophy underpinning teacher education in Ghana aims at producing teachers imbued with professional skills, attitudes and values, and depth and breadth of content knowledge as well as the spirit of enquiry, innovation and creativity that will enable them to adapt to changing conditions, use inclusive strategies and engage in life-long learning. The teachers are required to have a passion for teaching and leadership, to reflect on their practice, and engage with members not only in the school community but also in the wider community, and act as potential agents of change. This is derived from MoE's vision of preparing and equipping all Ghanaians 'with relevant education and productive and adaptive skills to promote the socio-economic development of the country' (ESP 2016-2030) and the adoption of the UN Sustainable Development Goal (SDG) Goal[4] to: 'ensure inclusive and equitable quality education and promote lifelong learning opportunities for all' (p 19).

The objective of teacher education in Ghana is to train and develop the right type of teacher who is competent, committed and dedicated and such a teacher should be capable of:

- Applying, extending and synthesizing various forms of knowledge;
- Developing attitudes, values and dispositions that create a conducive environment for quality teaching and learning in schools;
- Facilitating learning and motivating individual learners to fully realize their potential;
- Adequately preparing the learner to participate fully in the national development effort (Government of Ghana, 2002).

Ghana has over the years put forth efforts to train and develop teachers to form the bedrock of training the manpower needs of the country. A Presidential Committee on Education (2002) tasked to work on education reforms in Ghana, recommended a critical review and approach to making teacher education relevant to the development of the country. Reiterating what teacher education must encapsulate, Adegoke (2003) and Benneh (2006) indicated that the mission of Ghana's teacher education is to provide a comprehensive teacher education programme through pre- and in-service training that would produce competent, committed, and dedicated teachers to improve the quality of teaching and learning.

Teacher education in Ghana has undergone a number of reforms. These reforms are as result of policy changes aimed at producing well trained teachers to meet the educational needs of the country at various times. These changes have resulted in the production of different cohort of teachers with different types of certificates (Anamuah-Mensah, 2006). The Teacher Training Institutes initially offered 2-year Post-Middle Certificate "B" programmes, followed by 4-year Post-Middle Certificate "A" and 2-year Post–Secondary Certificate "A" programmes. The 2-year programme was later extended to a 3-year programme, which ran alongside the 4-year certificate "A" programmes until the latter was curtailed in the 1980s (Addo-Obeng, 2008).

In 2012 a comprehensive review of the educational system in Ghana led to the elevation all 38 publicly-owned Teacher Training Institutions (TTIs) to tertiary status and re-designated as Colleges of Education to offer tertiary programmes leading to the award of Diploma in Basic Education (DBE). The CoE Act, Act 847 was passed to give legal backing to the new status of the institutions. Prior to their elevation and re-designation as tertiary institutions, the then Teacher Training Institutions (TTIs) were under the

Ghana Education Service (GES). This is the agency responsible for pre-tertiary education. Buabeng, Ntow, & Otami, (2020)

The CoE Act, 2012, Act 847 provides that a CoE is to:

- Train students to acquire the necessary professional and academic competencies for teaching in pre-tertiary institutions and non-formal education institutions;
- Build the professional and academic capacities of serving teachers though regular continuing education;
- Provide programmes that will promote the effective teaching of science, mathematics, information and communication technology and other related subjects to meet the needs of contemporary society; and
- Foster links with relevant institutions and the community in order to ensure the holistic training of teachers.

Although the school education system had achieved a lot, especially in the area of gender parity at the primary level, increasing gross enrolment and completion rates, there were a number of issues that were of concern for the efficiency and effectiveness of the system. These concerns are discussed.

There is an increasing burden of the educational system on Ghanaian children due to curricula that are dissociated from the personal and social context of children, and inadequate preparation of teachers who are not able to connect with children and respond to their individual needs. (National Teacher Education Curriculum Framework, 2017).

Another concern was the poor development of numeracy and literacy skills among pupils in basic education. There was poor performance in the core subjects especially

English, integrated science and mathematics at both the basic and secondary levels. Again, poor professional conduct of teachers as seen through teacher absenteeism and loss of time-on-task was of concern. The national pre-tertiary level education curricula that were in use were developed many years ago and do not meet the proficiency, literacy, numeracy and life skills, and creative skills expected of adults in a rapidly changing society. Persistent presence of untrained teachers in the classroom impacted negatively on learning outcomes. There was an overemphasis on covering too many subjects in the basic education curriculum. This did not allow for an in- depth understanding of the content for each age level. Teachers had very little support and resources to develop the skills required to integrate ICT into teaching and learning. There was also insufficient support for teachers to integrate critical thinking, creativity, innovation, entrepreneurship, communication, collaboration and problem-solving skills in the school curriculum. Concerns with previous initial teacher education Curriculum are discussed in the next section. (National Teacher Education Curriculum Framework, 2017).

The teacher education curriculum prior to the reform was bedeviled with a number of impediments which are discussed. In the past twenty years, there had been numerous major reforms in the teacher education system in Ghana with very little impact on children's learning outcomes. The teacher education curriculum had not adequately responded to the lack of improvement in learning outcomes at the basic school level. The previous curriculum for teacher education was weighted heavily towards subject-content knowledge to the detriment of curriculum space for developing understanding of pedagogy and practical classroom teaching skills, a situation referred to as 'academic drift. There was a disconnect between the initial teacher education curriculum and the

Primary, Junior High School (JHS) and SHS curricula. Courses in mathematics, English and Science focused significantly on content that was not required to be taught at primary, JHS and SHS level. The curriculum was overcrowded and did not allow for reflection and cross Curriculum linkages. The curriculum for training basic education teachers prepared teachers to teach from one JHS three in all foundation subjects. This meant that the curriculum space for specialist subject-content knowledge linked to age-appropriate pedagogy was limited. Concerns and needs of today, that is, of the 21st century, were not reflected in the teacher education curriculum – it had not moved with the times. The previous teacher education curriculum did not include clear progression in learning to teach electively (e.g., according to the competencies set out in the 'Pre-tertiary Teacher Professional Development and Management Policy in Ghana' or the National Teachers' Standards). The subjects were taught separately with no connection made to other subjects. These inadequacies strengthened the need for reforms in the teacher education sector in Ghana. (National Teacher Education Curriculum Framework, 2017).

Although the new curriculum on teacher education provided structures and expectations of mentor support and practicum placement, mentoring, visits by subject specialists, and pre-and post-supervisory conferences, these rarely occurred as intended. Assessment system in the initial teacher education curriculum was too information-oriented, extremely quantitative and lacked comprehensiveness. It was also summative with 60% assessment by examination and 40% continuous assessment which could consist of a few quizzes and an assignment. A student's progression depended on success in the examinations. This made the curriculum both theory laden and examination focused, thereby preventing students from developing appropriate

pedagogical skills. Teacher education programmes failed develop in teachers, attitudes, values, dispositions and habits needed for effective teaching. (National Teacher Education Curriculum Framework, 2017).

The previous assessment system had no place for assessing these aspects. Student teachers had little or no opportunity to examine their own beliefs and biases and reflect on their own experiences as part of their classroom transaction and enquiry. Previous teacher education programmes did not recognise the centrality of language in the curriculum. As such, preparation to develop children's language and literacy was not prioritised. Other issues with the previous initial teacher education Curriculum are discussed below.

Theory courses were taught in isolation and had no clear links with practical work and the realties on the ground. There was the assumption that the links between learning theories and pedagogical knowledge are formed automatically in the understanding of the student teacher.

The practice of teacher education was shaped more by a technical-rationalist approach that required teachers to implement specific pre-determined rules/actions instead of being shaped by a research-based thinking paradigm (MoE 2017). Each of the universities providing initial teacher education had a different set of standards for assessing who a 'good teacher' is. This tends to prepare teachers with different levels of competence.

Issues of equity, gender and inclusion were not part of the day-to-day discourse in teacher education. Insufficient space was provided for encouraging the development of transversal skills, problem solving, critical thinking, creativity, collaboration,

communication, innovation, entrepreneurship, digital literacy etc., required for productivity in the twenty-first century.

Distance learning and sandwich programmes did not include support and assessment of students' practicums, school observation and on-campus teaching practice (OCTP) and tended to be theory focused. Assessment in this mode is also more quantitative and did not encourage critical thinking and higher-order skills.

The upgrading of COEs to run Bachelor in Education (B.Ed.) programme in the 2018 /2019 academic year, led to the design and rollout of a new and innovative 21st century relevant teacher education curriculum, that is, the new 4-year bachelor of education degree programme across all 46 public CoE (MoE 2017).

The new 4-year B.Ed. programme was designed to:

1. fully prepare student teachers to teach the School Curriculum, in particular, English, mathematics and science, concentrating on relevant subject and pedagogical knowledge;
2. equip student teachers to develop pupils' languages (Ghanaian and English) and literacy so all can access the curriculum;
3. give higher status to practical teaching experience through supported and assessed teaching in school;
4. widen the focus of assessment to include in-school learning and assignments as well as examinations, with students being assessed against the Teachers' Standards;
5. deepen student teachers' curriculum knowledge through introducing level specialisms – KG-P3, P4-P6, JHS and SHS;

6. emphasize a more interactive, learner-focused approach to training, modelling good teaching;
7. be explicit in addressing vital cross-cutting issues: equity and inclusivity, assessment, core skills, professional values, action research and rejection; these essential issues have shaped the Curriculum framework, which is underpinned by the National Teachers' Standards as the determiner of what a 'competent' teacher is, and the goal is to ensure that every child's right to competent teachers who are able to support learning and progress is fulfilled.

The intention of the B.Ed. programme is to develop a teacher who:

- demonstrates attainment of the minimum levels of practice, as set out in the National Teachers' Standards in order to inspire and challenge learners to achieve their potential;
- has a secure subject matter knowledge at the level he/she is being prepared to teach at, and at the same time has a good understanding of national educational policies;
- demonstrates an ability to integrate his/her curriculum, subject and pedagogical knowledge, and plans for and uses differentiated interactive instructional strategies and resources to improve the learning outcomes of all learners irrespective of gender, disabilities, or geographical location;
- has a good grasp of the content of the textbooks, teachers' guides, syllabi and other resources required by the curriculum at the specific level of training (early childhood, primary, junior secondary school or senior secondary school);

- has a good understanding of the learners, their development, their needs and their socio-cultural and political backgrounds, as well as a respect for their rights as human beings;
- has a good understanding of their own professional identity, beliefs, emotions, strengths and weaknesses;
- views learners as active constructors of knowledge and is therefore able to create learning contexts that are learner- centred and encourages learners to collaborate with others;
- exhibits technology and information literacy and is able to integrate technology, including open education resources in his/ her teaching;
- is an active co-learner with his/her students, a life-long learner, an effective communicator with learners, and is democratic in designing and arranging the learning experiences for learners;
- is competent in the use of different pedagogical strategies including project-based, enquiry-based, and problem-based instructional and learning strategies, to meet the diverse needs and learning styles of learners;
- promotes critical thinking, problem solving, and communication through the learning environment created by the teacher;
- exhibits potential attitudes, values and beliefs that are in tune with the code of ethics of the teaching profession;
- integrates informal learning and cultural knowledge in lesson plans to meet the needs of the learners and broaden the curriculum.

This means that the teacher education curriculum should provide opportunities that allow the student teacher to develop these characteristics which include:

- developing disciplinary knowledge in the various core subject areas of the teacher education curriculum;
- observing and communicating with learners in real classrooms;
- performing critical self-analysis and evaluation of one's assumptions, beliefs and emotions about knowledge, teaching, learner and learning;
- developing professional skills in pedagogy, observation, documentation, analysis and interpretation, drama, craft, story- telling and reflective enquiry;
- developing the capacity for self-directed learning, work collaboratively in groups and spend time to think, reflect, assimilate and articulate new ideas.

The 46 public CoEs are affiliated to five public Universities. The objective of affiliation in the Ghanaian tertiary education system is to ensure the attainment and maintenance of high standards for the promotion of academic quality (National Accreditation Board, 2010). The relationship is for the mentoring institution (Education-oriented traditional Universities) to provide academic support and supervision to the mentored institution and certify the graduates of the institution being mentored (National Accreditation Board, 2010).

The mentoring Universities designed and developed the new 4-year Bachelor of Education curriculum for initial teacher education to be offered at the CoE based on the National Teacher Education Curriculum Framework and specialisms for accreditation and implementation. All materials included in the revised curriculum have been justified in terms of how it will support the student in becoming a more effective teacher. (National Teacher Education Curriculum Framework, 2017).

The reformed pre-tertiary teacher education curriculum is to provide more opportunities for student teachers to teach in classrooms from the start of their training. This new

wave of teachers will look at education in a different way, adopting more modern teaching techniques that put the child at the centre of the learning process. The new 4 year. B.Ed. programme is a reform which comes with impediments with regards to the tutor. It introduces new content, new innovative instructional practices and assessment. This calls for a shift from the tutor's old ways to new ways of instruction (National Teacher Education Curriculum Framework, 2017).

Asare (2009) has indicated that a very important element in the process of education is the interactions that go on between the teacher and the learners. He added that through such interactive processes, education quality is achieved. McFarlane (2011) put it that "there should be a recognition that teachers and the methods they apply to impart knowledge in today's global economy is vital in defining and creating quality learners" (p. 15). On this premise, it behooves all involved in teacher education efforts to pay particular attention to how the teaching and learning process must go on to facilitate students' learning particularly during the implementation of a curriculum reform.

With all of the above issues about teacher preparation and development programmes being expressed, not from only one country, the questions that arise are; how are tutors delivering the new 4 Yr. B.Ed. curriculum to promote student learning and raise education quality? What is the extent of curriculum knowledge of tutors as they implement the new 4-year B.Ed. curriculum? What classroom practices are tutors employing in the implementation of the new 4-year B.Ed. curriculum? This study determines how tutors are delivering the new 4 year. B.Ed. curriculum in teacher preparation drives in the COEs to promote student learning and raise education quality in Ghana. In particular, it presents the extent of curriculum knowledge of tutors as they implement the new 4-year B.Ed. curriculum and the instructional practices they employ

as they implement the new 4-year curriculum. Also, it highlights the impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum and the approaches to teaching used by the teacher educators in the training programs.

Transforming Teacher Education and Learning (T-TEL) is part of the International Development (DFID) Girls Participatory Approaches to Students Success (G-PASS) programme and managed by Cambridge Education. It is a six-year government programme started in 2014 and supported by UK AID with an investment of £17 million – (over 90 million cedis). T-TEL is working with the Ministry of Education, its regulatory agencies, all 46 public CoEs and other education institutions to strengthen pre-service teacher education in Ghana and to support the implementation of the new policy framework for Bachelor in Education (B.Ed.) degree, teacher professional development and management. T-TEL aims to ensure Ghana's teaching graduates are equipped to deliver high-quality, inspirational teaching and learning in schools across the country by helping to improve the level of tutoring in CoEs across the core subjects of mathematics, English and Science, and support better management of the colleges. The Cambridge Education team has helped to reform the pre-service curriculum, including more opportunities for students to teach in classrooms from the start of their training.

1.2 Statement of the Problem

Many changes have taken place in the teacher education system in Ghana over the last few decades. These changes, usually in the form of newly designed or revised curricula, have been necessitated by the continuing need to update both subject matter and teaching methods, as well as by recurring changes in the education system. The final destination of any curriculum is the classroom where teachers and students translate

plans and intentions into activities and actions. Implementing the curriculum is therefore the most crucial and sometimes the most difficult phase of the educational change process. Inability to manage the difficulty often results in implementation failure, which has been a characteristic of most innovations and reforms in education.

CoE tutors have transitioned from the 3-year diploma programme to the new 4-year B.Ed. Programme with its numerous innovations. For the tutors to successfully implement the new curriculum, they have to understand the changes (content and pedagogy) in the new curriculum.

The vitality of curriculum reforms depends on the teacher's acceptance of the reforms and their principles, because the teachers are expected to put reform ideas into practice (Park & Sung, 2013). Various forms of teacher resistance may block the implementation of new reforms, since responding to reforms is an interpretive act that is personal, interactive, and continuous (Bantwini, 2010). Teachers' resistance is a natural reaction to the changes manifested in their effort to resist reform practices assertively (Berkovich, 2011; Noyes, Wake, & Drake, 2013). Disconnections between educational policies and teachers' practices are extreme (Meyer, 2010) as actors of curriculum reforms at different levels operate in 'relatively independent political arenas'; if their interests are in conflict, they might use resources to advance, sabotage, or ignore the efforts of actors at other levels (Meyer, 2010; Spillane, 2002).

The success of the curriculum depends on the ability of teachers to understand curriculum changes they face on a daily basis (Nsibande, 2002). The interpretation of the curriculum policy into practice depends essentially on the teachers who have the

influence to change meanings in numerous methods. This requires that teachers have the knowledge, skills, positive approach and passion for teaching.

Since 2018 Ghana's 46 public CoEs have been elevated from Diploma in Basic Education (DBE) programme to the new Bachelor of Education (B.Ed.) programme. The new B.Ed. programme has been carefully designed to ensure that it produces a cadre of skilled, knowledgeable and motivated Ghanaian teachers who meet the requirements of the NTS. The new 4-year B.Ed. curriculum blends content and pedagogy so all tutors are now expected to model the behaviour and practices expected of pre-service teachers in basic school classrooms whilst teaching student teachers.

The government has shown commitment to reform the education sector and improve learning outcomes. However, many of these policies have faced implementation issues, which have hampered their otherwise positive impact. No matter how big, well-funded, or popular a reform might be with lawmakers or the public, the buck ultimately stops with the teacher who has the ultimate responsibility of implementing the changes in the classroom. For this reason, it is critical to assess how tutors are delivering the new 4-year B.Ed. curriculum reforms. Are they embracing the changes?

Questions such as what happens in the real science classroom? How do tutors implement the new 4-year B.Ed. curriculum? Are they delivering the B. Ed. curriculum as intended by the curriculum designers? Do they have the requisite curriculum knowledge for the implementation of the 4-year. B.Ed. curriculum. What kind of activities do they adopt during science lesson? How do they organise these activities and what are their practices in the classroom? What impediments affect tutors' implementation of the new 4-year B.Ed. curriculum? Are they getting the support they

need can be raised? What is needed, thus, is to assess and describe science tutors' curriculum knowledge and their work in the classroom. Close examination of the "classroom reality" curriculum knowledge of tutors can provide answers to questions such as the above by enabling researchers to construct a picture of classroom work and contribute to the elucidation of teaching problems.

Examining the quality of teachers' classroom practices and their curriculum knowledge are central issues in the education systems of many countries as it is judged to be a meaningful and important process for both the teachers' professional development and educational improvement. However, in CoE, where this study was carried out, there is a lack of data concerning college science tutors' classroom practices and curriculum knowledge.

The goal of this study was to delve more deeply into the reforms tutors are experiencing in the CoE in the current moment, with the view of assessing tutors' curriculum knowledge, and classroom practices, and the impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum.

1.3 Purpose of the Study

The purpose of the study was to assess tutors' knowledge on the new 4-year B.Ed. programme, their classroom practices and determine which impediments affect them in the implementation of the new 4-year B.Ed. curriculum.

1.4 Research Objectives

The objectives of the study were to:

1. Assess tutors' knowledge on the new 4-year B.Ed. curriculum.

2. Assess tutors' classroom practices they employ in the implementation of the new 4-year B. Ed. Curriculum.
3. Ascertain which impediments affect tutors in the implementation of the new 4-year B.Ed. curriculum.

1.5 Research Questions

The following questions will be addressed in the study:

1. What extent of perceived curriculum knowledge do tutors have for the implementation of the new 4 – year B. Ed curriculum?
2. What classroom practices are tutors employing in the implementation of the new 4-year B. Ed. curriculum?
3. Which impediments affect tutors in the implementation of the new 4-year B.Ed. curriculum?

1.6 Significance of the Study

According to McMillan and Schumacher (2001) significance of a study tells the reader why the study is important and indicates the reasons for the researcher's choice of a particular study or problem.

It is hoped that the results from this exploration will be of great value for stakeholders of the 4-year B.Ed. curriculum design and implementation process. Findings from the study could assist education service providers, policy makers and other education workers to identify gaps in the implementation of the B.Ed. curriculum and develop policies, strategies and adjustments to address issues on the curriculum implementation. Unless curriculum designers assess the gaps in the new 4-year curriculum implementation using information available from this study to support the necessary

changes that will facilitate the implementation process, the mismatches will continue to grow and the goals of the curriculum innovation will surely not be met.

It would reveal impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. Findings of the study can be used to review the B.Ed. curriculum implementation. The findings of the study will prompt stakeholders to focus on doing consistent and in-depth capacitation of tutors on issues relating to curriculum implementation.

It is expected that the results from this study will be of immense value to stakeholders about changes and adjustments that still can be done, and the strengths and benefits that this initiative may be providing the tutors and the student teachers.

This investigation would also contribute to the existing literature related to curriculum innovation, change and implementation. At the same time, it may be considered as a worthwhile model for curriculum implementation research and contribute to the advancement of how processes of educational innovations are carried out. The findings on teachers' curriculum knowledge and classroom practices will provide useful insights for improving science teachers' education and/or in-service training. The findings can also be useful to those interested in the design and implementation of professional development programs.

1.7 Delimitations of the Study

Delimitations are the boundaries set or choices made by the researcher in the conduct of a research (Simon, 2011). For the goals of this study not to become impossibly large to complete, the following delimitations were set:

The study was restricted to only 8 out of the 10 COEs in the northern zone. This is because the colleges in the northern zone have the similar characteristics as the rest of the COEs in the south such as structures, facilities, staff and students, hence it was convenient for the researcher to delimit the study to the northern CoEs. The requirement to teach in a CoE is to possess a researched master's degree. It implies that all tutors have a minimum of a researched master's degree certificate. Again entry requirements for students' admission into CoE is the same across all CoEs. Grade C6 or better in three core subjects including English language and Mathematics and C6 or better in three elective subjects.

Again the study was delimited to only science tutors because the researcher is a science tutor and is familiar with the science strands of the new 4-year B.Ed. curriculum.

1.8 Limitations of the Study

Limitations in a research are the influences or factors that the researcher cannot control that place restrictions on the methodology (Simon,2011) The potential limitations or weaknesses identified for this study include a small sample size, which reduces generalizability, and limited time spent in the field (Creswell, 2014). Within the study's data collection techniques, possible limitations include participants' potentially inaccurate responses to the questionnaire and interviews as well as potential reflexivity in seeking to provide responses that would be acceptable to the interviewer (Creswell, 2014). Finally, geographical location was a limitation, since one specific area was examined for the study. Limitations associated with qualitative research in general include areas such as researcher experience and training. Qualitative research quality relies on the expertise, skills, and experience of the researcher. Creswell (2014) states that qualitative research may be more easily influenced by researcher bias than

quantitative research. Participant responses can control the data in terms of honesty, recollection, or the desire to produce a response that will be pleasing to the researcher. Qualitative research may become time consuming and expensive for the researcher, which may also become a limitation (Creswell, 2014).

1.9 Assumptions of the Study

In conducting this study, three assumptions were made; -

1. Teachers are well prepared to handle the curriculum. Mentoring Universities organize workshops to introduce course manuals to tutors. At the beginning of every semester, mentoring Universities which the colleges are affiliated to, do organize subject-based workshops for tutors. At these workshops, course manuals for all courses to be mounted in the semester are introduced to tutors. This includes how the course is expected to be delivered. It is assumed that tutors participating in this study have had the opportunity to attend and participate in such workshops and are expected to possess adequate knowledge about the new 4-year B.Ed. curriculum and its delivery.
2. Teaching and learning materials are available in the CoE. It is assumed that Government and college management have made effort to supply all the needed teaching and learning resources to the science departments to enhance teaching and learning in the colleges.
3. Tutors would be honest in providing truthful and accurate data for the study. It is assumed that tutors participating in the study have provided honest, truthful and accurate data for the study. In this study, curriculum knowledge means the same as the one opined by Shulman.

1.10 Definition of Terms

1.10.1 Tutors' curriculum knowledge

By curriculum knowledge, Shulman (1987), means teachers' broad comprehension of school subjects and an understanding and awareness of various instructional materials, teaching procedures, and learning objectives.

1.11 Organization of the Study

The study is organised into six chapters.

Chapter one, which is the introduction forms the beginning of the main body of this thesis and devoted primarily to justifying the research work. Accordingly, the chapter covers background to the study, statement of the problem, purpose of the study, research objectives, research questions, significance of the study, limitations of the study, delimitations of the study, basic assumptions of the study, definition of significant terms and organisation of the study.

Chapter two covers the literature review related to the study. It focuses on variables such as tutors' knowledge, skills and competence, tutor training on curriculum, teaching and learning materials, curriculum reform or innovation, and classroom practices. Also covered are theoretical framework and conceptual framework.

Chapter three is devoted to methodology of the study. This section provides information on participants, including sample and sampling techniques, and instruments, used in both data collection, and analysis. It also dealt with the research design, description and distribution of instruments, instrument validity, instrument reliability, data collection procedures.

In chapter four, the outcome of the research are presented and explained.

Chapter five presents discussion of the findings of the study. The findings are interpreted and discussed. The discussion highlighted major findings of the research and the inferences made from them in view of literature reviewed.

Chapter six presents summary of the study, conclusions, recommendations and suggestions for further research.

1.12 Chapter Summary

This chapter reviews available literature to inform the study and provide background on themes and topics such as: teacher education and its importance, pre-teacher education reforms in Ghana, pre-teacher education prior the new 4 year B.Ed. curriculum, the new pre-tertiary 4 year B.Ed. curriculum, curriculum knowledge and its aspects; the need to explore tutors' curriculum knowledge, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. in the Norther zone CoEs and ends with an overview of the chapters in the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This study explored CoE tutors' curriculum knowledge, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum.

This chapter outlines some concepts related to curriculum change, theoretical and conceptual frame works. It also presents related literature reviewed under themes developed from the objectives of the study.

2.1 Definition of Key Concepts in the Context of the Study

Relevant concepts underpinning the context of this study are below. They are curriculum, curriculum change, curriculum implementation, curriculum knowledge, classroom practices and educators.

2.1.1 Curriculum

Curriculum has different meanings and definitions depending on different philosophical viewpoints (Goodlad, Klein & Tye, 1979). Curriculum is defined as a plan or programme of the total experiences that the learner has as part of the responsibility of a school (Tanner & Tanner, 1995; Gatawa, 1990). For other authors like Beach and Reinhatz (1989), a curriculum outlines a "prescribed series of courses to take," while Cornbleth (1990) extends the definitions to include all other crucial aspects of curriculum when he maintains that curriculum refers to 'an ongoing social process comprised of the interactions of students, teachers, knowledge and milieu'. The definition of curriculum provided by all the authors above fit the context of this study.

Esu, Enukoha and Umoren (2004) also conceived curriculum as all learning experiences a child has under the guidance of a teacher. According to Offorma (2005), curriculum is a programme which is made up of three components: programme of studies, programme of activities and programme of guidance. Curriculum as viewed by Alebiosu (2005) also as an instrument that dictates the affairs of every educational system. It is the vehicle through which knowledge and other learning activities are disseminated. For the purpose of this study, Cornbleth's definition of curriculum is of crucial significance. This is because it presents curriculum as all the learning experiences and intended learning outcomes systematically planned and guided by the

school through the reconstruction of knowledge which is recognized as cognitive, affective and psychomotor development of the learner (Eya, 2012).

2.1.2 Curriculum change

Marsh (1999) regards "Curriculum change" as a broad concept, often used interchangeably with curriculum reform to include a whole family of concepts such as innovation, development and adoption. These changes can either be planned or unplanned. In the context of this study the change is planned. It is planned because it is guided by documents that shape the content to be covered when teaching. These documents arise out of policy environments and reflect what is deemed required or necessary for students to learn at specific levels of education or educational settings. Typically, planned curriculum documents are created by governments, publishers of subject matter series, publishers of assessments, or boards of education. Planned curriculum can be categorized in to two ways: curriculum that is prescribed or curriculum that is subscribed. Prescribed planned curriculum expects teachers to follow a defined set of objectives or outcomes, whereas a subscribed planned curriculum provides outcomes or objectives but allows for some teacher selection. Typically, planned curriculum is mandated at some level for teachers to use in their teaching. The new 4-year B.Ed. curriculum is a prescribed curriculum.

2.1.3 Curriculum implementation

Mezieobi in Bediako (2019) conceptualized the term implementation simply as a process of putting an agreed plan, decision, proposal, idea or policy into effect. Hence curriculum implementation includes the provision of organized assistance to staff (teachers) in order to ensure that the newly developed curriculum is delivered or put into practice at the classroom level.

Curriculum implementation process involves helping the learner acquire knowledge or experience. It is important to note that curriculum implementation cannot take place without the learner. The learner is therefore the central figure in the curriculum implementation process. Although various factors that also influence curriculum implementation such as the resource materials and facilities, the teacher, the school environment, culture, ideology, instructional supervision and assessment influence curriculum implementation significantly.

Implementation takes place as the learner acquires the intended experiences, knowledge, skills, ideas and attitudes that are aimed at enabling the learner to function effectively in a society. Therefore, putting the curriculum into operation requires an implementing agent. Stenhouse (1975) identifies the teacher as the agent in the curriculum implementation. She argues that implementation is the manner in which the teacher selects and mixes the various aspects of knowledge contained in a curriculum document or syllabus and put them into practice.

Curriculum implementation therefore refers to how the planned or officially designed course of study is translated by the teacher into schemes of work and lessons to be delivered to students.

Akwesi (2012) asserted that curriculum implementation is the practical application of theory into practice in a way that the eventual outcome is evidenced through the learners' performances in and outside the classroom. When teachers deliver both the curriculum content and instructional strategies in the way and manner they were designed to be delivered, curriculum implementation is said to have occurred. However, the ability and effectiveness of the teacher to carry out curriculum implementation

depends to a large extent on some variables such as tutors' knowledge/experience, skills, qualification and availability of resources and motivational issues among others.

Hopkins (2013) defines implementation as the phase of attempted use of the innovation. He echoes the need to understand what happens during implementation and what behaviours and factors make for success at this stage. Consequently, he identifies the key activities occurring during implementation as the carrying out of action plans, the developing and sustaining of commitment, the checking of progress and overcoming problems. He also outlines the major factors that make for success at this stage as:

- Clear responsibility for coordination among school head, coordinator and external consultant;
- Shared control over implementation between programme developers and implementers; cross- hierarchical work and relations; empowerment of both individuals and the school;
- Mix of pressure, insistence on 'doing it right' and support; Adequate and sustained staff development and in-service training;
- Rewards for teachers early in the process in the form of empowerment, collegiality, meeting needs, classroom help, and load reduction (Hopkins, 2013).

The implementation, as an essential part of curriculum development, brings into existence the anticipated changes. The changes can occur in several ways. The two most obvious ways are:

i. Slow change: this occurs for instance, when minor adjustments are incorporated into the course schedule, books are added to the library or when the unit plan is updated etc. is a slow change.

ii. Rapid change: This happens as a result of new knowledge or social trends influencing the curriculum, such as computer education being introduced into the curriculum, etc.

In curriculum implementation process, the teacher and learners are involved in negotiation aimed at promoting learning. This is the interactive stage of the curriculum process this takes place in the classroom through the effort of the teachers, learners, school administrators and parents. It also integrates the application of physical facilities and the adoption of appropriate pedagogical strategies and methods. The quality of curriculum implementation of any society is the bedrock of its political, economic, scientific and technological well-being.

2.2 Curriculum Fidelity

When considering the roles that teachers take on in the execution of an innovation, it is necessary to fully understand teachers' concerns within specific areas of change (Lochner et al. 2015). One of the leading roles of the teacher includes delivering a curriculum with fidelity, which means implementing the curriculum faithfully and keeping in step with its purpose and design. Fidelity and the trust association for curricular implementation can highlight teacher attitudes toward a curriculum. McShane and Eden (2015) offer insight into this problem with their study examining alignment between teacher implementation and the intended design of the curriculum. Thus, the study focused on whether teachers implemented the written curriculum with fidelity; the analysis also emphasized the vital role teachers play in successful new-

curriculum implementation (Budak, 2015). Some curricula remove the opportunities for decision-making in teacher instruction, which ignores or minimizes teachers' skills, strengths, and experience (Budak, 2015). Considering the vital role teachers play, determining what exactly has caused a lack of fidelity could help in determining if the curriculum itself is the problem (Hondrich, Hertel, Adl-Aminik, & Klieme, 2016). Hondrich et al. (2016) maintain that teachers may be more effective if they are given the freedom to adapt and modify a curriculum when warranted, yet the instructional support a given curriculum offers often supports student engagement within the specific curricular tasks the curriculum outlines.

Teacher beliefs about educational practices influence the actions that occur in the classroom, which can offer possible reasons for a lack of fidelity (Budak, 2015). The role of fidelity in accurately determining if a curriculum has achieved its intended purpose calls attention to another reason that teachers' roles require consideration. When a curriculum is implemented with fidelity, researchers can achieve accurate insights into whether the curriculum has met its intended objectives, which can then provide a better measure of student performance (Budak, 2015).

Because teacher fidelity influences student learning and the successful implementation of a curriculum, assessing fidelity requires research. Piasta, Justice, McGinty, Mashburn, and Slocum (2015) have identified four dimensions for assessing fidelity: (a) adherence, (b) exposure, (c) quality of program delivery, and (d) participant responsiveness. Fidelity is multidimensional because a curriculum generally consists of many components necessary for full implementation; teachers often choose specific

aspects of a curriculum to implement while disregarding others based on personal variables such as beliefs, concerns, or contradictions in philosophy (Budak, 2015; Hondrich et al. 2016; Piasta et al. 2015). Piasta et al. determined that most teachers who choose to implement with high fidelity experience gains in student literacy skills. This data supports the need to prepare and train teachers accordingly in order to understand the impact that fidelity has on students (Piasta et al. 2015).

When studies consider fidelity, questions often arise about the reasons that teachers choose not to implement a curriculum as prescribed. According Brighton, Moon, and Huang (2015), teachers reported that administrators primarily emphasized fidelity to the program, even though the program did not meet the needs of advanced readers. Teachers who strayed from the curriculum claimed to have done so to meet the academic needs of their students. In this instance, fidelity to the reading curriculum created a lack of challenge and rigor for the more advanced students; this situation then created a learning plateau for those students (Brighton et al. 2015).

2.3 Teacher Knowledge

Knowledge is directly related to teachers' behaviour in classrooms and influences the way teachers respond to curriculum change (Kneof, 2017). Therefore, it is a relevant source to draw on for innovators when implementing curriculum changes. Knowledge base, according to Shulman (1987), refers to teachers' ability to manage their classrooms, prepare lesson plans, and provide students with clear explanations, among others. Curriculum knowledge, as Carlson and Daehler (2019) have conceptualized it, includes teachers' knowledge of how to arrange lessons to improve students' understanding. They suggest that teachers should be attentive to the nature of the curriculum, be familiar with different types of assessment, and possess an array of skills

and strategies for effective teaching as well as the subject matter. Knowledge of pedagogy and subject matter is built up over the course of teachers' careers. According to Van Driel, Verloop, and De Vos (2001), this knowledge is mainly the result of their teaching experience. Pedagogical skills are not only understood as familiarisation with techniques that are used in the classroom, but also as the acquisition of routines which, without a doubt, every teacher needs in order to save time and energy for the more significant aspects of his work; at the same time, they refer to a set of variety of techniques and strategies which a teacher chooses and shapes, depending on the circumstances.

Actions by teachers which can be considered skillful with regard to teaching approach, include: setting realistic objectives, giving incentives to students for learning, applying various teaching methods, selecting participatory forms of teaching, present information in a clear manner, combine words with pictures, use various teaching aids, maximise teaching time through systematic measures (e.g. planning, reduced disturbances in the classroom), assign work that will stir the interests of the students, monitor and evaluate the progress of students, set evaluation criteria for students and inform the students about them, and provide feedback to the students. Another decisive skill is a teacher's ability to recognise the diversity of students, to choose the best method possible for each student, and to create incentives for students.

Another important factor is teachers' cooperation not only with the students, but also with the parents of the students, their colleagues and the community at large (Jasman 2002). Lastly, effectiveness, to a great extent, depends on the way problems in the

classroom are managed. Research shows that more effective teachers keep all happenings in the classroom in check, that they are constantly on alert, that they swiftly deal with any problem that may arise and that they adopt various ways of working with students (Everston and Randolph 1999, Wang, Margaret, Geneva, Haertel, & Herbert 1999). Knowledge fields constitute a necessary prerequisite for every teacher (Meijer, Verloop, & Beijaard, 1999, Meijer, Verloop, & Beijaard 2001), and which form the basic part of "professional knowledge" include:

2.3.1 Subject knowledge

Teaching a particular subject requires familiarisation with subject knowledge. Familiarisation with the subject and its dimensions is necessary. A classification of the dimensions of subject knowledge is the following (Kennedy 1990): i) subject content (opinions, axioms, facts, etc.). It relates to the "facts" and "principles" of the subject being taught, from which the teacher derives appropriate examples, pictures, etc. for instruction; ii) relations, organisation and structure of the contents of a subject. This knowledge on the subject defines the way it is presented to the students;

A teacher should also be in a position to diagnose misinterpretations of the knowledge offered by the students in the subject and fully comprehend the procedures required for the acquisition of the knowledge and skills connected to the subject being taught (Shulman 1987: 9, Perrone & Traver 1996: 395-397, Darling–Hammond & Baratz-Snowden 2005: 14-16). An extra requirement for a teacher would be knowledge on every subject in the curriculum of the grade he teaches, as this allows him to adopt an interdisciplinary approach to the material, i.e. using pictures, analogies and knowledge acquired by students through other subjects (Ernest 1989).

2.3.2 Knowledge of learners

This comprises knowledge on the biological, social, psychological and cognitive development of students, on issues related to group dynamics and interaction between students as well as teachers and students, students' behavioural problems, learning motivation, adjustment issues, learning difficulties, etc.

2.3.3 Knowledge of teaching methodology

A schematic presentation of the specific structural elements of instruction follows:

i. Lesson planning, i.e. a teacher's pre-lesson activities and actions (for example, organization of content into thematic units, transformation of teaching material into teachable knowledge, definition of teaching goals, methodological organisation of teaching, time planning, selection of evaluation process). Planning can vary, depending on whether it is short-term (weekly lesson planning or unit planning) or long-term (for the entire semester or academic year);

ii. Teaching performance, i.e. enforcing the choices made during planning (didactic organisation, teaching path, application of teaching forms, direct actions of the teacher, use of teaching methods and aids;

iii. Evaluation of teaching, i.e. evaluating the results mainly by assessing student performance (e.g. goals, forms, basic principles, assessment techniques).

Teachers should be familiar with new and innovative methods and techniques in teaching and be effective in adapting new trends in their classes. In fact, students' success depends on the success of their teachers, and the success of teachers depends on teachers' familiarity with new and innovative teaching methods and techniques (Altmisdort, 2016).

2.3.4 General pedagogical knowledge

This field relates to the organisation of the classroom, to motivating and retaining students' attention, pooling resources, learning theories and pedagogical theories. Shulman refers to it as "principles and strategic classroom management and organization" which exceed the knowledge of specific subjects" (Shulman 1986). This type of knowledge is nonetheless acknowledged, as it secures a framework of mental representations necessary for the comprehension and interpretation of the school classroom. Moreover, this knowledge is absolutely essential for lesson planning, as it guides the teacher's choices (Ernest 1989)

2.3.5 Knowledge of contexts

A teacher is called upon to evaluate the contexts in which he teaches and act accordingly, as his actions are defined by surrounding circumstances; in other words, there are no predetermined attitudes that would suit every occasion. Still, there are certain outlooks on reality, certain principles, research findings, that a teacher can use to interpret the context, as well as a host of techniques and strategies which can be used, depending on the situation. Hence, knowledge of contexts refers to knowledge of the environment and the circumstances where a teacher is required to work: the school, the region, the state. Specifically, it comprises knowledge of the students and their family background, as well as the entire local community, education system, the organisation and management of the school unit, the history and philosophy of education in every state, the institutional framework and administrative structure of education.

2.3.6 Knowledge of "self"

A basic knowledge of teachers, related to their views on their role, responsibilities, training and qualifications, rights and professional development, working conditions,

values, and philosophy, etc. and is mainly connected to their professional development through reflection, to learning through their teaching experience, in relation to their working environment (Lambert 1984, Kagan 1992). The way teachers perceive their role defines not only their options, but also the way they comprehend, interpret and use this knowledge (Clandinin & Connely 1987).

In conclusion, the qualities that can ensure a teacher's effectiveness are not the sum of his knowledge, but rather the link between the different types of knowledge he possesses. These types of knowledge do not simply coexist: they should form a complete, inseparable unit of knowledge (Kennedy 1990). The degree of connectivity between these separate types of knowledge sets apart a "competent" teacher from an "excellent" one, as a "competent" teacher manages to combine these knowledge forms in part, whereas an "excellent" teacher uses the knowledge deriving from each separate field most effectively (Turner-Bisset 2001: 131-141)

2.4 Classroom Practices

They are a set of strategies and instructional methods that characterize the interaction between teachers and students in the classroom, which are meant to promote learning, as well as develop and manage pupil's behaviour. Classroom practices include classroom management, pedagogy, learning activities, as well as students' engagement in learning and the use of instructional time.

The classroom is a place where social actors interact with each other towards the common objective of giving and receiving knowledge. For it to be well transmitted, classroom practices must be inclusive, to ensure every pupil feels valued and supported in their learning process. In addition, classroom practices include classroom

management which is the set of procedures, strategies, and instructional methods that teachers use to create a classroom environment which promotes learning. Classroom management is essential to create a safe and well-ordered environment to teach and learn while promoting quality education and inclusiveness. Classroom practices also include students' behaviour towards their peers and the teacher. In class, student must be taught in the best conditions to feel ready to learn with the same chances than other students in the classroom. Thus, students' learning outcomes are largely dependent on the type of pedagogy used by the teacher in the learning process, but also on the learning environment within the classroom.

Teachers are the central actors when it comes to managing classroom practices and must be oriented towards adapting their pedagogy. Teacher competence plays a decisive role for quality education, but the teacher-pupil performance relationship is complex (UNESCO, 2009) and is a result of multiple factors demanding a consistent context-related teacher management system. (Best, Tournier and Chimier, 2018). Classroom practices also include management of students' behaviours towards their peers and their teachers. Students must be taught in the best conditions to feel ready to learn. Students' learning outcomes are not only dependent on teachers' curriculum knowledge and type of pedagogies used but also on the learning environment within the classroom. The teacher may be knowledgeable in the curriculum, conversant with the practices and pedagogies suggested in the curriculum but challenges above may hinder the translation of his capabilities into the intended classroom practices.

2.5 Theoretical Framework

Curriculum development and implementation models help designers to systematically and transparently map out the rationale for the use of particular teaching, learning and

assessment approaches. Some curriculum implementation models relevant to this study are discussed in the next section.

Models are essentially patterns which serve as guidelines for action. Using a model in an activity can result in greater efficiency and productivity (Oliva & Gordon, 2013). The study was situated within the following curriculum implementation models. Fidelity model, Overcoming Resistance to Change model, Leadership-Obstacle Course model, Linkage model and Rand Change Agent model

These models are relevant to the study because any change will mostly be met with some resistance at first as long as people are still not aware of the purpose of the change. People who are affected by change need to be convinced that their prior knowledge, values and beliefs are significant, and that the change is necessary for the advancement of quality of education in the case of teachers as they are the focus group in this study. Teachers also need to know that change is not final; there will always be new methods and techniques to try out, which make curriculum change and implementation an on-going process. Successful implementation of any programme needs positive behaviour. Teachers should see the change as relevant to their professional lives and necessary to improve the quality of their teaching. Teachers' concerns should be taken into account, considered and addressed so that they can feel that their opinions are valued. The four models are discussed in the next sub-sections.

2.5.1 The fidelity model

The initial and most extensively documented model to curriculum implementation is the fidelity model. It investigates the degree of faithful implementation of the curriculum, and the criterion for success is the faithful use of the curriculum as intended

by the developers or sponsors of the programme (Snyder, Bolin, & Zumwalt, 1992). That is to say, when programme developers prescribe a fidelity approach to implementation, their intention is to measure the extent to which actual use of the curriculum corresponds with its intended use. Minor changes introduced by the implementers might be tolerated but the emphasis is clearly on ensuring that practice concurs with the intentions of the designer (Cobbold, 1999). He makes the pertinent observation that fidelity perspective to implementation seems highly optimistic about achieving pre-determined goals through the use of systematic, rational processes. This is consistent with the observation by Leithwood (1991) that developers tend to view the programme as a comparatively absolute answer to a definite problem in the school or school system. Consequently, implementers are encouraged to focus their attention on the new programme and its prescriptions and to trust that "faithful" implementation will solve the problem. The assumption that emerges from this is that implementation is a non-problematic phenomenon which occurs without hindrance provided people understand the value of an innovation and readily follow its prescribed practices. Because curricula are not always faithfully implemented, adequate training prior to implementation and support and monitoring during implementation have become standard features of this approach.

A number of assumptions underlie the fidelity perspective. First is the assumption that curriculum knowledge is created outside the classroom by the experts who design and develop the curriculum. The second assumption is that curriculum change is a rational, systematic, linear process that can be better administered the more we know about the factors that either facilitate or hinder the smooth operation of the process. Thirdly, the teacher is regarded as a consumer who should follow the directions and implement the

curriculum as the experts have designed it. As an imparter of the curriculum to learners, the teacher's role becomes crucial to the success of the curriculum (Cobbold, 1999).

Sympathizers of the fidelity orientation are likely to see the curriculum as a static thing (document) – a textbook or a syllabus. This is what Snyder et. al. (1992) imply when they state that from a fidelity point of view, A curriculum is something concrete, something that can be pointed to, something that a teacher can implement and something that can be assess to see if its goals have been accomplished.

The concept of implementation fidelity, sometimes called adherence or integrity is the delivery of instruction in the way in which it was designed to be delivered (Gresham, 1989). Deviations from, or dilution of the curriculum components, could have unintended consequences on programme outcomes. The 4-year B.Ed. programme calls for integrating methodology with content The fidelity approach to curriculum implementation is therefore the determination of the degree of implementation of a programme in terms of the extent to which actual use corresponds faithfully to the kind of use intended by the designers and to determine factors which facilitate such implementation (Snyder et al. 1992; Vaughn, Kingner, & Hughes 2000). It is in the light of this that the researcher sees the fidelity model relevant to this study. Offiong (2005) asserts that fidelity of implementation occurs when teachers deliver both the content and instructional strategies of the curriculum in the same way that they were designed to be delivered.

2.5.2 Overcoming resistance to change model (ORC)

Overcoming Resistance to Change model rests on the assumption that the success or otherwise of curriculum implementation primarily depends on the impact the developer makes on the users of curriculum such as, teachers, students and the society in general.

If change is desired then peoples' misgivings, their misapprehensions, or other such related factors must be addressed.

It must be pointed out to them that curriculum, wherever possible and appropriate, teachers' values, assumptions and beliefs must be incorporated. And while addressing the persons within the system, it should be remembered that to get the desired result, the subordinates should be motivated rather than ordered. Curriculum developers should, therefore, identify and deal with the concerns of the staff in various educational institutions when implementing new curriculum. The concerns can be grouped into the following four broad developmental stages:

1. ***Unrelated Concerns:*** At this stage, teachers do not perceive a relationship between themselves and the suggested changes. For example, if a new programme is being developed, a teacher at this stage may or may not be aware of this effort. If he/she is aware of it, he/she may not consider it something that concerns him / her. The teacher would not resist the change, because he / she really does not perceive the change as something that influences his / her own personal or professional domain.
2. ***Personal Concerns:*** At this stage, the teacher will react to the innovation in relation to his / her personal situation. He / she is concerned with how the new programme compares to the one already in use.
3. ***Task-related Concerns:*** This stage relates to the actual use of the innovation. The teacher at this stage will be concerned with the time required for teaching the new programme, availability of materials, strategies to be adopted, etc.
4. ***Impact-related Concerns:*** The teacher at this stage will be concerned with how the innovation will influence others. When working with the ORC model, we

must deal directly with the concerns at stages 2, 3 and 4 in order to serve the purpose for which the change is effected.

Overcoming-Resistance-to-Change (ORC) Model rests in the assumption that success or failure of planned organizational change basically depends on the leaders' ability to overcome staff resistance to change (Ornstein & Hunkins, 2009). Any successful approach for change would have to deal with peoples' feelings and perceptions. Change is about challenging ones beliefs, perceptions, and traditional ways of working and long held and established practices. As such, it can be pretty scary. According to Smith and Lovat (2003), such fears have to be dealt with effectively if successful change is to occur. For the 4-year B.Ed. curriculum management to be effective, it needs a principal who is clear about what he/she wants to achieve. His/her aim and objectives about the school should be clear. This means that he/she needs to have a systematic plan in place.

Commitment is required by all those involved in implementing the change. It is especially important that the principal and other stakeholders in the school be seen as actively supporting the change. If not, there is a little chance of the change succeeding. One strategy to overcome resistance to change is to give school administrators and teachers equal power. Subordinates should be involved in discussions and decisions about the programme. It is in the light of this that the researcher sees the ORC model relevant to this study.

2.5.3 Leadership-obstacle course model (LOC)

This model treats staff resistance to change as problematic and proposes that data should be collected to determine the extent and nature of the resistance in implementing the curriculum. This can be carried out by the following:

i. the organisational members must have a clear understanding of the proposed innovation;
ii. individuals within the organisation must be given relevant skills so that they possess the capabilities requisite for carrying out the innovation;
iii. the necessary materials and equipment for the innovation must be furnished;
iv. if need be, the organisational structure must be modified so that it is compatible with the innovation being suggested;
v. the participants in the innovation must be motivated to spend the required time and effort to make the innovation a success.

The LOC model considers educational change as a sequence of three stages:

i. initiation;
ii. attempted implementation; and
iii. incorporation.

It should be noted here that implementation obstacles solved at one point at a time using this model may arise again at another point. This model, therefore, has a feedback and monitoring mechanism to determine if problems once solved keep reappearing and so on.

The model treats staff resistance to change as problematic and makes efforts to collect data to determine the extent and nature of the resistance. This can be done by making sure that:

- the organisational members have a clear understanding of the proposed innovation;
- individuals within the organisation are given relevant skills so that they possess the capabilities requisite for carrying out the innovation;

- the necessary materials and equipment for the innovation are furnished;
- the organisational structure must be modified so that it is compatible with the innovation being suggested;
- the participants in the innovation must be motivated to spend the required time and effort to make the innovation a success.

It is for these reasons that the researcher sees the model relevant to this study.

2.5.4 Rand change agent model (RCA)

The Rand Change Agent (RCA) model suggests that organizational dynamics seem to be the chief barriers to change. As in ORC and LOC models it puts forward the following three stages in the change process:

i. Initiation: At this stage, the curriculum developers work to secure support for the anticipated change. To support a change, such as a new programme, people must understand and agree that it is legitimate. Thus, curriculum implementation activity requires the personal backing of the individuals involved. For example, at this stage, teachers should be informed about the need for change and how it might take place.

ii. Implementation: At this stage, the proposed change, i.e., the new programme and the organisational structure are adjusted to operationalize the change.

iii. Incorporation: During this stage, the changes implemented become part of the established programme. The assumption behind this is that the success of the implementation is a function of:

   a. the characteristics of the proposed change;
   b. the abilities of the academic and administrative staff;
   c. the readiness of the local community; and

d. the organisational structure.

During the incorporation stage, the changes implemented become part of the established programme. At this stage the programme implemented is provided with the necessary personnel and financial support.

This theory suggests that teachers who have taught many years may find it easy to implement curriculum efficiently. According to Seweje and Jegede (2005), a teacher's ability to teach is not only derived from the academic background of the individual but it is based upon the outstanding skills acquired. Adeyemi (2008), examined teachers' teaching experience and students' learning outcomes in secondary schools in Ondo State Nigeria and asserted that schools that included more teachers with 5 years and above teaching experience achieved better results than the schools that included more teachers with less than 5 years teaching experience. Harris and Sass (2011) indicated that all the studies of teacher productivity include some measures of teacher's experience. They found that there was an incredible contrast between the approach followed by a starting teacher and that of an experienced teacher. The more experience a teacher has acquired over sometime, the more capable and proficient he is in his work. It is in the light of this that the researcher finds the model relevant to this study.

2.6 Review of Related Literature

The purpose of this study is to explore and analyze curriculum knowledge of tutors and how tutors' classroom practices agree with the intentions of the new curriculum. The study further explores impediments affecting tutors' implementation of the new 4-year

B.Ed. curriculum. The related literature is therefore reviewed under the following themes. First, teacher education reforms in Ghana, tutors' curriculum knowledge, tutors' classroom practices and finally impediments affecting tutors implementation of the new 4-year B.Ed. curriculum.

2.6.1 Teacher education reforms in Ghana

In Ghana, the vision of pre-tertiary teacher education programme is to "prepare teachers to enable them function in the basic and second cycle schools and to develop and nurture them to become reflective and proficient practitioners capable of providing quality education for Ghanaian children" (Ministry of Education [MOE], 2012, p. 8). This statement and several others in the past have led to a number of reforms involving curricular changes and restructuring of teacher education institutions tasked with the responsibility of preparing teachers for the early grades to the senior high school levels. In spite of the numerous teacher education reforms (elaborated later) that Ghana has experienced, the quality of teaching and learning leaves a lot to be desired due to a myriad of factors such lack of policy coherence, mismatch between expectations as espoused in official policy documents and what is possible within a constrained school system among others. (MoE).

In Ghana, pre-tertiary education comprises the basic school level (at the moment, involves kindergarten, primary and junior high schools), the second cycle level (senior high school, technical/vocational institutions) and special schools. The preparation of teachers to teach at the basic school level took place in post-secondary institutions, now known as the College of Education (CoE). Currently, there are 46 public CoE in Ghana, up from 38 in 2014. The increase is due to the government absorbing eight private CoE with the aim of expanding the infrastructural facilities in the colleges. These CoE, prior

to the current reforms which began in 2014, offered three-year Diploma in Basic Education (DBE) programmes. The subsequent paragraphs provide details on teacher education reforms in Ghana

Teacher education reforms in Ghana have largely been influenced by socio-political changes. That is, nearly every government that has ruled the country since independence has engaged in some form of teacher education reforms which were aimed at preparing qualified teachers to meet the educational needs of the country. These reforms have produced different sets of teachers with different types of certificates (Anamuah-Mensah, 2006). Teacher Training Colleges (TTC), now known as Colleges of Education, initially offered 2-year Post-Middle Certificate "B" programs, followed by 4-year Post-Middle Certificate "A" and 2-year Post-Secondary Certificate "A" programmes. In the 1980s, the 2-year Post-Secondary programme was extended to a 3-year program, but ran alongside the 4-year certificate "A" programs until it was truncated (Newman, n.d.). However, the reforms yielded little impact on students' learning outcomes (MoE, 2012) such as achievement and development of critical values like problem solving.

Following the legislation of the Colleges of Education Act 847 to upgrade CoE into tertiary institutions, with effect from October, 2018 the CoE were upgraded to 4-year Bachelor Degree (B.Ed.) awarding institutions and no longer three-year Diploma in Basic Education (DBE) awarding Colleges. Prior to the enactment and passage of Act 847, the CoE were designated as Teacher Training Colleges (TTC) and were under the supervision of the Ghana Education Service, the body responsible for pre-tertiary teacher education. The passage of the Colleges of Education Act 2012, Act 847 has provided legal backing to their new elevated status. The colleges have since been under

the Ghana Tertiary Education Commission (GTEC). The GTEC is the government body responsible for the regulation of tertiary education institutions in Ghana.

2.6.2 Tutors' curriculum knowledge

Choppin (2009) and Heather and Charalambos (2012) have all identified curriculum knowledge as an important quality of a teacher.

According to Shulman (1986), there are requirements for teaching which are to be met by every teacher. One of these requirements is curriculum or curricular knowledge. He labels curriculum knowledge as the "tools of the trade" for teachers. These "tools of trade," according to him, are the things that enable teachers to execute and transact the curriculum. In its widest sense, it borders on the unabridged curriculum arranged for pupils, the programmes of study and the categories of curriculum materials used to teach each subject. It again refers to a teacher's understanding of the school's learning programs that have been developed for the different curricular levels. The learning program encompasses specific topics and subjects at any given level, the various instructional materials available, and the array of activities that would support the learning experiences (Livingston, 2016; Ozkan, 2016). According to Carlson and Daehler (2019), curriculum knowledge of teachers refers to their familiarity with arranging lessons in a way to improve students' comprehension, their mindfulness of categories of assessment and skills for effective teaching. Again, Şen, Oztekin and Demirdogen (2018) intimate that curricular knowledge comprises teachers' understanding of the objectives in the curriculum, their familiarity with the topics they teach and their knowledge of students' understandings to recognize the problems their students may encounter. They consider curricular knowledge as teachers' cognizance of specific curricular programs about the topic they teach. Abell (2008) defined

curricular knowledge as the organization, delivery, and modification of the contents of the curriculum, teaching subjects, problems, and issues related to the interests and abilities of the pupils.

In the context of this paper, curriculum knowledge is conceptualised as teacher's knowledge of; the rationale for teaching, the aims of the subject, the various levels at which the subject operates and the content/topics of the subject.

Bagherzadeh and Tajeddin (2021) have opined that curriculum knowledge is one of the vital dimensions of the teacher knowledge base and that it lends itself to variations across educational and sociocultural contexts. Curriculum knowledge is essential to the attainment of the aims of every educational program including Science Education. Metzler and Woessmann (2010) have indicated that teachers who possess high levels of curriculum knowledge impact their students' achievement positively. It is therefore imperative that a in the college of education (in this context, Science) possesses curriculum knowledge on the subject he/she teaches. It thus, plays an important role in shaping the teaching and learning of Science in Ghana.

Variations in science teachers' curriculum knowledge about science and teaching may influence the way that science programmes are implemented. Interpreting a research finding, Tobin (1987) showed that the root cause for the problems in science classes may not be external examinations or prescriptive curricula, but rather it may be related to teachers' knowledge about what to teach, how to teach it, how students learn and what is to be assessed. In a study conducted by Annan, Owusu-Fordjour, Koomson, Agyemang, Addae, and Anim (2021) on curriculum knowledge of science teachers and its effects on academic performance of pupils, the study revealed that the teachers have

weak science background knowledge. The teachers' curriculum knowledge influenced science teachers' instructional and assessment practices thus contributing to the pupils' poor performance in science. A teacher with adequate curriculum knowledge is able to organize science classroom instruction and assessment effectively. The current science curriculum requires the Ghanaian science teacher to relinquish singular claims to authority or power in the classroom and to play the role of a coach or facilitator who owes the pupils a duty to assist the latter to achieve the curriculum goals.

Knowledge of the curricula as noted by Tomasevic and Trivic (2015), are important components of teachers' knowledge and are emphasized in different models proposed for teachers' knowledge. Teachers are equipped with experiences, characteristics, beliefs, knowledge, and skills that facilitate a better understanding of the contents of curriculum materials. Beyer & Davis (2012) also observed that, if the teachers have limited knowledge of the curriculum, they are unable to analyze curriculum materials, they would either make unnecessary changes or fail to make needed modifications.. Consequently, they should learn how to adapt curriculum materials

In the context of this study, teachers' curriculum knowledge is conceptualized as teacher's broad understanding of school subjects. T includes the awareness of various instructional materials, teaching approaches and procedures, and learning objectives, the rationale for teaching, and the aims of the subject.

Studies have shown that the teachers' knowledge of the rationale and aims for teaching a subject is paramount in the attainment of intended learning outcomes (Sahin & Suylu, 2017; Ozkan, 2016). This implies that a teacher who lacks knowledge of the rationale and aims for teaching a subject, which is a critical component of curriculum knowledge,

would not promote effective learning in the classroom. The issues of teaching and learning and the role of both the teacher and the learner have taken centre stage of research in education in recent years. Most of the studies have emphasised the critical role teachers play when it comes to effective teaching. The need for teachers to be updated and clothed with the required knowledge and skills, have been underscored (Heather & Charalambos, 2012), if educational goals are to be attained. Postulating from Shulman's (1986) requirements for teaching, Fitchett and Heafner (2018) are of the view that Curriculum Knowledge is one very critical requirement for teaching. It encompasses skills that ensure that the teacher is on top of the subject he/she teaches (Bagherzadeh & Tajeddin, 2021).

2.6.3 Tutors' classroom practices

Writing on Ghana, Akyeampong (2003) reflected on a number of approaches used in teaching the contents of the various subjects. He mentioned (a) transmission of knowledge where tutors lectured their students, (b) student-centered teaching where students are engaged in discussions and debates on topical issues, with tutors acting as facilitators and (c) question and answer approach in which case, tutors mainly asked questions and used students' answers to further develop the lesson. Other methods tutors use in teaching trainee teachers are discovery learning process, brainstorming method, individualized method, project method, and problem-solving method. In addition, tutors used role-play and demonstrations (simulation methods), educational visits and field experiences, and deductive and inductive methods in their teaching (Ghana Education Service, TED, 2004). The students are also taught by means of the following methods: expository teaching process, drills, teacher-led discussion, and case studies.

Despite the array of methods of teaching used by the tutors in a variety of ways, it has been found that “the dominant pedagogical stance remains one where trainees are largely regarded as ‘empty vessels,’ with little knowledge or experience of teaching” (Lewin & Stuart, 2003). These authors added that the trainees are seen as people who “need prescriptive advice and guidance from lecturers about how to teach, whether or not the prescriptions appear to suit the learning contexts in the schools where trainees work or the demands of new curricula. No literature has been sighted that suggest(s) that what Lewin and Stuart (2003) pointed out has changed. A study conducted by Annan et al. (2021) revealed that Junior High School science teachers’ preferred teaching method was teacher-centred instead of learner – centred.

In a study conducted by Behar and George (1994) on teacher’ use of curriculum knowledge, teacher-centered and didactic teaching were characteristic of the type of instruction. Based on what was observed, there seemed to be little opportunity for students to assume the role of active learners. One teacher, for example, simply read through vocabulary words and failed to engage students in any kind of active learning. She displayed a remarkable insistency in covering all the materials in the fixed 50-minute period. However, she provided little opportunity for checking students' understanding or promoting their acquisition of the learning through activities usually associated with the concept attainment model. While covering the topic of personal pronouns, an instance of "incomplete construction" emerged. She did not take the opportunity to explain this concept. A teachable moment was sacrificed while she continued to rapidly read through the worksheet and supply students with the correct answers. Another teacher began class without greeting and proceeded to the blackboard. The topics that were central to her lesson plan include slope, functions, proportions,

and ratios. She presented information didactically and did not assess students' level of comprehension. As students began to complete a worksheet assignment, the number of raised hands indicated that at least one third of the class did not understand how to apply the formula. Student outcomes might have been facilitated by: having students solve a few problems in small groups, solving problems on the board, asking students to provide definitions for new terms that were introduced, or providing a review of the ideas and procedural steps that were being emphasized.

2.6.4 Impediments affecting tutors' implementation of the new 4-year B.ED. curriculum

In curriculum implementation, a number of factors may interact and impede the smooth implementation of the curriculum. Such factors are discussed in the next section.

2.6.4.1 Poor resources (Human, Material, Physical and Financial)

An important factor that influence curriculum implementation has to do with the provision and distribution of materials that will enhance the achievement of the teaching and learning objectives. Such materials include: textbooks, instructional materials, desks etc. this is because for the curriculum contents to be effectively implemented at any stage of the educational system, some materials which are expected to compliment the classroom activities of the teacher should be provided for effective implementation at the classroom levels of any of the educational programmes. Sometimes the curriculum is implemented without these resources making it difficult for learners to assimilate lessons. Fullan, (2001), argued that, if obstacles to implementation were not removed, instead of moving ahead from the implementation phase to the continuation phase, a change would suffer from the failure to be used in the intended manner and the rejection by decision-makers.

Fullan (2007), a world-renowned authority on educational change, believes that curriculum implementation is a difficult process that necessitates an investigation into the contextual and cultural constraints embedded in the school. The implementation of a new curriculum places additional demands and expectations on educators and schools while the support and resources allocated to them are not sufficient for their needs (Fullan, 2007; Flores 2004). Fullan (2007) further argues that such insufficiency of resources (teachers, materials, space) limits educators; implementation of a new curriculum.

According to MacPhail (2007), the implementation of the revised physical education curriculum in Scotland failed because of a lack in the provision of the required resources such as textbooks. Thai scholars Prapaisit de Segovia and Hardison (2009) and Vietnam's Cahn and Barnard (2009) also allude to inadequate resources as hindrance to the implementation of the new English curriculum. According to Penny, Ward, Read and Bines (2008), the government of Uganda failed to implement their new curriculum programme called Education Strategic Investment Plan (ESIP) of 1998 because they did not have adequate learning and teaching resources, with no budget to pay for it and without sufficient training of educators. In a review of the implementation of the Ntaoinla Curriclum Reform in China from 2001 to 2011, Hongbiao (2013:345) found among other things limited supportive resources for schools (particularly rural schools); unsatisfactory professional support for teachers; and questionable effectiveness of classroom teaching consistent with the shortfall in teachers' knowledge of some methodologies, moreover, Schneider and Ingram (1990) point out that it is only when people know about a policy and its expectations and are appropriately resourced that they develop the capacity to implement it.

While Guskey (1986) agrees with all the above authors, he emphasizes the need to encourage and support educators during this difficult process. Nnabuike (2012) identified some factors that could hinder the achievement of instructional objectives which is the focus of curriculum implementation include the following:

Utilization of Instructional Materials and the importance of instructional materials in teaching and learning can also influence curriculum implementation. Instructional materials promote efficiency of education by improving the quality of teaching and learning (Adeoye 2010). The use of instructional material enhances permanent retention. It is unfortunate that despite all the advantages of instructional materials, and the fact that they are part of the curriculum planning and design, some governments do not base on the importance of TLMs to implement new curriculum.

2.6.4.2 Timeframe and tutors' workload

Another issue is excess contents added to the curriculum to be covered by both the students and teachers possess serious impediments in curriculum implementation. Some global and emerging issues, such as family life education. Citizenship education, education on HIV/AIDS and drug abuse among others which are recently introduced in the school curriculum as contents to be learnt by student/pupils without extending the instructional hours affect its implementation. Afangideh (2009) in Obilo and Sangoleye (2010) states that some teachers are having issues with such topics already, hence making its' implementation a challenge. Obilo and Sangoleye (2010) further maintained that the time allotted for the implementation of these heavy academic loads is not adequate enough. A followed-up issue on this matter is that when these new courses are introduced or included in the existing curriculum, new personnel who

specialized in them were not usually employed neither do government send the old staff on training on how to implement them.

Park and Sung (2013) postulate that teachers' limited understanding of the view behind the curriculum reforms can be related to their workload. In their study of the nationwide Senior Secondary Schools (SSS) curriculum reform in the four selected provinces of Guangdon, Shandong, Hainan and Ningxia in China in 2004, Lee and Yin (2011) found that the SSS curriculum reform obliged teachers to use new teaching methods in classroom teaching. This implies that teachers had to move from the comfort zone of their professional practices and embrace the uncertainties of the reform. Getting used to the new methods of teaching demanded more time to adjust, creating heavy workloads, which made the implementation of reforms too stressful and tiring for educators. Educators also found the use of new text books demanding, worrisome and a contributing factor to their loss of control in teaching. In a study by Cheung and Wong (2012) it was revealed that the growing recurrent meetings and professional development training also add to the teachers' heavy workloads. According to park and Sung (2013) teachers perceive curriculum reform as extra work and demonstrate poor motivation to implement it.

2.7 Conceptual Framework

The goal of the study was to gain insight into tutors' classroom practices and determine whether they concured with the intentions of the new 4-year B. Ed. curriculum. Further, the study assessed tutors' curriculum knowledge for the implementation of the new 4-year B.Ed. curriculum. It also established impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum.

This section shows the proposed relationship between tutors' curriculum knowledge, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. It also shows how tutors' curriculum knowledge may influence their classroom practices and how impediments may affect classroom practices which has consequences on the implementation of the new 4-year B.Ed. curriculum. The conceptual framework (Fig. 1) is derived from the literature reviewed on the implementation of curriculum reform with specific reference to the variables of the study.

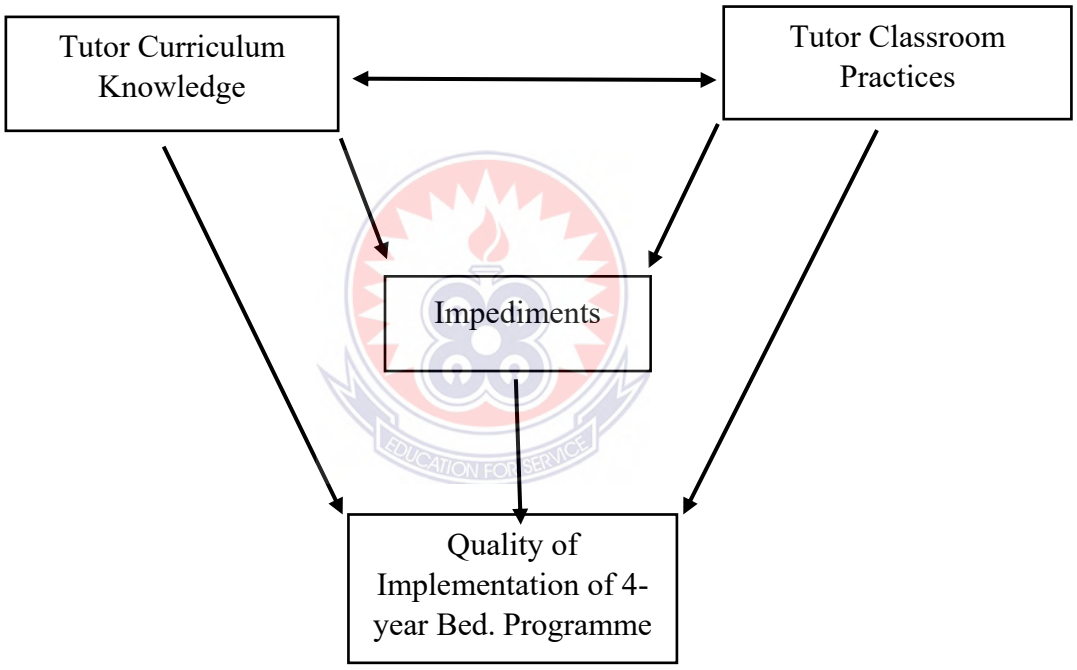

Figure 1: Conceptual Framework of the Study

There is a strong correlation between the quality of implementation of a new curriculum, teachers' curriculum knowledge and quality of practice in teaching and learning process. Researchers and educators (e.g. Barnett & Hodson, 2001 and Baxter & Lederman, 2006) have stressed the importance of tutors' curriculum knowledge and its relation to teaching practices. They suggest that tutors' curriculum knowledge

informs their practices and directs their actions in the classroom. They also suggest that, most likely, relationships between teachers' curriculum knowledge structures, classroom practice and student achievement exist. Thus, issues related to what sort of knowledge teachers might need in order to become effective practitioners, what teachers know and how their knowledge informs their classroom practices are central to stakeholders concerned with teacher education and continuing professional development of tutors.

Many scholars suggest that teachers' classroom practice is rooted in their curriculum knowledge. They suggest that, curriculum knowledge guides teachers' actions when dealing with a specific subject matter in the classroom. Science teachers make instructional decisions that greatly impact the learning of their students. Some of these decisions pertain to how the curriculum can be modified and how science content can be presented to the students. Such decisions are largely influenced by their curriculum knowledge. This knowledge "allows teachers to reason pedagogically and to make decisions pertaining to practice that ensures students will develop an understanding of science. The teacher must also be able to apply best and innovative practices in the classroom to motivate learners to learn. Shulman (1987) relates teachers' practices directly to their curriculum knowledge, which, according to Van Driel and Berry (2012), can be influenced by the teachers' specific professional contexts. Sparks (1983) suggests that a promising trajectory towards the improvement of instruction is a closer examination of individual teachers' classroom practices and needs.

It can be inferred from the preceding paragraphs that, important prerequisites for successful implementation of a new curriculum reform are ample knowledge of the curriculum and quality of classroom practices. If the teacher is to be able to translate

curriculum intentions into reality, it is imperative that the teacher understands the curriculum document or syllabus well in order to implement it effectively. Well-equipped teachers support better learning outcomes because they are most knowledgeable and skillful about the practice of teaching.

In the implementation of a new curriculum, tutors are expected to be conversant with the dictates of the curriculum in terms content, instructional strategies, assessment procedures etc. The new 4-year B.Ed. curriculum reform require tutors to change from their usual classroom practices and embrace new teaching methods. This implies that tutors have to move from the comfort zone of their professional practices and embrace the uncertainties of the reform. Using the new methods of teaching prescribed in the new 4-year B.Ed. curriculum may be challenging to tutors who may resort to their usual ways of teaching. Also additional contents added to the curriculum to be covered may be challenging to tutors who may teach those content poorly or ignore them entirely.

Also, there may be impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. For instance, lack of resources such as teaching and learning materials, inadequate classroom space, inadequate time to cover curriculum content, heavy workload and so on can affect classroom practices and ultimately affect implementation of the reform. If the tutor is to be able to translate curriculum intentions into reality, it is imperative that all impediments that may impede the implementation of the curriculum must be identified and removed. Knowledge of the curriculum, classroom practices and implementation impediments can interact and lead to implementation success or failure. In educational practice, these variables interact with each other and generate influences that cannot be attributed to one factor or another hence, they constitute the conceptual framework underpinning the study.

2.8 Chapter Summary

This chapter provides a comprehensive review of relevant literature. The reviewed literature was organised into themes to act as framework to the field of inquiry and covers: theoretical framework and conceptual framework of the study; curriculum knowledge, its importance and domains, classroom practices as well as curriculum implementation impediments with reference to the new 4 year B.Ed. curriculum and its implementation. The literature reviewed indicates the importance of curriculum knowledge in teaching. Also attention was focused on implementation of curriculum in the international and Ghanaian contexts.

CHAPTER THREE

METHODOLOGY

3.0Overview

This study explored CoE tutors' curriculum knowledge, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum of the new 4 year B.Ed. curriculum. This chapter discussed the research design, study area, population, sampling procedure, instrumentation, validity and reliability of instruments data collection and ethical considerations.

3.1 Study Area

Presently, there are forty-six public Colleges of Education (CoE) in Ghana. They are grouped into five zones namely, Northern, Ashanti-Brong Ahafo, Central-Western, Volta, and Accra-Eastern. The five regions of the north constitute the northern zone: They include Northern. Savannah, North East, Upper West and Upper East Regions. There are ten CoE in the northern zone namely; Bagabaga CoE, Gambaga CoE, Bimbila E.P. CoE, Gbewaa CoE, N.J Ahmadiya CoE, St. John Bosco CoE, Tamale CoE, Tumu CoE, St. Vincent CoE and McCoy CoE. The CoE in the study area have varying years of existence since their establishment and are all delivering the new 4-year B. Ed. curriculum. St. John Bosco and Bagabaga CoEs have been in existence for 78 and 74 years respectively, Gbewaa, Tamale and E.P. CoE have also been in existence for 69, 64 and 60 years respectively. McCoy and St. Vincent have also been in existence for eight and six years respectively. The study was conducted in eight out of the ten CoEs in the Norther Zone namely Gambaga CoE, Bimbila E.P. CoE, Gbewaa CoE, N.J Ahmadiya CoE, St. John Bosco CoE, Tamale CoE, Tumu CoE, St. Vincent CoE and McCoy CoE.

Programmes run by Gambaga CoE are B.Ed. Early Grade Education, B.Ed. Primary Education (Upper Grade) and B. Ed Junior High School Education with the following options; Mathematics and Information and Communication Technology (ICT) option. Social Studies and Religious and Moral Education (RME) option. Social Studies and Music Option. Tamale CoE also runs B.Ed. Primary Education (Upper Grade) and B.Ed. Junior High School Education with the following options; Science and Maths, Mathematics and ICT, Social Studies, RME and Music whiles Tumu CoE runs B.Ed. Early Childhood Education (ECE) and B.Ed. Primary Education (PE). Programmes offered at Bimbila E..P. CoE include B.Ed. Early Grade Education, B.Ed. Primary Education and B.Ed. JHS Education. St. John Bosco's, St. Vincent and McCoy CoE also offer, the following B. Ed. Programmes. B.Ed. Early Grade Education, B.Ed. Primary Education and B.Ed. JHS Education.

3.2 Research Design

Research design is a blueprint which governs a research process and spells out what is to be done and how it should be done. It is also considered as a plan that leads researchers to arrive at reasonable solutions to research questions (Burns &Grove, 2003). This study used explanatory sequential mixed-method design. An explanatory sequential mixed-method design according to (Creswell, Plano Clark, Gutmann & Hanson 2003) consists of first collecting quantitative (numeric) data and then collecting qualitative data to help explain or elaborate on the quantitative results. The rational for this approach is that the quantitative data and results provide a general picture of the research problem; more analysis, specifically through qualitative data collection is needed to refine, extend or explain the general picture. The design was followed through by an initial phase of quantitative data collection and analysis,

followed by a phase of qualitative data collection and analysis, and a final phase of integrating or linking of data from the two separate strands of data. The design would promote deeper conceptual understanding of tutors' curriculum knowledge and their classroom practices in the implementation of the new 4-year B.Ed. programme.

Explanatory sequential mixed-method design is represented diagrammatically as Fig. 2

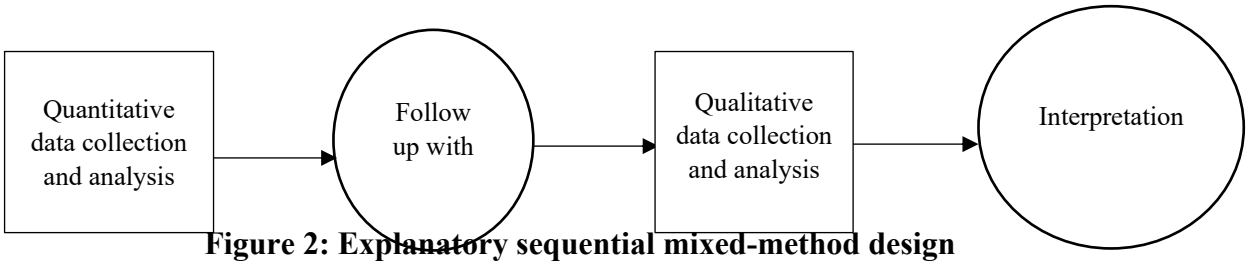

Figure 2: Explanatory sequential mixed-method design
Source: Creswell, Plano, Clark, Gutmann, & Hanson (2003)

3.3 Population

Mugenda and Mugenda (2003) state that a target population is that population which the researcher wants to generalize result over. The target population for this study was Science tutors in all 46 public CoEs in Ghana.

The science tutors have varying lengths of teaching experiences at the CoE and are expected to have a minimum qualification of a researched Master degree with education component. They are considered to have expert knowledge of the curriculum. They are also considered to have taught in both the previous DBE and the new B. Ed. curricula.

The accessible population of this study consisted of all Science tutors in the CoEs in the Northern Zone. The researcher has reasonable access to these tutors as he himself a tutor in the Northern Zone, he has close proximity to the participants. The study was conducted at the time the CoEs were in full session. The researcher combined his work as a tutor alongside conducting the study so it became necessary to use tutors in the

Northern Zone. The northern Zone CoEs and the tutors have the similar characteristics as tutors in other Zones.

3.4 Sample

In research terms a sample is a group of people, objects, or items that are taken from a larger population for measurement. The sample should be representative of the population to ensure that we can generalise the findings from the research sample to the population as a whole. Eight CoEs in the Northern Zone were sampled for the study. There were at least, eight tutors in the science departments of the eight colleges in the Zone. At least, eight tutors in each of the eight sampled CoEs participated in the study. Many of these tutors had witnessed the transition from DBE to B.Ed**.** In all, 60 science tutors participated in the study.

3.5 Sampling Technique

Convenience sampling technique was used to select eight CoEs in the Northern Zone. This was because of the proximity of the CoEs to the Researcher. Purposive sampling technique was also used to select only science tutors numbering 60 in the eight sampled CoEs in the northern zone. Purposive sampling was used because the Researcher was interested in information from only science tutors in the colleges. Tutors used for the classroom observation and interview were randomly selected. Codes were assigned to tutors (e.g. T1 to T7) and written on pieces of paper. These pieces of paper were placed in a box, thoroughly mixed and one paper picked without looking into the box. The paper that was picked was the tutor that was observed and interviewed. The procedure was repeated in all eight CoEs to get the tutor that was observed and interviewed. This was done in order not to introduce any bias in the selection of tutors to be observed and interviewed.

3.6 Instruments for Data Collection

According to Yin (2014), an effective study requires more than one source of evidence for substantiation. Other scholars posit that a complete picture of a phenomenon cannot be generated with evidence from only one source (Alan, 2008). In line with the recommendations of Creswell (2014), the study used three modes of data collection: questionnaire, semi-structured interviews, and classroom observation schedule.

3.6.1 Questionnaire

A questionnaire is a research instrument consisting of series of questions that is administered to generate information about the trends in attitude, opinions, behavior or characteristics of a group of respondents (Creswell, 2012). The researcher considered questionnaire as an appropriate instrument for the study due to the fact that it is a common and familiar data collection instrument that is widely used in educational research on tutors' knowledge. Similarly, it also serves as a means of minimizing bias and requires less time to administer (Denueme, 2016). The appropriateness of questionnaire, according to Hall (2015), is that it provides the first round of data to substantiate the interview data participants provide in order to highlight any patterns in their responses. Despite the numerous benefits of questionnaires, they also carry with them some challenges. They often have low response rates, and cannot delve deep into respondents' opinions and feelings (Alhassan, 2006). Notwithstanding the challenges associated with its usage the researcher weighed the advantages over the challenges and considered it as the best instrument for the collection of quantitative data for the study.

The questionnaire was used to collect quantitative data on tutors' curriculum knowledge, and classroom practices in implementing the curriculum to answer research questions one to three of the study. Kusi (2012) asserts that, most research participants

feel more comfortable responding to pre-determined response than items that require them to express their views and feeling. Accordingly, the items on the questionnaire were close ended and required participants to check a box to show their degree of acceptance to each item.

The questionnaire was made up of four sections, A, B, C and D. (Appendix B). Section A comprised four items on the demographic characteristics of respondents. They were meant to solicit information on the respondents' gender, number of years of teaching in college and their professional qualification. Section B comprise 16 items. They were designed to explore tutors' knowledge of the new B.Ed. curriculum. Section C comprised 24 items. They were designed to assess the quality of tutors' classroom practices. Section D also comprise four items designed to identify impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum.

In all, the questionnaire was made up of 44 Likert scale type items that run from "strongly disagree" to "strongly agree".

3.6.2 Semi structured interview

Being aware that questionnaires alone cannot provide an in-depth understanding of the phenomenon, interviews were also conducted. According to Creswell (2014) an interview is an interactive process between a researcher and a subject within which the researcher poses a question and records answers supplied by the subject. Similarly, Mitchell and Jolley (2010) also perceived interview as a survey in which a researcher orally asks participants questions. Denscombe (2010) asserts that "although there are a lot of superficial similarities between a conversation and an interview, interviews are actually something more than just a conversation" (p. 172). He further identified three

categories of interviews namely; structured interview, semi-structured interview and unstructured interview. Structured interview involves tight control over the format of questions and answers. It is more or less like a questionnaire administered face-to-face with a respondent with which the wording of questions, order of questions and range of answers are all standardized. For the semi-structured interview, the interviewer is flexible and provides room for the interviewee to speak widely on the phenomenon. Finally, unstructured interview are open and provides room for both interviewer and interviewee to deliberate at length on the topic (Denscombe, 2010).

In this study, a one-on-one semi-structured interview was used to collect qualitative data on tutors 'curriculum knowledge and their classroom practices in delivering the new 4-year B.Ed. curriculum. The interview guide was designed based on emergent issues from the national Teacher Education Curriculum Framework (NTECF) and the National Teachers' Standards (NTS) and the Pre-tertiary Teacher Development and Management (PTPDM) policies. It comprised twenty major questions constructed to obtain tutors' curriculum knowledge, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum.

The choice of Interviews was made because, it is used to collect richer information from a small number of people about attributes, behavior, preferences, feelings, attitudes, opinions and knowledge. Also, interviews are most effective for qualitative research. They help the researcher to explain, better understand, and explore research subjects' opinions, behavior, experiences, phenomenon, etc. Interview questions are usually open-ended questions so that in-depth information can be collected. Wisker (2009)

points out that, if one decides to use interviews, one has to decide on whether one will take notes (which is distracting) during, or whether one will tape (accurate but time consuming) the interview. The other alternative is to rely on one's memory to recall what has been said or to ask the respondents to write down their answers (Tambara, 2015). Despite the arguments Wisker (2009) raised, the researcher blended all the three alternatives in the cause of interviewing participants in order to collect rich and accurate data on tutors' curriculum knowledge and classroom practices in the delivery of the new 4-year B.Ed. curriculum. On exploring impediments faced by teachers in curriculum implementation, Lumadi (2014) used semi-structured interviews and questionnaires as instruments for data collection.

3.6.3 Classroom observation

The third method for data collection was classroom observations. According to Isore (2009), the most common data source of tutors' practices in real classroom settings is observation.

The observation checklist was designed to align with the research questions and the purpose of the study, which sought to the examine classroom practices, and identify barriers that prevent faithful implementation of the new 4 year B.Ed. curriculum.

Using this instrument gives the researcher the opportunity to interact with participants in their natural settings, sees things for himself, and determines the data to collect (Kawulich, 2005). Observation methods are used for other reasons. Kawulich (2005) points out that observations provide researchers with ways of checking for the nonverbal expression of feelings, determining who interacts with whom, grasping how participants communicate with one another, and checking how much time is spent on

various activities. They also increase the validity of a study, as they help researchers to gain a better understanding of the phenomenon under study. Tambara (2015) points out that observation is valid and strong when used together with other instruments, such as interviewing, document analysis, and questionnaires.

The observation check list composed of two sections A and B. Section A consisted of one item to see whether tutor demonstrates excellent subject knowledge that is integrated with excellent pedagogical knowledge in a seamless, logical manner and linked to learning outcomes. Section B consisted of 25 items. They were designed to explore classroom practices. (Appendix C) ‘

Classroom observations provided insight into which aspects of the curriculum were (or were not) being implemented with fidelity. Sibuyi (2012) used observation checklist in a study of teachers’ pedagogical content knowledge in teaching of quadratic functions in mathematics. Similarly, Kilic (2009) used observation checklist when he studied the components of pedagogical content knowledge that pre-service teachers gain through a method course offered at a certain university. Interview and questionnaire were also used by Jóhannsdóttir (2013) and Tambara (2015) in their respective studies of teachers’ pedagogical content knowledge in the teaching of mathematical concepts. To assess the quality of classroom practices, Sofianidis and Kallery (2021) used classroom observation as well as questionnaires to record teachers’ practices.

3.7 Pilot Test

Pilot test is a small-scale version or a preliminary study conducted to help researchers make informed decisions about a major project (Leon, Davis, & Kraemer, 2011; Crossman, 2017). Awanta and Asiedu-Addo (2008) conceived pilot testing of

instruments as a window which enables researchers to modify items that are difficult to understand, reduce ambiguities and incorporate new categories of responses identified as relevant to the study.

Accordingly, the researcher piloted the test among a group of seven science tutors of Tamale CoE. The sample size for the pilot study represented 10% of the actual sample for the study. The researcher chose science tutors at Tamale CoE because they have similar characteristics as the sample such as academic qualification and years of teaching in the college. The pilot-test provided room to enhance the validity and reliability of both the questionnaire and the interview guide.

3.8 Validity

Validity is the extent to which a measure adequately represents the underlying construct that it is supposed to measure. The term construct refers to the skill, knowledge, attribute or attitude that the researcher is investigating. In principle, validity answers the question, "Does your measurement process, assessment, or project actually measure what you intend it to measure?" (Handley, 2002). Internal, external and content validities were addressed in this study.

Winterstein and Kimberlin (2008) posits that, because there is no statistical instrument that determines whether a research instrument sufficiently covers the content it purports to measure, content validity usually depends on the judgment of experts in the field. To this effect the researcheer requested two experts in the field of science education to scrutinize and assess the instruments for their relevance. This was done to ascertain their opinions as to whether the instruments had addressed all relevant issues on the phenomenon under study (Eiselen & Uys, 2005).

3.9 Reliability

According to Drost (2011), reliability is the extent to which measurements are repeatable when different people perform the measurement on different occasion, under different conditions, supposedly with alternative instruments which measure the construct or skill. It is basically the repeatability or replicability of research findings. Similarly, Cohen, Manion, and Morrison (2007) perceive reliability to be a synonym for consistency and replicability over time, over instruments and over a group of subjects.

According to Trochim, (2006), reliability can be estimated in one of the following four ways; interrater reliability, split-half reliability, test-retest reliability, and internal consistency.

Alpha coefficient was used to test the internal reliability and consistency of the questionnaire. According to Creswell (2014) and George, Hall, and Stiegelbauer (2013), the alpha supplies a coefficient used for the estimation of score consistency in the questionnaire. Table 1 presents the alpha coefficient for the questionnaire.

In this study the internal consistency of the questionnaire was determined by means of Cronbach alpha statistics with the help of SPSS package Version 20. Cronbach's alpha reliability coefficient is an important and most common means of evaluating the internal consistency of a research statistical instrument (Tavakol & Dennik, 2011). Table 1 shows the Cronbach alpha value of the questionnaire items in section B.

Table 1: Cronbach alpha Reliability Coefficient of Questionnaire

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of items
0.915	0.816	16

Source: Computed result using SPSS, July 2022

According to Kumekpor (2002) an alpha value of 0.70 and above indicates a reasonable internal consistency and that alpha value between 0.60 and 0.69 indicate minimal adequate reliability. The instruments in this regard produced a reliability Alpha value of 0.91 (91%) and as such the survey questionnaire were considered reasonably reliable for collecting the data.

3.10 Trustworthiness of semi-Structured Interview

Trustworthiness is the reliability of qualitative instrument. It is also used to evaluate the worth of qualitative research (Devault, 2018). To establish the trustworthiness of a qualitative instrument researchers have to ensure: credibility, transferability, dependability and confirmability of qualitative findings (Lincoln & Guba, 1985). In this study the researcher adopted Lincoln and Guba's model of establishing trustworthiness as a means of evaluating the worth of the instrument. The model was adopted due to the fact that it is developed conceptually and is widely used by qualitative researchers.

3.10.1 Credibility

Credibility is defined as the confidence that can be placed in the truth of a research finding (Anney, 2014). To ensure credibility of the present study, the researcher spent sufficient time in the various sampled colleges and with participants to gain insight in to the context of the study, presented collected data to participants to verify (member checking), and finally exposed the collected data to colleagues for constructive

criticism (peer debriefing). Feedback from sample was used to improve upon the quality of the findings.

3.10.2 Transferability

Transferability is explained to mean the degree to which qualitative results can be applied with participants in other context (Bitsch, 2005). To facilitate transferability of the results, the researcher provided detailed description of the enquiry and participants were selected purposively.

3.10.3 Dependability

According to Bitsch (2005) dependability is described as "the stability of findings over time" (p. 86). To ensure the study dependability, the researcher submitted it to a lecturer in the Department of Science Education for external audit who was not involved in the study to examine the process and product of the study. The feedback generated from the external audit was used to improve upon the trustworthiness of the study.

3.10.4 Confirmability

Confirmability is a prove that data and interpretation of findings are not fabrications from the researchers imaginations, but are truly derived from participants (Anney, 2014). To establish the confirmability of the study qualitative findings, the researcher highlighted every step of data analysis that was made in order to provide justification for the decision made (audit trial).

3.11 Data Collection Procedure

A letter of introduction (Appendix D1) obtained from the Department of Science Education in the University of Education, Winneba, (UEW) together with another written by the researcher (Appendix D2), were used to seek permission from Principals

of the selected CoE to collect data. The letter spelt out the objective and purpose of the study. It also explained the need for participants to give their consent to and co-operate with the researcher. The approval letters from the Principals of CoE (Appendix E) was used to seek the consent of college tutors for the administration of the research instruments.

3.11.1 Administration of the questionnaire

Prior to administering of the questionnaire, each principal of the sampled colleges convened a staff meeting for the researcher to explain his study and to acquaint himself with the college environment as well as establish rapport with the tutors. At the meeting, the researcher gave a brief introduction of himself, an overview of the study, and solicited tutors consent to participate in the study. He also addressed concerns teachers had about the study. He assured participants of the confidentiality of their responses in his presentation. Subsequently, the questionnaires were personally administered to consented tutors by the researcher. This gave the researcher the opportunity to clarify any uncertainty that arose from the questionnaire. It also enhanced a faster completion of the items and aided 100% retention.

3.11.2 Classroom observation

In this study, classroom observations were conducted to gain more insight into tutors' classroom practices in implementation of the new 4-year B.Ed. curriculum. The researcher purposefully selected eight tutors, one from each of the eight sampled colleges for the observation in order to assess tutors' classroom practices in the implementation of the new 4-year B.Ed. curriculum.

The researcher visited each of the tutors who agreed to be observed on an agreed date in an environment of mutual trust. The researcher adhered to Chesterfield's (1997) good observation practices by being sensitive, considerate and helpful when the need be; by recognizing the tutor as the expert in respect of what was taking place in the class by interacting with the tutor and learners and by being less of an evaluator or judge, and more of a listener and confidant. Prior to each classroom observation, he exchanged pleasantries with the tutor and the class and requested for a seat at the back of the classroom. As a non-participant observer, I made use of an observation checklist to keep track and focused on the aspects the researcher intended to observe. A tick (√) was used to denote the presence of a practice and a cross (×) for absence. Data collected were analysed and used to answer the research question two.

3.11.3 Conducting the interview

The researcher purposefully selected eight tutors, one from each of the eight sampled colleges for the interviews order to gain an in-depth understanding of their knowledge of the new 4 year B.Ed. curriculum, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum

Data collected from interview and observation were integrated and used to complement data generated from questionnaire and used to answer the research questions. The interview was specifically conducted to validate respondents' opinions on research question one to three of the study. The venue and time of the interviews were agreed upon by the participants and the researcher. The interview questions covered tutors' knowledge of the new 4-year B.Ed. curriculum, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum.

The interviews were conducted in an atmosphere of mutual trust where the researcher assured participants of their consent and confidentiality of their responses. The researcher spent a maximum of 30 minutes with each respondent. With the consent of the tutors, each interview was taped and later transcribed for analysis.

3.12 Data Analysis

Marshall and Rossman (2014) explained data analysis to mean a process of bringing order, structure and meaning to collected data. Similarly, Burns and Grove (2003) described the construct to mean the systematic organization and synthesis of research data, and the testing of research questions. In mixed method research the analysis of data involves the analysis of both quantitative and qualitative data (Creswell & Plano Clark, 2007). Data analysis in mixed method research is dependent on the design of the study (West, 2012). The study employed sequential explanatory mixed method design and analyzed the quantitative and qualitative data separately and later integrated them.

3.12.1 Quantitative data analysis

Quantitative data from the questionnaire was analyzed using descriptive statistics with the help of SPSS version 20. The items of sections B and C of the questionnaire had their scales of measurement reduced from four Liker-type scale to two Likert-type scale for easy analysis of the data. The researcher combined "Strongly Disagree" and "Disagree" to Disagree and "Strongly Agree" and "Agree" to Agree. Quantitative data was organized, summarized, and transformed into frequencies, and percentages which were used to answer the respective research questions. Item-by-item analysis of data was conducted. The percentage of the total sample responding to each question was determined.

3.12.2 Qualitative data analysis

Qualitative data from the interview guide and observation checklist were categorized according to themes (Ormston, Spencer, Barnard &Snape, 2013) that reflected the research questions and the purpose of the study. Specifically data from the checklist were organized into frequency tables and percentage frequencies. Data from the semi-structured interviews was also analysed by 'coding' words, patterns, or recurring responses, separating them into labels or categories for more robust analysis. Data were closely examined to identify common topics, ideas, or patterns. This helped to draw preliminary conclusions about the participants' views, knowledge, practices and so on. The data collected were identified by their 'codes' and grouped. The codes gave a condensed overview of the main points and patterns identified in the data. The 'codes' were then organised into themes.

3.13 Ethical Consideration

Permission was sought from the Principals of eight Northern CoEs to enable the researcher conduct the study in the colleges through an introductory letter from the Science Department of University of Education, Winneba (UEW). According to Tambara (2015), the human rights of respondents in social research need to be respected at all times. Accordingly, tutors who participated in the study were made aware of what was required of them in relation to the study. Also, each individual tutor was made aware of their right of choice to participate in the study. Moreover, participating tutors were given assurance that their responses would be anonymous, and that the information provided by them would be treated as confidential at all times. The ethical considerations were adhered to not only to protect the human rights and welfare of

participants, but also to minimize the risk of physical and mental discomfort, harm and danger from the research procedure (Tambara, 2015).

3.14 Chapter Summary

The study was conducted on curriculum knowledge, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. Curriculum in eight out of the ten public Northern CoE. This chapter brings to light the research methodology and design employed by the researcher coupled with justifications for their usage. Similarly, the chapter also describes the sample and sampling technique used in drawing participants for the study, the research instruments and the process of establishing their validity and reliability and ends up with the ethical consideration that respects the rights of the participants.

CHAPTER FOUR

RESULTS

4.0 Overview

This study explored CoE tutors' curriculum knowledge, classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. Both quantitative and qualitative data were collected using questionnaire, interview and observation checklist. Quantitative data was analyzed using SPSS version 20 while qualitative data was analyzed thematically to reflect the research questions. This chapter presents analyzed results. All results presentations are themes of the research questions, namely tutors' curriculum knowledge, their classroom practices and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. The results are presented and interpreted according to the research questions.

Section A of the questionnaire asked participants to provide their demographic information (See Appendix A). Participants' responses to the items were aggregated using frequency count and converted into percentages and presented in Table 2.

Table 2 shows that, all the participants (60, 100%) are master degree holders. This implies that all the respondents have the requisite qualification to deliver the new 4 year B.Ed. at the CoE. The gender distribution revealed that 51 (85%) of the respondents are males and 9 (15%) are females. This implies that, very few females are into the science education at the tertiary level in Ghana. Opportunities should be created to attract females into the field of science to serve as role models for younger generations. Almost half (28, 47%) had taught between four to six years, a quarter (15, 25%) taught between two to four years and few (9, 15%) had taught six years and above can be said to be the most experienced in the practice. Again few tutors (8, 13%) had taught between one and two years, these can be said to be the least inexperienced in the practice.

Table 2: Demographic Characteristics of Respondents

Variable	Characteristics	Frequency	Percentage (%)
Gender	Male	51	85
	Female	9	15
	Total	**60**	**100**
Period of Teaching in COE	1-2 years	8	13
	2-4 years	15	25
	4-6 years	28	47
	6+	9	15
	Total	**60**	**100**
Highest professional qualification	PhD	0	0
	Masters	60	100
	Bachelors	0	0
	Total	**60**	**100**

Source: Field survey, July 2022

4.1 Research Question One - What is the Extent of Tutors Perceived Curriculum Knowledge in the Implementation of the New 4 – year B.Ed. Curriculum?

The first research question sought to find out tutors' knowledge base on the new 4 year B.Ed. curriculum. Items one to sixteen in section 'B' of the questionnaire were designed to examine tutors' knowledge on the new 4-year B.Ed. curriculum (Appendix A). Tutors were to demonstrate their understanding of the new 4 year B.Ed. curriculum by indicating the extent to which they agree or disagree with representations of basic facts of the 4-year B.Ed. curriculum on a four-point Likert type of scale. For easy analysis of data, the researcher reduced the four point Likert scale to two scales. "Strongly Disagree" and "Disagree" to "Disagree" and "Strongly Agree" and "Agree" to "Agree". The responses of the participants were subjected to descriptive analysis and the results presented in Table 3.

Table 3 indicate generally that, majority of the respondents agree with most of the items (one to 16) in the questionnaire. All the respondents (60, 100%), indicated their agreement with items one to five and 10 to 12.

Almost half of the respondents (24, 40%) disagreed with item 6 while a little over half of the respondents (36, 60%) indicated their agreement with it. On the contrary, all the respondents (100%) disagreed with item seven. This suggests that, tutors have limited knowledge in the use of project-based instructional learning and assessment strategies to meet the diverse needs and learning styles of their learners.

Furthermore, a little less than half of the respondents (27, 45%) indicated their disagreement with item 8 while 33 (55%) agreed with it. Additionally, a little over a quarter of the respondents (18, 30%) indicated their disagreement with item 9 while a majority (42, 70%) agreed with it. All respondents agree with items 10 to 12. A significant number of respondents (39, 65%) indicated their disagreement with item 13

while only 21 (35%) agreed with it. This suggests that tutors have a limited knowledge in the use of concept mapping in teaching, learning and assessment to meet the diverse needs and learning styles of learners of their learners. A few respondents (11, 18%) disagreed with item 14 while a significant number (49, 82%) agreed with it. Lastly, all the respondents disagree with statements 15 and 16. The percentage of respondents that indicated their agreement with all the statements ranged from 35% to 100% and those who indicated their disagreement with the statements ranged from 0% to 100%. This implies that tutors have limited knowledge in the use of 'think - pair - share' and pyramid discussion in teaching, learning and assessment to meet the diverse needs and learning styles of their learners.

The quantitative results suggests tutors have significant knowledge on the new 4-year B.Ed. curriculum about the use of strategies such as 'talk for learning', 'think - pair - share' and pyramid discussion in teaching, learning and assessment to meet the diverse needs and learning styles of their learners.

Table 3: Percentage Frequency Distribution of Tutors' Knowledge of B.Ed. Curriculum

S/N	Statements	D		A	
		f	%	*f*	%
1	I have an appreciable level of knowledge of the practices, as set out in the National Teachers' Standards to inspire and challenge student teachers to achieve their potential.	0	0	60	100
2	I have a secure subject matter knowledge to teach the content of the new B.Ed. curriculum.	0	0	60	100
3	I have an appreciable knowledge of integrating the curriculum, subject and pedagogical knowledge.	0	0	60	100
4	I have a good understanding of my learners and their developmental needs.	0	0	60	100
5	I have a good understanding of my learners' socio-cultural and political backgrounds.	0	0	60	100
6	I have an appreciable knowledge in technology and information literacy.	24	40	36	60
7	I have an appreciable knowledge in the use of project-based instructional, learning and assessment strategies to meet the diverse needs and learning styles of learners	60	100	0	0
8	I have an appreciable knowledge in the use of enquiry-based instructional, learning and assessment strategies to meet the diverse needs and learning styles of learners	27	45	33	55
9	I have an appreciable knowledge in the use of problem-based instructional, learning and assessment strategies, to meet the diverse needs and learning styles of learners	18	30	42	70
10	I have an appreciable knowledge in the use of mixed group discussions in teaching, learning and assessment to meet the diverse needs and learning styles of learners	0	0	60	100
11	I have an appreciable knowledge in the use of demonstrations in teaching, learning and assessment to meet the diverse needs and learning styles of learners	0	0	60	100
12	I have an appreciable knowledge in the use of role plays in teaching, learning and assessment to meet the diverse needs and learning styles of learners	0	0	60	100
13	I have an appreciable knowledge in the use of concept mapping in teaching, learning and assessment to meet the diverse needs and learning styles of learners	39	65	21	35
14	I have an appreciable knowledge in the use of 'talk for learning' in teaching, learning and assessment to meet the diverse needs and learning styles of learners	11	18	49	82
15	I have an appreciable knowledge in the use of 'think - pair - share' in teaching, learning and assessment to meet the diverse needs and learning styles of learners	60	100	0	0
16	I have an appreciable knowledge in the use of pyramid discussion in teaching, learning and assessment to meet the diverse needs and learning styles of learners	60	100	0	0

Source: Field survey, July 2022

N=60 (100%),* Key: SD = D = Disagree, A = Agree, ***f* = Frequency, (%) = Percentage.

Participants' responses to the Likert scale items could be mere guesses that may not necessarily reflect their knowledge. To gain more insight into tutors' knowledge of the new 4 year B.Ed. curriculum, eight participants were interviewed using the interview guide (Appendix B).

The interviews were taped, transcribed and themes generated from the transcription. The themes revealed interviewees have significant knowledge on the new 4-year B.Ed. curriculum when items designed to ascertain their knowledge on B.Ed. curriculum were asked. For question one (Appendix B) six out of eight interviewees' admitted that they are adequately resourced with the requisite knowledge to deliver the new 4-year B.Ed. curriculum, whiles the remaining two were indifferent about the knowledge of the curriculum they possess to be able to deliver the B.Ed. curriculum. Similarly, six of the interviewees were able to demonstrate significant knowledge on the core and transferable skills as well as the crosscutting issues spelt out in the 4 year B.Ed. curriculum. They were able to identify and mention examples of the core and transferable skills and the crosscutting issues when questions 2, 3 and 4, designed to ascertain their knowledge on the core and transferable skills and crosscutting issues were asked. (Appendix B). The remaining two were unable to mention or demonstrate how they supported student teachers in understanding and to develop the core and transferable skills and the crosscutting issues.

When respondents were asked; which cross cutting issues they supported student teachers to understand? A tutor's response was:

> *So for the crosscutting issues, core and transferable skills I think some of them are critical and independent thinking, Equity and Inclusivity, Social Collaboration/Team work, Creativity,*

> *innovation, problem solving, manipulation, reflection, developing scientific process skills and Inquiry etc.*

As a follow up question to tutors who mentioned the core and transferable skills and crosscutting issues, were asked as how they supported student teachers to understand and develop core and transferable skills and crosscutting issues, another tutor's response was;

> *This Idea of inclusivity and gender where……. I always ensure that in my classroom practices I give equal opportunities for both males and females to participate. Also when I am putting them into groups, I make sure that they are mixed in the group. Another thing I do is that I encourage them to use their mobile phones to search for information on the internet. So I do these a lot.*

Another tutor articulated that;

> *So [eeeeerh] actually with this one, the cross cutting issues, yes as time goes on everybody improves on his or her ways of doing things so at the moment I use ICT tools a lot in my teaching. I also encourage students to use ICT tools in their studies. I also create opportunities for students to use ICT tools to do their assignments. I also create opportunities for students to understand and develop the core and transferrable skills as well as the cross cutting issues for instance when grouping students to assign them task I ensure there is diversity in the groups.*

Similarly, another tutor explained that;

> *[Eeermm] I think action research, I do, I also do for the cross cutting issues in the course of my lessons I do those things. ICT integration I do. In my teaching I try to form groups that are devoid homogeneity, when I have to form groups I do it ensuring that, group members have different abilities from different backgrounds are all brought to form a group. I much as possible, I try to let my students understand the cross cutting issues. I*

create opportunities for my students to develop the core and transferrable skills.

4.2 Research Question Two - What Classroom Practices do Tutors Use in the Implementation of the new 4-Year B. Ed. Curriculum?

To answer research question two on classroom practices tutors used, four Likert type of scale items on classroom practices was presented to participants to respond to. For easy analysis of data, the researcher reduced the four point Likert scale to two scales that converts "Strongly Disagree" and "Disagree" to "Disagree" and "Strongly Agree" and "Agree" to "Agree". Tutors' responses to the classroom practices items were subjected to descriptive analyses and the results presented in Table 4.

The frequency of samples' responses ranged from 13 (22%) to 60 (100%). All respondents (60, 100%) indicated their agreement with items 17, 18, and 20 to 39. Most of the respondents (47, 78%) indicated their agreement with item 19.

Majority of respondents (43, 72%) indicated their agreement with item 39 whiles few (13, 28%) disagreed with it.

Table 4 Percentage Frequency Distribution of Tutors' Classroom Practices

S/N	Statements	D		A	
		f	%	*f*	%
17	I promote critical thinking, problem solving, and communication through the learning environment.	0	0	60	100
18	I view learners as active constructors of knowledge and therefore create learning contexts that are learner- centred and encourage learners to collaborate with others;	0	0	60	100
19	I plan for and use defferentiated interactive instructional strategies and resources (e.g., videos, computer simulations, games/plays rhymes songs etc.) to improve the learning outcomes of all learners irrespective of gender, disabilities, or geographical location. In other words,	13	22	47	78
20	In my lesson planning I include consideration of student teachers' prior learning i.e., lesson built upon learning gained in previous lessons or other experiences	0	0	60	100
21	I do communicate learning outcomes clearly to my student teachers.	0	0	60	100
22	In my lesson delivery I ensure that learning indicators are coherent with teaching and learning activities.	0	0	60	100
23	In my lesson delivery I ensure that learning indicators are coherent with assessments.	0	0	60	100
24	In my lesson delivery I ensure that all student teachers have the required opportunity to achieve the learning outcomes of your lessons	0	0	60	100
25	In my teaching I address conceptual barriers in my classroom	0	0	60	100
26	In my teaching I address social barriers in my classroom	0	0	60	100
27	In my teaching I address cultural barriers in my classroom	0	0	60	100
28	In my teaching I address linguistic barriers in my classroom	0	0	60	100
29	In my teaching I address gender barriers in my classroom	0	0	60	100
30	In my teaching I model techniques appropriate to teaching content in the basic school classroom	0	0	60	100
31	In my teaching I identify and address core and transferable skills, inclusivity, equity and diversity.	0	0	60	100
32	In my teaching I set up systems that encourage collaborative learning.	0	0	60	100
33	I use terms related to higher order thinking skills in the classroom.	0	0	60	100
34	I encourage my students to ask each other questions.	0	0	60	100
35	I encourage my students to do smaller group discussion of topic under consideration	0	0	60	100
36	I guide my students to relate what they have learned in different lessons or situations.	0	0	60	100
37	I utilize my students 'opinions to enrich the lessons.	0	0	60	100
38	I provide my students learning experience that will develop higher order thinking skills.	0	0	60	100
39	I integrate technology, including open education resources in my teaching.	0	0	60	100

Source: Field survey, July 2022

N=60 (100%),* Key: SD = D = Disagree, A = Agree, ***f* = Frequency, (%) = Percentage

Participants' responses to the Likert scale items could be mere guesses and may not necessarily reflect their practice, for this reason a checklist was used to assess the quality of the classrooms with respect to tutors' classroom practices (Appendix A). A check (√) on the checklist denotes the presence of an observed practice and a cross (×) signifies the absence of a practice. The observed practices and not observed practices were organised into frequency counts and presented in Table 5. The frequency counts for the observed (present) and not observed (absent during the classroom observation) were converted into percentages and presented in table 6.

From Table 6, all participants (8, 100%) were observed to display item 17. seven out of eight participants (87.5) were also observed to have displayed item 24 while only one participant (12.5%) failed to display it. Six out of eight participants (75%) also used items 18, 20, 22, 25, 27, 29, 30, 34, 36, 37 and 39 while only two (25%) did not. Also, five out the eight participants (62.5) used items 19, 23, 32, 33 and 35 while three (37.5%) did not. Four out of the eight participants ((50%) were observed to also display item 38 while the remaining four (50%) did not. Three out of eight participants (37.5%) used items 21 and 26 while majority (5, 62.5%) did not. It can be suggested from Table 6 that generally tutors are conversant with the instructional strategies intended in the new 4-year B.Ed. curriculum. Their classroom practices concurred with the tenets of the new 4-year B.Ed. curriculum. This has corroborated the finding from the quantitative data that tutors were conversant with classroom practices intended in the new 4-year B.Ed. curriculum.

Table 5: Frequency Counts of Tutors' Classroom Practices during Instruction

S/N	Item / Tutor	T1	T2	T3	T4	T5	T6	T7	T8	Total (√)	Total (×)
17	Reviews learners' relevant previous Knowledge (RPK) and links it to new topic i.e. lesson build upon learning gained in previous lessons or other experiences	√	√	√	√	√	√	√	√	8	0
18	Shares learning outcomes with student teachers	√	√	×	√	√	√	√	×	6	2
19	Guides students to relate what they have learned in different lessons or situations.	√	√	×	×	√	√	×	√	5	3
20	Engages learners in varied teaching/ learning activities to present concepts logically	√	√	√	√	√	×	√	×	6	2
21	Makes connections between different areas of the curriculum that are relevant to the topic	×	×	√	×	√	×	√	×	3	5
22	Uses varied TLMs including ICT in lesson	√	√	√	√	×	√	√	×	6	2
23	Cites examples / concepts in real life situations	×	×	×	√	√	√	√	√	5	3
24	Handles learner contributions in a professional manner	√	√	√	√	×	√	√	√	7	1
25	Encourage students to do smaller group discussion of topic under consideration	×	√	×	√	√	√	√	√	6	2
26	Manages seating arrangements	×	√	×	√	×	×	√	×	3	5
27	Utilize students 'opinions to enrich the lesson	√	√	√	×	√	√	√	×	6	2
28	Handles learners' behaviour appropriately	√	√	√	√	√	√	√	√	8	0
29	Classroom activities are learner-centred	√	√	√	√	×	×	√	√	6	2
30	Tutor facilitates the lesson	×	√	√	√	√	√	√	×	6	2
31	Has positive relationship with student teachers and engages learners in active participation.	√	√	√	√	√	√	√	√	8	0
32	Potential barriers to student teacher learning are identified and addressed in the lessons so that learning is equitable and inclusive.	√	√	×	√	×	√	√	×	5	3

33	Cross cutting issues, core and transferable skills integrated into the lesson? i.e., problem-solving, critical thinking, communication etc.	√	√	×	√	×	√	√	×	5	3
34	Encourages collaborative learning among students i.e., learner-learner interaction to ensure students teachers get immediate feedback from their peers.	√	√	√	×	√	√	√	×	6	2
35	Summarise key points and evaluates lesson	×	×	√	√	√	×	×	√	5	3
36	Uses variety of assessment modes and gives appropriate feedback	×	×	√	√	√	√	√	√	6	2
37	Assessment of student teacher's learning include assessment of, for and as learning?	√	√	√	√	√	√	√		6	2
38	Assessment go beyond recall of knowledge to higher order learning and includes, for example: presentations, simulations of laboratory work and classroom activities, projects, tests and examinations?	×	×	√	×	√	√	×	√	4	4
39	Models techniques appropriate to teaching content in the basic school classroom	√	√	√	√			√	√	6	2
40	Teaching / learning activities are coherent with learning indicators and assessment.	√	√	√	√	√	√	√	√	8	0

Source: Field survey, July 2022

Key: T = Teacher, √ = Presence of a practice, and × = absence of a practice

Table 6: Percentage Frequency Distribution of Tutors Classroom Practices during Instruction

S/N	Item	Presence of practice (√)		Absence of practice (×)	
		Frequency (*f*)	Percentage (%)	Frequency (*f*)	Percentage (%)
17	Reviews learners' relevant previous Knowledge (RPK) and links it to new topic i.e. lesson build upon learning gained in previous lessons or other experiences	8	100	0	0.00
18	Shares learning outcomes with student teachers	6	75.0	2	25.0
19	Guides students to relate what they have learned in different lessons or situations.	5	62.5	3	37.5
20	Engages learners in varied teaching/ learning activities to present concepts logically	6	75.0	2	25.0
21	Makes connections between different areas of the curriculum that are relevant to the topic	3	37.5	5	62.5
22	Uses varied TLMs including ICT in lesson	6	75.0	2	25.0
23	Cites examples / concepts in real life situations	5	62.5	3	37.5
24	Handles learner contributions in a professional manner	7	87.5	1	12.5
25	Encourage students to do smaller group discussion of topic under consideration	6	75.0	2	25.0
26	Manages seating arrangements	3	37.5	5	62.5
27	Utilize students 'opinions to enrich the lesson	6	75.0	2	25.0
28	Handles learners' behaviour appropriately	8	100.0	0	0.00
29	Classroom activities are learner-centred	6	75.0	2	25.0
30	Tutor facilitates the lesson	6	75.0	2	25.0
31	Has positive relationship with student teachers and engages learners in active participation.	8	100.0	0	0.00
32	Potential barriers to student teacher learning are identified and addressed in the lessons so that learning is equitable and inclusive.	5	62.5	3	37.5
33	Cross cutting issues, core and transferable skills integrated into	5	62.5	3	37.5

	the lesson? i.e., problem-solving, critical thinking, communication etc.				
34	Encourages collaborative learning among students i.e., learner-learner interaction to ensure students teachers get immediate feedback from their peers.	6	75.0	2	25.0
35	Summarise key points and evaluates lesson	5	62.5	3	37.5
36	Uses variety of assessment modes and gives appropriate feedback	6	75.0	2	25.0
37	Assessment of student teacher's learning include assessment of, for and as learning?	6	75.0	2	25.0
38	Assessment go beyond recall of knowledge to higher order learning and includes, for example: presentations, simulations of laboratory work and classroom activities, projects, tests and examinations?	4	50.0	4	50.0
39	Models techniques appropriate to teaching content in the basic school classroom	6	75.0	2	25.0
40	Teaching / learning activities are coherent with learning indicators and assessment.	8	100.0	0	0.00

Source: Field survey, July 2022

4.3 Research Question Three - Which impediments affect tutors in the Implementation of the new 4-year B.Ed. Curriculum?

The third research question sought to explore the impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. To explore Impediments Tutors Face in the Implementation of the new 4-Year B.Ed. Curriculum, a questionnaire of a four point Likert type scale was used for participants to indicate their level of agreement (Appendix A). For easy analysis of data, the researcher reduced the four point Likert scale to two scales converting "Strongly Disagree" and "Disagree" to "Disagree" and

"Strongly Agree" and "Agree" to "Agree". The responses of participants were subjected to descriptive analysis and the results presented in Table 7

The results from Table 7 shows that, all respondents (60, 100%) indicated their disagreement with statements 41 and 42 which sought to find out whether tutors faced subject matter and pedagogical knowledge challenges during instruction. This implies that they were all knowledgeable in subject matter and have pedagogical knowledge to successfully implement the new 4 year B.Ed. curriculum. On the contrary, all respondents (60, 100%) indicated that they found challenges with items 43 and 44 on infrastructure (i.e. classroom space and furniture) challenges and impediments in obtaining teaching and learning resources from the college as they implemented the B.Ed. programme.

Participants' responses to items could be mere guesses and may not necessarily reflect the reality on the ground in terms of impediments that affect them in the implementation of the new 4-year B.Ed. curriculum. For this reason eight of the tutors were interviewed to ascertain the veracity of their responses to the items.

The interviews with tutors established a number of factors that were impeding the effective implementation of the new 4-year B.Ed. curriculum. Tutors' responses are organized under the following themes.

Table: 7 Percentage Distribution of Tutors Responses on Impediments affecting their Implementation of the new 4-Year B.Ed. Curriculum

S/N		D		A	
		f	%	*f*	%
41	I face subject matter challenges in the delivery of the B.Ed. programme.	60	100	0	0
42	I face pedagogical content challenges in the delivery of the B.Ed. programme.	60	100	0	0
43	I face infrastructural (i.e. classroom space and furniture) challenges in the delivery of the B.Ed. programme.	0	0	60	100
44	I face impediments in securing funds to procure materials for teaching and learning.	0	0	60	100

Source: Field survey, July 2022
N=60 (100%),* Key: SD = D = Disagree, A = Agree, ***f* = Frequency, (%) = Percentage

4.3.1 Inadequate teaching and learning resources and facilities

Six out of eight tutors asserted that inadequate teaching and learning resources and facilities are the impediments affecting tutors in the implementation of the new 4-year B.Ed. curriculum. Teaching and learning resources and facilities such as projectors, teaching and learning materials, classroom space, and internet access are inadequate in the CoEs. Another related impediment they face is difficulty in securing funds to purchase these teaching and learning materials.

Tutor 2, articulated that;

> *Teaching and learning materials in my college are inadequate or out of-date.*
>
> And *I have difficult securing funds to purchase teaching and learning materials*
>
> *Errmm……Each time I submit request to my principal for funds to purchase teaching and learning materials, the amount is often times slashed and delayed.*

Another tutor intimated that;

> *I wish to use projector each time I have lecture with my students but they are not enough. My department has only two. I don't get to use projector because each time I want to use one, they are being used by other tutors in the department. Five projectors would have been ideal for the department.*

Five out of the eight tutors indicated that inadequate classrooms which results in overcrowded classrooms is an impediment they face.

One tutor stated that;

> *I often have to combine two groups of 50 students in one lecture due lack of classroom space. This brings about overcrowding which does not promote effective teaching and learning.*

Five tutors out of the eight tutors interviewed indicated that they don't have a reliable internet access. Most tutors also complain of frequent power cuts and fluctuations.

Another tutors has this to say;

> *Ooooh, that one is a big issue at our college. Internet stability is a big challenge, I come to office with the hope of getting a reliable network to do preparation for the next lesson only to rearlize that network work is unavailable. That can be can sometimes be frustrating to say the least particularly when you don't have bandle or data in your phone to use. Even this new curriculum requires the use varied TLMs including ICT in lesson. Even worse of it all is frequent power cuts and fluctuations.*

4.3.2 Poor conditions of service

All eight tutors asserted that, they were not happy about the current conditions of services for college tutors. The said it is not rewarding enough.

4.3.3 Timeframe and educators' workload

All eight tutors indicated that the content of the curriculum to be covered by both the students and tutors is large but instructional hours has not been extended. Tutors also asserted that the new 4-year B.Ed. curriculum has brought upon them heavy workloads as a result of increased enrolment which hither to was not the case.

CHAPTER FIVE

DISCUSSION

5.0 Overview

This study explored tutors' curriculum knowledge, classroom practices and impediments affecting their implementation of the new 4-year B.Ed. curriculum in public CoE in the Northern zone. Both quantitative and qualitative data were collected using questionnaire, interview and observation checklist. Quantitative data was organized into percentages using SPSS version 20 while qualitative data was analyzed thematically to answer the research questions. This chapter presents discussions of results. The findings were discussed under themes developed from the research questions namely, tutors' curriculum knowledge, classroom practices of tutors and impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. The results are discussed according to the research questions.

5.1 Research Question One – What is the Extent of Tutors Perceived Curriculum Knowledge in the Implementation of the New 4 – year B.Ed. Curriculum?

The first research question sought to find out tutors' curriculum knowledge on the new 4 year B.Ed. curriculum. The study found from both quantitative and qualitative results that generally, tutors have significantly high knowledge on the new 4-year B.Ed. curriculum.

Tutors were conversant with most of the teaching strategies prescribed in the new 4-year B.Ed. such as pyramid discussion, 'talk for learning', think - pair-share. This implies that tutors have adequate knowledge to deliver the new 4-year B.Ed. curriculum. They also had high level of confidence in terms of mastery of the content

of the curriculum. However, the results also suggested that few tutors had challenges with the use of concept mapping and project-based learning to meet the diverse needs and learning styles of learners of their learners.

The study is found to be in agreement with all the researchers mentioned above. This implies that, tutors are equipped with experiences, characteristics, beliefs, knowledge, and skills to deliver the curriculum.

According to Metzler and Woessmann (2010), curriculum knowledge is essential to the attainment of the aims of every educational program. They have indicated that teachers who possess high levels of curriculum knowledge impact their students' achievement positively.

Tobin (1987) also noted that the root cause for the problems in science classes may be related to teachers' knowledge about what to teach, how to teach it, how students learn and what is to be assessed. The teachers' curriculum knowledge influence their instructional practices. A teacher with adequate curriculum knowledge is able to organize science classroom instruction and assessment effectively thus contributing to students' high performance in science. Also, according to Tomasevic and Trivic (2015), knowledge of the curricula are important components of teachers' knowledge. Beyer and Davis (2012) also observed that, if the teachers have limited knowledge of the curriculum, they are unable to analyze curriculum materials, they would either make unnecessary changes or fail to make needed modifications.

Again as noted by Sahin & Suylu (2017) and Ozkan (2016), teachers' curriculum knowledge is paramount in the attainment of intended learning outcomes this implies

that a teacher who lacks curriculum knowledge would not promote effective learning in the classroom.

5.2 Research Question Two – What Classroom Practices do Tutors Use in the Implementation of the new 4 - Year B. Ed. Curriculum?

Research question two of the study sought to examine tutors' classroom instructional practices.

Despite the array of methods of teaching available for teachers. The study found from both quantitative and qualitative data that tutors' classroom practices largely concurred with the tenets of the new 4-year B.Ed. curriculum. Tutors considered learner as partners in learning. They engage students in class activities using innovative instructional strategies such as concept mapping, pyramid discussion, think – pair - share, 'talk for learning' etc in their teaching. The current science curriculum requires the Ghanaian science teacher to relinquish singular claims to authority or power in the classroom and to play the role of a coach or facilitator who owes the pupils a duty to assist the latter to achieve the curriculum goals. This implies that tutors are implementing the B.Ed. curriculum as intended by the designers.

Contrary to the findings of this study, Lewin and Stuart (2003) have observed that, the dominant pedagogical stance remains one where trainees are largely regarded as 'empty vessels,' with little knowledge or experience of teaching. Again a study conducted by Annan et al. (2021) revealed that Junior High School science teachers' preferred teaching method was teacher-centred instead of learner – centred. In a study conducted by Behar and George (1994) on teacher' use of curriculum knowledge, teacher-centered and didactic teaching were characteristic of the type of instruction.

5.3 Research Question Three - Which impediments affect tutors in the implementation of the new 4-year B.Ed. Curriculum?

The third research question sought to establish the impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. The study established a number of impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. These are discussed under the following themes.

5.3.1 Inadequate teaching and learning resources and facilities

The study found that there is inadequate teaching and learning resources and facilities in CoEs. Resources and facilities such as teaching and learning materials, projectors, and internet access are impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. Worse still, with increase in enrolment in the colleges, classrooms are overcrowded and learners are made to share whatever little stocks of material and furniture available. In such situations, tutor effectiveness is hampered and it becomes almost impossible for the tutor to render individual student attention because of large numbers of students in classes. This kind of situation in the colleges will make it very difficult for curriculum implementers to carry out their roles effectively.

Myriads of researchers have established that an important factor that influenced curriculum implementation has to do with the provision and distribution of materials that will enhance the achievement of the teaching and learning objectives. Such materials include: textbooks, instructional materials, desks etc. According to Fullan (2007) and Flores (2004), implementation of a new curriculum places additional demands and expectations on educators and schools while the support and resources allocated to them are not sufficient for their needs. They further argues that such insufficiency of resources (materials, classroom space) limits educators'

implementation of a new curriculum. According to MacPhail (2007), the implementation of a revised physical education curriculum in Scotland failed because of a lack in the provision of the required resources such as textbooks. Thai scholars Prapaisit de Segovia and Hardison (2009) and Vietnam's Cahn and Barnard (2009) also allude to inadequate resources as hindrance to the implementation of the new English curriculum. According to Penny, Ward, Read and Bines (2008), the government of Uganda failed to implement their new curriculum programme called Education Strategic Investment Plan (ESIP) of 1998 because they did not have adequate teaching and learning resources. In a review of the implementation of the Ntaoinla Curriclum Reform in China from 2001 to 2011, Hongbiao (2013) found among other things, limited supportive resources for schools and unsatisfactory professional support for teachers and questionable classroom practices with shortfall in teachers' knowledge of some methodologies. Kelly (1999), also noted that the absence of or inadequacy of teaching and learning resources can have devastating effect on the implementation of an educational programme. He added that there is limited procurement and supply of these resources in schools and that instructional materials and laboratory equipment are all in short supply or may not be available at all – no library books, no science apparatus. This study found that the situation alluded to by the researchers above is not different from what exists in the CoEs. Fullan, (2001), argued that, if obstacles to implementation were not removed, a change would suffer failure of implementation.

5.3.2 Timeframe and tutors' workload

The study also revealed that, tutors are faced with heavy workload. Tutors asserted that, the content of the curriculum is large and the timeframe within which it is to be covered is short. According to Obilo and Sangoleye (2010), excess contents added to the

curriculum to be covered by both the students and teachers without extending the instructional hours affect its implementation. He maintained that the time allotted for the implementation of these heavy academic loads is not adequate enough.

In their study of the nationwide Senior Secondary Schools (SSS) curriculum reform in four selected provinces of Guangdon, Shandong, Hainan and Ningxia in China, Lee and Yin (2011) found that the SSS curriculum reform obliged teachers to use new teaching methods in classroom teaching. This implies that tutors have to move from the comfort zone of their professional practices and embrace the uncertainties of the reform. Getting used to the new methods of teaching demanded more time to adjust, creating heavy workloads, which made the implementation of reforms too stressful and tiring for educators. In a study by Cheung and Wong (2012) it was revealed that the growing recurrent meetings and professional development training also added to the tutors' heavy workloads.

5.3.3 Poor conditions of service

The study also found that, tutors were not happy with their present conditions of service. Poor conditions of services is an impediment to curriculum implementation. When curriculum implementers have lower salaries, no housing units, they would resort to going out in search of resources to sustain their families. Some tutors may even resort to go into private commercial enterprises to supplement meagre salaries. If various education policies and programmes are to be effectively implemented, tutors ought to be adequately remunerated and motivated with incentive packages.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.0 Overview

This chapter presents summary of the research findings as well as conclusions drawn from the results and how they may affect educational practices and ends with recommendations based on the findings in chapter four.

6.1 Summary of the Study

This study explored tutors' knowledge in the new 4 year B.Ed. curriculum in the Norther zone colleges of Ghana. The objectives of the study were to: explore tutors' curriculum knowledge; to examine the classroom practices used by tutors in the delivery of the new 4 year B.Ed. curriculum in CoE in the Northern zone of Ghana; and identify impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. The following research questions guided the study:

1. What extent of perceived curriculum knowledge do tutors have for the implementation of the new 4 – year B. Ed curriculum?
2. What classroom practices are tutors employing in the implementation of the new 4-year B. Ed. curriculum?
3. Which impediments affect tutors in the implementation of the new 4-year B.Ed. curriculum?

A mixed method sequential explanatory design was employed by the researcher to address the purpose and research questions of the study. The target population for the study comprised of all science tutors in the Northern zone CoE, whereas the accessible population comprised science tutors in eight public CoE in the Northern zone. In all, 60 science tutors participated in the study. The research instruments that were used to

collect data for this study include a questionnaire survey, interview guide and observation checklist. The questionnaire survey was used to collect quantitative data while the interview guide and observation checklist were employed for the collection of qualitative data. Quantitative data from the questionnaire was analyzed using descriptive statistics (frequency, percentage) with the help of SPSS version 20, whereas the data gathered via qualitative means was analyzed thematically. Findings were presented sequentially with respect to the research questions stated.

6.2 Key Findings

The following key findings emerged from the study: The quantitative results of research question one showed that majority of tutors are generally knowledgeable on new 4 year B.Ed. curriculum. These results were consistent with that of the interview responses.

Similarly, it was revealed from the quantitative findings on research question two that majority of tutors' classroom practices generally to corresponded to the programme design as intended by the developers. The responses from the interview guide validated the quantitative finding.

For research question three, all the tutors in Coe in the Northern zone indicated that inadequate infrastructural i.e. classroom space and furniture and teaching and learning materials were the impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. Results generated from the interview guide once again validated this finding too and added that shortage of teaching and learning materials, workload of tutors, inadequate instructional time are other impediments affecting tutors in the implementation of the new 4-year B.Ed. curriculum.

6.3 Conclusion

The following conclusions were drawn from the study. Generally, the findings revealed that, tutors possessed a significant level of knowledge in the new 4 year B.Ed. curriculum and are better placed to implement the new 4 year B.Ed. curriculum successfully. This was evident when most of the tutors were able to articulate their view vividly on aspects of the new four year B.Ed. curriculum.

Similarly, tutors' classroom practices largely corresponded with the intentions of the developers new 4 year B.Ed. curriculum. This was evident from the manner in which tutors supported and justified their responses in the interviews.

Finally, the study revealed some impediments affecting tutors' implementation of the new 4-year B.Ed. curriculum. These impediments ranged from inadequate resources such as classrooms, teaching and learning resources including T/LMs, unreliable internet connectivity, insufficient instructional time, overcrowded classrooms, work overload etc.

6.4 Recommendations

Even though tutors displayed a significant level of curriculum knowledge and classroom practices, there is still room for improvement. The study made the following recommendations:

1. The government through Ministry of Education should ensure that basic necessities such as school facilities, and teaching and learning materials are provided to all colleges for effective learning and implementation of the curriculum.

2. Colleges can have institutional initiatives to supplement government efforts in supplying shortage of teaching and learning materials, hiring part time teachers and financial initiatives to sustain themselves.
3. College should engage corporate organizations and alumni association to help in supplying the shortage of college necessities.
4. College tutors should be adequately remunerated and incentivized so that they are motivated to give off their best.

6.5 Suggestions for Future Research

As noted by Lee and Yin (2011), curriculum reform obliged teachers to use new teaching methods in classroom teaching, it implies that tutors have to move from the comfort zone of their professional practices and embrace the uncertainties of the reform. Getting use to new methods of teaching demand more time to adjust, creating heavy workloads, which may make the implementation of reforms too stressful and tiring for tutors. Embracing new methods of teaching and dealing with heavy workloads requires acceptance and commitment from tutors. Tutors' commitment and acceptance of an educational reform is considered important in promoting its implementation. It is therefore recommended that a study be conducted on the attitudes of tutors towards the new 4-year B.Ed. curriculum.

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APPENDICES

APPENDIX A

Questionnaire

The questionnaire is designed to find out tutors' curriculum knowledge, classroom pedagogical practices employed in teaching and challenges they face in implementing the new 4-year B.Ed. curriculum. The information gathered via the questionnaire is used for educational research only and has no relation to the evaluation of your teaching performance in the COE. Be rest assured that your response will be classified.

It is important that you read each item carefully so that your response will reflect your opinion about the item. They are no "right" or "wrong" answers to any of the items. You are only to tick (√) a box for each item. To change your response kindly put a [×] over the selected item and tick the new item.

Section A: Demographic Information

Name of college: ……..

Gender: a) Male [ ] b) Female [ ]

How long have you been in the teaching in COE?

a) 1-2 years [ ] b) 2-4 years [ ] c) 4-6 [ ] e) 6 + years [ ]

What is your highest professional qualification?

a) PhD [ ] b).Master's Degree [ ] c).Bachelor's Degree [ ]

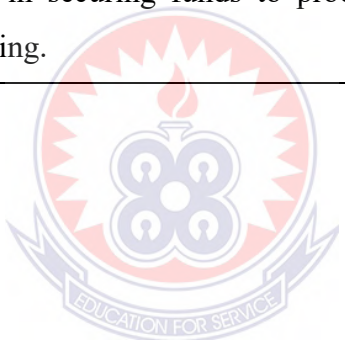
Tick a box from the boxes provided next to each item to show your degree of acceptance.

S/N	Section B: Tutors' Knowledge of B.Ed. Curriculum	1	2	3	4
1	I have an appreciable level of knowledge of the practices, as set out in the National Teachers' Standards to inspire and challenge student teachers to achieve their potential.	1	2	3	4
2	I have a secure subject matter knowledge to teach the content of the new B.Ed. curriculum.	1	2	3	4
3	I have an appreciable knowledge of integrating the curriculum, subject and pedagogical knowledge.	1	2	3	4
4	I have a good understanding of my learners and their developmental needs.	1	2	3	4
5	I have a good understanding of my learners' socio-cultural and political backgrounds.	1	2	3	4
6	I have an appreciable knowledge in technology and information literacy.	1	2	3	4
7	I have an appreciable knowledge in the use of project-based instructional, learning and assessment strategies to meet the diverse needs and learning styles of learners	1	2	3	4
8	I have an appreciable knowledge in the use of enquiry-based instructional, learning and assessment strategies to meet the diverse needs and learning styles of learners	1	2	3	4
9	I have an appreciable knowledge in the use of problem-based instructional, learning and assessment strategies, to meet the diverse needs and learning styles of learners	1	2	3	4
10	I have an appreciable knowledge in the use of mixed group discussions in teaching, learning and assessment to meet the diverse needs and learning styles of learners	1	2	3	4

11	I have an appreciable knowledge in the use of demonstrations in teaching, learning and assessment to meet the diverse needs and learning styles of learners	1	2	3	4
12	I have an appreciable knowledge in the use of role plays in teaching, learning and assessment to meet the diverse needs and learning styles of learners	1	2	3	4
13	I have an appreciable knowledge in the use of concept mapping in teaching, learning and assessment to meet the diverse needs and learning styles of learners	1	2	3	4
14	I have an appreciable knowledge in the use of 'talk for learning' in teaching, learning and assessment to meet the diverse needs and learning styles of learners	1	2	3	4
15	I have an appreciable knowledge in the use of 'think - pair - share' in teaching, learning and assessment to meet the diverse needs and learning styles of learners	1	2	3	4
16	I have an appreciable knowledge in the use of pyramid discussion in teaching, learning and assessment to meet the diverse needs and learning styles of learners	1	2	3	4
	Section C: Tutors' Classroom Pedagogical Practices	1	2	3	4
17	I promote critical thinking, problem solving, and communication through the learning environment.	1	2	3	4
18	I view learners as active constructors of knowledge and therefore create learning contexts that are learner- centred and encourage learners to collaborate with others;	1	2	3	4
19	I plan for and use defferentiated interactive instructional strategies and resources (e.g., videos, computer simulations, games/plays rhymes songs etc.) to improve the learning outcomes of all learners irrespective of gender, disabilities, or geographical location. In other words, I try to meet my students' different learning needs via different instructional strategies, methods, and techniques.	1	2	3	4

20	In my lesson planning I include consideration of student teachers' prior learning i.e., lesson built upon learning gained in previous lessons or other experiences	1	2	3	4
21	I do communicate learning outcomes clearly to my student teachers.	1	2	3	4
22	In my lesson delivery I ensure that learning indicators are coherent with teaching and learning activities.	1	2	3	4
23	In my lesson delivery I ensure that learning indicators are coherent with assessments.	1	2	3	4
24	In my lesson delivery I ensure that all student teachers have the required opportunity to achieve the learning outcomes of your lessons	1	2	3	4
25	In my teaching I address conceptual barriers in my classroom	1	2	3	4
26	In my teaching I address social barriers in my classroom	1	2	3	4
27	In my teaching I address cultural barriers in my classroom	1	2	3	4
28	In my teaching I address linguistic barriers in my classroom	1	2	3	4
29	In my teaching I address gender barriers in my classroom	1	2	3	4
30	In my teaching I model techniques appropriate to teaching content in the basic school classroom	1	2	3	4
31	In my teaching I identify and address core and transferable skills, inclusivity, equity and diversity.	1	2	3	4
32	In my teaching I set up systems that encourage collaborative learning.	1	2	3	4
33	I use terms related to higher order thinking skills in the classroom.	1	2	3	4
34	I encourage my students to ask each other questions.	1	2	3	4
35	I encourage my students to do smaller group discussion of topic under consideration	1	2	3	4
36	I guide my students to relate what they have learned in different lessons or situations.	1	2	3	4
37	I utilize my students 'opinions to enrich the lessons.	1	2	3	4

38	I provide my students learning experience that will develop higher order thinking skills.	1	2	3	4
39	I integrate technology, including open education resources in my teaching.	1	2	3	4
40	I respect my students' rights as human beings.	1	2	3	4
	Section C: B.Ed. curriculum Implementation Challenges	1	2	3	4
41	I face subject matter challenges in the delivery of the B.Ed. programme.	1	2	3	4
42	I face pedagogical content challenges in the delivery of the B.Ed. programme.	1	2	3	4
43	I face infrastructural (i.e. classroom space and furniture) challenges in the delivery of the B.Ed. programme.	1	2	3	4
44	I face challenges in securing funds to procure materials for teaching and learning.	1	2	3	4



APPENDIX B

TUTORS' INTERVIEW GUIDE

Interviews are to provide clarification and further information to support observation

Interviewee name: ……...……

Date of interview: ……

Time of interview ……

Location of interview: ……..……

Introductory script

Greetings and self-introduction.

Hello, I want to thank you for voluntary acceptance to participate in this study. I would also like to take this opportunity to prompt you that your participation is voluntary. If, at any time, you do not want to answer a question please notify me and we will skip that particular question. With your consent, I would like to audio record our interview in order to enhance accurate documentation of our conversation. If you do not agree, I will take notes throughout the conversation. Is it ok if I record our conversation? Yes_____ No_____

YES: If, at any time, you would like me to turn off the recording device, please draw my notice and I will press the button here (point to button) and it will stop recording.
No: To make sure I record accurate information; I will be taking notes throughout our conversation.

INTERVIEW QUESTIONS

Section A: General information		
S/N	**Tool**	Reflective notes
Section B: tutors' knowledge of Curriculum		
1	As science teacher, how adequately resourced are you with the requisite knowledge to implement the new 4-year B.Ed. curriculum?	
2	Which cross cutting issues do you support student teachers to understand?	
3	Which core and transferable skills do you support student teachers to develop?	
4	How do you help your students to develop core and transferable skills in your teaching?	
5	How do you set up systems that encourage collaborative learning?	
6	What are the main approaches you use when assessing student teachers?	
7	How do you decide what approaches to assessment to use?	
Section C: Classroom Practices		
8	How do you ensure that all student teachers have the required learning to be able to achieve the learning outcomes of your lessons?	
9	Where some student teachers do not have the skills, knowledge or understanding to take part in a lesson, what do you do to address this?	
10	How do you address barriers to student teacher learning in your teaching?	
Section D: Curriculum Implementation Challenges		
11	What kind of support do you receive from your college to enable you implement the new 4-year B.Ed. curriculum?	
12	What challenges do you encounter in the process of implementing the new 4-year B.Ed. curriculum?	
13	What are your suggestions for effective implementation of the new 4-year B.Ed. curriculum in colleges of education?	

APPENDIX C

TUTOR CLASSROOM OBSERVATION CHECKLIST

Raters are to *check* on the cells provided under the **Yes** and **No** headings on the table below.

Date of observation: ……..……

Time of observation: ……

Tutor: ……..……

College……....……

Subject: …… …… ……..……

Topic: ……..……

Observer …….

Title of Lesson:			
Name of College of Education and Date of Observation			
S/ N	***Section A: Curriculum Knowledge***	**Yes / present**	**No / absent**
1	Demonstrates significant subject knowledge and integrates with excellent pedagogical knowledge in a seamless, logical manner and linked to learning outcomes.		
2	Exhibits sufficient knowledge of assessment techniques?		
Section B: Classroom Practices			
3	Reviews learners' relevant previous Knowledge (RPK) and links it to new topic i.e. lesson build upon learning gained in previous lessons or other experiences		
4	Shares learning outcomes with student teachers		
5	Guides students to relate what they have learned in different lessons or situations.		
6	Engages learners in varied teaching/ learning activities to present concepts logically.		
7	Explains concepts clearly		
8	Makes connections between different areas of the curriculum that are relevant to the topic		

9	Uses varied TLMs including ICT in lesson		
10	Cites examples / concepts in real life situations		
11	Establishes a good learning environment		
12	Handles learner contributions in a professional manner		
13	Encourage students to do smaller group discussion of topic under consideration		
14	Manages seating arrangements		
15	Utilize students 'opinions to enrich the lesson		
16	Handles learners' behaviour appropriately		
17	Classroom activities are learner-centred		
18	Tutor facilitates the lesson		
19	Has positive relationship with student teachers and engages learners in active participation.		
20	Potential barriers to student teacher learning are identified and addressed in the lessons so that learning is equitable and inclusive.		
21	Cross cutting issues, core and transferable skills integrated into the lesson? i.e., problem-solving, critical thinking, communication etc.		
22	Encourages collaborative learning among students i.e., learner-learner interaction to ensure students teachers get immediate feedback from their peers.		
23	Summarise key points and evaluates lesson		
24	Uses variety of assessment modes and gives appropriate feedback		
25	Does assessment of student teacher's learning include assessment of, for and as learning?		
26	Assessment go beyond recall of knowledge to higher order learning and includes, for example: presentations, simulations of laboratory work and classroom activities, projects, tests and examinations?		
27	Models techniques appropriate to teaching content in the basic school classroom		
28	Teaching / learning activities are coherent with learning indicators and assessment.		

APPENDIX D 1

UNIVERSITY'S INTRODUCTORY LETTER

UNIVERSITY OF EDUCATION, WINNEBA
FACULTY OF SCIENCE EDUCATION
DEPARTMENT OF INTERGRATED SCIENCE EDUCATION
P. O. Box 25, Winneba, Ghana
+233 (020) 204 1077

Our ref. No.. ISED/PG.1/Vol.1/22
Your ref. No.:

24th January, 2022

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF INTRODUCTION
MR DONKURUN, AARON

We write to introduce, Mr Donkurun is a postgraduate student of the Department of Science Education, University of Education, Winneba, who is conducting a research titled:

Colleges of Education tutor's curriculum knowledge, pedagogical classroom Practices and Challenges they face in their Implementation of the new 4-year B. Ed. Curriculum

We would be very grateful if you could give him the assistance required.

Thank you.

Yours faithfully,

ALEXANDRA N. DOWUONA
PRINCIPAL ADMIN. ASSISTANT
For : HEAD OF DEPARTMENT

APPENDIX D 2

DATA COLLECTION REQUEST LETTER TO PRINCIPALS

Bagabaga College of Education
Box E/R 35, Tamale
1st March, 2022
The Principal

……
……

Dear Principal,

REQUEST FOR PERMISSION TO COLLECT DATA FOR A RESEARCH

My name is Aaron Donkurun, a post graduate student of Science Education Department of University of Education, Winneba (UEW) and also a tutor at the Science Department of Bagabaga College of Education, Tamale.

I am writing to seek your permission to collect data for my research study titled; *Colleges of Education Tutors Curriculum Knowledge, Classroom Pedagogical Practices and Challenges they face in the Implementation of the new 4-year B.Ed. Programme.*

This data will be used for research purposes only.

Attached is an introduction letter from the Science Education Department of UEW.

I look forward to your kind approval and permit to enable me collect data from the Science Department staff.

Thank you

Aaron Donkurun
0205443430

APPENDIX E 1

ST. VINCENT COLLEGE OF EDUCATION PRINCIPALS' CONSENT LETTER

St Vincent College of Education, Yendi
St Vince, Ghana. P.O. Box YD184, Yendi, N.R. GHANA
TEL: +233 0372098563 MOB: +233 0506809571
stvincentyendi@yahoo.com

MR. AARON DOKURUN
BAGABAGA COLLEGE OF EDUCATION
BOX N/R 35
TAMALE

17TH MARCH, 2022

RE – REQUEST FOR PERMISSION TO COLLECT RESEARCH DATA

In reference to your letter dated 3rd February, 2022, asking for permission to collect data for your research in St. Vincent College of Education, I am pleased to grant you permission for the purpose stated in your letter.

Please contact Head of Department- Science for further assistance.

Thank you.

MR NYAMEKYE, PROSPER
Vice Principal

VICE PRINCIPAL
ST. VINCENT COLLEGE OF EDU.
P. O. BOX YD 184
YENDI

APPENDIX E 2

ST. JOHN BOSCO'S COLLEGE OF EDUCATION PRINCIPALS' CONSENT LETTER

ST. JOHN BOSCO'S COLLEGE OF EDUCATION
Our Ref: CP/ info@sjbcoegh.com
Your Ref:.....
Telephone: 038-2122617
Post Office Box 11
Navrongo.
Upper East Region

7th April, 2022.

MR. AARON DOKURUN

BABABAGA COLLEGE OF EDUCATION

BOX E/R 35

TAMALE

Dear Sir,

RE – REQUEST FOR PERMISSION TO COLLECT RESEARCH DATA.

In reference to your Letter asking for permission to collect data for your research in St. John Bosco's College of Education, I am pleased to grant you permission for the purpose stated in your letter.

Please contact the HoD for Science for assistance.

Thank you.

Yours faithfully,

.....

Rudolf A. Nyaaba

(Vice Principal).

APPENDIX E 3

N.J. AHMADIYYA COLLEGE OF EDUCATION PRINCIPALS' CONSENT LETTER

In the Name of Allah, Most Gracious, Ever Merciful

NUSRAT JAHAN AHMADIYYA COLLEGE OF EDUCATION, WA

WE LEARN TO SERVE

Our Ref: NJCOE/WA/GF.52

Your Ref.:

10th March, 2022

Mr. Aaron Dokurun
Bagabaga College of Education
Post Office Box E/R 35
Tamale

RE-REQUEST FOR PERMISSION TO COLLECT RESEARCH DATA

In reference to your letter asking for permission to collect data for your research in N.J. Ahmadiyya College of Education, Wa. I am pleased to grant you permission for the purpose stated in your letter.

Please contact the H.O.D for Science for assistance.

Yours faithfully

Salih Saeed
Ag. Principal

Members of the Science Department have been duely informed.
Go ahead
Dr. Osman Froko

P. O. Box 71, Wa – Upper West Region | Info@nujaced.edu.gh | 0392097200 | www.nujaced.edu

APPENDIX E4

TAMALE COLLEGE OF EDUCATION PRINCIPALS' CONSENT LETTER

TAMALE COLLEGE OF EDUCATION

In case of reply, the number and date of this letter should be quoted

Our Ref: GTEC/NR/TACE/EP.142/07

Your Ref: .....

P. O. BOX 1 E/R
TAMALE
GHANA

Digital Address: *NS-025-3208*
Tel: +233 (0)37 2023687

Date: **April 28, 2022**

Mr. Aaron Donkurun
Science Department
Bagabaga College of Education
P. O. Box 35 E/R
Tamale

Dear Aaron,

RE:REQUEST FOR PERMISSION TO COLLECT DATA FOR A RESEARCH

Your letter dated **3rd February, 2022** on the above subject refers.

I wish to inform you that approval has been given for you to carry out your study in Tamale College of Education.

Please contact the Head of Science Department for Assistance.

I hope you will ensure that the research conforms to the ethical standards of the College.

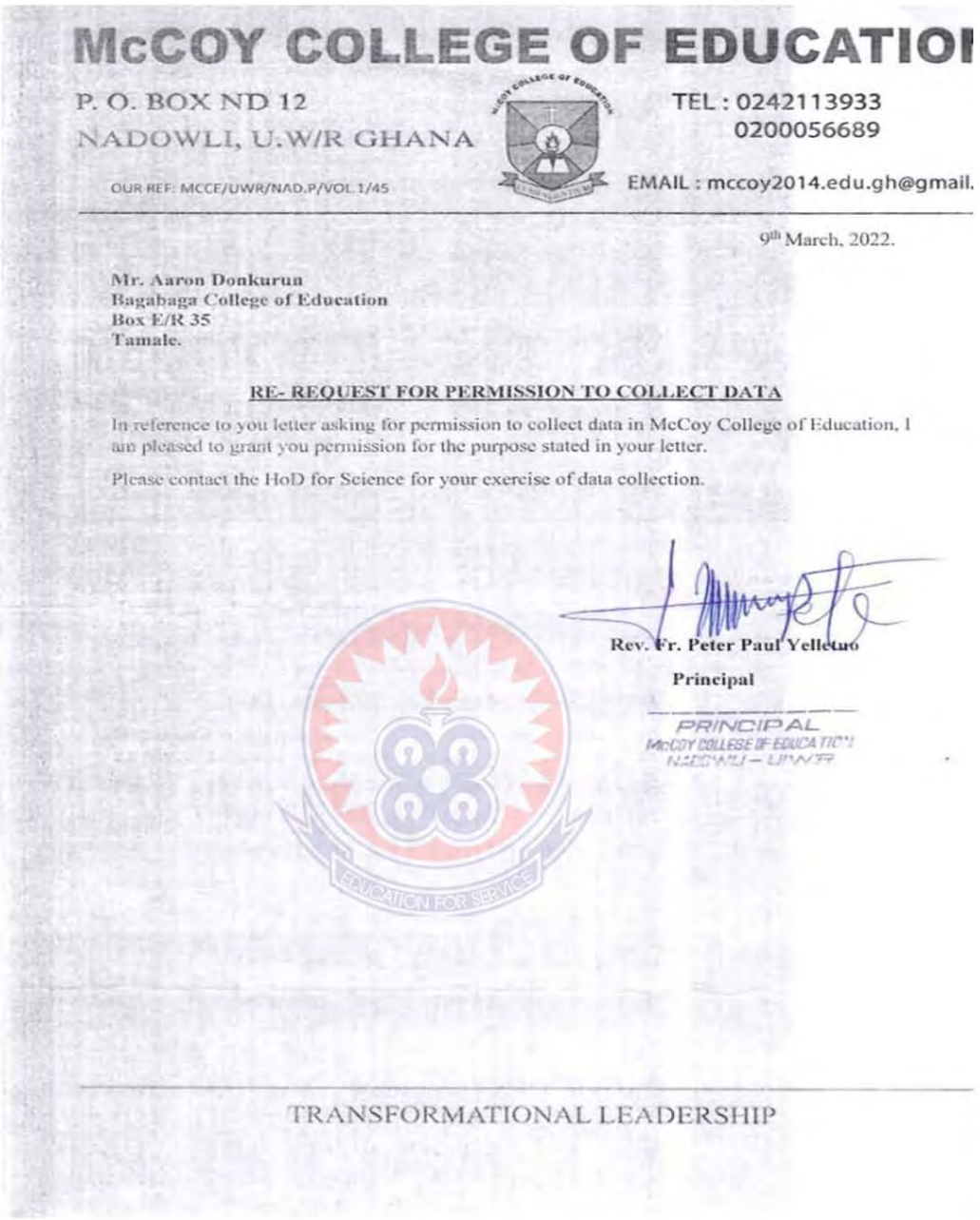
Yours faithfully,

.....
Mr. Imoro Nuhu Alhassan
Vice Principal
(For Principal)

Website: www.tace.edu.gh E-mail: tacetamale58@gmail.com/info@tace.edu.gh
MOTTO: **ORA ET LABORA**

APPENDIX E_5

MCCOY COLLEGE OF EDUCATION PRINCIPALS' CONSENT LETTER



McCOY COLLEGE OF EDUCATIOI

P. O. BOX ND 12
NADOWLI, U.W/R GHANA

TEL : 0242113933
0200056689

OUR REF: MCCE/UWR/NAD.P/VOL.1/45

EMAIL : mccoy2014.edu.gh@gmail.

9th March, 2022.

Mr. Aaron Donkurun
Bagabaga College of Education
Box E/R 35
Tamale.

RE- REQUEST FOR PERMISSION TO COLLECT DATA

In reference to you letter asking for permission to collect data in McCoy College of Education, I am pleased to grant you permission for the purpose stated in your letter.

Please contact the HoD for Science for your exercise of data collection.

Rev. Fr. Peter Paul Yelleuo
Principal

PRINCIPAL
McCOY COLLEGE OF EDUCATION
NADOWLI – U/W/R

EDUCATION FOR SERVICE

TRANSFORMATIONAL LEADERSHIP

APPENDIX E 6

E.P. COLLEGE OF EDUCATION PRINCIPALS' CONSENT LETTER

E. P. COLLEGE OF EDUCATION, BIMBILLA

Our Ref: .....
Your Ref: .....

P. O. Box 16
Bimbilla, N/R
Office Tele: 037-2093548/ 037-2095899
Principal's Residence: 037-2091750
Email: epcollege.bimbilla18@gmail.com
Date: .....

6th April, 2022

Mr. Aaron Dokurun
Bagabaga College of Education
Box E/R 35
Tamale

Dear Sir,

RE: REQUEST FOR PERMISSION TO COLLECT RESEARCH DATA

In reference to your letter asking for permission to collect data for your research in E. P. College of Education, Bimilla. I am pleased to grant you permission for the purpose stated in your letter.

Please contact the Head of Department for Science for assistance

Yours Sincerely,

Anas Seidu Salifu
Vice Principal
(For Principal)

VICE PRINCIPAL
E. P. COLLEGE OF EDUC.
BIMBILLA

APPENDIX E 7

TUMU COLLEGE OF EDUCATION PRINCIPALS' CONSENT LETTER

TUMU COLLEGE OF EDUCATION

Your Ref. N°:.....

My Ref. N°: TUCE/RCP/VOL.1/6

Post Office Box 19
Tumu – UW/Region
20th April, 2022

Mr. Aaron Dokurun
Bagabaga College of Education
Box E/R 35
Tamale

RE – REQUEST FOR PERMISSION TO COLLECT RESEARCH DATA

In reference to your letter asking for permission to collect data for your research in Tumu College of Education, I am pleased to grant you permission for the purpose stated in your letter. Please contact the HoD for Science for assistance.

Yours faithfully,
Dapilee Felicia
(Ag. Vice Principal)
For: Principal