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Are They Good Enough for Student-Centered And Constructivist Class? Investigation into Teachers' and Students' Perception towards Mathematics Textbooks for Junior High Schools in Ghana

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Abstract
This study aims to investigate into the perception both students and teachers hold towards the mathematics textbook in the public Basic Schools in Ghana and explore whether the textbooks are good enough to help teachers to implement learner-centered and constructivist approach in teaching of mathematics. Specifically, it examines both students and teachers' points of view on the problems of the current mathematics textbooks and whether the textbook had contributed to abysmal performance of the students in the basic schools as stated in the TIMSS report and the data available from West African Examination Council on Basic Education certificate Examination from 2010-2014 or whether the textbooks had not helped teachers to deliver the right kind of instruction: student-centered and constructivist teaching and learning in the classroom. A close examination of the current literature also inform us the problems existing in the math textbooks of Ghana and its negative impacts on educational reform in high schools. Previous studies on textbooks and the use of textbooks in teaching and learning mathematics raise important questions about textbooks as representations of the curriculum. One important question concerns their role as a link between curriculum and activities in classrooms. Some findings from the thesis on textbooks showed that the objectives of mathematics textbook, formulated in the national curriculum, are only partially realized. This study followed a mixed method design to gather quantitative and qualitative data through questionnaire and interviews from both students and teachers. The number of participants who took part in this survey was about 216 in total The findings suggested that the textbooks may have contributed negatively to the performance of students in mathematics and thus our textbooks need to be reexamined. More specifically, most teachers and students don't trust the textbook to deliver concepts effectively. The study revealed that, the manner in which mathematical concepts are outlined in the mathematics textbook contributed negatively to student performance in mathematics: it does not succeed in promoting student-centered teaching and learning and facilitating understanding, and that teachers and students know the contribution of mathematics textbook to teaching and learning because it basically the first call of point when it comes to the implemented curriculum which students comes into contact with. The implication of this research is for the actors in the education sector to be up and doing in putting the right contents that allow students to interact with themselves and the world at large that would translate into economic growth in the future.
Keywords: Textbook; Constructivism; Curriculum; Teachers' and Students' perception on textbook, pedagogy.
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CHAPTER ONE
INTRODUCTION AND CONTEXT

1.0 Background of study.

Mathematics is a very important subject in every country's curriculum because of its close link with the national development in health, engineering, economy, etc. and Ghana is not an exception. It is therefore the wish of all governments since 1957 to improve its teaching and learning by providing the necessary tools, materials, human resources and everything when it comes to the teaching and learning of mathematics. The government of Ghana acknowledges the importance of mathematics and science education in achieving the millennium/sustainable development goals and the vision 2030 as this would provide the important drive towards developing the right human resources to steer the country into new industrial and technological development. This challenge is been shouldered by the ministry of Education supported by its relevant agencies and civil society organizations in education to champion this great course which seeks to enhance the introduction and perpetuation of constructivist/student-centered approach to teaching and learning and also designing our textbook and models for teaching to suite this method which takes the focus of learning from the teacher and placing the learning process into the hands of the learners who then gets the opportunity to dictate the pace of learning .

Vygotsky's theory of sociocultural learning, the role of social and cultural interactions plays an important role in the learning process. Vygotsky's theory states that knowledge is co-constructed and that individuals learn from one another. It is called a social constructivist theory because in Vygotsky's opinion the learner must be engaged in the learning process. Learning happens with the assistance of other people, thus contributing the

social aspect of the theory. A fundamental aspect of Vygotsky's theory is the Zone of Proximal Development. This is a "range of tasks that are too difficult for an individual to master alone, but can be mastered with the assistance or guidance of adults or more-skilled peers (Vygotsky, 1962)." Another part of this theory is scaffolding, which is giving the learner the right amount of assistance at the right time. If the learner can perform a task with some assistance, then he or she is closer to mastering it. This theory is relevant to healthy adolescent development because if students work in pairs, they are interacting with people and therefore can learn different academic ideas from one another. This theory shows that students learn from each other; they can assist one another and co-construct knowledge. This theory can be seen to support Kyriacou in how the textbook should be design to allow for much participation by learners in the teaching learning process. (Kyriacou, 1992, p.310)

This theory can be applied in the classroom in several ways. The students can be grouped such that the students who understand the content work with the students who do not. For example, if a student did not understand factoring, a method to find the zero or zeros of an equation, I could have another student explain the concept to them. The more knowledgeable peer might use different language than I did as a teacher. The student's phrasing might make more sense to the other student. The more knowledgeable student would also learn something, perhaps a deeper understanding of the content or a way to explain the concept that they had not thought of before. Students of different readiness levels will work together in groups when they do discovery activities, such as problem-based learning. According to the constructivist theory, learning can point towards a number of different teaching practices. In the most general sense, it usually means encouraging students to use active techniques (experiment, real-world problem solving) to create more knowledge and then to reflect on and talk about what they are doing and how their understanding is changing.

Constructivist teachers encourage students to constantly assess how the activity is helping them gain understanding by questioning themselves and their strategies, students in the constructivist classroom ideally become "expert's learners" and see the teachers as facilitators. This gives them ever broadening tools to keep learning, with a well-planned classroom environment, the students learn "how to learn". In this study am looking to see if our mathematics textbooks were well designed in the manner to include constructivism ideas in learning. According to Von Glasersfeld (1989) learners construct their own understanding and that they do not simply mirror and reflects what they read, and that learners look for meaning and will try to find regularity and order in the events of the world in the absence of full or complete information.

According John Dewey (1989), learners learn by participating in relevant learning experiences which forms the basis for the theoretical framework for these studies. Dewey went on to explain that student could learn enormous amount by participating in relevant experience thus involving learners in the learning process by providing tools that learners can use to construct ideas and knowledge for themselves. He also advocated for problem-solving skills in life of the learners, that learners should be taught to solve problems everyday by what they are taught and later apply the lessons in their daily lives. Dewey underlined this point by writing "only in education, never in the life of a farmer, sailor, merchant, physician, or laboratory experiment does knowledge mean primarily a store of information.

Dewey further explains that learning should not take place in the vacuum and therefore should prepare learners for future endeavor that "I believe that education is the fundamental method of social progress and reform". The broader theory of learner-centeredness is what I have curved into constructivism since the ideas are similar and expounds on the same principle of getting learners to construct knowledge for themselves by giving the relevant tools in order to develop and create meaning by themselves. Others researchers such as Shook, J.R. (2000), Schilpp, P.A. (1939) also too inspiration from Dewey's theory and works whiles many others also expounded his theories and vision of pragmatism; they were convinced that students or others who are learning must experience reality as it is. From John Dewey's educational point of view students must adopt to their environment in order to learn. Dewey's theory shows that great thinkers had same ideas about teachers. His views about the ideal educational and classroom had be stipulated in pages below and had similarity with the democratic ideals. Dewey posits that it isn't just the student who learns, but rather the experience of students and teachers together that yields extra value for both. Janse, B. (2019).

To improve the study of mathematics, government have outlined a number of activities such as the national science and math quizzes for high schools to help develop mathematics competencies and physics for which some of these programs have been extended to basic level. However, the low performance in mathematics has persisted despite measures or attempts by successive government to provide adequate facilities, teachers, teaching-learning materials, and in-service training for teachers and therefore has generated national debate for this problem to be solved. This therefore implies that there are other factors that are contributing to this failure for which it must be investigated. From the indicators revealed by the table below shows how student have performed in core subjects in Basic Education Certificate Examination (BECE) from 2010-2014 of course which mathematics is inclusive.

Table1. BECE percentage passes at the National level in Mathematics

Year	Total No. of candidates who pass	Total No. of candidates who sat for the exams	% of candidates who passed
2010	698,564	1,176,402	60
2011	627,882	1,044,920	59.5
2012	660,491	1,109,710	59.8
2013	869,681	1,144,777	72
2014	703,752	1,162,782	60

From the last five years results have been above average, yet wavy. Aside the 2012/13 academic year, pass rates in mathematics, English and science have been at an average of 60%. However, whiles acknowledging that there has been improvement in the basic education delivery in Ghana, such as the introduction of the re-sit policy at the basic level, there is room for improvement as far as quality in education service delivery is concerned. While most reform efforts seems to embrace the importance of proper learning objectives, instructional methods to be well outlined in the national mathematics curriculum, they fail to realize the full impact of the content of the mathematics textbook which is the "bible" or manual for which teachers and learners deeply rely on. According to both Ravitch (2003) and Valverde et al., (2002) textbooks are vitally important, they play a significant role in shaping teachers', students' and families' views of school subjects. By this, one can clearly see that no matter how good teaching force, student factor, and home factor may be that alone cannot result in better teaching, learning and achievement. It is therefore incumbent on for policy makers to now shift focus on school factor-thus giving attention to the mathematics textbook to find out the contribution it have had over the past three decades.

Textbooks are an indispensable part of the world education as they serve numerous purposes; for teachers they often become the embodiment of the curriculum, the extent that many instructors believe in teaching their student the entire content of these books from cover to cover, for learners, these not only constitute the corpus of the subject matter on their grade but also provide a structure and reinforcement to their learning by the way they are organized and illustrated (Miller & Berry, 1962). Research point to the fact that textbooks are essential to both teachers and learners and that it forms the core of what is taught to learners. Whereas for the entire system, from government to district and to schools these books becomes the curricular and evaluative point of reference (Alefiyah, 2015).

According to Neill (1982), the layout of the school textbook does not merely deal with aesthetics, even though it an important aspect. By including essential features such as glossaries, relevant graphics, teachers' notes just to name a few, a textbook becomes a consolidated educational resources across-the-board, these features becomes essential pedagogical tools for teachers (Alefiyah, 2015). Conversely, inappropriate textbook layout and features may have detrimental effects on student learning and interest, and may render this resources ineffective (Harp & Mayer, 1997). By this it will be completely outrageous on anyone to downplay or rubbish the claim that investigating into the impact of mathematics textbook is not relevant. According to Chadwick (1990) there is certain gap that exists between textbook design and usage in developing countries, Ghana is of such countries. First, the preparation of well-researched and designed textbooks are highly labor-intensive, again the shortage of seasoned textbook writers all contributes immensely to teaching and learning of any subject. Mathematics as crucial as it may need attention in developing the right human and material resources for any nation to develop it teaching and learning. It is therefore to consider how to improve mathematics textbook and it usage in our basic schools and textbook analysis is particularly important to support educational reform and hence this chapter sets out to establish the significance of conducting textbook research and highlighting best practice in the area. As I stated earlier, it is important to look at other factors that are inhibiting quality education and this should be situated in the context of educational reform because you can achieve quality education when there have not been reform to improve the existing structures. Textbook research have been neglected far too long in Ghana and that is what this research seeks to unearth because as a teacher who have taught for over five year in the basic school and with my experiences that I have gathered over these year felt the need to investigate in the regard to find out how textbook have also imparted in the teaching and learning of mathematics.

The kind of mathematics education highlighting constructivism/ active learning needs corresponding textbook that outlines the principles of active learning. According to Crawford & Witte (1999), the best word to describe a constructivist classroom is positive energy. Engaging students in the active learning process is very important. (Polya, (2002) stated that obtaining this type of engagement requires a much different classroom from the authoritative and teacher-centered traditional classroom in which the teacher stands in front of the class directing the content that is delivered to the students. These approaches has some demerits which has implication on the part of learners which does not encourage them to learn math in the future thus, in a traditional or teacher-centered class students work alone, they don't learn to collaborate with other students, and their communication skills may suffer, teacher-centered instruction can be boring for students. Their minds may wander, and they may miss important facts, and teacher-centered instruction doesn't allow students to express themselves, ask questions,

and direct their own learning. In Ghana, a typical mathematics classroom prepares student for standardize test, intimidating and clearly does not foster deep learning that student could apply to new situation. Socrates during his days conveyed that the teacher should act as a midwife and that ideas should be born into the student's mind by discovering what they want to learn for themselves. This idea support the constructivist approach to education in which the central role of learning is placed in the hands of the student (Polya, 2002).

The corresponding type of mathematics textbook that is needed according to (Kyriacou, 1992, p.310) in an active learning can be described by the application of any of the following five key concepts to a learning activity: And these are the component that a mathematics textbook for basic schools student should encompass. Firstly, the use of concrete materials and direct learning process, also the use of investigative or problem oriented techniques, the use of small group work, again the pupils must be made to own the learning process or task and finally personal focus and relevance of the learning process or task should be encouraged.

Statement of the Problem

There are numerous negative attitudes and factors contributing towards under-achievement in the teaching and learning of mathematics. While many student considered colorful pictures important and also found their textbook visually stimulating, the fact that this did not make a difference in the motivation to study from these books seems to validate Harp and Mayer's (1997) conclusion of their study as cited by Alefiyah (2015). The recent ranking by TIMSS 2019 placed Ghana above 40 which is an indications that we need to do better, the report also suggested that the difference in students' achievement in mathematics mainly due to school factors. This study would concern itself with how teachers and student perceive the mathematics textbook in Ghanaian basic school and the potential it has to influence teaching and learning.

The various efforts and attention been The various efforts and attention been given to the quality of teacher education, facilities, materials etc which has seen significant improvement towards learning math but little attention is given to the textbook design, structure and pedagogical aspect which carries or has the embodiment of the curriculum (Miller & Berry, 1962). There is the need therefore to understand how mathematical textbook influence the student performance and the teachers' perception in the teaching and learning of mathematics in the basic school. Therefore to understand and solve this problem in mathematics performance by students need stakeholders and policy makers to also have first-hand information in order to make reforms that can bring changes to way mathematics is taught and learned.

Claudio-Rafael et. al, (2015)Claudio et al. (2015) In the field of education, reforms of education are clearly one of the most complex and controversial subjects, because of the effects that they generate in the societies and countries where they take place. However, this situation makes it possible to investigate the reasons why such reforms generate great changes in the school systems where they are applied. The present study emanates as its object the analysis of great educational reforms across the world in order to relate some of the main lines of development: when the curricular design is changed and the consequent curricula; when the system as a whole is modernized, imposing more quick and effective dynamic for institutional operation; when decentralizing the central bureaucracy; when an attempt is made to raise the general quality of education, in order to improve the academic yield of students and reduce school failure; when an attempt is made to adapt educational formation to the demands of the labor market; when changes in pedagogical styles are introduced for educational reasons; when there is a wish to transform the institutional cultures of the schools; when the intention is to improve the organization and institutional management of schools.

It is worth noting that the reforms arise in a historical, social, economic, and political context. Consequently, it is important to consider this when designing, implementing, evaluating or analyzing reforms. For Popkewitz (2002), educational reforms imply questions of social production and state regulation, which they in turn “construct” (2002). Reforms, then, depend on a discourse that often remains hidden, or implicit, and that determines our way of looking at the school world; visions that produce social values and relationships of power that are not neutral. The purpose of educational reforms is to transform school structures with the aim of raising the quality of education in a country. These reforms would automatically translate into quality education that we've all been calling for all these years in regards to mathematics education in Ghana.

In order to evaluate the quality of textbook, we need to understand whether the existing textbook is or had achieved it purpose and I would want to evaluate it from both teachers and students' perspectives, beliefs, attitudes and what they think about the textbook and whether it's serving or had served its purpose.

Purpose of the Study

The purpose of this study is to determine the effectiveness of the mathematics textbook in the past two decades towards student performance in light of the demand of constructivism and how both teachers and students perceive it in the teaching and learning of mathematics.

Objectives of the study

i. To determine teachers' perception towards the mathematics textbook in teaching and learning of mathematics in Asikuma Odoben Brakwa District.

ii. How the Junior High school students perceive the mathematics textbook in learning mathematics?

iii. Determine if the mathematics textbook is good enough in delivering mathematical concepts in the basic school.

iv. To seek recommendation on how to improve the quality of the mathematics textbook.

Research Questions

i. What is the teachers' perception towards mathematics textbook in A.O.B district?

ii. How does the JHS student perceive the mathematics textbook?

iii. Is the mathematics textbook good enough in delivering a constructivist lessons in our basic schools?

iv. In which way can the mathematics textbook be improved towards better teaching, learning and performance in mathematics?

Significance of the Study

Education of mathematics over the years is under reforms where we have seen so many researches been conducted in the field just to improve teaching and learning.

The significant of this research is to inform policymakers about the dangers of neglecting the important role textbook plays in the teaching and learning of mathematics and how it can go a long way to reform the existing educational challenges that Ghana is facing in delivery of quality education by 2030 according to UN millennium development goals. According to data available to us by the OECD an economic think tank rank Ghana 76 among 176 countries by face2faceafrica.com (2015) In fact, according to the report, “Poor education policies and practices leave many countries in what amounts to a permanent state of economic recession.” By this report it means Ghana needs to step up its mathematics learning if we want to achieve this target set by UN by 2030. The only way to grow the economy is by educational reform which places the learners at the center of the teaching learning process is to strengthen the use of the constructivist approach in facilitating learning. In the past mathematics education has always been delivered and is being delivered in the traditional way which has not yielded the desired results as shown above by a few statistics gathered. In 21st century mathematics education, various educational theories that have been tried and tested and good for teaching abound, one of the new way of teaching mathematics is the constructivism, which puts the student as the center of focus as against the old way which places the teacher first. The student-centered approach to teaching is not new in Ghana but the manner in which it has been taught and implemented by policy and curriculum designers I would say has not been the best and must be looked at again. Constructivism is a learning theory that emphasizes student agency through self-guided exploration, reflection, and evaluation it's active, it promotes student agency. It develops advanced skills such as critical thinking, analysis, evaluation, and creation, It promotes diverse viewpoints, It encourages students to reflect, evaluate their work, and identify intermediary skills to acquire based on their needs, and It reflects our modern world's vast access to content.

Again, these reforms should incorporate the ideas of the constructivism into the designing of the textbook for the student which will allow student to participate fully in teaching and learning of mathematics which will take away the lukewarm attitudes from student and encourage them to love mathematics. The current textbooks lack this values and qualities and thus needs to evaluate and examined in order to make proper recommendation so we can achieve the results we've all wanted in the performance of our learners.

The findings of this research would help all interested entities or stakeholders in education in understanding how textbooks play a vital role in the teaching and learning process. Student would get to also understand their role and responsibility when it comes to learning with the mathematics textbook. The study would help expose some perceptions learners have about textbook and provide vital information to all stakeholders in education attempting to improve teaching and learning of the subject in all schools especially mathematics. The research therefore would provide crucial information to curriculum planners who will provide information to designing policies and strategies towards improving performance in the subject.

Again, it would help teachers understand their role and responsibility towards the use of the mathematics textbook and how their learners perceive them and their use of the textbook to improve relevant instructional strategies. It will inform teachers about the new or current ways to apply and use the textbook and help learners understand that their performance is a process and not an event in the teaching learning process. The school administration would also understand their role and responsibility in the teaching learning process by making sure the teachers have up to date methods of teaching mathematics in their textbooks provided to student, secure materials and the necessary support they can provide to teaching and learning. The study would also provide useful and supplementary information to the existing literature and guide in the future research by other researchers who are also interested in researching into similar subject or area or probably those who would be

faced with similar problem in the near future.

Limitation of the Study

The study was carried out in the central region of Ghana, precisely Asikuma Odoben Brakwa district. The district has quite a number of public and private basic schools. The focus of the study was to get both students and teachers to response to questionnaires; on the part the student some of them might not be able to understand fully some of the questions.

Delimitation of the Study

This participant selection in this study would be confined to basic school students from basic 8 and 9 grades since they are able to read and understand, teachers from some selected schools within the districts. The selected schools are about 20 Junior High Schools 8056 teachers and 150 basic school students. The selected schools at least are quite better in terms of facilities, adequate subject teachers, conducive environment which would allow for investigation into teachers' and students' perception towards mathematics textbooks and how this affect teaching and learning and student performance. This topic has not receive enough attention from stakeholders in education and therefore set to reveal how it has affected mathematics education for many years.

Assumptions of the Study

This study assumed that

i. The manners in which mathematical concepts are outlined in the mathematics textbook contribute positively or negatively to student performance in mathematics
ii. Teachers and students know the contribution of mathematics textbook to teaching and learning.
iii. The respondents would cooperate and provide truthful information during data collection.
iv. All sampled schools had enough staff, facilities and information.
iv. Findings of the research would be used to generalize all schools in the region and districts.

CHAPTER TWO
LITERATURE REVIEW

This chapter is to review literature related to mathematics textbook in Ghana and how mathematical concepts are applied using constructivist approach in a student-centered class with the aim of reforming and improving quality mathematics education and how using the mathematics textbooks helps to deliver its content in primary or basic school in Ghana. The literature reviewed is cited both from Ghana and from various studies conducted outside Ghana. In this study or review, issues discussed include: The theoretical framework of the study, Traditional way mathematics was taught in relation to reforming mathematics education, mathematics teachers' perception and beliefs towards mathematics teaching and learning, students' perception and beliefs about the learning of mathematics, teachers' factor in improving mathematics teaching and learning, and the New wave of teaching mathematics. These areas that are discussed is to give us a fair idea about how mathematics educations in terms of reform are geared towards quality mathematics education and things that others have done in other areas consolidating mathematics education is worth considering since mathematics textbook cannot be discussed in isolation because there are other factors that contributes to a successful reform in this regards.

Theoretical Framework

This study on relevant instructional practices that mathematics textbook provides hinge on the social constructivist theory. The principles and criteria set out by theorist about what a good textbook in general should look like on the basis of whether the textbook enables and provides what is needed for learner participation in the teaching learning process. This study seeks to look at how students and teachers perceive the math textbook in the bid to reform instruction, pedagogy, content, and in general about mathematics education in Ghana. The study is greatly influenced by the constructivist ideology, even though it has recently been defined, the foundations were originally inspired by the seminal work of Jean Piaget, John Dewey and Vygotsky in the period of the eighteenth century. John Dewey (1938) expressed the importance of the learner having an active role in his or her level of understanding through the process of inquiry and discovery rather than rote method of teaching. Dewey believed that students should be involved in activities that promote learning and construction of knowledge (Dewey, 1938). Vygotsky also built on what had been established on the premise of learning through experience, his stance on social interaction and it role in knowledge acquisition. According to Vygotsky one acquires knowledge through social interaction (Vygotsky, 1978).

Researchers believe that a good textbook should incorporate all these great ideas into making learning easy and understandable for learners, in that, it incorporate the idea of constructivism with learner-centered approach to instruction as the focus. Valverde et al. (2002). Proposed three aspect of textbook analysis: content (numbers, measurement, etc); performance analysis (knowing, using routine procedures, problem-solving, mathematical

reasoning and communicating); and perspective (attitudes, careers, participation interest and habits of mind). It is important to understand from both teachers and student perspective whether or not the textbook which is intended to purposely help students is serving that purpose. A number of studies have examine the role of new technologies in terms of tools used (Lerman, 2006) the role of mathematics textbook as an instrument for teaching and learning has gain much attention, so far, a number of studies have examined the use of mathematics textbook by teachers and students (Bromme & Homberg, 1981; Haggerty & Pepin, 2002; Hopf, 1980; Johansson, 2006; Pepin &Haggerty, 2001; Remillard, 2005; Woodward & Elliot, 1990; Love & Pimm, 1996) All this studies dealt aspect of the textbook usage but intend to move beyond that to find out what those who use the textbook of the textbook in respect to the theories that abound about what a good textbook should be.

According to Freudenthal (1973) and RME, mathematics should be seen as an activity rather than being receivers of ready-made mathematics, students should be active participants in the educational process, in which they develop mathematical tool and insight by themselves. The underlying commitment about the nature of mathematics, mathematics activity and how mathematics is learnt vary between textbook series and between countries, how these is promoted in the design and content of the textbook is important area of study because a textbook series might have more influence on learners and learning than a national curriculum (Claire, 2014). In designing a textbook (curriculum) for understanding; the key concept and process of the discipline should be clearly identified, explicated and organized in a coherent fashion around the big ideas. (Mintzes, Wandersee and Novak, 1998; National council of Teachers of Mathematics [NCTM], 1995; NRC,1996). According to Iowa Core Mathematics (2010, p.3) an effective textbook which they term “problem-base instructional textbook (task) should be able to do the following:

- Help students develop a deep understanding of important mathematics.
- Emphasize connections, including the real-world
- Are accessible yet challenging to all.
- Can be solved in several ways.
- Encourage student engagement and communication.
- Encourage the use of connected multiple representation.
- Encourage appropriate use intellectual, physical and technological tools.

According to American Association for Advancement of Science [AAAS] (2001), the interrelationship among topics should be clearly articulated to provide a framework teachers can use in developing their student learning. The National Research council, (2002) outlined principles that a good textbook (curriculum) design should have; structures the concepts, factual content , and procedures that constitute the knowledge base of the discipline around the organizing principles (big ideas) of the domain, links new knowledge to what is already known by presenting concepts in a conceptually and logically sequenced order that builds upon previous learning within and across grade levels, focuses on depth of understanding rather than breadth of content coverage by providing students with multiple opportunities to practice and demonstrate what they learn in a variety of context including structured learning activities that, in a real or simulated fashion, allow students to experience problem solving and inquiry in situation that are drawn from their personal experience and real-world applications, develops students abilities to make meaningful applications and generalizations to new problems and contexts, incorporates language, procedures and models of inquiry and truth verification that are consistent with the accepted practice of the expertise in domain and emphasizes interdisciplinary connections and integration and help with issues, problem and experiences that figure prominently in their lives outside of the classroom. These principles outlined by the NRC are in consonance with the constructivist ideas of learning which can be adopted by textbook designers.

Mathematics is a connected and coherent subject; it should be taught that way so student can learn it that way (Claire, 2014). Therefore effective mathematical instructional task (textbook) must take into account the nature of mathematics and knowledge as well issues of teaching and learning. Many curricular and instructional materials (textbook) are not design to help students conditionalized their knowledge. For example, textbooks are more likely to tell students how to do something than to help them to understand the conditions under which doing it will be useful (Simon, 1980, p.92). The underlying principle is to incorporate understanding into the task (textbook) design “understanding involves the construction of knowledge by individuals through their own activity, so that they develop a personal investment in building knowledge” (Capenter & Lehrer, 1999, p.23). As stated by Gardner “when you've encountered an idea in your own way and brought your thinking to bear, the idea becomes a part of you…it's a part of your own experience” (1993, p.6). According to Resnick (1994) well design experiences also encourage students to apply their knowledge and skills to concrete, real-world problems or novel situations.

Teaching for understanding can be operationally defined as in the Every student counts project (ESC, 2008, p.3) which outlined the principles for effective teaching and learning which corresponds to the ideals of constructivism:

- Developing deep conceptual and procedural knowledge of mathematics.

- Posing problem-based instructional task.
- Engaging students in the task and providing guidance and support as they develop their own representations and solution strategies.
- Promoting discourse among students to share their solution strategies and justifying their reasoning.
- Summarizing the mathematics and highlighting effective representation and strategies.
- Listening to students and basing instructional decisions on their understanding.

According to researchers, a good math textbook must have six (6) principles which include curriculum principles, discipline principles, pedagogy principles, technology principles, content principles, presentation principles all geared towards creating the space for experience learning by students. (UNESCO, Module 5). Before a textbook is design the broader curriculum goals must be represented or taken into consideration, the discipline principles requires that school math textbook mist provide solid foundations for students to understand, apply and study math in their daily life, further learning and workplace. The pedagogy principle requires that textbook must be developed to facilitate the teaching, learning and assessments in mathematics. As Fan & Kaeley, (2000) indicated, textbook as a learning tool or resources can convey different pedagogical messages to teachers (and students) and provides them with an encouraging or discouraging curricula environment, promoting different teaching learning strategies. In fact available studies have consistently revealed, textbook can, to some extent, affect not only what to teach, but also how to teach, which will ultimately affect students' learning in math (Zhu & Fan, 2002, Fan, Chen, Zhu, Qiu & Hu, 2004). The field of math education, technology has affected what and how to teach and moreover, why to teach. Technology principle requires that technology must be reflected and more importantly embedded into teaching and learning of mathematics. The content principle requires that the textbook developers to provide adequate cultural, social and even historical context when introducing mathematics concepts and contents. This principle is particularly important when application of math is concern. Finally, the presentation principle requires that the presentation of the content in the textbook must suits the level and needs of teaching and learning. This principle is meaningful in textbook development as well designed presentation can make the reading and use of the textbook easy and pleasant – taking into account the following , real-life pictures and the realistic drawings, clear layout and illustration, use of colors, simple language.

The corresponding type of mathematics textbook that is needed according to (Kyriacou, 1992, p.310) in an active learning can be described by the application of any of the following five key concepts to a learning activity: And these are the component that a mathematics textbook for basic school students should encompass. Firstly, the use of concrete materials and direct learning process, also the use of investigative or problem oriented techniques, the use of small group work, again the pupils must be made to own the learning process or task and finally personal focus and relevance of the learning process or task should be encouraged, the design framework describe in this paper takes above perspectives into account. The resulting tasks are used in textbooks (Fey et al. 2010; Hirsch et al. in press) in teacher resource books (Hart, Kenney, DeBellis & Rosentein, 2008) in classroom lesson (Resources for the Iowa Additions of Iowa Core Mathematics, 2012). In conclusion a good textbook should be able to involve students in the learning process where they are made to construct knowledge for themselves, prepare students for the future, be able to apply what they have learn to their daily lives and finally be able to solve problems from what they have learned.

Mathematics Textbook and Teaching; the evolution

Mathematical textbook and teaching are a vital part of and the backbone of this study. To start with, textbook have vital role in shaping the manner in which any topic is taught and in turn shape the opinion of students. Boyer, Carl & Uta. (1991). this fact is perhaps best appreciated by considering recent debates over teaching, and textbook evolution in the classroom. The content of mathematics textbooks helps to set the tone for how the educated public view mathematics in the eighteenth and subsequent centuries by portraying mathematics as a useful tool, these books helps to encourage it acceptance by a wider array of merchants, engineers, and scientist than had previously been the case.

The first mathematics textbooks were published in the mid-1700s and we can see, then, that the appearance of the first textbook in mathematics was an important milestone in the history of math education or learning. By writing these books, the authors helped to establish a standard framework that formed the basis for all mathematics education not just at the times but continuing until present. Math textbook and teaching mathematics has evolved as we can see and according to Pepin et al. (2017) the evolution of textbook has brought the integration of digital component from paper textbook to e-textbook which leads to an evolution of related fields. They further argued that as result of this evolution each textbook is to be considered as a composed entity and each teacher is considered as a user of a composed set of resources exceeding a single textbook. By these we see how important the textbook is to the teacher and the whole teaching and learning of mathematics.

The existence of mathematics textbook has predated this century and that it has continued to serve as a tool

or resource for both students and teachers in the teaching process. Qi, Zhang & Huang, (2016) provided a strong evidence of the differences between teachers' textbook usage with respect to their experience: “novice teachers mostly arrive at the adhering level while using textbook” (p.47). This also explains how “beginning” teachers adhere and stick to use of textbook and how important a resource it is to teachers in teaching mathematics. Fan et al. (2013) stated that textbooks in china appear to provide much bigger room to proofs, they considered three levels of presentation of which distribution of the treatment of proofs in textbooks are the focus of the study which also buttress the point made by earlier researchers about the important role of the math textbook to the course of mathematics education.

According to Remillard as cited by Trouche et al. (2018) made empirical contribution to the understanding what she termed teacher-resources for which she proposed to define “curriculum-resources” as “print or digital artifact design to support a program of instruction and student learning over time” (p.71) she distinguished each of these resources from each other by comparing three components: teachers' guide, student text (books) and documents design by teachers. She argued that teachers put all these together to craft instructional episodes. Siedel & Stylianides as cited by Trouche et al. (2018) also explained that teachers select the kind and right resources or textbook base on accessibility and characteristics, cultural environment of instruction, mathematics topics and teacher characteristics (personal interest and perceived student needs), Wang, (2013) also asserted that math teachers expertise, curriculum resources such as the textbook and their collective work is an inherent feature of teachers' professional activity and thus the textbook has become part of the teachers' everyday classroom life. At this point I consider a triangular relationship between the teacher, the student and the textbook (can be any curriculum resources) that exist in the classroom and therefore is crucial to both the teacher and the student as we have seen from the literature available.

According to Trouchel et al. (2018), resources such as the textbook help teachers to plan for interactions with students' ideas. “the authors focus on a particular kind of resources instructional sequence produced in classroom design experiments that were design to support teachers in establishing in their classroom particular types of interactions with the aim of facilitating the emergence of specific students' mathematical ideas” The reason am talking about the mathematics textbook is the presume challenges facing our textbooks and how to address the gap in knowledge about how our mathematics textbook might have contributed to the poor performance of our student over the past years in the context of educational reform. It is therefore necessary that we look at every possible means of making our textbooks and the way of teaching math better for student in order to improve their mathematical competencies and skills. On teachers' decision on lesson sequence and their impact on opportunities for student to learn Kim, (2015) said teachers make adaptations to the sequence of the task provided by the resources for a given lesson. This means that not all resources are of a certain standard that can enhance understanding by student and therefore calls for concern to try to modifier the math textbook in order to make it accessible for use. Kim further stated that teachers make such decision to improve upon the quality of instructions and opportunities for student learning and appreciate the reasoning in the resources. That is why it is important to have both students and teachers perspective on our textbook that we have been using for the years passed without any proper evaluation in the face of the decline in mathematical competencies by student in Ghana.

According to (Enu, Agyman & Nkum, 2015), Ghanaian students' mathematics performance has been low by global standard, which saw Ghana ranked last among 45 participating countries in mathematics achievement (Mullis, Martin, Foy & Arora, 2012). Many reasons accounted for this low performance some of which had been the frequent use of expository teaching style in schools in Ghana (Enu, Agyman, & Nkum, 2015) as compared to the learner-centered approach, teachers often do not sound convincing to student that the content taught in class can be applied in life (seah, Ernest & Monica, 2017). This also gives us the cause to investigate the content of the textbook from the users' (teachers and students) point of view. I have realized many studies abound that have tried to find solution to this enigma of poor performance by students in Ghana both locally and internationally but have neglected the role that our mathematics textbooks had contributed to these failures which I intend to find out.

Textbook use and the affordance of modern technology have changed and brought dynamics to the way teaching and learning is done in the 21st century. As we look at the evolution of the math textbook, we realize that “most teachers use textbooks and/or online packages of materials as their total or main source of task”. (ICMI study document). Textbooks are now frequently complemented by digital materials as a result of the introduction of computer technology in our classrooms and the everyday lives. Technology in education has provided new avenues for the structuring and designing of textbooks for the use by both teachers and students. It also opens up new possibilities for design and further evolution. Students today are not different from those of the past, but the difference is the technology which is at their disposal, likewise teachers too. Both teachers and students are able to multitask with constant internet access are inch away from superior flow of information. This has come to change the way mathematics is taught and learned.

Technology has made it easy for experts and teachers to prescribe appropriate textbook for students.

Prescribe textbooks has been frequently used in education to integrate discipline knowledge and support teachers in developing students' learning outcome (Fasso et. al., 2014). In as much as there is technology taking root in teaching and learning of mathematics a large Australian study of textbook use in high education institutions reported that almost all courses in science, mathematics, and business education prescribe a textbook as being essential for student learning. (Horsley, Knight, & Huntly, 2010). (Knight & Horsley, 2013) further stated that students have been encouraged to use textbooks as authoritative sources to do the "heavy lifting" of understanding principles relevant to a discipline. According to Knight, 2013; Knight & Horsley, 2013) data available on textbook sales have shown that spending on textbook has remained constant despite the increasing quantity of digital resources. However, as students increasing network with voluminous sources of information, teaching needs to move beyond one sources of knowledge such as a textbook. (Knight, 2015).

Because of technology, textbooks have evolved quite recently and have taken on many shapes and forms. Murphy, Mahoney, Chen, Mendoza-Diaz and Yang (2005) as cited by Knight, (2015) proposed a model which includes the use of text to guide the development of students' cognitive skills. Similarly, in Salmons', (2002) model to facilitate online teaching, a textbook is essential to aid information exchange and knowledge construction, enabling students to become engage in learners. "Textbook provides the scope, sequence and learning activities of the course, with learning management system resources complementing the textbook" (Knight, 2015). As textbook evolves and the take on different dimension, technology helps to communicate more and foster collaboration in many ways and gives us chances to share ideas across the breath and length of human interaction thus in the classroom. Textbooks have been used to enhance teaching in many varied discipline at all levels of schooling for many years. Zucker, (2012) indicated that students who preferred the electronic version of the textbook found it easier to navigate digital content and simpler to satisfy teacher expectations and participation in class activities. Technology has been a big part of the world recently, many of the work , jobs that did not require technology use in the past require technology today, so as we are talking about textbook use, perception students and teachers hold on textbook and the way to improve mathematics education, technology can't be left out . Children in my part of the world are becoming more technologically inclined as social media/networking, interactive games are becoming part of the life of students, not to talk of the negative effects of technology on students but the intent to harness the positives in order to help learners improve their mathematical skills. According to Kevin, (2014) "we are involving technology society and in many ways have become dependent on its use, thus, the use of technology and teaching students have become a high priority in public schools" (p.2). Learners in the basic schools should begin to use familiar technological tools as part of their academic program.

Textbooks can be made accessible in digital form to students in that manner as students learn to maneuver through the technological tools they learn and make use of the digital textbook and thus improve their mathematical skills. Kevin (2014) explained that technology also provides hand-on learning opportunity that can be integrated into all schools curricular areas including mathematics, reading, science and social studies as well as other academic subjects. Christen (2009) asserted that if students' learning environment mirrors the way in which they engage with the world, they will excel in their education. In our basic schools less or no digital textbooks are sometimes available or made use of, as we seek to involve, implement learner-centered approach to teaching mathematics, many studies have shown the advantages of using technology in classroom instruction. Technology can be used as a tool to establish meaningful projects to engage students in critical thinking and problem-solving. (Kevin, 2014). Research has shown that technology integration is shown to be effective in all age groups. Finally, teachers should model the use of technology in support of the curriculum (textbook) so that children can see the appropriate use of technology and benefits from exposure to more advance application that will be use independently when they are older. (Depasquale, McNamara, & Murphy, 2003).

Mathematics Textbook as instruments for Teaching and Learning.

Mathematics textbooks as the instrument for teaching and learning predates ages, it therefore holds a special place in mathematics education. According to Stray (1994 p.g 2) Textbooks are special kind of books since they are intended to be used in education "designed to provide an authoritative pedagogic version of an area of knowledge". De castell, Luke and Luke, (1989), p.vii stated that textbooks hold a unique and significant social function in relation to other texts available for a reader since they "represent to each generation of students an officially sanctioned, authorized version of human knowledge and culture". Textbooks as instrument for learning cannot be relegated to the background, according to Johnsen (1993): a textbook is neither just subject content, nor pedagogy, nor literature, nor information, nor morals, nor politics. It is the freebooters of public information, operating in the gray zone between community and home, science and propaganda, special subjects and general education, adult and child (p.330). According to Kilpatrick, (1992) textbooks are written for students and teachers only serve as mediators between the textbook and students. (Kang & Kilpatrick, 1992) further argued that since authors cannot intervene directly in the communication between teachers and students they usually write the textbook from the teacher's position.

The mathematics textbook is one of the most important resources for teaching and learning of mathematics based on the many researches that abound. Research in math education has been concerned with the role of new technologies in the teaching of math from the beginning of computers being introduced into our classrooms. (Sebastian, 2009), role of textbooks in the life of both students and teachers but little is said of what students thinks and makes of the books they are provided to learn with. According to ICMI study computers are considered to be a new dimension in the math classroom. They argued that, there existed a triangular relationship between students-teacher-computer where previously only a dual relationship existed. Churchhouse et. al. (1984). But according to Sebastian (2009) debunked this notion and stated that the relationship in the classroom has never be dual.

Mathematics textbook as an instruments for learning has been considered to be one of the most important tools in all generations and currently it plays an important role in mathematics education world-wide and according to Howson, new technologies have not affected its outstanding role: “despite the obvious powers of the new technology it must be accepted that its role in the vast majority of the world's classrooms pales into insignificance when compared with that of textbook and other written materials” (Howson, 1995). Valverde et. al.(2002) asserted that the structure of the math textbook is likely to have an impact on the actual classroom instruction and that the way a textbook is structured advance a certain clear-cut pedagogical model and thus contain a plan for a particular succession of educational opportunities. Mathematics textbooks therefore should not be observed from a far as some researcher have done but rather viewed from the user's perspective. Textbook forms the interactive part of the larger school curriculum and anytime there's the need to review and reform it content and pedagogy the input of the user's (students) are often neglected or little attention is paid to it in this regard.

According to Rezat (2006), the relationship that existed in the classroom between student, teacher, mathematics and textbook is like a tetrahedron which is based on the fundamental model of didactical system of Chevallard (1985). He explained that math textbook is executed as an instrument at all sides of the triangle; teachers use textbook in the lesson and to prepare their lesson, by using the textbook in the lesson teachers also moderate textbook use to students and students learn from the textbook finally. As we have seen above that mathematics textbook has great impact on the activity and way of learning mathematics as a whole that is depicted by the didactical triangle on the bottom of the tetrahedron. According to Rezat (2010) “The activities the mathematics textbook is involved in do not only give an insight into students' utilization of mathematics textbooks, but they also give an idea of what learning mathematics is about for students”. He concluded that utilization scheme types does not only provide insight o student use of math textbook but also show how students learn mathematics. According to Johansson (2006) “textbook contribute to the field of mathematics by preserving and transmitting skills and knowledge”. Looking back at history of mathematics education and the role of math textbook have played, it is evident that one can't downplay the importance of textbooks in our quest to make mathematics learning enjoyable, and encouraging to students. From a classroom point of view, it is obvious that textbooks as tools, or instrument that facilitate the daily work of teachers.

Textbooks as instruments for learning must take into consideration the uses of the students and teachers; everyday textbook has a way in which the content and pedagogy are outlined to convey meaning to learners and teachers, a view of learning is, in some sense, inherent in each textbook. One could for example recognize the ideas of cognitive ideas in a book that focuses on logic and reasoning. From a constructivist and socio-cultural perspective, it would be more important to start from the students own experiences and create problems that nurture discussion and cooperation (Selander & Skjellored, 2004). (Johansson, 2006) stated that many teachers in Sweden makes use of the textbook, she went on to say that “mathematics in many classrooms in Sweden is simply what is written in the textbook”. Many researchers have written, publish and made remarks that shows the dependency of both teachers and students on textbooks in general and not just the math textbook; it therefore exigent that we get to master-mind the psychology of the users of the textbook which is cardinal to this study.

Convey the real world experience to learners in order to encourage learners to learn and understand mathematics. According to the numerous researches that abound in mathematics, instructional strategies, textbook use and it application, it is clear that students learn through meaningful social interaction. For most of the educational history of Ghana, instructors, facilitators, teachers have tried to teach students mathematics by transferring knowledge from the teacher to the learner, they have done this by demonstration, note taking, and lectures. (Fosnot, 2005; Hiebert, 1997) argued that the understanding of mathematical concepts is uncovered by the individual rather than been transferred from another source directly. This was further explained by (Kitchen et. al. 2007) that when students are able to develop their own personal strategies to solve problems through the use of mathematical tools and meaningful discussion, they perform significantly better than those who simply memorized algorithms to solve problems. This means students who learn most effectively are not asked to memorize complex formulas or a set of procedures instead, students with a deep understanding of mathematical content are given the chance to derive or arrive at their own method and formulas. Students should have been provided with knowledge to reason, but teachers instruct learners through rote mechanism that provide students

with just enough information just to pass achievement tests which is the conditions in Ghanaian school currently. According to Hommond (1979), "whatever our twentieth-century education system has produced, it is increasingly clear that it has not developed wide-spread pedagogy for understanding". (p.96). Even though most teachers claim to understand the concepts of constructivism and student-centered approach to instruction (Ampadu, 2012), it is evident that these concepts are not been applied in the classroom.

When students understand the process of mathematics, they have the potential to learn more at a quicker rate. Hiebert, (1997) stated "understanding is crucial because things learned with understanding can be used flexibly, adopted to new situation and used to learn new things".(p.1). (Fosnot, 2005) argued that depriving student of the right to understand why mathematics works proves detrimental to their learning and will suppress their future success in mathematics. Growing up, I was deprived of this right to understand why mathematics works by teachers and I intend to contribute to making things right in this 21st century by exposing some of these factors that had militated against students' progress in the teaching and learning of mathematics. According to Clement and Ballista, (1990) who argued "In reality, no one can teach mathematics, effective teachers are those who stimulate students to learn mathematics"(p.6). Therefore, it is incumbent on teachers create an environment that allows student to uncover math in problem solving approaches. In as much as students must be taught to understand mathematics, the most crucial or important aspect that matters is it application in real-world. Zieglar & Chapman, (2004) asserted that teachers should "attempt to make applied math relevant to real-world and particularly to the student in the class". (p.2). Bobis & Handel, (2004) explained that providing students with purpose for mathematics education helps to humanize learning and allows students to see and understand why they need to learn the information. Math represented to the student in most textbook does not in any way suggest it application in real-world that is why Zieglar & Chapman stated that math must be relevant in the life of the learner, one way to accomplish is by planning guest speakers that discusses the importance of math in areas such as car and logistics industry as well as financial planning. (2004). Bobis & Handel (2004) also suggested that another way to teach students to reflect real-world interest and application is to teach in themed units. Therefore, concepts, skills and strategies are to be taught around a central theme that is intended to give meaning and direction to the learning process. It is therefore necessary that we subject the textbooks that are in the system to these criteria to be able to understand whether it is serving that purpose and helping teachers to deliver the right content and whether it also helps students to also learning math in the right possible way. According to (Garner, 2015), when students find meaning in what they are learning, they are not only more excited to learn the information but they will also have a better chance of retaining the information.

Textbook has become the instrument for teaching and learning of mathematics throughout history for which it must represent the reality of the life learners live. Pogrow (2004) stated, though teaching for real-world is critical to the instruction of mathematics, it is important that teachers consider what "real-life" constitutes for students. If teachers try to incorporate math and uses situations that students are not aware of due to a student's cultural background, and socioeconomic status, background knowledge or life experiences, the notion of real life application could be irrelevant and more confusing than helpful to students (Garner, 2015). (Pogrow, 2004) pointed out, "the worst thing that you can do to students who think that math is a pointless extension of adult-imposed rules is to tell them that they will understand the need for mathematics when they grow up or that learning math would make them more successful adults" (p.299).

Conclusively mathematics textbooks must be designed to encourage students to construct knowledge and understanding of mathematical concepts and skills for themselves and guided to teachers to apply these concepts and skills for real-world application, and this is the role of facilitators and teachers alike.

Influences of the mathematics Textbook on Learners.

Textbook as resources plays an important role for mathematics instruction and thus gives students opportunities to learn in a mathematics class. According to Valverde, Bianchi, Wolfe, Schmidt & Houang (2002) stated that textbooks are mediators between official curriculum and the implemented curriculum by the teachers. Without mathematics textbooks teachers would not be able or might lose track of the methodology, content, or concepts that they need to follow in order to deliver concepts intended in the curriculum to learner. According to TIMSS 2011 data as cited by (Mullis, et al.2012) textbooks are the most important learning resources in mathematics education for basic or primary school teachers. Textbooks in general translate the abstract curriculum into concrete operations teachers and student can carry out. Research provided evidence that topics not covered in the textbooks were unlikely to be presented in the classroom (Schmidt, Mcknight, valverde, Houang, & Wiley, 1997). In addition, the findings also reveal that there are some signs that textbooks used by mathematics teachers have an effect on the achievement of their students.

Influences of the mathematics textbook on learners have always persisted. Data from TIMSS 1999 in Finland showed that the number of learning opportunities a textbook provided for the content correlate with students' performances in the TIMSS 1999 test (Tornroos, 2005). Heinze et. al., (2009) also reported similar effects of efficient strategies used by students and the instructional approach of their textbook. Base classroom

interaction between students and teachers, teaching and learning materials (textbook) are of significant interest in this context because it frames the teaching activities in the math class and thus gives students opportunity to adapt and strategies on ways to learn. (Mullis, Martin, Foy, & Arora, 2012). Every textbook must help students to learn positively. According to O'Neill (1989) a well-designed textbook allows for a great deal of improvisation and adaptation by a teacher and also provide ample scope for spontaneous and creative interaction in the classroom which research shows connection between learning opportunities in a mathematics textbook and learning outcomes. This was also affirm by the position paper on 'curriculum, syllabus and textbook of the national curriculum framework, (2005) which states that a good textbook should function as a guide to construct understanding through active engagement with text, ideas, things, environment and people rather than transferring knowledge as a finished product. This I think agrees with the constructivist ideas on the procedures and methods in teaching and learning should be conducted in the classroom setting. As far back 1931, American educator W.C Bagley recorded the use of textbooks in class, Cronbach also called for research into the use of textbooks in 1955, which has the potential to outdoor new knowledge, understanding and relationship that existed between students, teachers and math textbooks.

According to Chambliss and Calfee, (1998) textbooks still determine 75%-90% of instructional content and activities in American schools, because of the important role textbook plays in the teaching and learning, research have advance in many direction seeking to find the use, importance, analysis etc among many others to improve and better textbooks use in schools generally. Since students' performance are a product of textbook which are the "mouth piece" of the broader curriculum goals. Robitaille & Travers, (1992) expressed the view that textbooks content and how such textbooks are used impact directly on students' learning. As many would put it that the curriculum is cardinal to influencing the choices and treatment of the subject matter in a math class, one key way to implement this content is the textbook (Schmidt, Mcknight, Valverde, Houang & Wiley, 1997).

Influences of the mathematics textbook on learners cannot be relegated to the background, as we all know the importance of mathematics in our daily routine. The achievement of students in mathematics is of considerable interest to every government in many developed and developing countries across the globe. According to (Tarr et. al., 2008) textbook provide important opportunities to learn mathematics, what is in a textbook can determine both components and the methods of learning (Awashi, 2006; Stern & Roseman, 2004). The implication is that students' learning experiences can be affected by what the textbook offer in terms of text, content, concepts, methods etc. In mathematics, textbooks are thoughts to characterize the teaching-learning process more than in other subjects (Fan et. al., 2013), studies examining how mathematics textbook influences instruction generally agrees that they have a significant influence on students' opportunities to learn mathematics (Stylianides, 2009). According to (Grouws et. al., 2013; Stern, Remillard, Smith, 2007) the particular textbook a teacher uses can influence or affect what students learn , how they learn, and the cognitive level at which they learn. This point was further buttressed by Tarr, Chevez, Reys & Reys, (2006) that the extent of textbook use by middle school mathematics teachers utilizing different textbook series found that "textbook strongly influences both what and how mathematics is taught... coupled with the high frequency of textbook use by teachers, these data suggest that textbooks likely impact students' mathematics experience in important ways" (p.200).

Influences of the mathematics textbook on learners is key to this study as the research seeks to find out how both students and teacher perceive the textbook and how at the long run affects student performance in the primary school and in the Basic Education Certificate Examination (BECE) organized by West African Examination Council (WAEC). Houang and Schmidt, (2008), Chavez et. al. (2015) as cited by Linor, (2017) several attempts have been made to link teaching and learning materials (including textbook) to students' achievement. In their analysis of the focus and coherence of curriculum documents, Houang and Schmidt showed positive relation between these documents and achievement across countries; they suggest a link can be established by analyzing aspects lying beyond the documents' content. When Chavez et. al. Studied the effects of two types content organization (as integrated approach and a subject-specific approach) they found students in the integrated curriculum scored significantly higher than those in the subject specific curriculum on a common objective test but not on standardized test. Textbook play an essential or active role in teaching and learning (Ezeife, 2002; Likpa & Adams, 2004; Melis, Goguadze, Libbrecht, & Ullrich, 2009). In addition to the quality of instruction and appropriate use of resources (Birenbaum et. al., 2007; Flores, 2007) textbook may be another source of inequality in education. Expectations of students' performance can be transmitted by several means (Kitchen, 2007); textbooks are certainly one.

Traditional way of learning mathematics

Taking a look into past years on how mathematics was taught would give a picture of whether we've been successful or not and inform government and decision making bodies in charge of mathematics education to enact policies and inform future researchers' about the direction in this regard to make mathematics teaching and learning better. About the traditional way of teaching mathematics textbooks were central and a key part of the teaching process textbooks were also a core to teaching, in this regard researchers have argued including

Romberg and Kaput, (1999) that mathematics is perceived by most people as fixed, static body of knowledge and the corresponding teaching approach is view as a careful sequencing of task designed to enable student to accumulate bits of knowledge by drills on number facts and computations. Senk and Thompson(Senk & Thompson, 2003).

In the Traditional way of teaching mathematics, students are made to obtain knowledge by “copy method" approach (Koseki, 1999), students are further charged to memorize facts or procedures without understanding and often not sure when or how use what they know and such learning is often quite fragile (Bransford, Brown, & Cocking, 1999). This was further asserted by (Ernest, 2004) that, in the traditional class ‘'the classroom task instructs learners to carry out certain symbolic procedures; to do, but not to think; to become automations, not independent exercise of critical judgment." (Ernest, 2004). (Silver, 1989) has argued that daily activity for most students in mathematics classes consists of watching a teacher work problems at the board and then working alone on the traditional problems provided by the textbooks or by a worksheet (1989, p.280). (O' Neill and Mc Mahon, 2005) further stated that mathematics has always been taught the traditional way – Teachers are the main persons to teach through lectures and activities with students mostly in the passive receiver mode.According to (Dramani and Gyasi, 2003) instructional delivery in mathematics class by most basic school teachers is non-interactive and this encourages pupils to learn by rote memorization.

How mathematics textbooks are even used in traditional class is also evident on the fact that teachers are the center of knowledge transmission. Senk and Thompson (2003) said the textbooks used in a mathematical class are ‘'each topic was usually introduced by stating a rule followed by an example of how to apply the rule; then a set of exercises was given” (p.5). Linda & Pepin, (2001) in an Investigation of mathematics textbook and their use in three European countries made it clear that mathematics textbook are used vigorously by teachers as means of imparting knowledge, this report also suggested and buttress the point stated by Senk and Thompson and Silver et al.

Mathematics Teachers' Perception and Beliefs towards Mathematics Teaching and Learning/Textbook

Mathematics teachers' perception towards the teaching and learning of mathematics is very important to the improvement and the performance of student in mathematics. It is important to establish the fact that the perceptions teachers who facilitate the learning of mathematics cannot and should not be left out because indirectly it shape how teachers also perceive the textbook which is the integral part of this discussion.

Teachers' perception and beliefs towards mathematics cannot be ignored because it gives us the literature about how we can see math in the eyes of the facilitators of teachers if we think about reforming our way of seeing the approach to new way of making mathematics interesting to learners, for which this studies intends to do that through the mathematics textbook. Textbook is a dynamic part of any educational system. They provide the necessary guidelines for the teacher (Tamanna and Islam, 2018), so it is critical to know what belief and perception teachers hold towards mathematics textbook as it has the potential to directly or indirectly influence his/her practice. (Tamanna & Islam, 2018; Salehi & Amini, 2016) found that teachers possess a positive view about approach of mathematics textbook. The importance of mathematics in every facet of the economic and social life and the recent argument on the falling standard of mathematics globally and in particular Ghana; about the student achievement in mathematics has triggered the growing concern for researchers, educators and parents in their quest for the way forward over the last three decade (Blum, 2002).

Research in this regard has seen Research on Teachers' perception and beliefs towards mathematics has seen writers like Agyeman, 1993; Kraft, 1994; Aseidu-Addo and Yidana, 2004, Mereku, 2003). According to Fullerton and Lamb, (2002) three different but interrelating factors affecting mathematics teaching and learning are distinguishable in literature as cited by Ampadu, (2012): personal, classroom, school related factors. It is important to note that individual factors as beliefs and attitude, preparedness to learn; home factors as socio-economic status, parents educational background and occupation and classroom and school factors as the school physical environments, learning resources, teaching and learning strategies also affect teaching and learning of mathematics Fullerton & Lamb, (2002). (Fullerton & Lamb, 2002)

Teachers' perception and beliefs towards mathematics according to (Aubrey, 1997; Ball, 1991 and Mewborn, 2001) have studied the impart of teachers' subject content knowledge on their teaching and promulgate that teachers subject content knowledge impart on their teaching. Ernest, (1989) established good subject knowledge and the teachers beliefs or perception influences on how a teacher teaches. He further argued that the way a teacher teaches is immensely influenced by the teachers' theoretical perception and more importantly his/her beliefs towards the subject and broad research has been conducted into knowing teachers' perception of their teaching (Jurdark, 1991; Teo, 1997; and Perkkila, 2003). Mewborn,(2001) explained that although mathematics teacher' subject content knowledge plays vital role in their teaching ‘'merely knowing more mathematics does not ensure that one can teach it in a way that promotes students conceptual understanding" (p.28). Jurdark(1991) stated that mathematics teachers conception and the kind of beliefs they hold influence the way they teach, that is, teachers' perceptions of their teaching is a valuable indicator in promoting effective teaching and learning of

mathematics as what the teacher teaches and the way he/she is a reflection of the experiences and beliefs he/she holds (Ernest, 1989).

Perkkila,(2003) in his study involving Finish primary school teachers revealed how recollections of their experience and beliefs has greatly influence on their teaching and further added that, the way a teacher teaches can be traced back to how he/she experience teaching and learning of the subject (2003).Even though some the teachers holds the constructivist idea of teaching but practically it is absent in their teaching.

All the above studies outlined showed great call and demand of the mathematics curriculum and the national call for change in the teaching of mathematics and its impact on teachers. However, the teachers' beliefs, perceptions and experience cannot be underestimated. This means a lot for us as a nation to wake up to the current way mathematics is being taught and the new way to design a corresponding textbook to meet the needs of learners in a constructivist approach.

Teachers' perception of their teaching According to (Ahmed and Aziz, 2009) teachers' perception of their teaching and how they teach is of great value in determining the effectiveness of mathematics teaching and learning and thus reinforces the teachers' decision making. Handal and Herrington, (2003) also explained that ‘'successful curriculum change is most likely to occur when the curriculum reforms goals relating to teachers' practice takes into account of the teachers' beliefs" (p.65). Ernest, (1989) established that, reforms cannot take place unless teachers' deeply hold good beliefs about mathematics teaching and learning changes. Smith III, (1996) explain that teachers' perception of their teaching practices have always been in favor of new curriculum in principles. (Schoenfeld, 2002; Spear, 2005; Ernest, 1989) have investigated into mathematics teachers' beliefs and how these beliefs impact teaching and learning of mathematics. Makama,(2005) as cited by Clement et al.(2015) explained that mathematics teachers hold different perception towards mathematics curriculum and it teaching and therefore concludes on the fact that their perception had contributed to the abysmal performance by student. It is important to talk about teachers' perception in this study because it would at the end give us a clear picture of what teachers think and do situated in a context of educational reform. After addressing the concerns and problems of our mathematics textbook the results or recommendation which will be implemented must be done by teachers again taking into account it educational reform which is also a motive of this study. It would be incongruous to leave it out with having to expound or exhaust the literature on perception because it gives us a fair idea of what has been done and to get into the minds of those who would be task to implement whatever decision that comes out of this study t and the way forward in improving quality education.

Students' Perceptions and Beliefs about the Teaching learning of Mathematics

Students' perception and beliefs towards mathematics greatly influence student performance and how mathematics is developed in every country. The school curriculum is a major factor in shaping the quality of education (CRDD, 2007) likewise the student perception and belief system that affect the teaching and learning of mathematics (Wong, 2000) and this calls for views and how to approach this to the advantage of teaching and learning of mathematics in Ghana. A comprehensive report on compulsory education has revealed that mathematics, next to English, is perceive by learners as the most difficult subject. (Awanta, 2009) stated that, the proportion of students who encounter difficulties learning mathematics increases from primary school grade three (3) onward. It is therefore important to find out from the student point of view why these problems persist. Ahmed & Aziz(2009) argued that collecting data from student regarding their teachers' teaching provides meaningful data of what their teachers do. They further stated that collecting data from student about their teachers' teaching is important as their perception is ‘'colored by challenging and interesting experiences that allow them to observe teaching and learning behaviors more intimately than their teachers" (p.19). Ahmed and Aziz further stated by doing this enables the teacher to assess his/her teaching as data collected provides direction and suggestion for the teachers' future improvement.

Data about student perception about the teaching and learning of mathematics and how they perceive the textbook is important to stakeholders because it allows for proper assessment and evaluation since the “textbook is an embodiment of the curriculum”. Assessment and evaluation is important in every system since it the bases for reforms to take place, it gives a fair idea to what should be included and excluded in every reform courtesy assessment and evaluation. Assessment and Evaluation before enrolling new curriculum reforms have been carried out in other part (Lawton, 1989; Skilbeck, 1984). But in Ghana no proper assessment is often done because most governments are always in a rush to implement policies promised the people. “Mathematics counts" (Cockroft's Report of committee of Inquiry into teaching of mathematics in schools: Cockroft, 1982) of the United Kingdom and “Everybody count” (Report to the Nation the future of mathematics Education: Mathematical Sciences Education Board, 1989) of the United states are two well know examples into mathematics education. Rawnsley,(1997) explained that students develop a more positive attitude towards their mathematics lessons where the teacher is considered to be highly supportive and gives the student the chance to play an integral role in the teaching learning process. Research has also showed that using student feedback and ratings has proved to be successful and reliable method to measure teachers' instructional practices (Centra, 1993;

centra, 1995, Arthure et. al. 2003) According Arthur et. al.(2003) using teachers' view as a way of assessing his/her teaching is not reliable since teachers' views are likely to be skewed, moreover, it is the student who are directly affected by the teachers actions and inactions.

On students' perceptions and beliefs about mathematics, Ampadu, (2012) argued that students perception of their teachers' teaching is a collection of mixed reactions where the teacher employs both teacher-centered and student-centered approaches in their teaching. Ahmed & Aziz(2009) further buttress the assertion that most students have positive attitude towards their teachers' teaching methods have a direct impact on their leaning experience. Mathematics Teaching and Learning strategies in PISA(OECD, 2010) reported a positive association between student-Teacher relation as a variable to improve learning in mathematics, this goes to emphases on the point that student enjoy and learn mathematics base on how they perceive their teacher and the learning climate in their school and class. Over the years, the way student perceives a teacher or a subject especially mathematics determines their success or failure in that subject (Audu, 1995). Skaalvik & Federici, (2014) reported research finding that have positive perceptions of teachers of are associated with positive educational outcomes such as students' engagement. How are they related to "textbook"? Most of the articles are about teaching and learning. You need to focus on your topic!

Perception is the way people judge others with whom they are in contact (Allport, 1968). (Ajai & Iyekekpolor, 2016) reported that students' perceptions help the teacher to reformulate the best approach that will portray him as a "friend" of the students to provide an ideal mathematical learning environment and ensure better achievement.

New wave of Teaching Mathematics: The Constructivist Learning Approach

According to Lappan (1999, cited in Senk and Thompson, 2003 p.16) "we've had the longest running experiment in human history about whether rote memorization of facts and skills work, and it doesn't work". Students are coming to the universities and into the work place not understanding mathematics. Why wouldn't I try something new? Lappan quizzed. This call according to Lappan had raised concerns and the awaking of a new way of teaching mathematics to learners in a more practical way. It call therefore fit into the constructivist theory which is the theoretical framework for this study.

The National Research Council (1989, cited by NCTM, 1991) stated that the effective teachers are those who can stimulate student to learn mathematics,… to understand what they learn, they must enact for themselves verbs that permeate the mathematics curriculum; 'examine,' 'represent,' 'transform,' 'solve,' 'apply,' 'prove,' 'communicate,' This happens most readily when students work groups, engage in a discussion, make a presentation, and in other ways take charge of their own learning (p.2). Learning according to the constructivist is very personal yet social as students firstly try to make meaning out of what's brought in front of them, then through social interaction with peers and teachers, put the new information into proper order or structure (Hein, 1991).

Constructivism has become relevant as a first principle of learning in mathematics. Wood, Cobb, & Yackel (1995) have argued that mathematics should not be viewed as objective knowledge, instead, it should be perceived as an active construction by and individual that is shared with others (p.405). Cooper, MacGregory, Smith & Robinson as cited by Froyd and Sampson (2010) also showed that student centered learning has led to increased learning among students, better understanding of concepts, able to handle more complex situations and critical thinking, Higher attendance to class more independent and better confidence. Kember and McNauhght, as cited in Kember(2009) further stressed that meaningful learning is bound to take place when students are actively engaged with a variety of learning tasks especially in discussion on any important learning activity.

In using constructivist theory in teaching mathematics, learners are not passive recipient of information but are active agents in constructing their own knowledge, learners involves the construction of new understanding by combining prior learning with new information (Brooks & Brooks, 1999). Constructivism presents the idea that the learner is much more actively involved in a joint collaboration with the teacher in creating new meanings (Artherthon, 2010). Under the new wave of teaching mathematics Marzano(2004) explained that connecting mathematical concepts with real-life situation creates interest among the students and in the meantime, it helps students to learn the concepts. This study supports earlier findings of RMERC(1999), Brune(2010) also supported Marzano by stating that solving a problem by inquiry approach enhances students learning by developing thinking skills. Student-centered approach of teaching mathematics gets student to be more extrinsically motivated and learn important skills such as critical thinking and problem solving (Zakaria and Iksan, 2007; Johnson, Kimball, Melendez, Myers, Rhea, and Travis, 2009; Froyed & Simpson, 2010). (Cornish, 2007; Quitadamo, Brahler and Crouch, 2009) further stated that student by sharing are able to check on other people's understanding and perceptions and consolidate or strengthen what is already known to what they have just listened. This point is to enable researchers and textbook designers to include and design mathematics textbook to make room for group learning or peer teaching so as to enhance collaboration between students.

(NCTM, 1989) provided a new wave of change affecting how mathematics should be taught and learned in

schools, in this agenda, it was noted that there was the need to pay particular attentions to how mathematics is taught instead of concentrating on what mathematics was taught in schools. Liu and Li (2010) argued that the Chinese mathematics curricular experienced changes in "many different aspects of mathematics education ranging from what is valued for all student to learn, how mathematics should be taught and learned, how the assessment should be viewed and used (p.10). They further established that the purpose of this dramatic change was to help and motivate students in learning mathematics through creativity and independent learning which stimulate students' conceptual understanding and interest. According to (NCTM, 1991) the purpose of this new way of teaching mathematics was to increase student participation and engagement in the teaching-learning process by decreasing memorization of algorithms and reducing teachers power of being the disseminators of knowledge to becoming facilitators in the teaching-learning process.

(MoESS (2007) stipulated how the new national mathematics curriculum should look like and therefore highlighted the importance of students' active role in the teaching-learning process, which represent a shift from teacher-centered to learner-centered approach to teaching mathematics. The new curriculum like other school curricular around the world is underpinned by the epistemologies of constructivism and it advocates for a change in teachers' role as custodian of knowledge to facilitators in the teaching learning process (Ampadu, 2013). On the awakening of the new wave of teaching and learning of mathematics (Ampadu, 2013) in his study reveal that teachers are aware of the requirement of the national curriculum, the majority of these teachers have not fully conceptualize these ideas and it's requirements in their classroom discourse. In general, although most of the teachers professed that they used a student-centered approach to teaching; teacher-centered methods were most used. Asuah, Yakubu, Aseidu, & Arthur (2016) stated that many teachers agreed they effectively implement constructivist instructional strategies but only a few a teachers said they would be able to implement the constructivist instructional strategies.

Under the new approach, teaching requires teachers who understand pupils' existing ideas, beliefs and practices that are able to create learning experience that allow pupils to either accommodate or restructure their knowledge framework for new learning (Myer, 2004). In constructivist classrooms, pupils are able to think, reason, communicate, reflect upon, and critique the mathematics they encounter; their classroom relationships become a resource for developing their mathematical competencies and identities (Turnuklu and Yesildere, 2007). (Mary, 1999) further stated that constructivist teachers are able to create flexibly an opportunity for pupils to construct their own knowledge and use energy in a meaningful way in the learning environment. (Gravemeijer, 1994; Treffers, 1991; Freudenthal, 1991) suggests that students should be given the opportunity to experience a process similar to the process by which a given piece of mathematics was invented. (Silver, 1989) argued that "to gain mathematical power, students needs to make conjectures abstract properties and relationship from problem situations, explain their reasoning, follow arguments, validate assertions, and communicate results in a meaningful form". Windschitt(2002) acknowledged that the profound challenge for teachers are not associated merely with acquiring new skills but with making personal sense of constructivism as a basis for instruction. Even though most teachers have heard about the potential of the use of the constructivist instructional strategies to improve pupils' academic performance (Abbort and Fouts, 2003; Herman and Knobloch, 2004; Cunningham, 2004; Opoku-Asare, 2004; Kim, 2005) there is little research that has examined teachers' ideas, beliefs and practices of use of constructivist instructional strategies in Ghana. According to (Philip, 2000) Constructivism ideally represents most teachers' ideas, beliefs and practices of mathematics teaching in the classroom. In Ghana, there seems to be a general haste to cover topics without given pupils the opportunity to acquire deeper understanding of concepts or topics (Anamuah-Mensah, Mereku and Ghartey-Ampiah, 2008). This new wave is therefore to throw more light on the current trend in engaging student/learners to more effective and productive in the 21st century classroom using the constructivist approach to teaching and learning of mathematics.

Mathematics Textbook as the Locus of Change.

Many factors have contributed to the falling standard of mathematics education all over the world but in Ghana many research had been conducted to unearth these problems and attempt to find solution to this problem. Some the problems include institution failure, teachers, students, parents etc. Mathematics and it content presented to student in the textbook must also be considered and few of such research is limited in this regard in Ghana. Just as (Lebrun et. al., 2002). Argued school textbooks are fundamental in the shaping of the pedagogical framework of the teachers and the pupils. (Bernstien, 2000; Morgan, Tsatsaroni and Lerman, 2002) stated school textbooks appear as "tools" for the pedagogical guidance of the teachers, for the shaping of their teaching and the promotion of the "teaching-learning" process in such a way as to be adapted to the age-related capability of the pupils in the particular grades they are designed for. Since textbook are the "carrier" of the content through which knowledge and what the curriculum want teachers to teach to the learners and its importance is worth studying. Basil Berstein's contribution to the theory for the analyses of the way, in which the content of school mathematics textbook is shaped, is significant, and my study will make little use of the concepts of classification (Bernstein, 1991: 2002).

School textbooks implement the intended curriculum from the official education policy, transforming the teaching objectives and guidelines that are formulated there, into teaching content, in other words into a curriculum that can be enacted in the school classroom.(Valverde et. al., 2002; Ball, & Feiman-Nemser, 1988). Research on the contribution of mathematics textbooks to teaching and learning has only been identified in recent decades(Konstantinos, Lavidas & Koustourakis, 2018) Research shows that math textbooks comprises the basic tool teachers use in their teaching(Schmidt et. al., 1996; Roth McDuffie and Mather, 2007). They help the teachers determine the pace and the timing of the teaching recommend projects for the pupils and determine either directly or indirectly what is to assessed (Koustourakis & Zacharos, 2011). Research finding reveals that the dependence the teachers and pupils have on the mathematics textbook is more marked than the dependence on the textbooks for other subjects on the curriculum (Fan et. al. 2013). The math textbook is often the chief material the teachers base their teaching on (Grouws et.al. 2004).

The marked research interest in the multidimensional role of math textbooks has led in recent decades to a host of research in which the investigation of the content of the textbooks has been studied as an independent variable (Valverde et al., 2002). According to Fan et al. (2013) the analysis of math textbooks contains a wide range of research interests. We now quote some indicative examples of research orientations: some research attempts to trace the pedagogical intentions of math textbooks, their structure and the math objects from which they draw their particular content (see: Pepin & Haggarty, 2001; Pepin et al., 2013). Other research focuses on particular areas of math, such as for example, the concepts of stochastic mathematics (Pickle, 2012), the concept of proportion (Dole & Shield, 2008), the manner of negotiating the concept of function (Mesa, 2004), on the degree of encouragement in the development of mathematical reasoning (Stylianides, 2009; Stacey & Vincent, 2009) and the way in which the issue of problem solving is negotiated (Fan & Zhu, 2000; Sun, 2011). There is a whole host of research concerned with the sociological frameworks and cultural viewpoints which are contained within the mathematics textbooks, as well as with the investigation of beliefs that are imprinted in their content, on the nature of mathematics and the manner of the formation of mathematical knowledge (see: Dowling, 1998, 2002; Koustourakis & Zacharos, 2011; Morgan et al., 2002). Other research concerns the use of textbooks in the classroom (Remillard, 2005; Zhu & Fan, 2002). In addition we encounter research which focuses on the comparative analysis of different math textbooks from within the same country or from different countries with the objective of determining differences and similarities (see: Fan et al., 2013; Fan & Zhu, 2007; Pepin & Haggarty, 2001; Johansson, 2003; Valverde et al., 2002). More particularly, in Valverde et al.'s (2002) comparative study of school textbooks from a number of countries, problems in incorporating the recommended reforms into the math textbooks were highlighted. In addition, in Fan and Zhu's(2007) multinational research, which focuses on problem solving, mismatches between the pedagogical aims of the curriculum and the school textbooks were found. The aim of this research is to find out whether the mathematics textbook which the both teachers and student have over relied on in the past decade is really yielding results and contributing to student performance and whether it represent enough the mathematical concepts of constructivism from the curriculum. Not much have been done in this regard especially perception both teachers and students hold when it comes to mathematics textbook and therefore I intend to look into how it has affect mathematics development in Ghana the context of educational reform and how best we can to improve it teaching and learning. As indicated earlier how mathematics performance among students across grades has performed abysmally and by this charged to look into how to improve mathematics education in Ghana. By this it important to look into how mathematics textbook and how teachers have applied the content has contributed or affect performance and to find a remedy.

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY
3.1 Introduction
This section highlights or discusses how the study was conducted. It outlines the procedures and the strategies which were used to collect and analyze data. It consists of the description of the research design, variables considered, location of the study, target population, sample size and technique, research instrument and their validity and reliability, data collection procedures and data analyses.

Research Design
Research design talks about the conditions for data collection and analyses of data. The research adopted a descriptive survey design /and an interview as it dealt with peoples' views, thought and hence was important to the study area. According the Grazino & Raulin (2000), descriptive survey design is often used to study peoples' feelings, thinking and attitudes about specific aspects or topics. Also according to Manuel & Medel (1976), it involves the descriptions, recording, analyses, and interpretation of the present nature, composition or process of phenomena. Some authorities in research described the descriptive method to be a fact finding or information gathering with analytical interpretations. According to Sanchez, this method in involves describing what already exist hence was relevant for this study as views and attitudes could not be directly measured or observed but

were inferred from certain cues which depicts and explain the existing construct.

This study seeks to capture how students view the mathematics textbook which indirectly influences their behavior or attitudes towards the learning of mathematics. The data for the study was obtained through the use of prepared questionnaires given to students and teachers to collect views attitudes variables on the various themes. The responses were organized and analyzed both in qualitative and quantitative approaches then summed up in a descriptive manner according to the themes.

Variable

Dependent variables included the teachers' and students' perceptions towards current mathematics textbook which were determined and influenced by the mathematics textbook (independent variable), simply put they are responses from our participants. They represent the total influence from the effects of the independent variables. It was measured by the tallying and taking cues and from the analyses of the data. Independent variables included those aspects which have an effect on dependent variables though indirectly. They included the students' and teachers' perception, beliefs, and how learners' views of how the mathematics textbook influenced her/his attitudes and performance, these factors captured the part of the research which has no manipulative control; but could be measured through the use of predictor variables including both teachers and students' views on the mathematics textbook, the value, the interest in learning mathematics, it importance and future expectations indirectly. The independent variables include the aspect the researcher measured, manipulated, or selected which includes whether textbook prompts interaction, initiates learning, enhance collaboration and team work, and integrates technology that promotes hands-on learning, whether it shapes the values of learners, works as tool/handbook to promote thinking and whether it relates to real-life applications. This would be measured using some statistical tools percentages, bar/pie charts, normal frequency table etc. A qualitative analysis would be use to analyze the interview questions which would help us to understand how to improve and design the mathematics textbook in the future if government deem it so.

Location of the study and Target Population

This study was carried out in the central region of Ghana precisely Asikuma Odoben Brakwa district, this district was selected for this study because it has the perfect conditions to help gather the data. There are 412 public basic schools in the area, with 106 Junior high schools. The districts were particularly selected because I have first-hand information as a teacher in the district. Any other district could have be selected for this study but like I said for the purpose of this study Asikuma Odoben Brakwa district like many other districts have schools that I had quick access to and makes it convenient for me. Based on my experience in the district unlike in the city centers were some teachers don't use the textbook provided by the government, in this district even though not all teachers use the government provided textbook but at least 90% of teachers use this textbooks for that reason it makes it possible to generate the kind of responses needed for this study. This research is representative in the sense that all government schools in the country are supposed to use the mathematics textbook provided by the government at all levels of learning. Need to discuss the representativeness of the district or its unique feature worthy of investigation

Target Population

This study targeted public junior high schools in the central region of Ghana particularly Asikuma Odoben Brakwa district which have 412 public and private schools. 20 schools were selected in the district for the study due to the fact that most schools share a lot in common. In the 20 sampled schools, there were about 800 second and final year students for the student population but only 160200 were selected as participants from junior high school one to three and 56 teachers as well. These students were selected because it is believed that they can read, understand and answer the questionnaires appropriately.

Sampling Techniques and Sample Size

These includes the various methods of selecting the sample and how the sample size would be arrived at

Sampling Technique

The following sampling techniques were adopted for the purpose of this study. They include; purposive sampling, convenient and stratified sampling techniques, this would enhance the variability and make it more representative. These methods were used as follows:

1. Purposive Sampling as used in the central region precisely in Asikuma Odoben Brakwa districts respectively has both 412 public and private schools with 106 junior high schools. For the purpose of this study only government schools were selected. These were categorized into public and private schools how it is a purposive sampling? Include both public and private? Need to clarify
2. Stratified Random Sampling - this method was used to ensure fairness in the categorization of the

schools, convenient sampling as used here was to ensure accessibility given that most schools were performing at the equal levels.

3. Stratified Sampling as used in this study made room for ability groupings and gender. It created room for equal opportunity for participants to be selected; in order to ensure gender equality Stratified sampling was use to improves the accuracy and representativeness of the results by reducing sampling bias.

Sample Size

According to Ary et al (1972) 10%-20% of the total population is the preferred sample size in a descriptive research. A sample size of the preferably 20% of the total was appropriate given that most schools had equal level of opportunity. Mugenda & Mugenda (2003), stated that appropriate sample size should be at least 10% of the total population. In this study, the total population of the second and final year participants is made up of the junior high school, students of the 20 schools were selected; 150 students from all 20 schools were selected, participants from junior high school level three, two, and one respectively each from each grade totaling 150, these student or participants were engage. Same procedures were conducted to select a total of 56 teachers for this study which represent 20% of 280 teachers in all 20 schools, 10 Heads from across this were interviewed.

Research Instrument

This research basically made used of questionnaires and interviews which were designed by the author for both teachers and students selected to participate in this study. The questionnaires included both open-ended and closed-ended. The closed ended questions were meant for the student in order to elicit thought process and their perception about the mathematics textbook while the teachers were made to answer the open-ended questions and interviews. All participants were asked to tick the right responses in relation to the statement. The questions were design to capture opinions, beliefs and views of all participants in relation to the subject as adopted from the modified Fennema-Sherman attitudes scales of (1976). The interview is intended to give further explanation in places where the questionnaire couldn't cover and allow proper understanding and analysis to be done.

Questionnaires are the most preferred method compared to others since it is the most appropriate method in dealing with a larger population or sample size. Kothari (2003) argued that questionnaires are useful in that it serves a large population giving the respondents adequate time to give well thought time to give well thought out answers.

Validity

In ensuring validity of the study, a check was done by revising the questions to get rid of ambiguity, wrong spelling and phrasing by the subjecting the questions to the supervisor in order to ensure it conveyed the intended ideas to the respondents. In order to ensure validity, pretest was conducted using the instrument in a pilot in one of the schools which would be excluded in the final study. To confirm the validity of the questions, the questions were matched against the stated objectives of the study by comparing and checking the questions with the stated objectives. The questions are the true reflection of the objective stated.

Reliability

Research reliability is the degree to which research methods produces stable and consisted results. A specific measure is considered reliable if its application on the same object of measurement if the number of the time produces the same results. Piloting was done in different schools apart from the ones sampled; the schools chosen were of the same status and had same facilities and performance. The results from the schools were compared and it produces consistency though they may not be valid.

Alternatively, test-retest reliability was also used to measure the degree to which the same results could be obtained in a repeated trial. One school had been used to obtain responses in the same subjects but at different time e.g. in a difference of two weeks. It was expected that 1st and 2nd administering of the trials would be nearly the same if the instrument was reliable (Orodho, 1999). In other instances; the two sets of results could be compared by calculating a correlation coefficient which was not adopted by this study.

Data Collection

The researcher first informed the districts directorate about the date and time of the research and the information he seeks to collect from the schools for research purposes. This information was sent by a letter to the district director of in-charge of supervision, he then booked for an appointment dated with the schools for the administering of the questionnaires. The questionnaires were distributed to the sampled schools on the actual day with the permission already sorted; the teachers involved were also given their questionnaires. The researcher went from schools to schools to do the distribution by himself. The respondents were made to understand that their anonymity was been protected and the work was only meant for research, the completed questionnaires were then kept safely for the researcher to pick.

Data Analyses

The data collected was checked, read, revised and marked with coding and groupings done according to the themes or variables considered for the study which reflected the objectives. The data was captured in the statistical package for social sciences (SPSS) from where the analysis was done jointly for all the schools considered and for easy comparison of factors. The method of analyses included both qualitative and quantitative methods.

Qualitatively similar information was grouped into same themes for easy analyses and in making conclusions, quantitative method; simple frequency tables and percentages were calculated and inferences were drawn by comparing these figures. Likewise, hierarchical analyses of attitudes were done by calculating the percentages of each variable to determine the significant factor. In the open-ended items or questionnaires descriptive analyses or narration was done or used. Summary, conclusion and recommendation were drawn depending on the findings and the analyses done.

Logistical and ethical Consideration

This research followed all the logic and ethics of research world-wide. The consent of participant were first sort from the education directorate, teachers and then student were asked to voluntary participate. Explanation was given to student about what information the research seeks to collect and that no harm was intended with whatever information provided would be kept confidential.

Anonymity of participant was also assured and help from teachers were sort to help ease stress or tension among participants given that the item were not exams but was only meant for a research. The research intended to only assess those components that are of relevance to the research and this was communicated to the participant, the teachers who helped in administering the questionnaires sampled the right participants by explaining or reading the instructions to the students so that they could know how to answer the question.

CHAPTER FOUR
PRESENTATION OF FINDINGS

This chapter contains and represents the findings of the study base on the data collected from the students and teachers and analyzed according to the grounded theory methodology. The data was analyzed using percentages, mean and graphs in line with the themes and the objectives of the study. The objectives of the study were:; to determine the perception of teachers' towards the mathematics textbook in teaching and learning, how junior high school students perceive the mathematics textbook in learning mathematics, determine if the mathematics textbook is good enough according to the teachers' and students' perspective in delivering a learner-centered constructivist approach to learning mathematics, and seek to make recommendation based on this perception on how to improve the quality of the mathematics textbook in Ghana.

The Dimensions

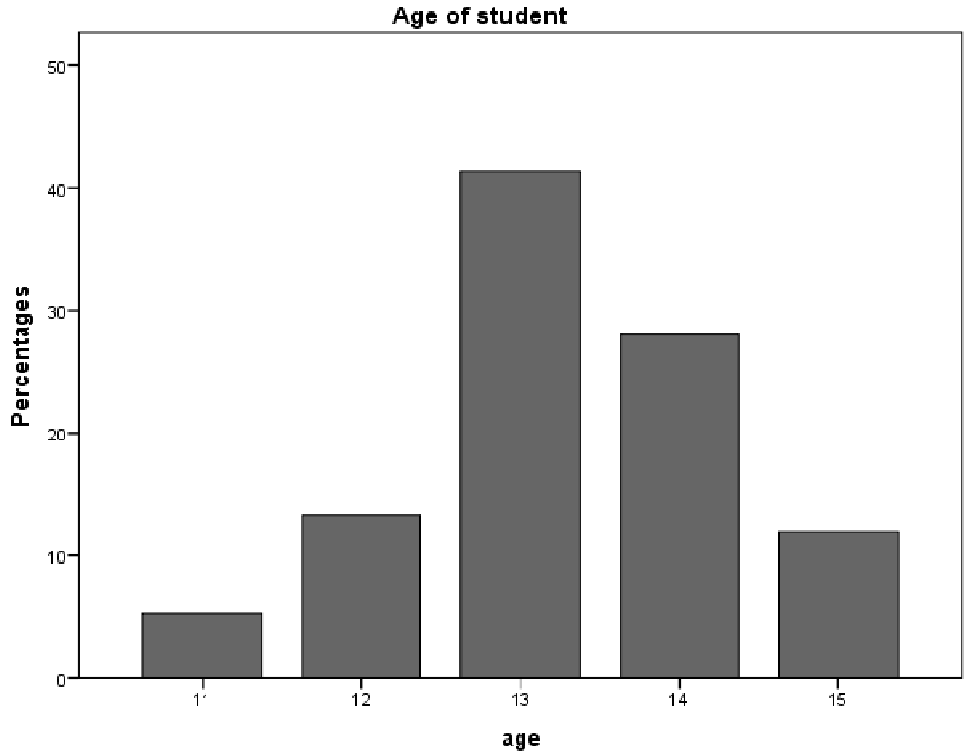
In analyzing the data that was collected, the researcher designed and categorized the objectives into dimensions/variables to enable easy measuring and understanding of what went into the questionnaire that were responded to by the respondents. The dimensions were; Textbook prompts interaction, Initiates learning/Learner involvement/Language, Enhances collaboration and team work, Integrates technology that promotes hands-on learning, Whether it shapes the values of learners/C' creativity, Works as tool/handbook to promote thinking, It relations to real-life applications, and whether the textbook delivers mathematical concepts effectively to learners understanding.

Profile of Respondents

A total of 221 questionnaires were successfully filled and collected for the study. 150 questionnaires were filled by the students, 56 were filled by teachers, and 15 Heads of basic were interviewed. In the 221 respondents that filled both questions and interviews, students represented 68% represented students, 25% represented teachers and 7% represented Heads of basic elementary schools respectively. The students aged between 11-15 years, the age range for teachers is between 18- 60 years and 30-60 for heads of basic schools. The figures below explain into details the demographics of the respondents.

***Figure* 4.0 Age of students**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	11	8	5.3	5.3	5.3
	12	20	13.3	13.3	18.7
	13	62	41.3	41.3	60.0
	14	42	28.0	28.0	88.0
	15	18	12.0	12.0	100.0
	Total	150	100.0	100.0	



Shows the age of teacher who responded

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-20	2	3.6	3.6	3.6
	21-30	29	51.8	51.8	55.4
	31-40	23	41.1	41.1	96.4
	41-50	2	3.6	3.6	100.0
	Total	56	100.0	100.0	

Out of the 56 teachers who responded to the questionnaire 33 were males whiles 23 were females representing 58.9% and 41.1% respectively. The students who responded to the questionnaires are in grade 8 and 9 respectively and their genders were also equally tallied below. The qualification of the teachers were also collected and their corresponding teaching experience.

***Figure* 4.1 Gender of Teachers who responded**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	33	58.9	58.9	58.9
	female	23	41.1	41.1	100.0
	Total	56	100.0	100.0	

Students Gender/Grade Frequencies

		Responses		Percent of Cases
		N	Percent	
Gender and Grade of students	Gender	70	51.5%	65.4%
	Grade	66	48.5%	61.7%
Total		136	100.0%	127.1%

Gender of Teachers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	33	58.9	58.9	58.9
	female	23	41.1	41.1	100.0
	Total	56	100.0	100.0	

Out of the 56 teachers 23 have diploma certificate representing 41.1%, 28 have bachelor representing 50% and 5 have Master's degree representing 8.9%, whiles 58.9% of males and 41.1% females teachers responded to the questionnaires.

***Figure* 4.2 Teachers' Qualification**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	23	41.1	41.1	41.1
	Bachelor	28	50.0	50.0	91.1
	Master	5	8.9	8.9	100.0
	Total	56	100.0	100.0	

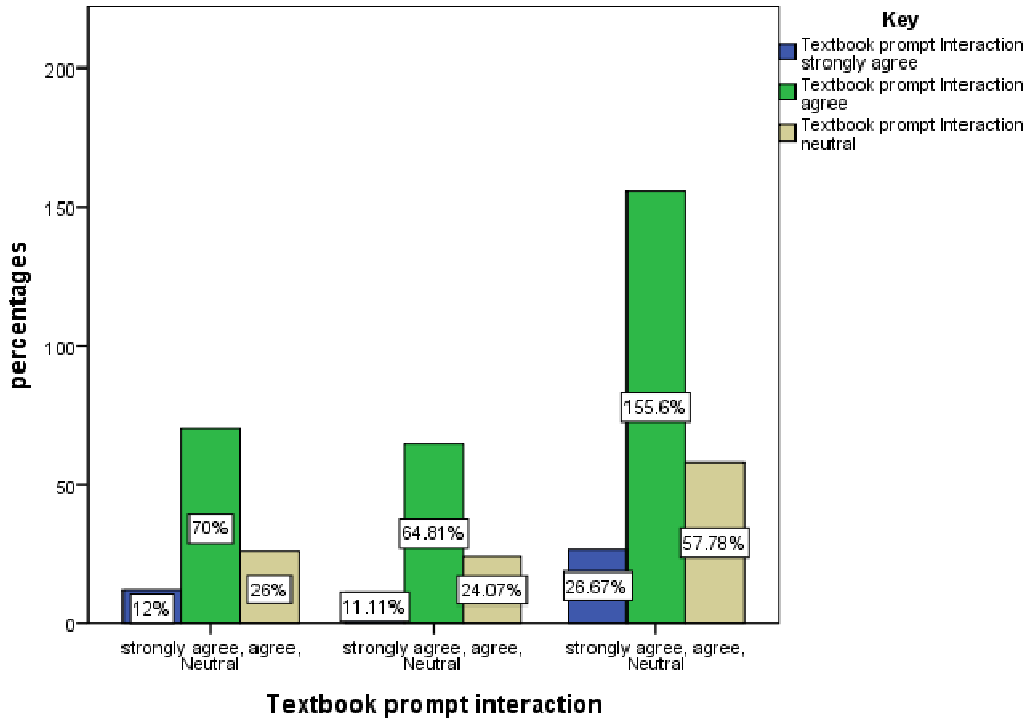
Teachers' and students' perception towards mathematics textbook in the teaching and learning of mathematics.

This study sought to determine the perception of both students and teachers towards mathematics textbook and whether it helps them to appreciate mathematics as a subject. On the part of the teachers, the study seeks to investigate their perception toward what they make of the current mathematics textbooks and whether it helps them to deliver or engage students using the constructivists approach in delivering lessons. The responses were for the teachers were rated as strongly agreed (SA), agreed (A), not sure (NS), disagreed (D) and strongly disagreed (SD). On the other hand similar responses were taken from the students to assess the same subject or topic but their responses were different from that of the teachers. Students responses were rated as Yes, No, and Not sure. Percentages were used in making comparing and conclusion.

***Figure* 4.3 Teachers responses on whether textbook prompt interaction during learning.**

Teachers' Interaction Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook prompt Interaction	strongly agree	12	11.1%	26.7%
	Agree	70	64.8%	155.6%
	Neutral	26	24.1%	57.8%
Total		108	100.0%	240.0%



Students' Interaction Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook prompt interaction	Yes	126	28.0%	84.0%
	No	228	50.7%	152.0%
	Not sure	96	21.3%	64.0%
Total		450	100.0%	300.0%

It is clear from the table that most teachers agree that the textbook prompt interaction among teachers, most of them agreed whiles those who are not sure followed and lastly very few of them were of the strongest conviction that textbook prompt interaction. On the other hand, 50% of students feel that the textbook doesn't prompt interaction among them during studies, 21.3% were also not sure about whether the current textbook prompt them to learn.

Textbook Initiates learning/learner involvement

Figure 4.4 Teachers' perspective on textbook Initiates learning.

		Responses		Percent of Cases
		N	Percent	
Textbook initiates learning	strongly agree	54	13.8%	96.4%
	Agree	151	38.5%	269.6%
	Neutral	46	11.7%	82.1%
	Disagree	112	28.6%	200.0%
	strongly disagree	29	7.4%	51.8%
Total		392	100.0%	700.0%

Students' perspective on textbook Initiates learning

		Responses		Percent of Cases
		N	Percent	
Textbook Initiates learning	Yes	121	26.9%	80.7%
	No	230	51.1%	153.3%
	Not sure	99	22.0%	66.0%
Total		450	100.0%	300.0%

The findings in the figures above explains the variables that intends to measure how the textbook initiates learning in students and how it involves them in the teaching and learning of mathematics, this just like all other variables are from the teachers perspective and followed by the students point of view of the variables. 13.8% of teachers strongly agreed, 38.5% agreed and 11.7% were neutral, 28.6% disagreed and 7.4% strongly disagreed. The students were very straight forward with their responses on the statement that 51.1% said “No” to fact that the textbook doesn't initiate learning in the learning environment where they find themselves.

Textbook enhance collaboration among students

Figure 4.5 Teachers and student positions on textbook enhancing collaboration and team work.

Teachers' position (Collaboration Frequencies)

		Responses		Percent of Cases
		N	Percent	
Textbook enhance collaboration/team work	strongly agree	15	14.6%	27.3%
	Agree	64	62.1%	116.4%
	Neutral	24	23.3%	43.6%
Total		103	100.0%	187.3%

Students' position (Collaboration Frequencies)

		Responses		Percent of Cases
		N	Percent	
Textbook enhance collaboration/team work	Yes	118	49.8%	81.4%
	No	119	50.2%	82.1%
Total		237	100.0%	163.4%

The findings on whether the current mathematics textbook enhances collaboration and team work in the above diagrams juxtaposing the teachers' responses to that of the student is so clear. Whiles 62.1% of the teachers agreed that the textbook enhance collaboration and team work during the teaching and learning process using the textbook, 50.2% of students responded in the negative. The percentage of teachers 23.3% who were neutral on the response is quite mentioning because majority of teachers in Ghana according to the data collected showed majority of teachers being Bachelor degree holders.

Textbook Integrates Technology that promotes Hand-on learning

Figure 4.6 Teachers' responses on textbook enhancing Technology Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook integrates Technology	strongly agree	22	25.0%	43.1%
	Agree	36	40.9%	70.6%
	Neutral	30	34.1%	58.8%
Total		88	100.0%	172.5%

Students' responses on textbook integrating Technology Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook integrate technology	Yes	72	30.4%	51.1%
	No	165	69.6%	117.0%
Total		237	100.0%	168.1%

From the diagram above it is obvious that most teachers feel technology is properly represented in quite remarkable 34.1% were not sure whether technology that promotes hands-on learning among students. Just 25% percent of teachers strongly agreed that technology is represented in the current math textbook. On the other hand, the 69.6% students said no technological tools to enhance hands-on learning; most actually felt that teaching of mathematics is too abstract during the learning process and will abandoned the learning of mathematics if the school authorities were to make mathematics learning an option. But 40.9% teachers and 30.4% students respectively believed that technology is actually represented.

The textbook shapes values and creativity of learners

Figure 4.7 Teacher responses on textbook shaping Values Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook shapes values of learners	strongly agree	43	15.4%	76.8%
	Agree	98	35.0%	175.0%
	Neutral	47	16.8%	83.9%
	Disagree	75	26.8%	133.9%
	strongly disagree	17	6.1%	30.4%
Total		280	100.0%	500.0%

Students responses on Textbook shaping Values Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook shapes values of learners	Yes	168	37.3%	112.0%
	No	167	37.1%	111.3%
	Not sure	115	25.6%	76.7%
Total		450	100.0%	300.0%

The findings in these diagrams above indicate simply that our mathematics textbook is performing averagely in terms of shaping values of learners. 15% of teachers strongly agreed believe that the textbook shapes values and makes students think critically what it means is that 26.8% teachers disagreed and don't believe that the textbook shape values of learners or helps in shaping values of learners or helps in shaping the creativity of learners in Ghana. On the part of the students 37.3% said the textbook promotes thinking among students, 37.1% also believe it doesn't promotes thinking and 25.6% of the students were not sure whether it

does or not.

Textbook as tool/handbook to promotes thinking

Figure 4.8 Teachers responses on textbook promoting Thinking Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook work as tools promote/thinking	strongly agree	48	17.1%	85.7%
	Agree	110	39.3%	196.4%
	Neutral	26	9.3%	46.4%
	Disagree	69	24.6%	123.2%
	strongly disagree	27	9.6%	48.2%
Total		280	100.0%	500.0%

Students responses on textbook promoting Thinking Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook as tools promoting thinking	Yes	167	37.1%	111.3%
	No	194	43.1%	129.3%
	Not sure	89	19.8%	59.3%
Total		450	100.0%	300.0%

The findings in the diagram indicated that the mathematics textbook in terms of working as a tool to promote thinking does not go down well with the respondents. On the position of the teachers 17.1% strongly agreed 39.3% agreed, 9.3% were neutral on the subject 24% disagreed and 9.6% strongly disagreed 9.6% to the statements. The student's responses to the statements were summarized as Yes 37.1% and No 43.1% and not sure 19.8%. The percentage of students who disagreed with the statement is quite remarkable.

Textbook must promote real-life applications.

Figure 4.8 Teachers responses on textbook promoting real-life application Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook promotes real-life application	strongly agree	74	22.0%	132.1%
	Agree	101	30.1%	180.4%
	Neutral	46	13.7%	82.1%
	Disagree	75	22.3%	133.9%
	strongly disagree	40	11.9%	71.4%
Total		336	100.0%	600.0%

Students responses on textbook promoting real-life application Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook promotes real-life application	Yes	80	17.8%	53.3%
	No	192	42.7%	128.0%
	Not sure	178	39.6%	118.7%
Total		450	100.0%	300.0%

The findings indicates that 42.7% of students are really pouring out their heart out in this studies were they get to say it as it is, for over the decades the textbook have not really imparted their lives and felt that the aspect that must introduce them to real-life application and concepts is missing and that the textbook doesn't impart them when it comes to it applications. 22.3% of teachers believe that the textbook doesn't promote real-life application.

Textbook delivers mathematics concepts effectively.
Figure 4.9 Teachers responses concepts Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook deliver concepts effectively	strongly agree	55	38.2%	98.2%
	Agree	72	50.0%	128.6%
	Neutral	17	11.8%	30.4%
Total		144	100.0%	257.1%

Students responses on textbook delivering Concepts effectively Frequencies

		Responses		Percent of Cases
		N	Percent	
Textbook delivers concepts effectively	Yes	113	25.1%	75.3%
	No	230	51.1%	153.3%
	Not sure	107	23.8%	71.3%
Total		450	100.0%	300.0%

The findings under these diagrams clearly indicated that most teachers and student were dissatisfied with fact that the textbook doesn't deliver mathematical concepts effectively. 11.8% were indifferent on the statement, but a hooping 51.1% of students said No to the fact the textbook doesn't deliver concepts effectively and 23.8% of them were not sure. This is also clearly violates the agenda to putting students at the center of the teaching and learning of mathematics. The study really exposes the dangers related to how learner-centered constructivist approach to teaching mathematics has been poorly implemented.

Qualitative results from the interview

The interview was not conducted and collected directly by the interviewer but were sent by mails and printed out before the coding and analysis was done. The interview guide has four main themes; general opinion on textbook, methods and content of textbook, how to improve the current mathematics textbook, and general standard and theories to support a good textbook for a constructivist class.

As part of the research, 10 heads of elementary schools were interviewed on the areas that were stated above, some of the questions are stated below and their responses. For the purpose of the interview the identity of the heads cannot be made known and therefore “H” will be used to represent each Head teacher and a number to distinguish between each respondent in this case. The questions below were asked and responses elicited from the heads. This heads were chosen because in they have worked with the Ghana education service for many years and had gathered enough experience when it comes to teaching, they have mentored many trainee and have been in the helms of affaires of the various schools for many years. Not many women in terms of percentage wise are heads but only one female head was interviewed the rest were men, they fall within the age range of 30 to 59 years, all the school heads are degree holders with some have master's degree. The heads are within the setting for which this studies was conducted and I think it appropriate to interview them since they have firsthand information with the schools within the same setting.

1. General opinions on textbook

I. What are your general views on the current mathematics textbook for the basic school?

II. Do you think the current mathematics textbook allows for creativity, critical thinking and collaboration among learners?

2. Methods and content of textbook

I. Do you think the methods employ by teachers allows learners to own, engage and communicate during lessons?

II. Do you think the methods used by teachers encourage the use of connected multiple representation?

III. Does the content in the math textbook provide several ways to solve questions?

IV. Does the math textbook encourage appropriate use of intellectual, physical and technological tools?

V. Do you think that the content of the math textbook represent, or include real-life experiences that can enable learners to learn with understanding?

VI. Do you think the language used in the textbook is simple enough for learners at their level to understand?

VII. How do you think the math textbook had contributed to students' failure?

3. How to improve the textbook

I. In your opinion, what do you suggest can be done to improve the quality of the textbook?

4. General standard and theories to support a good textbook for a constructivist class.

II. What are the recommended approach, design, educational theories that can be employ to improve the

content to include, increase active student participation in the classroom?

H 1, indicated that his general opinion on the current mathematics textbook for the basic school is average and that it only helps to deliver teacher centered approach even though the content contains a little evidence of learner- centered approach, "I will say it (textbook) contains only 20% of learner-centered approach". On the question 1(i) he stated that, due to the way the content of the textbook is structured, it does not allow or lend support to stimulate creativity and among students because the teacher is the one who has to organize the learning process and that students have to sit and take instruction as to how a particular mathematical should be solved. He again indicated that the methods employed by teachers does make little room to really engage learners during lessons, the textbook was design to enable and encourage connected multiple representation "but what effect will this be to a learner if he/she is not engaged properly during lesson" he stated.

The textbook needs improvement in terms of promoting collaboration, critical thinking, and creativity. H 2, on his general opinion, stated that textbooks are simply not appealing to learners, the textbooks allow for collaboration among learners because it difficult for an individual student to really understand the methods and therefore makes it room for collaboration among them but "am not sure whether it allows for creativity and critical thinking, because they only solve for procedural purposes". Students at a point own the lesson at other times too they don't, H 3 in his general opinion about the textbook he said "the current textbook need serious improvement" because it does not deliver the appropriate content in the 21st century global space in terms of learning mathematics and because it lacks the ability to impact stimulate creativity and critical thinking skill among students. Again, in this qualitative analysis, H4 and H5 were of the same opinion and therefore I decided to summarize their views together, they stated in their general opinion that the textbook has no problem but they feel that some mathematics teachers actually lack the pedagogical skills to be able implement and organize a successful learner-centered approach in the classroom, H6 stated in his general views about the current mathematics textbook that the rate at which the governments changes our textbooks is abysmal and thinks that it had contributed to the low creativity, critical thinking among students. H7 and H8 also made similar revelations and their responses were very straightforward to the interview questions and therefore I have put them together, their general views on the current textbook was that the textbook has no problem and actually allow for creativity, critical thinking and collaboration among learners, but they said that learners actually do not own the lesson and that they want teachers to go for professional development on how to allow students own the lesson during class.

, H9 and H10, In Ghana the basic requirement for becoming an elementary school head teacher is a bachelor degree but upon my further checks indicates that these head teachers have a masters' degree and so their answers to the questions actually reflected in their quality of answers provided, they indicated in their general opinion that base on the basic principles in theories that the textbooks were poorly constituted and for that matter can't allow students to think critically, be creative and collaboratively work among themselves. They went on to state that, since the textbook is theoretically weak, it cannot allow teachers to create an atmosphere where learners are allowed to own, engage and communicate effectively during lessons. This finding reaches consensus with my findings in the survey. In the quantitative analysis, it was discovered that majority of teachers and 50% of students believe that the textbook prompt interaction whiles on whether the textbook initiates learning 51% of students and 28.6% of teachers rejected this question. These figure says it all on the perception that the respondents hold concerning the textbooks that is been used to deliver concepts in our classroom.

On the Q2- the methods and content of textbook the Heads have mixed opinions about responses are stated below, H 1 stated the textbook in some instances provides for multiple approaches to solving some questions but it depends on the topic. On the issue of whether the textbook makes use of intellectual, physical and technological tools he just provided a percentage saying "it just 35%". "The language use for me is ok but I think it can be improved" He further stated that the mathematics textbook has contributed in many ways to the failure of students, if the textbook does not deliver and represent for students what it supposed to do, H2 exclaimed that teachers' methods do encourage connected multiple representation because each lesson is build up upon an existing concept but the textbook does not always provide several ways to solving questions. The math textbook does not encourage the use of intellectual, physical and technological tools because students are always spoon fed with how to go about solving the questions in the mathematics textbook. "Once I was in my office and one former student came to me and we happen to be chatting then he asked me, I will want to know the use of some of the things that we learned in school, like ($A=\pi r^2$), I understood perfectly what his problem was because it not like what he wanted to know has no real life application but he was just made to memorize the procedural method of using that formula to solve a mathematical problem but was never taught to apply in real-life setting". According to H 2 the language used in the textbook is ok but it has over the years contributed massively to the failure of students because students spend more time with their books than teachers and there if the mathematics textbooks are not self-explanatory enough for students cannot learn and passes their exams. H3, on the methods employed, said it does enable learners to communicate but does not enable them to own the lesson, the methods also used by teachers does not encourage the use of connected multiple representation. 50.2% of student believes

the textbook does not enhance collaboration and teamwork among students and by this, it clear and confirms what most of the heads are saying.

The current mathematics textbook is deficient in providing multiple approaches in solving math questions, inadequate in providing appropriateness in the use of intellectual, physical and technological tools, does not includes enough real-life experience but does not provide for hands-on learning approach among students "the language is not above the learners" he stated, "its contribution to student failure is evident in the final score/results of the students for all to see". H4 and H5 also expressed their concern towards the textbook on the fact the methods and content of the current mathematics textbook need to be improved, that teaching and learning materials should be made available by the educational supervisory body to make learning of mathematics real to learners. H6 on the issue of whether the methods used encourages connected multiple representations she stated categorically that it does because some of the teachers have less knowledge on the subject. The mathematics textbook we have in our schools provides "no" other methods for solving mathematical question. She made revelation that our entire educational system from the basic to the tertiary institution emphases on the humanities to the detriment of intellectual, physical and technological skills among students, that even if there are any technological skills to be impacted into students the teachers at the basic schools are not able to the task. The textbook as it is now does not include real-life experience for easy understanding of concepts during lessons but she also stated in his her write up that the language use is simple enough for the students to understand, she again agreed with the previous respondents that the textbook have actually contributed to students' failure in mathematics "because you don't expect to get a good result with a bad process".

H7 and H8 on their answer to question (iii) they just went straight to say "yes" this is quite strange for the first time for me to have straight answers to interview questions. They again agreed on the fact that there are several ways to solve the question in the textbook and that actually there are enough intellectual, physical and technological tools within the textbook but it been managed poorly, there are real-life application or experiences that enable learners to learn with understanding. The language is simple enough for learners to understand with their level. The textbook is only a link between curriculum and students and therefore the teachers are responsible for getting the curriculum and it content to the students and therefore the textbook is not responsible for the failure of the students. H9 and H10 stated that, "The textbook does not encourage the use of intellectual, physical and technological tools even though many students are doing well in trying to invent some technological gadget, equipment etc but the support from teachers, government and the country at large is not encouraging" they stated. By extension, they agreed that the math textbook has little inclusion of real-life experiences that enable learners to have a hands-on learning environment in our classroom, "they are always recipient of information in this modern era or age". They also talked about the fact that the language used in the math textbook good but the way the concepts are presented cannot be understood by and learner at their level to understand on face value and therefore had contributed immensely to the performance of students at the basic level. From the quantitative analysis 69.6% of students said no technological tools are implored to enhance hands-on learning, this confirm what the H9 and H10 said in these paragraph. It absolutely bizarre, in the 21st century not to have properly represented technological concepts in our textbook. This is in error and must be corrected ASAP.

How to improve the textbook and the general standard and theories to support a good textbook for a constructivist class, most of the heads equally expressed their opinions , on what can be done to improve on the current math textbook,(it is clear that the way to go is a learner-centered constructivist class that is need to make this changes that we need possible) H1 stated that, stakeholder consultation is needed so as to search for the best practices on the global scale, "the textbook needs to include more practical and self-solving method". H2 also stated that, the textbook should be learner learner-friendly and more flexible approaches to solving question should be adopted to give learners the confidence needed. On the part of H3, he said there are best practices are over the world for us to emulate especially from the Asian countries for us to see, they have set the pace in term of mathematics he concluded he didn't state and particular educational theory that can be implored to make the textbook user friendly. H4 and H5 were the first heads to express their concern that the constructivist approach to engaging learners in the teaching and learning of mathematics should be implored explored because it is gaining global acceptance when it comes to one of the best approaches in delivering a successful classroom experience. They wildly believe that it is the best way to go if we really want to see positive changes in the way mathematics is taught and learnt in Ghana. H6 in her opinion about how to improve the quality of the mathematics textbook she actually advocated for a cultural reintegration and inclusion on things that identifies us as a people, "we always adopt foreign means of solution to everything; we need to start thinking about culturally base approach to some of our problems". Let us improve our content by including hands-on learning/activities in our textbook so that learner can be free and happy to learn mathematics. H7 and H8, the textbook is only a link between curriculum and students and therefore the teachers are responsible for getting the curriculum and it content to the students and therefore the textbook is not responsible for the failure of the students. On whether the there are

ways to improve the quality of the math textbook, they said there are few improvement that can be done in the area of the practicality of the textbook to deliver hands-on learning.

H9 and H10, When ask about how to improve the textbook, they concluded that the government represented by the Ministry of Education and the Ghana Education Service should take an entrenched position in the constructivist approach in all levels of our educational institution especially those responsible for the training of teachers in the country to make sure teachers actually understand what their role is in the teaching and learning process. From the analysis that were run from the SPSS, 17.1% strongly agreed and 39.3% of teachers agreed that the textbook promotes critical think whiles while 37.1% students agreed (Yes) to the question, if these assertion is true then much needs to be done to increase these percentages above 50% by accepting to implement the constructivist approach have been tried and tested in other jurisdiction and approved to be the best approach just like H4 and H5 suggested in their submission about how to improve the standard of the mathematics textbook.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATION
Summary of the findings
Perception of students' on the current mathematics textbook.

The findings of the study indicate that the students have a negative attitude towards most of the dimensions that were measured in relation to the study of mathematics. The general findings showed that majority of the students in the basic schools dislike mathematics because of the way the mathematics textbook is structured and the ways they are taught. Most students showed the potential of excelling in mathematics study but it is clear that the way the contents are structured in the textbook does not help learners to explore, create and initiates learning. Looking at the percentage of students who felt that textbook doesn't prompt interaction among students is quite enormous. On the issue of whether textbook initiates learning/learner involvement, 51.1% of student interviewees said ‘no' to the statement that was asked. This is clear indication and a violation of the constructivist approach to teaching and learning of mathematics in the 21st century. Kannada textbook for standard VIII, IX & X published by Kannada textbook society stated that to judge if the content of the textbook meet the needs of the pupils, the textbook must try out unit wise in the real classroom situation in selected schools and the learners for whom it is written. In this case, the learners for whom the textbook is written have evaluated the textbook with their responses and which is obvious that they are not in favor of the textbook in initiating learning.

On the statement of whether the current mathematics textbook enhances collaboration and team work among students, majority of the students again said ‘no' to response to the statement. The textbook should encourage collaboration and team work among students. In the ideas of constructivism, learning should incorporate technology which will help put the students in a more advance position to embrace the growing trends and demands for creativity, exploring with technological tools in moving economies and countries into a robust and technological driven economies.

It will be oblivious of curriculum and textbook planners and designers to relegate the importance place on the mathematics textbook to instill in learners proper social and cultural values that are needed to propel a country and people into height where learners are made to respect societal norms, respect for the aged, consciousness to time, etc. which are needed to move a people into development-driven mindset needed for growth. According to (Schunk, 1991), “learning is an enduring change in behavior or in the capacity to behave in a given fashion, which results from practice or other forms of experience” (p.2). This shows that learners, prior to coming school setting, possess certain behaviors and values that the teachers or instructors with the help of the content provided through the textbook must fashion the learners to conform to certain values that are widely accepted. The constructivist idea of learning which allows learners to establish and construct meaning by interpreting information in the context of their own experience would automatically come to reality with directions and guidance by the instructors or teachers that they need to modifies their already existing ideas to conform in order to be a better individuals or citizens.

Textbook works as tool/handbook to promote thinking. Constructivism makes us understand that, critical thinking is one of the important trends in education relative to the dynamic relationship between how teachers teach and how students learn (Mason, 2010). Critical thinking shifts classroom design from model that largely ignores thinking to one that renders it pervasion and necessary (Cohen, 2010, Tittle, 2010; Vaugh, 2009). Fred C.(2011) also stated that critical teaching views contents as something alive only in the minds as modes of thinking driven by questions, as existing in textbook only to be regenerated in the minds if students. According to Fred, content is inseparable from thinking that generates, organize analyzes, synthesize, evaluate and transform it, and therefore 37.1% of students and 17.1% of teachers saying the textbook promotes thinking with those percentages among students is abysmal and thus the content must be reviewed and redesigned. At every level in the educational ladder and in all subjects, students need to learn how to precisely put question, define

context and purpose, pursue relevant information, analyze key concepts, drive sound inferences that generate good reason, recognize questionable assumptions, trace important implication and think empathically within different points of view (Dunn, 2010; Hooks, 2010; Leicester, 2010), and that is what our textbook should get learners to be doing during teaching and learning of mathematics.

In constructivism, a constructivist learning environment, which involves students in real world projects, is believed to be able to motivate students in learning (Andy Law, 2007). According to Andy, the real world experience must not only have a real end-user but also a connection to the community. Constructivists emphasized that a problem or a learning goal must be owned by the learner and suggest that learning should be situated in realistic settings. According to Andy Law, (2007) the adoption of simulated projects without real end-user is deemed to be less effective in motivating students in learning because the acquisition of skills requires real world experience. These studies found that only 22% of teachers strongly agreed that the current mathematics textbook promotes real-life application and 42.7% of students disagreed or said 'no' to the same statements. Most students believed that the current mathematics textbook does not promote real-life application, on few occasions students questioned some concepts in the mathematics textbook and actually wonder it real-life application because it has no end-user or connection to real-life or community. A real-world, community related project is a key component in learning environment and must be incorporated into our mathematics textbook.

Finally, on the statements on whether the mathematics textbook deliver concepts effectively, 38.2% teachers strongly agreed to the statements and 51.1% of students said 'no' to the statement while 23.8% were not sure. Since textbook is what provides the content which composes the concepts to be taught to learners, it is clear that mathematics textbook should help deliver concepts effectively to learners. It should be made simple and broken down into simpler methods for proper assimilation. According to the constructivist approach to learning the environment must stimulate learners to create, explore and participate in every activities been organized by the teachers. Constructivism focuses on students and their ownership of the learning activity, as in the example in the design of problem based learning curricula (Suvey & Duffy, 1995) in using query as a mechanism for defining curriculum and textbook. The fact that the textbook from the students and teachers point of views does not really and effectively deliver concepts is a course for worry and concern for the mathematics society in Ghana.

Impacts of Students and Teachers' attitudes towards the mathematics textbook

Students and teachers' attitudes affected the efforts and behavior towards mathematics textbook and learning in various ways. Learners who have positive attitudes towards the mathematics textbook enjoy mathematics because positive attitudes are synonymous to achievements or results and therefore learners are motivated, could complete assignments, do extra work, pay attention to the teacher, could not miss a lesson and are always prepared for mathematics lessons regardless of the presence or absence of the teacher. Quite a large number of students were in contradiction to this expectation which would show in their performance and would refuse to finish their assignments. Generally, the responses offered by the students showed a certain degree of uncertainty and negative responses on the part of students on the all statements submitted to them. The percentages of students who affirm the negative is quite enormous and therefore demand that something is done to salvage the remaining confidence left by the students about the mathematic textbook.

On the part of the teachers, the percentage for example on the statement whether the math textbook promotes real-life application on agrees and disagree is 30.1% and 22.3% respectively which indicated that the margins are not quite large. The responses performed averagely well but the numbers speaks volumes for itself and details are not quite good.

Finally, students put up negative attitudes towards the mathematics textbook, and this is fairly understandable because their performance in the Basic Education Certificate Examination (BECE) is not encouraging and because the students were affect by so many factors including the poorly designed, structured textbook with concepts that were not properly handled by teachers. The teachers on the statements were not quite forthcoming and most of them indifferent but the detailed analyzes on their various responses gives clearer picture on how they viewed and perceived the mathematics textbook. I felt most teacher in answering the questionnaire withheld giving out information, this reason cannot be traced, so also I felt did not quite vested in the theory of constructivism and therefore the reason for such performance.

Suggestion for improving the current mathematics textbook

Mathematics teaching and learning in the 21st century has changed but many teachers and textbook which serve as the link between curriculum, content and students remain much unchanged. This calls for action on the constructivist point of view. Constructivism is the new way to go in the teaching and learning of almost every subject and not just mathematics. (Jong Suk Kim, 2005) stated that constructivist teaching is more effective that the traditional teaching in terms of academic achievement and that constructivist environment was preferred by students to the traditional classroom.

During the years 2020-2021, millions of students are learning from homes and teachers are to learn how to teach virtual classes as most schools closed because of covid-19 with the devastating effects of covid-19. All of a sudden, every stakeholder in our educational system all the world has to make progress towards online classes. Whiles everybody must learn to adapt to the changes as a result of covid-19, an army of robots dances without music in Baltimore, US, appearing to take orders just arrived over the internet at one of Amazon's 177 distribution centers, in Cologne, Germany, a group of computer experts are putting together a new version of the Deepl translation engine which is revolutionizing the field of artificial intelligence base translation. While in Zhongwei, china where I am, the sun is raising on 43 square kilometer of solar panels located in the Tengger desert, which produce enough energy to meet the need of 1.4 million of Chinese.

What am trying to say is that, the world is changing at a faster pace in technologically driven economies all made possible by science and mathematics education at its best but education and mathematics which will help revolutionize our country and move the country into a technology economic resilient is moving at sail pace for lack of planning, initiative and lack of a sense of direction on the part of our governments and the educational sector as a whole. Our textbooks from the perspective of this studies lack every bit of quality to deliver a constructivist approach to students.

Our mathematics textbook must be able to do a couple of things if we want to achieve a constructivist approach. First of all, the textbook must prompt interaction and discussion among students, it must initiates learning and engage learners in the learning process, it must enhance collaboration and team work where learners get to brainstorm and work in group to enhance the quality of their thoughts. Textbook must integrate technology that promotes hands-on learning. According to (David H. Jonassen, et, al, 1999) “knowledge is embedded in technology and the technology presents that knowledge to the students”. From constructivist perspective, technology must be a tool to support knowledge construction and information as a vehicle for exploring knowledge to support learning by constructing etc.

Again, textbook must shape the values of the learners and creativity. As early as 1929, concerns were raised, that the way students learn in school resulted in a limited inert form of knowledge, useful only for passing examinations. It is therefore imminent that we must move away from such methods and generate the creativity of learners in our classrooms. According to Maddux, Johnson, & Willis (1997) knowledge cannot be taught in an abstract manner and that to be useful, it must be situated in a relevant or authentic context. Textbook must be a tool/handbook to promote thinking. Lai (2011) points out that critical thinking, from a psychological point of view, can be defined as the mental processes, strategies and representations people use to solve problems, make decisions and learn new concepts. (Sternberg, 1986, p.3) stated that the use of those cognitive skills or strategies that increase the probability of a desirable outcome. This is the kind of agenda we want our learners to gain as resultant effects of the textbook. The textbook must put forward content that will enable students to engage their minds and think critically to help the country.

Furthermore, textbook must help learners to relate concepts to real-life applications, the use of stimulating open-ended questions enhance learning experience for all students. Today, the challenges of teaching diverse student population are at the forefront of all educational initiative worldwide. The use of the constructivist teaching model can help teachers meet some learning challenges of our students with special needs and therefore bridge the achievement gap in the 21st century. It is the most effective teaching strategy that works well in an inclusive classroom, as learning begins with students understanding of a subject and is developed by participation in the realistic and meaningful learning experiences (Snowman, et al, 2009; Ultanir, 2012; Koh, Chai &Tsai, 2014; Kasbolah, 2012; Sultan, Woods & Koo, 2011).

Finally, textbook must deliver mathematical concepts effectively, students must be made to understand mathematical effectively and should make this possible by enhancing concepts explanation and it breakdown easy for learners to assimilate. According to (David Hilbert, 1902) mathematics begins with posing problems in the context of concrete activities suggested by the world of external phenomena. Students at all educational level seek concreteness and are naturally curious and therefore the textbook must initiates this through the concepts that are been introduce to learners.

Conclusion of the study

This study “Are they good enough for teaching in a student-centered class: Investigation into teachers' and students' perception towards mathematics textbook for Junior High schools in Ghana” seeks to evaluate the quality of textbook, and understand whether the existing textbook is or had achieve it purpose and I would want to evaluate it from both teachers and students perspective, beliefs, attitudes and what they think about the textbook and whether it's serving or had served its purpose. The studies find out that within the setting of this study, believed that the textbook doesn't in its entirety benefit and deliver or promotes interaction among, enhance collaboration and team work, integrate technology, shapes values, textbook as tools/handbook to promotes thinking, relates to real-life application and whether the textbook helps delivers concepts effectively. These dimensions were looked at and measured in relation to teachers and students. Most teachers who were

males and the majority being females really did not show absolute believe in the textbook to deliver concepts effectively to students.

In order to evaluate the quality of textbook, we need to understand whether the existing textbook is or had achieve it purpose and would want to evaluate it from students and teachers perspective, beliefs, attitudes and whether it is serving or had served its purpose. In this study, students had shown that the current mathematics textbook in all dimension as measured in these study had shown that the textbook had not deliver on it mandate or integrate the constructivist ideas of teaching and learning of mathematics. The study had also shown completely that the question "is the mathematic textbook good enough in delivering a constructivist lessons in our basic schools" had received a "no" from both teachers and students and that the mathematics textbook barely performed above average in this context. This is an indication that the textbook needs to be looked at again or reviewed by the government, stakeholders in education, civil society organization, teachers etc who take interest in education with students' views and needs taken into consideration since the textbook is said to be designed for students.

In the study, the attitudes of students also shown that because the lesson are not looked at from the students points views or from the constructivist approach, students really do not own the lessons and are made to learn mathematic by rote memorization. It affected their attitude and the way they learn mathematic and by extension affected their achievements, they lack commitment which limits them of their future career opportunity due to the abysmal performance in the subject. This may also imply that the educational goals are not being achieved. Students attributes their achievement in mathematics mostly to what the school seeks to offer, the school environment, their abilities, future interest and personal efforts and less on social constructs.

Recommendations of the study

The study makes the following recommendation:

- The Ministry of education, who is in charge of government policies on education should review with the stakeholder, expert consultation the mathematics curriculum and by extension the textbook being used at the basic school level to includes ideas and methods of the constructivist approach to teaching and learning in the 21st century mathematics.
- The Ghana Education Service in collaboration with the National Teaching Council should formulate and design to include in the courses of teacher trainees and make constructivism and all other relevant methods of the ideas a focus point to be included in teacher trainee institutions across the country in consonance with the change in curriculum and textbook so that teachers can better execute a constructivist student-centered approach in their classrooms.
- The government, Ghana Education Service together with school administration should make sure that all necessary tools and materials should be made available to teachers before and during a mathematics class if we expect that students achievement or results in mathematics is to improved, learners should be encourage to create a strong inclination and culture of mathematics as a subject in the basic school where students can score favorably in other subject.
- Teachers' continuous professional development should be a priority to the Ministry of Education and the Ghana Education Service. Teachers' continuous professional development should be a matter of concern where it is ensured that the teacher update his professional knowledge in the field of education on the modern trends of curriculum, contents, textbook, classroom practices, new teaching approach or methodology etc on the things that seeks to improve the general growth of the education in the country and the world at large.
- Again, teachers can best motivate their students to excel in mathematics and change their attitudes towards the mathematics textbook, import tools in shaping and changing the students' attitudes towards mathematics as to acquire the necessary knowledge and skills not just for examination but also their love for mathematics in general.
- Finally, learners are to be made to understand their position when it comes to teaching and learning of mathematics, that commitment is key and that success can only be achieved when one is ready to embrace every odd and willing to sacrifice his or her energy, time and resources for the good of the society and mankind. Students should be made to understand that life is mathematics is life.

Suggestion for further Research

The study was limited to students and teachers within Asikuma Odoben Brakwa district, however the perception, understanding and performance of the mathematics textbook could be different in other districts of the region but the results may or may not differ much because the whole country uses the same mathematics textbook in government schools. The study suggest that an extensive similar study can be done in large scale within the districts to include more schools in the region, so as to have a more comprehensive report on the perception and performance of our basic school students

The study was limited to students and teachers; however the views of the heads of schools that play vital role in the administration of the schools were left out because of time and other unforeseen circumstances beyond my control. There is the need to carry out a similar study involving heads of schools and stakeholders in education in order to incorporate their views so as to have a comprehensive report. The study made use of only on instrument for data collection. The use of more than one method could be appropriate so as to compare the data, verify the results to make more informed choices.

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