IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

GHANA'S FREE EDUCATION POLICY AND CHALLENGES OF INFRASTRUCTURE AND TEACHING/LEARNING-MATERIALS: SITUATIONAL STUDY OF PUBLIC SENIOR HIGH SCHOOLS IN THE TAMALE METROPOLIS

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ABSTRACT

Undoubtedly, infrastructure and teaching-learning materials are the backbone of formal education. Ghana free education policy has led to huge increment in student's enrollment. Managing large students' numbers required supply of additional infrastructure and teaching-learning materials to schools. Therefore, this study investigated the effect of Ghana's free educational policy on infrastructure and teaching-learning materials in public senior high schools in Tamale Metropolis. The study formulated four objectives: to examine the availability of infrastructure; to examine the availability of teaching-learning materials; to identify the challenges; to investigate the effect of Ghana's free educational policy on infrastructure and learning materials in public senior high schools. The study used the mixed method and data was collected using pre-tested questionnaire and observation.

This study found the available infrastructure in senior high schools to include classrooms; teachers' quarters; dormitories for boys and girls; assembly halls; dining halls; kitchens, classroom doors and windows; hand-washing

stations; water storage systems; dust bins; adolescent girls changing and washing room in all toilet; recreational halls; internet facilities; sewerage system; toilet for girls; toilet for boys; urinal for boys; urinal for girls; bathrooms for boys; bathrooms for girls; most participants; available clean water; science labs; ICT labs; market place; lightening in school compounds; boundary walls; access to electricity; teachers' room; headteachers' office; library facility; sports facility; storage room in the schools. Through observation, this study found that most of these facilities were insufficient, require repairs, and some were too damaged to be repaired.

This study further demonstrates that the available teaching-learning materials in senior high schools include teachers instructional guide; textbooks; shelves or storage for books; equipment and materials in labs; audio-visual medium; classrooms and schools' ventilation; furniture in library; furniture in classrooms; furniture for teachers; books in the libraries; and the schools are experiencing overcrowding in classrooms and in schools. Through observation, the study noticed that most of these resources were not in good form to be used to their fullest capacity and others were even non-functional.

The current study found that the obstacles facing senior high schools include deterioration of classroom facilities and school buildings; congestion in classrooms; inadequate classrooms and classrooms furniture; inadequate water supply; lack of equipment and dormitories; lack of funds for operational cost; delayed in disbursement of funds for feeding; poor quality of food for students; lack of toilets and other hygiene facilities; lack of subject's teachers; teaching-learning materials; insufficient Technology; decreased teacher resources; lack of teacher motivation; overused library resources; increase students' enrolments; increased student-teacher ratio.

Also, this study results demonstrates that the free education policy has positive effects such as reduced financial pressure on students and their parents; increase students' enrolments and reduced school dropout from schools. The current study found that the free education policy does not positively affect or improved infrastructure; increased funding for operational cost in schools; increased technology and access to computers for students; increased labs and equipment; increases academic performance of students; improved library facilities; increased classrooms; and increased sport facilities in public senior high schools.

The results showed that free education policy is associated with inadequate classrooms; lack of dormitories; decreased quality of infrastructure, students' congestion in classrooms; poor quality of food for students; increase exams malpractice in schools; delayed disbursement of funds for schools; inadequate classrooms furniture; lack of labs and equipment; insufficient teaching-learning materials e.g., textbooks; absence of subject's teachers; put pressure on library resources; inadequate supply of water; and lack of toilets and other hygiene facilities.

In conclusion, while the findings of this research demonstrate that the introduction of the free education policy has been beneficial in making education accessible to all, it is clear that there is still a great deal to be done to improve educational infrastructure and learning materials at senior high schools.

CHAPTER ONE

1.1 BACKGROUND

Education is the pillar of any nation and plays an influential role in the success and prosperity of its citizens. The influence of education is capable of advancing economic growth and enhancing social mobility (Joshi, 2017). Currently, majority of Ghanaians are classified as poor and live below the poverty line, though most of these poor people are rural dwellers (Kofinti & Annim, 2016). The higher poverty rate in Ghana demonstrates the inequality with regards to jobs, education, socio-economic and income distribution (Kofinti & Annim, 2016; Musah, Ibrahim, & Adam, 2016). Education is the best tool that can get rid or minimize such inequality by proving the citizens with relevant knowledge and skills that can help them acquire jobs and financial growth. To achieve economic growth and development in a country, the nation must take its educational system serious (Osei, & Zhuang, 2020). According to Prajapati, Sharma, and Sharma (2017), effective education has characteristics such as relevance, applicability, and the provision of knowledge, skills, and talents that enable learners to contribute to the advancement of their society. Education empowers people and support them to escape poverty, increase income and wealth and lower their poverty levels (Santos, Neumeyer, & Morris, 2019). These benefits of education can only be realized through quality education.

The reduction of poverty and income inequality among the world's population are among the benefits of high-quality education (Serneels, Beegle, & Dillon, 2017). According to the Center for Public Education (2016), educational equity is the state in which all students have access to the same resources and receive the same treatment. An essential human right is the right to an education. Governments are required by international law to remove any obstacles that prevent its citizens from getting a decent education (Todorova, & Djafche, 2019). Hence, SDG 4's education objective 1 aims to ensure that everyone has access to high-quality education while promoting lifelong learning (Osborn, Cutter, & Ullah, 2015). Because education continues to be a crucial tool for fostering empowerment and social cohesion, expanding access to it has been a global priority (Roser & Ortiz-Ospina, 2016). However, this idea "defeats" the growing discussions about moving away from equality and focusing instead on "equity," where people should instead be treated according to their particular needs. This is due to the fact that

individual differences in aptitude and drive, as well as one's history and the resources available to them, can all affect the learning outcomes. Therefore, educational justice, fairness, and inclusion are required (UNESCO, 2017). The Center for Public Education claims that equality in education is attained when all students have access to the tools, they require to graduate from high school prepared to succeed beyond graduation (Center for Public Education, 2016). Whether the objective is to complete elementary school, graduate from high school, or succeed in college or university, quality education is yet required to produce high quality and productive citizens.

According to Ainscow (2016), inclusion and fairness are two distinct but linked concepts that are required for educational equity based on the broad idea and "principles of equity". The former demands that personal and socioeconomic circumstances (such as gender, socioeconomic status, and ethnic origin) not serve as barriers against the achievement of a child's educational potentials, whereas the latter refers to ensuring a fundamental minimum standard of education for everyone (Banerjee, 2016). The fundamental principle is that every child has different aptitudes, learning demands, and aspirations; as a result, a fair educational system needs to be flexible and take these personal differences into consideration (Kumpulainen & Lankinen, 2012).

School fees are a significant barrier to education access in developing nations, especially for children from low-income families. The United Nations International Covenant on Economic, Social, and Cultural Rights and the Sustainable Development Goals both have provisions that guarantee the right to free public education, which includes secondary school (Colclough, 2005). Other international bodies such as African Union and several UN bodies (Mcquade, 2022), the Center for Global Development (Crawfurd & Ali, 2022), and international groups like Human Rights Watch (Human Rights Watch, 2018) are among those who support the immediate elimination of secondary school fees. Secondary school enrolment rates in Africa lag far behind than those in other parts of the globe. Ohba (2011) found that the cost of sending a child to secondary school was equivalent to 4 and a half months of the average household income and where boarding school cost was 8 months (World Bank, 2018). Therefore, abolishing secondary school fees is the clear next move after to achieve universal secondary enrollment. Studies

have shown that removing financial barriers can result in significant enrollment increases (Bold et al., 2017; World Bank, 2018).

Social and economic benefits of increasing access to secondary education are significant, mostly in low-income situations (Fredriksen & Fossberg, 2014; The Education Commission, 2017). Literature shows that education is connected to numerous positive life outcomes such as higher earnings, better help, and increased happiness (Behrman, 2015; Duflo, Dupas, & Kremer, 2021). Secondary education is particularly beneficial for girls: it improves their agency and empowerment and reduces harmful socio-cultural practices such as forced marriage (Arnot et al., 2012). Moreover, improve access to secondary education reduces child mortality, decreases the prevalence of teenage pregnancy, and lowers fertility rates (Bhuwania, Huh, & Heymann, 2023; Duflo, Dupas, & Kremer 2021). There are significant social and economic advantages to expanding secondary education access, especially for low-income populations (Fredriksen, & Fossberg, 2014; The Education Commission, 2017).

When it comes to the demand for education in Ghana, it's at an all-time high. This is mainly due to the government's free educational policy implemented in 2017, which has enabled more children and adolescents to attend school and gain access to a quality education.

Ghana's educational system strives to offer top-notch instruction to all pupils, regardless of their ethnicity, aptitude or skill level, religion, or financial situation (Ministry of Education, 2013). This goal is shared by other African nations. Gender and rural-urban gaps in population and performance persist despite decades of efforts to attain educational fairness (Ghana Statistical Service, 2014; Koinzer, Nikolai, & Waldow, 2017). Urban Ghanaian students perform better in school and have better access to formal education than their rural counterparts. The failure to take into account the particular learning requirements of schoolchildren, whether it be infrastructure and/or learning materials, is the cause of the discrepancies, according to earlier research (Agbenyega, 2011, Akyeampong, 2010, Akyeampong et al., 2007, Akyeampong, Rolleston, Ampiah, & Lewin, 2012, and Senadza, 2012). The obligation for officers in education to keep up to and implement modern educational reforms, while filtering in new strategies and technologies as they emerge with tried-and-true educational methods.

Bonner et al., (2010) defines educational infrastructure as all facilities needed to facilitate teaching and learning, which includes classrooms, furniture, outside learning and playgrounds, water and sanitation, storage, administrative buildings, cooking, laboratories and dormitories. According to According to Bonner et al. (2010), the accessibility, quality, and effectiveness of education are impacted by the state, location, and kind of school infrastructure. The infrastructure of schools must be planned to satisfy student needs and provide better conditions for instruction and learning (Bonner et al., 2010). In order to improve the atmosphere for public learning, it is crucial to solve these problems. Effective leadership strategies must be developed at the district and school levels in order to meet the challenges (StudyCorgi, 2021). Regmi and Jones, (2020) pronounce teaching-learning materials as enablers for teacher and students' demonstration in the classroom situation used to enhance teaching strategy and students learning. Frimpong, (2021) highlighted the importance of instructional materials availability in achieving effectiveness in school system teaching and learning process and supervision (Yeboah, Abonyi, & Luguterah, 2019). Additionally, Abdu Raheen (2014) explained that teaching resources simply explanations and comprehensively subject matter to the students.

1.2 PROBLEM STATEMENT

Sub-Saharan Africa has experienced the highest rise in secondary education enrollment than any region across the globe (Darvas et al., 2017). This is due to the tremendous growth in the number of Sub-Saharan African nations over the past 20 years that have implemented the free secondary education policies. Secondary education is considered to be free when there is proof that senior high school (SHS) fees have been waived, while students are still responsible for paying for additional expenses such textbooks and school feeding (Koski et al., 2018). The free education policy is now run in majority of sub-Saharan African nations. To give only a few examples, the Gambia began offering free secondary education in 2015, Namibia in 2016, Ghana in 2017, Malawi and Sierra Leone in 2019, Togo in 2021, Zambia in 2022, and South Sudan in 2023 (Koski et al., 2018; Bashir et al., 2018).

This action is in accordance to SDGs 4 objective 1 which states that by 2030, all boys as well as girls should be given access to free, fair and quality education that leads to meaningful and effective learning outcomes (Free SHS Ghana, 2018). Many governments in Africa, after building on their success in making primary school tuition free,

see secondary education as the 'next frontier' for increasing access to education for all (Bashir et al. al., 2018). Incidentally, in 2017, the government of Ghana implemented a free SHS policy that allows everyone to receive free secondary education. The intention of the policy was to provide equal rights and opportunities to access second cycle education for all Ghanaians living anywhere in Ghana, regardless of their family's economic status. Efforts on education must go hand in hand with huge spending ambitions and ensuring effective implementation of free SHS plans. Ghana's 2017 free high school policy is the continent's most comprehensive, covering not only tuition fees but also admission fees, uniforms, textbooks, school meals and boarding fees.

In theory, free education should enable increased enrollment, as demand for education is cost dependent (Kwegyiriba, 2021; Sandholtz, 2022; World Bank, 2009). A comparative study found that the abolition of SHS fees increased secondary school enrollment by an estimate of 6% (Asante, 2022). This outcome was established in various country-specific studies. For example, the FSE policy in The Gambia, which abolished school fees for girls, resulted in a 5 percent increase in girls' school enrollment, and a 0.2% corresponding increase in the total girls' enrollment in secondary education (Gajigo, 2016), and a 55% increase in the number of girls sitting for the high school final exam (Blimpo et al., 2016). As a result of larger numbers, the cost of free and universal secondary education is very high. Wils (2015) found that providing general education up to the secondary level could cost up to 6.6% of GDP in low- and lower-middle-income countries and up to 20% of GDP in low-income countries.

The high cost of FSE raises serious concerns about financial sustainability and ‘crowding out’ expenditure on basic education. For example, following the introduction of its free senior High School program, Ghana allocated almost half of its non-salary education budget to senior high schools compared to less than 5% of pre-primary primary and Junior high schools combined (African Education Watch, 2023). For instance, the government invested 10.5 billion Ghana Cedis in education in 2017, a significant increase over the 9.08 billion Cedis invested in education in 2016 (Armah, 2021).

Moreover, expenditure continued to grow, for example, Ghc 12,7 billion in 2018; Ghc 13,3 billion in 2019; Ghc 14,7 billion in 2020; and in the 2021 budget, the education sector expenditure is set to increase by Ghc 15,6 million

on education to argue the 2nd cycle education sector, as foreseen in the Armah, 2021, to further promote the free SHS for equity and access to all Ghanaians in Ghana. The Ghana free educational policy aims to make secondary education affordable and improve the academic performance of learners by eliminating user fees and providing them with the necessary infrastructure, textbooks and other learning materials.

The high cost of FSE raises serious concerns about financial sustainability and the 'crowding out' of spending on basic education. For example, Ghana allocated almost half of its non-salaried education budget to high school after the introduction of a free high school programme, compared to less than 5% of its combined budget for primary and secondary school (African Education Watch, 2023). For example, in 2017 the government spent 10.5 billion GHC on education, which is more than 1 billion more than 9.08 million GHC in 2016 (Armah, 2021). Moreover, spending continued to grow, for instant expenditure was GHC 12.7 billion in 2018, GHC 13.3 billion in 2019, and GHC 14.7 billion in 2020. The budget in 2021 showed a further rise in spending in the educational sector, with 15.6 million Ghc expected to be invested in education to endorse and continue to support the second cycle education sector (Alma, 2021), this will guarantee free Higher Secondary Education System based on equity and accessibility for all Ghanaians residing in the country. Ghana's free education policy aimed to make secondary education more affordable and improve learners' academic achievement. This should be achieved by eliminating user fees and providing the necessary infrastructure, textbooks and other learning materials.

The implementation of free education policies has resulted in a surge in enrollment in schools, as a result of the new strategic approach of mass promotion (Tamanja & Pajibo, 2019). This strategy eliminated the use of cutoff points in placing BECE candidates into high school. However, the boost in student numbers will need to be managed by the government through improvements in infrastructure and teaching-learning materials. Marishane (2013) said that free tuition policies help ease the burden of paying tuition fees for parents, but they do not help schools deal with infrastructure problems. Infrastructure plays a major role in supporting teachers and learners' altitudes, interactions, practices and believes towards achieving success in schools (Shirrell, Hopkins & Spillane, 2018). Infrastructure determines a country's level of development and competitive economic growth and is critical to educational success (Palei, 2015). Therefore, to makeup for the huge increased in enrolments, government should make changes such as

adding classrooms, improving technology such as computers and digital projectors, and improving sanitation systems.

The availability of the infrastructure installed in schools to support learning predicts teacher and learner attitudes towards classroom practice (Shirrell, Hopkins & Spillane, 2018). According to Ngwaru & Oluga (2015), most schools suffer from challenges such as lack of resources, lack of maintenance finances, and slow response of relevant authorities to the needs of schools, resulting in poor student and teacher success. It leads to loss of motivation. As a result, the GF SHS policy eliminated user fees by allocating her 22,244 cash per student as president for the year. The per capita amount is paid in 3-month installments of 3, 2, 1 based on the period date. The abolition of user fees has further increased enrollment. However, it is unclear whether these policies led to a corresponding increase in school infrastructure and teaching materials. Besides, there is little research in this area to determine the exact situation on the ground. The purpose of this study is to investigate the effect of Ghana's free education policy on senior high school infrastructure, and teaching-learning materials.

1.3 OBJECTIVES/RESEARCH QUESTIONS/HYPOTHESES

1.3.1 GENERAL OBJECTIVE

The aim of this study is to investigate the effect of Ghana’s free educational policy on infrastructure and teaching-learning materials in public senior high schools in Tamale Metropolis.

1.3.2 SPECIFIC OBJECTIVES

Specifically, this research will consider the following objectives, such as

1. To examine availability of infrastructure in public senior high schools in Tamale Metropolis.
2. To examine availability of teaching-learning materials in public senior high schools in Tamale Metropolis.
3. To identify challenges of public senior high schools after the implementation of free educational policy in Tamale Metropolis.
4. To investigate the effect of Ghana’s free educational policy on infrastructure and teaching-learning materials in public senior high schools in Tamale Metropolis.

1.3.3 RESEARCH QUESTIONS

This study formulated the following research questions:

1. Is there available infrastructure in public senior high schools in Tamale Metropolis?
2. Are there available teaching-learning materials in public senior high schools in Tamale Metropolis?
3. What are the challenges of public senior high schools after the implementation of free educational policy in Tamale Metropolis?
4. What is the effect of Ghana's free educational policy on infrastructure and teaching-learning materials in public senior high schools in Tamale Metropolis?

1.4 SIGNIFICANCE OF THE STUDY

This research piece has several significance wealth of consideration. One obvious significance is its contribution to knowledge, policy, and practices concerning Ghana's free educational policy and school infrastructure and teaching-learning materials. This study findings will inform policy makers on the current state of infrastructure and teaching-learning materials in public senior high schools after the implementation of free educational policy.

The results of this research would also reveal the challenges of public senior high schools after implementation of the free educational policy. In addition, it will identify availability of infrastructure and teaching-learning materials in public senior high schools. As such policy makers can make new policies to ensure successful implementation of the free educational policy and maximize benefits in schools.

Its findings would also provide knowledge about effect of Ghana's free educational policy on infrastructure and teaching-learning materials in public senior high schools. The results would further give an over view of the benefits or drawbacks of effect of Ghana's free educational policy in public senior high schools. This kind of knowledge shall inform government and policy makers to review, formulate and strengthen existing policies and strategies in order to overcome the hurdles for success.

Finally, in the educational system, the outcome of the study shall provide many benefits to stakeholders and opinion leaders such as Ghana Education Service (GES), head-teachers, teachers, school management committee and parent teacher association. Fundamentally, it would help these leaders to understand the need of providing infrastructure

and teaching-learning materials in school, maintaining and provision of funds to run operational costs in school. The research would draw the attention of regulatory bodies and administrators to initiate practices and strategies in schools that can alleviate these challenges making the implementation of free education policy successful. Moreover, the study findings would help institutions to put in measures that would enhance and sustain the provision of infrastructure and teaching-learning materials in schools.

1.5 SCOPE OF THE STUDY

In order to limit the scope of a study, researchers set constraints and boundaries before the study even begins. The current study was delimited to only in public senior high schools in Tamale Metropolis.

Scope of the Content: This study will concentrate on investigating the effect of Ghana's free educational policy on infrastructure and learning materials in in public senior high schools in Tamale Metropolis. The investigation is restricted to school administrators, headmasters and regular teachers public senior high schools in Tamale Metropolis. This because the burden of free educational policy on infrastructure and learning materials may high at the secondary school level.

Geographical scope: This study will be limited to only public senior high schools in Tamale Metropolis.

Time scope: The time spent on administering questionnaires, data collection, data analysis, final write-ups and submission during the study process was 12 months.

1.6 OVERVIEW OF THE METHODOLOGY

This section looks at the methodological approach that were used throughout the study. This study utilized a descriptive study design**.** This study employed a hybrid data collection methodology term mixed-method that combined qualitative and quantitative research. The data collection tools used were a questionnaire and an interview. The results of the analysis were presented using descriptive statistics.

1.7 LIMITATIONS OF THE STUDY

The cross-section design of the study resulted in a number of limitations. The results were limited due to the limited sample size and inclusion of instructors and administrators in the study. Furthermore, only one semester was allocated for survey administration, data collection, data analysis and final written reports. However, as collective

case studies involve a limited sample size, it is essential to emphasize that the sample size is acceptable for mixed-method design. A further disadvantage of this study is the researcher's role as primary questionnaire administrator which may have resulted in the researcher's bias development during the study.

1.8 ORGANIZATION OF THE STUDY

This study has been divided into six distinct chapters. The first chapter outlines the rationale for the study, provides a problem statement, outlines the study objectives, evaluates the research questions, evaluates the importance of the study and defines the study boundaries. The second chapter reviews relevant literature related to the topic, the third chapter outlines the methods employed in the study's implementation, the fourth chapter examines the data analysis and the presentation, the fifth chapter provides an overview of the study's findings with citations to relevant literature, and the sixth chapter provides a comprehensive overview of the findings, conclusions and advice.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews relevant literature from previous studies, textbooks, periodicals and reports produced in accordance with the aims of this research, with a particular focus on the following topics: Theoretical framework; Teaching-learning materials for students in public senior high schools; The need for quality education; Equity in Education; The effect of teaching-learning materials and infrastructure on student learning; Effects of free education policy; Free Educational Policy in Ghana; and Challenges of public senior high schools.

2.2 REVIEW OF RELEVANT CONCEPTS

2.2.1 THE CONCEPT OF TEACHING-LEARNING RESOURCES

In the teaching process, teachers use a range of training materials that are known as teaching-learning resources. Technical Resources Include Charts, Diagrams, Textbooks, Maps, the Internet, and Electronic or Audiovisual Learning Resources, Such As Tape Recorders, Radio Cassettes, Televisions, Laptops, Phones, Overhead Projectors, Classrooms, Computers, and Improvisation Materials. Other Learning Resources Include Writing Implements, Such As Rubber, Workbooks, Crayons, Pens, Colored Pencils, Chalks, Note Books, Drawing Books, Registers, Exercise Books, Slates, and Paper. A Scientific Laboratory with the necessary Tools, Such As A Test Beaker, Insulators, Tube, Volumetric Flask, and Capacitor. When performing simple demonstrations and practical work, these resources are crucial. Both individually and in groups, students need these resources (Blazar & Kraft, 2017). Teaching materials are educational tools and tools used in schools to help students learn. They're used to help students follow instructions and reach their goals, as well as to help them engage in learning activities like assessments. They help to create a learning experience that's more engaging, active, and engaging. Examples of teaching materials include realia, audio visual, and audio-visual materials. Audio-visual materials are those that use hearing aids like tape recorders or radios, while audio-visual materials use computers, movies, or TVs. Teaching materials are used to give students the information skills they need to learn and support institutions. In some African countries, teaching materials are becoming more and more accessible, with rural schools becoming more accessible and urban schools becoming more accessible. According to a World Bank report from 2012, some countries in Africa don't have enough money to cover the costs of education. The same was said in Obara and Was'

report on education for all in sub-Saharan Africa (2020). Teaching and learning resources assist both teachers and students in their personal development. They enhance student participation in child-centered teaching and learning strategies (Machaba, 2013). Utilizing educational resources helps students succeed academically. Ashiono, Mwoma, and Murungi's (2018) research indicates that integrating ICT into classroom instruction increases students' motivation to learn and enhances their ability to recall information. Teaching-learning resources can have a significant impact on the success of students and schools, as evidenced by the findings of the study by Kipngetich, (2017). These resources can enhance teaching effectiveness, identify the individual needs of different learners, and enhance lesson plans. Without adequate teaching and learning materials, a school's primary objectives of teaching and learning in order to achieve high academic performance can be significantly hindered, regardless of the school's personnel (Saad, 2020). Since they captivate science students' interest and excite, stimulate, and hold it, instructional resources come in a variety of forms that can be used to promote development.

2.3 REVIEW OF RELATED STUDIES

2.3.1 TEACHING-LEARNING MATERIALS IN SCHOOLS

Teaching and learning outcomes have been linked to the availability of resources, and to improve schools that are not performing optimally, educational institutions must increase student levels and self-assurance through the use of these resources in order to prepare students for national examinations (United Nations Educational, Scientific and Cultural Organization, 2015). Developing educational materials and distributing resources can help to achieve this. A range of materials are available to help teachers fulfill the requirements and choose the interests of their students, ranging from textbooks to library books to websites. Material resources, physical facilities, and people resources are the three categories into which TLR have been divided (Akungu, 2014). Only physical resources (library and laboratories) and material resources (blocks, charts, computers, projectors, chemicals, etc.) were the subject of this investigation. Resources for teaching and learning may include text, audio, or video. In accordance with the requirements of MOE (2011) there is a wide range of educational resources available, such as the chalkboard, textbooks and magazines, wall coverings, graphs, charts, atlases and globes, and specimens, including living and preserved items, models and jigsaw puzzles. According to a study, the majority of the resources utilized in computer-assisted teaching and learning include audio and video recorders, slide projectors, opaque projectors,

overhead projectors, still photographs, program instructions, film strips, and graphs (Aduwa-Ogiegbaen et al., 2005). MOE (2012) acknowledges the significance of these resources for students' academic success. In this report (MOE, 2012), it was highlighted that overcrowded classrooms caused by rising enrollment had put a burden on the resources, lowering the quality of instruction. compromises the standard of education.

2.3.2 THE NEED FOR QUALITY EDUCATION

Education is the pillar of any nation and has a significant impact on the prosperity and well-being of its people. The influence of education is capable of advancing economic growth and enhancing social mobility (Joshi, 2017). Currently, majority of Ghanaians are classified as poor and live below the poverty line, though most of these poor people are rural dwellers (Kofinti & Annim, 2016). The higher poverty rate in Ghana demonstrates the inequality with regards to jobs, education, socio-economic and income distribution (Kofinti & Annim, 2016; Musah, Ibrahim, & Adam, 2016). Education is the best tool that can get rid or minimize such inequality by proving the citizens with relevant knowledge and skills that can help them acquire jobs and financial growth. To achieve economic growth and development in a country, the nation must take its educational system serious (Osei, & Zhuang, 2020). The Center for Public Education (CPE) argues that equity in education is achieved when all students have access to the resources they need to graduate with the skills they need to thrive after high school (CPE, 2016). Education provides people with the tools and support they need to break out of poverty and increase income and wealth. According to our one at a time analysis of all education and poverty, the higher a population's educational level, the lower the poverty rate (Santos (1962), Neumeyer (1962), Morris (1962), etc. Regardless of the goal, whether it's high school graduation, college success, or just completing elementary school, policy makers aim to ensure an equitable and fair distribution of students' resources to achieve their goals including adequate school facilities to ensure that every member of every age group has the chance to attend school. Equity is a global goal with implications for the building environment. It includes every gender, people with disabilities, urban and rural and marginal area populations; people in transition; working children; and young people.

2.3.3 EQUITY IN EDUCATION

Good quality education has a positive impact on poverty and income inequality among the world's population. Therefore, good quality education that is equity-based has an impact on poverty and inequality among the world's population.

Educational equity describes the situation in which all students have equal access to the same resources and are treated equally. However, this concept 'overrides' the growing debate on moving away from equality and towards 'equity,' where individuals should be treated based on their individual needs. This is because differences in learning outcomes can be due to differences in individual ability and motivation, the type of background a student comes from, and the types of resources they have access to. This is why UNESCO calls for educational equity – equity and inclusion.

Drawing on the general concept and principles of equity, Ainscow (2016) argued that educational equity is based on two intertwined but distinct concepts: equity and inclusion. The first is based on the principle that personal and social factors (e.g., gender, economic background, and ethnic background) should not prevent a child from achieving his or her full educational potential (see Banerjee, 2016), while the second focuses on ensuring a minimum level of education for everyone. The fundamental idea is that children possess different abilities, learning requirements, and goals; therefore, an equitable educational system must be adaptive and recognize these individual differences (Kumpulainen & Lankinen, 2012).

In Ghana, like in other African countries, the goal of the education system is to provide quality education to everyone, regardless of their race, abilities, religion, or income (source: Ministry of Education, 2013). Despite numerous attempts to achieve educational equality throughout the years, there are significant disparities in terms of both rural and urban populations, as well as gender; where school pupils in urban Ghana have a greater degree of formal education access and higher academic performance than those in rural Ghana (as reported by the Ghana

Statistical Service (2014), Koinzer (Nikolai), & Waldow (2017)). Previous research (Agbenyega, 2011; Akyeamong, 2010; Akyeambong, 2007; Rolleston, 2012; Ampiah, 2012; Lewin, 2012; Senadza, 2012) link the differences to a lack of attention to the unique needs of school pupils, whether in terms of infrastructure or learning materials.

Education is a human right. According to international law, governments are required to eliminate any impediment to its citizens' access to a high-quality education (todorova, & djafche, 2019). A

Free senior high school is one of the best socio-economic intervention policies that directly impacts parents and their children in senior high. However, formal education includes kindergarten, primary education, junior high education, senior high education and tertiary education, which are designed for the attainment of knowledge, abilities, values and characteristics(Young, 2019). There are many indicators that can be used to measure an equitable and inclusive education system. According to the Centre for Public Education's (2016), the indicators used to measure educational equity include: Well-funded schools High-quality curriculum and qualified teachers Maintaining discipline Offering additional academic support to low-performing students Ensuring access to technology both at school and at home Providing comprehensive family services Offering mentorship programs and trained counselors. The Voices For Racial Justice (2016) utilizes a range of indicators to assess equity in education, including access to opportunity, opportunity to learn, inclusion in the community, equitable discipline, community involvement, academic performance, access to resources, and shared responsibility. This mandate is commonly found in the laws of many countries; however, implementation is often limited due to financial constraints.

2.3.4 THE EFFECT OF TEACHING-LEARNING MATERIALS AND INFRASTRUCTURE ON STUDENT LEARNING

In the classroom, teaching-learning resources are used to help the teacher present and communicate educational content and achieve educational goals, while assisting the schoolchildren to acquire knowledge and identify different abilities and values (Bušljeta, 2013). Teaching materials used in teaching have a lot of goals in common:

to motivate students, to encourage creativity, to remind them of what they already know, to help them understand, to organize and synthesize the material, to help them think logically and logically, to help them interact and communicate, and to help them develop different skills and to help them reach their goals. It's all about making sure they remember what they've learned and retain the attitudes and skills they need to succeed (Bušljeta, 2013).

School infrastructure has lots of benefits to the society. School infrastructure has been shown to facilitates many advantages in schools including students learning and achievement (Barrett et al., 2019). This is backed by several otherr evidences in literature. Regmi and Jones, (2020) pronounce teaching-learning materials as enablers for teacher and students' demonstration in the classroom situation used to enhance teaching strategy and students learning. In Abdu raheen's (2014) manuscript, he talks about how teaching resources just explain things to the students and cover a lot of ground. Also, Frimpong (2021) stressed how important it is to have access to the right materials when it comes to teaching and learning in the school system, as well as overseeing the process. Yeboah, Abonyi, & Luguterah (1919). The use of television and the internet has enabled learners to gain insight into the way they are perceived through sound, resulting in a greater emphasis on visual and auditory stimuli. Our educational system would not be what it is today without the use of multiple learning tools, such as audio and video recordings and the internet. Teaching and learning materials are designed to make the educational process more interactive and engaging, to facilitate active learning, to support the development of different abilities, and to foster the acceptance of accepted values and attitudes among learners. To accomplish these objectives, it is essential to accurately identify the conditions and techniques for the use of teaching-learning materials within the classroom. For example, a well-equipped and utilized science laboratory offers students the chance to gain knowledge in practical science. Selecting the right teaching and learning tools can lead to the development of nurturing concepts for use in the classroom (Frampong, 2021). They also facilitate the extraction of abstract ideas into a process of comprehension (Odhambo, 2018). The successful delivery of a curriculum course necessitates the provision of appropriate and suitable premises, equipment, and educational resources. Institutions should ensure that teaching-learning resources are utilized and made available to all students in accordance with Moodley (2013), in order to enable learners to be actively engaged in the educational and instructional process. According to Frimpong (2021), interactions during

lesson delivery may not be effective due to a lack of teaching materials. Studies have shown that the use of learning resources has a significant impact on curriculum implementation. Learners retain 90% of the information they say, observe and do. Learning resources also help to pull the often abstract concept into an understandable flow (Maina, 2015). According to Butcher (2015), students need learning materials that are customized to their needs. Students in an inclusive setting would need additional materials beyond what the school provides. For this reason, teachers should utilize locally available materials to support inclusive learning. Moodley (2013) suggests that using locally available materials can also help to alleviate problems and allow teachers to deliver better. According to Othoo (2019), learning-learning materials play a significant role in academic performance. The study looked at public secondary schools and found that learning-learning materials had a significant impact on learner performance on exams. Lewinski (2015) looked at how classroom architecture affects academic performance and found that a lack of structure has diverse impacts on learning. In 2016, Awolaju (2016) found that the quality of teaching-learning materials in senior secondary schools had a significant impact on students' academic performance in biology. In 2017, Deku (2017) found that there was a lack of teaching-learning resources for students with disabilities. Additionally, the lack of curriculum support materials limited teachers' ability to use various content-based teaching and learning activities to effectively deliver the curriculum. Due to the poor learning environment, students from public schools do not perform as well as those from private primary schools due to a lack of educational materials and teachers (Ongaki (2014)). Poor teaching-learning materials lead to poor strategies and passive learning, resulting in low performance. As technology and communication have become more sophisticated, more effort has been put into the development of teaching and learning tools, which has been beneficial for learners in many parts of the world. In 2019, Bukoye (2019, June) found that there is a very strong positive correlation between learning materials and academic performance. He also found that schools with more resources may produce better results than those with less resources.

Fisher (2001) found there is a causal association between school infrastructure and schoolchildren performance and comportment to study. This is confirmed by the results of Okongo (2015), Ngao (2015), Rop (2015), and Nyongesa's (2015) who established schools owned by people who do well because they have the right infrastructure

and learning & teaching resources. Adalikwu (2013) shows that the quantity and value of learning & teaching resources have an effect on students' performance. The researchers found that learning centers with sufficient facilities, such as textbooks, are more likely to achieve good exam marks than schools with insufficient amenities. Poor performance may be due to a lack of education and learning tools and training. The upkeep and growth of physical facilities in learning centers must continue to be a priority for parents sponsors and community. The lack of such amenities hinders the learning process. The importance of school amenities in relation to quality teaching was demonstrated by Ndirangu and Udoto (2011). The physical facilities of the school include the lecture hall, classroom, administrative block, auditorium, laboratory, playground, special rooms (e.g. clinic conference hall, learner's hostel, employee's quarters), canteen/kitchen, toilets, etc. According to Ndirangu (2011), the quality of the school amenities is linked to the quality of the teaching. Ndirangu (2013) further argues that having a sufficient supply of good physical infrastructure increases the productivity of learning. Figueroa, Lim, and Lee (2016) argue that the physical and institutional conditions of the school prevent a society of achievement. Crampton, (2009) stated that Investment in school physical infrastructure have about 55.8% and 77.2% influences on schoolchildren achievement. The study Asiyai, (2012) investigated school infrastructure in public senior high schools and the findings exposed that school facilities were mostly in poor shape with insufficient maintenance.

2.4 REVIEW OF THEORY

According to Imenda, (2014), theoretical framework is made up of a number of interconnected concepts based on theories. The study was based on Pierre Bourdieu's social capital theory, which holds that resources found in social relationships facilitate collective action. Social capital, as defined by Serageldin et Grootaert (2017), is a network of shared values, beliefs, and practices that encourage cooperation within or between groups. It refers to a person's position or involvement in a particular social group that has an effect on their life in a particular way.

In general, social capital refers to resources and their value, as well as both physical and non-physical public spaces and private property. It also refers to intangible actors and human capital, as well as relations between those resources and their effects on those relationships' constituent resources and on larger groups as a whole. Traditionally, social capital was seen as a form of capital that provides public goods to the whole. The theory of

social capital held that membership in a particular group offered certain advantages that were advantageous to an individual. Due to the existence of communities and social networks, social capital could only be created collectively, but it could also be utilized simultaneously by both individuals and groups. People can use the social capital in their networks to further their own interests, and organizations can use it to uphold a particular set of standards or behaviors (Aldrich & Meyer, 2015). In order to achieve this, social exchange and interaction between two or more social actors are what enable a person to access resources, such as social relationships built over time, and to improve his position in society through social networks. In the case of education, the resources are used to enhance academic results, enabling social mobility and maintaining social stratification. The social capital themes and related indicators center on control in the context of how the free education policy has affected the physical environment and instructional resources at the primary school level. This includes how well schools helped students develop a sense of control over their own lives, as well as how they might have an impact on social and political decision-making in their communities and organizations. Additionally, it helped students develop self-efficacy, a sense that their actions and opinions mattered, and an understanding of the structures and characteristics of communities at all levels. This was accomplished by having schools audit the local, national, and international communities and then incorporating that awareness into the learning opportunities for students. The way the school community interacted with and worked to better both itself and the larger community was clear evidence of this.

2.5 IMPLICATIONS OF THE REVIEW FOR THIS CURRENT STUDY

2.5.1 FREE EDUCATIONAL POLICY IN GHANA

Sub-Saharan Africa has experienced the highest rate of high school education enrollment of all global regions, according to Darvas et al. (2017). This is because the number of sub-saharan African countries with free Secondary Education policies has increased rapidly over the last two decades. Secondary Education is said to be free when evidence shows that school fees had been cancelled, though students can still pay for other costs including textbooks and school meals (Koski et al., 2018). Most countries in sub-Saharan Africa now run the FSE system. For instance, Gambia introduced free Secondary Education in 2015, Namibia in 2016, Ghana in 2017, Malawi and Sierra Leone in 2019, Togo in 2021, Zambia in 2022 and South Sudan in 2023 (Koski et al., 2018); Bashir et al. 2018).

This action is in accordance with Goal 4, Target 1 of the Sustainable Development Goals (SDGs), which stipulates that by 2030, all primary and secondary school-aged children should receive free, fair and high-quality education that leads to effective and relevant learning outcomes (Free SHS Ghana 2018). Building on the successful experience of primary school fee abolition, many African government see secondary education as the 'next frontier' in expanding access to education for all (Bashir et al., 2018). The implementation of the Free SHS policy by the Government of Ghana in 2017 was intended to provide equitable access to Secondary Education for all Ghanaians living anywhere in the country, as well as access to Second-cycle Education regardless of the financial situation of the family.

The investment in education should be commensurate with the skyrocketing expectations of spending and ensuring that its goals are met. Ghana's 2017 free senior High School policy is the most comprehensive on the continent covering not only tuition but also registration fees, uniforms cost, textbook, school meals, and boarding fees. In theory, free education should facilitate an increase in enrollment, because demand for education is responsive to cost (Sandholtz, 2022; World Bank, 2009). A comparative study found that upper secondary school fee abolition led to an average increase of 6% in upper secondary school enrollment (Asante, 2022). This finding was confirmed in various country-specific studies. For example, Gambia's FSE policy which eliminated fees for girls led to a 5% increase in girls' enrolment rates and a 0.2% increasing their years of schooling (Gajigo, 2016), and a 55% increase in the number of girls sitting the high school exit exam (Blimpo et al., 2016).

As a result, the cost of free and universal Secondary Education is very high. Wils (2015) estimated that providing universal education up to the secondary level can cost up to 6.6% of GDP in low and lower-middle income countries but could cost up to 20% of GDP in the lowest income countries. The high cost of FSE raises serious concerns about financial sustainability and 'crowding out' expenditure on basic education. For example, following the introduction of its free senior High School program, Ghana allocated almost half of its non-salary education budget to senior high schools compared to less than 5% of pre-primary primary and Junior high schools combined (African Education Watch, 2023). For instance, in 2017, the government of Ghana spent a total of 10,5 billion GHC

on education, which is a billion GHC more than the 9,08 million GHC spent on education in 2016, according to Armah, (2021).

Moreover, expenditure, for example, increased by Ghc 12,7 billion in the year 2018, by Ghc 13,3 billion in the year 2019, and by Ghc 14,0 billion in the year 2020. In the 2021 budget, the education sector expenditure is expected to increase further. The government plans to spend Ghc 15,6 billion on education in the second cycle of the education sector to argue the free secondary school education on equity and accessibility to all Ghanaians living in the country. The Ghana free education policy was designed to provide secondary education at an affordable price and to enhance the academic performance of learners by eliminating user fees and providing them with the necessary infrastructure, textbooks and learning materials.

The free educational policy has led to the increased of schoolchild's enrollment due to the new strategy term mass promotion (Tamanja & Pajibo, 2019). This strategy cancelled the use of the cutoff point in placing BECE candidates to the senior High School. However, if the number of students increases, it should be accompanied by an increase in infrastructure and teaching materials provided by the government. According to Marishane (2013), The no-fee policy was introduced to save the parents from having to pay school fees. However, this does not help schools solve their infrastructure problems. Infrastructure plays an important role in providing support that changes teachers' and learners' behaviour and beliefs about schools. (Source Shirrell, Hopkins, Spillane 2018). Infrastructure determines the level of development and competitive economic growth of nation (Pehli, 2015), which is important for educational success.

2.5.2 EFFECTS OF FREE EDUCATION POLICY

African Union and several UN bodies (Mcquade, 2022), the Center for Global Development (Crawfurd & Ali, 2022), and international groups like Human Rights Watch (Human Rights Watch, 2018) are among those who support the immediate elimination of secondary school fees. FSE advocates typically combine more utilitarian and right-based justifications to support their positions. The United Nations International Covenant on Economic, Social, and Cultural Rights and the Sustainable Development Goals both have provisions that guarantee the right to free public education, which includes secondary school (Colclough, 2005). School fees are a significant barrier to

education access in developing nations, especially for children from low-income families. Secondary school enrolment rates in Africa lag far behind those in other parts of the world, as evidenced by Ohba's (2011) survey of primary school leavers in Kenya, which found that the cost of sending a child to secondary school was equivalent to 4 and a half months of the average household income and that boarding school was equivalent to 8 months (World Bank, 2018). From this vantage point, eliminating secondary school fees is the obvious next move after several nations have utilized them to achieve nearly universal primary enrollment. Pre-primary education programs in several African nations have shown that removing financial barriers can result in significant enrollment increases (Bold et al., 2017; World Bank, 2018). In particular, FPE increased access for the underprivileged and aided in achieving gender parity in enrolment. Accordingly, it is reasonable to anticipate that FSA policies will enable more kids, especially those from low-income families, to continue their education (Crawfurd & Ali, 2022). Additionally, it would free low-income households from having to pay school fees, allowing them to spend their money on other essentials (Ngware et al., 2007). In the end, it is anticipated that increased secondary school access, particularly for girls, will enhance both individual well-being and the social conditions of society as a whole (World Bank, 2018; Kabeer, 2012). Social and economic benefits of improving access to secondary education are substantial, particularly in low-income situations (Fredriksen & Fossberg, 2014; The Education Commission, 2017). Evidence shows that education is causality link with a range of positive life outcomes including higher earnings, better help, and increased happiness (Behrman, 2015; Duflo, Dupas, & Kremer, 2021). Secondary education is particularly beneficial for girls: it improves their agency and empowerment and reduces harmful socio-cultural practices such as forced marriage (Arnot et al., 2012). Moreover, improve access to secondary education reduces child mortality, decreases the prevalence of teenage pregnancy, and lowers fertility rates (Bhuwania, Huh, & Heymann, 2023; Duflo, Dupas, & Kremer 2021). There are significant social and economic advantages to expanding secondary education access, especially for low-income populations (Fredriksen, & Fossberg, 2014; The Education Commission, 2017). Evidence demonstrates a causal relationship between education and a variety of favorable life outcomes, such as higher salaries, better assistance, and enhanced happiness (Behrman, 2015; Duflo, Dupas, & Kremer, 2021). According to Arnot et al. (2012), secondary education promotes girls' agency and empowerment while reducing negative sociocultural practices like forced marriage. Additionally, expanding access to secondary

education lowers fertility rates, teenage pregnancy rates, and child mortality (Bhuwania, Huh, & Heymann, 2023; Duflo, Dupas, & Kremer, 2021).

When it comes to the demand for education in Ghana, it's at an all-time high. This is mainly due to the government's free educational policy, which has enabled more children and adolescents to attend school and gain access to a quality education.

To meet this increased demand, many senior high schools have had to expand their facilities and infrastructure. The federal government and to a lesser extent school management are supposed to provide schools with their infrastructural needs. But what other benefits has this policy brought? For one, it has led to a surge in enrollment at SHSs in Ghana. More students mean more infrastructure and learning materials are needed, so schools have been able to improve their facilities to accommodate the increased demand. Additionally, the policy has also made it easier for low-income families to send their children to school, which has opened up educational opportunities for many Ghanaian children who otherwise would not have had access to higher education.

Infrastructure matters a great deal in creating support that changes teachers and learners practice and believes in schools (Shirrell, Hopkins, & Spillane, 2018). Infrastructure determines the level of development and competitive economic growth of nation (Palei, 2015) which is important for educational success. Investment in educational infrastructure is an important step towards modernizing the country's schools and providing all schoolchildren with the prospect to succeed in a healthy and productive environment (Jackson, 2021). This includes having additional classrooms, upgraded technology such as computers and digital projectors, and improved sanitation systems. The availability of the infrastructure the local schools put in place to support learning predicts teacher's interactions and their instructional practice (Shirrell, Hopkins, & Spillane, 2018). Bonner et al. (2010) study found that the state, location, and type of school infrastructure had a significant influence on the accessibility, quality, and outcomes of education. Consequently, it is essential that school infrastructure is designed to meet the needs of schoolchildren and provide a more conducive learning environment (Bonner et al., 2010). In schools where the community has been involved, there's been progress in improving the educational system and making sure it's sustainable, but the

quality and type of education provided by the community isn't always top-notch and hasn't been able to tackle teaching-learning issues (Wedam, Quansah, & Debrah, 2015).

In addition, most of the schools have seen an increase in teachers, and the quality of the learning materials provided by the government has also improved. With more resources available for students and better infrastructure, these senior high schools are helping to create a brighter future for generations to come. According to Shirrell, Hopkins, and Spillane, (2018), teacher professional learning and preparedness is best accomplished by the availability of infrastructure.

2.5.3 CHALLENGES OF PUBLIC SENIOR HIGH SCHOOLS

Public schools in the United States are confronted with a variety of difficulties, including a lack of financial resources, a lack of adequate personnel, and inadequate school management plans (StudyCori., 2021). It is essential to address these challenges in order to enhance the quality of public education. To overcome these difficulties, effective leadership initiatives must be implemented at both the district and the school levels.

South Africa's education system is characterized by poor teacher performance, poor work ethic, poor community and parental involvement, inadequate control by the education authorities, weak teacher support, and low accountability (mouton, louw, &Strydom, 2013).

The officers in education should be aware of the obligation on them to keep up to and implement modern educational reforms, while filtering in new strategies and technologies as they discover tried-and-true educational methods (Hussin, & Al Abri, 2015).

Most schools in Africa are wrestling with a variety of challenges such as absence of resources and delay replies to school needs by authorities in charge; the parents, students and teachers lack the motivation to strive for success; inadequate funds for maintenance; malfunctioning doors and windows; inadequate locks; latches hinges; poor infrastructure; lack of TLMs; lacks furniture Ngwaru & Oluga, (2015). Some schools faced leadership challenges such as quality education, running safe schools, making distributive leadership, equity gaps, digital devices (Parveen et al., 2022).

School principals face challenges such as keeping school children highly-motivated and safe in a school environment that is increasingly apathetic and violent and rendering quality education to all school children for students with disabilities. (Cornelius, & Cornelius, 2014; Furrer, Skinner, & Pitzer, 2014).

In schools there are problems of insufficient time to organize induction program for freshly recruited teachers lack of communication between district education administrators and school offices regarding induction and inadequate funds for conducting the induction program (Dorcas, 2018).

According to Mouton, Louw, & Strydom (2013), both administrative and school level hurdles have influenced the absence of discipline, poor moral values, ruthless violence, absenteeism, truancy, lateness to school, high dropout rates and very poor performance in essential areas such as Mathematic and English language among learners (Gahungu, 2018).

Policies to address teacher quality must be appraised with regards to their impact on learners' performance but not on noticeable teacher characteristics (Jacob, 2007). The lack of qualified teachers in schools is exacerbated by a variety of issues, including wage levels, employment conditions, and the distance between teachers and their educational institutions (Du Plessis, & Mestry, 2019). In Jacob (2007), it was suggested that administrators should experiment with various methods to increase the number of teacher candidates available, such as salary increases and bonuses, as well as increasing retention rates through the implementation of mentoring programs. Additionally, the district should enhance its recruitment procedures and revise its policies regarding teacher tenure in order to ensure that ineffective teachers are terminated.

CHAPTER THREE

METHODOLOGY AND STUDY CONTEXT

3.1 INTRODUCTION

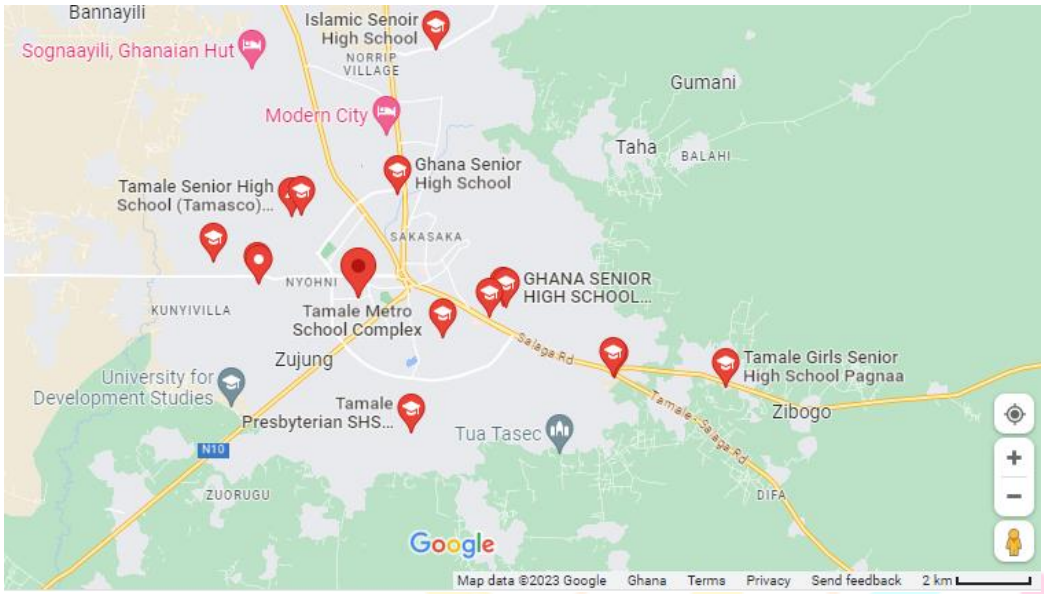
This chapter provides an overview of the methodology employed in the study, including the scope of the study, the research design, the target population, the sampling methods, the data types and sources, the questionnaire design,

the data collection process, and the data analysis. Its primary purpose is to provide an overview of how the entire study was conducted.

3.2 PHILOSOPHICAL BACKGROUND OF THE STUDY

The study was carried out in the three main areas of Tamale Metropolis. The metropolis is divided into three zones: South, Central and North. Located in the central part of the Northern Region, Tamale Metropolis shares borders with the Sagamigu district in north-western side, the Mion district to east-central, the East Gonja district at south-eastern side, and the Central Gonja district in south-west. The latitude of the metropolis is 9º16 to 9º34 North, and the longitude is 0º36 to 0º57 West. Considering data from 2010 Population and Housing Census, it has 115 communities, 19,387 houses and 6.3 individuals per household, and total population of 233,252 with 80.8% and 19.1% living in urban and rural areas, respectively. Additionally, the household structure is mostly the extended type (46.1%) consisting of mainly children (40.4%) with fewer (16.1%) household heads. Within the metropolis there are 742 basic schools: 14 Senior high schools, 112 Junior high, 304 Primary and 94 Kindergartens. Out of the population (aged 11 and above), majority are literates (60.1%) and 39.9% are non-literates. Among the population of the metropolis, 84,897 (aged 3 and older) are currently in school (52.9% males and 45.1% females), 15.1% are in the nursery, JSS/JHS pupils are 18.2%, SSS/SHS students are 12.5% and the largest percentage (40.0%) is in primary, whereas 58.6 and 41.4 percent males and females, respectively, have attended school in the past. Currently 15.1% are enrolled in nurseries; 18.2% are enrolled in junior secondary schools/junior high schools; 12.5% are enrolled in senior secondary schools/senior high schools; 6.7% attend tertiary institutions; and 40.0% are enrolled in primary schools. The original customary land belongs to a tribe known as Dagombas who speak Dagbani and are generally followers of the Islamic religion. The metropolis is diverse in terms of religion, culture and languages, however, the leave together peacefully.

Base on the reginal total population, the informal sector employs 83.4%, the private sector absorbs 11.5% and the formal sector only absorbs few members of the population (Government of Ghana Portal). The informal sector is highly composed of entrepreneurs having limited background in terms of formal education (693%) (Alhassan, Hoedoafia & Alhassan, 2016). According to a survey by Alhassan, Hoedoafia & Alhassan, (2016) many businesses in the metropolis are not registered.



Source: (Google Maps).

Figure 3.1: Map showing the major Senior High Schools in Tamale Metropolis and Sagnarigu Municipal.

3.3 RESEARCH DESIGN

Research design can be explained as an arrangement of conditions and procedures that informs decisions during data collection and analysis, and justifies the relevance of the study findings in the context of the study purpose (Siedlecki, 2020).

This study utilized a descriptive and explanatory study design. The advantage is that this study design is usually low-cost, quick, easy to do and do not need too much effort (Aggarwal & Ranganathan, 2019). The choice of a research design is based on the theoretical views, procedures or strategies, and the approaches of the study process that leads to an acceptable conclusion (Asenahabi et al., 2019). The main purpose of a descriptive studies is to study and describe events, conditions and people in their natural occurrence (Siedlecki, 2020). In that instance the researcher does not control or alter any variable, however, he/she only describes the variables and/or the samples (Aggarwal & Ranganathan, 2019). Descriptive study is also useful in investigating one variable, though it can equally explore several variables without considering any causal or other hypotheses (Aggarwal & Ranganathan, 2019).

3.3.1 RESEARCH APPROACH

This study uses a mixed method data collection approach. Halcomb and Hickman (2015) explained mixed methods study as a study that comprises using both quantitative and qualitative data in one specific investigation. It is used as an alternative approach at an instance where merging quantitative and qualitative methods yields more accurate and dependable information then using either quantitative only or qualitative study (Halcomb & Hickman, 2015). The qualitative study is defined by Aspers and Corte (2019) as a process in which the scientific community is improved by making new important distinctions resulting from closer study of the phenomenon studied.

Qualitative methodologies are used to provide answers to questions related to experience, meaning, and perspective, mostly based on the participant's subjective opinion (hammarberg, kirkman, & de lacey, 2016).

The term 'quantitative study' is used to describe the process by which measurements are taken from study populations to produce numerical data (RUTBERG & BOUKHISIDI, 2018). In addition, quantitative studies involve the use of standard questionnaires / experiments to collect numerical data (GOTERNZ, 2017).

3,3.2 RESEARCH PURPOSE

The main focus of this study is to investigate the effect of Ghana free education policy on the senior high school infrastructure and the teaching-learning materials available to students. The study also looks at the challenges faced by public senior high schools, the accessibility of teaching-learning materials, and the impact of Ghana's free educational policy on the infrastructure and learning materials available to students in the public senior high schools of Tamale Metropolis.

3.4 POPULATION

A study population should be carefully defined in order to identify the appropriate sources from which to collect data. Hu (2014) defines a population as a subset of individuals, occurrences, or objects with a common observable property. Asiamah (2017) defines a target population to be the sum of all elements (or individuals) of a phenomenon to be studied that exist in the field of study. Hu (2014) classified a target population as members of a certain set who much an investigation criterion and can provide valid information

relevant to the study purpose. In this context, a target population can be defined as an entity, an event, or a group that meets a particular set of criteria that the researcher wishes to investigate in order to form generalizations. The intended target population for this study was a sample of senior high school students from Tamale Metropolis.

3.5 SAMPLE SIZE AND SAMPLING TECHNIQUES

Sampling is the manner by which a subset of a population of interest is selected in a research study (Turner, 2020). The sampling procedure is picked based on who will provide the best information to answer the study questions. The researcher focused on the population with similar features who the required facts and are willing to share them. Therefore, purposive sampling was thus applied in this study and 138 administrative and managing personals including student leaders from five mixed public senior high school in Tamale Metropolis were sampled. Table 3.1 illustrate the target population distribution and sample size.

Generally, purposive sampling refers to the process of intentionally selecting specific individuals or events in specific settings to provide important information that cannot be obtained from other sources (Ames, 2019). According to Etikan, (2016), the advantage of purposive sample selection is that the researcher can use their knowledge, skills, and experience to choose the right respondents for their study. This study used purposive sampling because it was considered as cheaper and appropriate in sampling adults who have completed or uncompleted tertiary education. This is justified by Campbell et al., (2020) who proposed that purposive sampling is used when the researcher wishes to target particular people with characteristics of interest in a study. Besides, the researcher considered this method so suitable for this study due to its extreme cost-effectiveness and demand of minimal time compare to other techniques as mentioned by (Turner, 2020).

A sample size illustrates the various elements within the target population that was sampled for the investigation. A subset of a population is referred to as a sample, whereas sampling is the process of selecting a sample of the target population that is identified as having relevant information for a particular study (Mugenda and Mugenda, 2003). Sample size is the number of people that are included in the study. A sampled population is considered the least relevant population and yet possessed useful information as that population from which it was drawn. Considering this kind of study, the investigator chose purposive sampling to sample only public and mixed senior high schools (Ghana senior high schools, Vitting senior high schools, Dabopka senior high schools, Anbaria senior high schools,

Business senior high schools) enjoying the free education and also to sample participants for the study. A total of 138 participants were sampled comprising of administrative and managing personals plus student leaders from five senior high school in Tamale Metropolis. This group of the participants are chosen because the researcher had a strong conviction that they are the first-hand witnesses to the issues under investigation and so are considered the best sources to provide the needed information to answer the research questions.

Table 3.1: The distribution of the target population and sample size

Administrative and Managing Personals	Sample size
Principals and assistant heads	20
Patrons	5
Accountants	5
Parents association (PA) chairmen and vices	5
Board of governance chairmen and vices	5
Old students' heads and assistants	5
Domestic bursars	5
Librarians	5
Department heads	30
Storekeepers	5
Housemasters and housemistresses	28
Students' leadership	20
Total	138

The participants were carefully selected on the basis of established inclusion and exclusion parameters. The investigator's inclusion and exclusion parameters for the selection of participants for the study are presented in the following Table 3.2.

Table 3.2: Inclusion and exclusion parameters used to select participants

Inclusion	Exclusion
Public and mixed senior high schools	Non-public and non-mixed senior high schools
Administrative and managing personals and students' leadership in senior high schools.	Other workers in senior high schools who are not included in the administrative purposes and management and students' leadership.
Administrative and managing personals and	Administrative and managing personals and

students' leadership in senior high schools who were available and accepted to be part of the study.	students' leadership in senior high schools who were not available and/or rejected to be part of the study.

3.6 DATA COLLECTION PROCEDURES

The primary data in this study was obtained using a questionnaire. The data collection instrument was completed by the researcher and assistants. In order to promote engagement, we solicited the agreement of participants first before any participants was recruited. The researcher purposively reached participants, through headmasters and assistants or senior house masters and PTA chairman who provide instruction to participants in relation to the purpose, form, and requirements of the study. After this, the questionnaire was presented to the participant to complete by the guide of the researcher or assistant. During the recruitment process, study participants were invited to opt-in to the survey and to voluntarily submit data to the extent possible.

3.7 RESEARCH INSTRUMENTS

3.7.1 QUESTIONNAIRE

This study employed a structured questionnaire, with straightforward and uncomplicated questions, to collect data from participants. A structured questionnaire is beneficial for obtaining uniform statistical information from multiple subgroups within a relatively large sample size (Patra, 2019). According to Buchanan, (2018) a questionnaire method is a less expensive way of data collection. Using questionnaire has numerous benefits including minimal cost involved and lessening the time of study as standard questionnaire could be rapidly administered to a huge number of participants (Communication & Access, 2016; Tran et al., 2017). The questionnaire contained both open and closed ended type questions. The closed-ended questions were used where it was reliably admitted that information being solicited from respondents has much evidence to its varying nature. The questionnaire was designed into five sections and part I was for obtaining responses regarding demographic information. The other four parts (II, III, IV and V) was to gather data regarding the variables including the availability of infrastructure and teaching-learning materials for schoolchildren in public senior high schools in Tamale Metropolis. Also, it will identify the challenges of public senior high schools and investigate the effect of

Ghana's free educational policy on infrastructure and learning materials in public senior high schools in Tamale Metropolis.

3.8 SOURCE OF DATA

Currently, studies depend on both primary and secondary data (Lowry, 2015). The study was made relevant through detailed facts representation and justification using different sources of data. The data sources used by this study appeared in two ways: primary and secondary data.

3.8.2 PRIMARY SOURCES

Ajayi, (2017) defined a primary data in any research piece as the first-hand compiled data obtained from the analysis of the study results. Primary source of data included responses from the chosen participants made of adults who have completed or uncompleted tertiary education in the Tamale Metropolis. The researcher pursued detailed information and evidence around the study topic. The instrument used in this process was only the questionnaire (and observation) which was administered to administrative and managing personals and students' leadership in senior high schools.

3.8.3 SECONDARY SOURCES

Johnston (2017) defined secondary data in any research piece as the gathered known facts or the primary data from other research works. This kind of data is used to make the study relevant and raises the validity and reliability of a research work. Secondary sources of data included existing but relevant literature on the subject matter. It included materials sourced from available journals, textbooks and applicable websites.

3.9 DATA ANALYSIS

The process of data analysis, as defined by Connell et al. (2018), involves the calculation of specific indices or measures, as well as the search for patterns of association that exist between data categories. Similarly, the process of data analysis is defined by Albers (2017) as the systematic search for patterns and underlying trends in a study, with the aim of uncovering the underlying patterns and associations for the purposes of presentation and providing meaning to the data obtained. Data analysis encompasses manipulating data, coded and organizing data, breaking into manageable parts, searching for relationships, synthesizing, making important discoveries and communicating the findings (Ali & Bhaskar, 2016).

Mishra et al., (2019) claimed that descriptive statistics is an appropriate way of presenting summary of analysis output and gives a more comprehensive view of the data. The commonly used descriptive statistics include the median, mean, mode, standard deviation and percentage (Kaliyadan & Kulkarni, 2017). In this study, the data collected was carefully coded, entered and analyzed using Excel and SPSS Version 20.0. the qualitative data from interview and focus group discussions were analyzed through transcription and thematic analysis and used to support the analysis from the quantitative data.

3.10 RELIABILITY AND VALIDITY OF INSTRUMENTS

Reliability and validity remain fundamental concepts in research practices, as they influence the robustness of a research and thus the reliability of findings (Heale & Twycross, 2015).

3.10.1 VALIDITY

Validity can be defined as the degree to which the study measuring tool measures well what it is intended to measure (heale & twycross, 2015) A number of studies have proposed various measures of validity, such as content validity, face validity, etc. (Connell et al, 2018). For the purpose of this study, we considered the two main types of validity, content and face validity. Reliability refers to the ability or inability of a measure to produce similar/the same results over a period of time. Generally, a reliability test is composed of: Internal consistency test-retest split half (Connell et al., 2018).

3.10.2 RELIABILITY

In a similar vein, reliability is the extent to which a research instrument or test reproduces the similar/same results after repeated application (Heale et al., 2015). It is also sometimes referred to as the accuracy or uniformity of measurement. Simply put, reliability is much particular about the quality of any research instruments. In addition, validation and dependability are essential elements of research, as the purpose of data collection tools is not only to collect data, but also to collect accurate data that is independent of significant errors (Krippendorff, 2016). The reliability of a measure was also noted by Connell et al. (2018) as a demonstration of the robustness and uniformity of the instrument used to measure the concept and aid in assessing the measure's accuracy. Reliability was evaluated by utilizing The Cronbach's Alpha as an internal consistency measure.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSIONS

4.0 INTRODUCTION

The main purpose of this study was to investigate the effect of Ghana's free education policy on the provision of educational infrastructure and resources in public secondary education in Tamale Metropolitan. Consequently, this study examines the accessibility of educational resources and resources for students in the public secondary education system in Tamale Metropolitan, as well as the difficulties faced by the public secondary education sector. Additionally, the results of this study will be examined in relation to other similar works. This chapter is divided into several parts, beginning with the background information of the survey respondents, followed by the generated results of the main section of the questionnaire, and concluding with the main findings associated with the research objectives.

4.0.1 RELIABILITY RESULTS

Henson (2001) mentioned that the internal consistency is related to the similarity of the items or the degree with which a construct is measured by a collection of items. In this study, the Cronbach alpha coefficient was used to test the reliability of the data collection instrument. The Cronbach alpha was calculated for the independent and dependent variables in the data collection instrument using SPSS Software. Standardly, a minimum alpha value of 0.6 is required and usually used to check the instrument's reliability, however, alpha values more than 0.8 are preferable (Wim et al., 2008). The Cronbach Alpha values have been found to depend on the sum of items in a scale (Pallant, 2010). Nevertheless, the Cronbach Alpha estimates between 0.50-0.70 are considered moderately reliable (Hinton et al., 2004).

The calculated alpha values in this study were all more than 0.8 indicating the reliability of the scale used. The reliability results showing Cronbach Alpha values are presented in Table 4.1.

Table 4.1: The Cronbach Alpha estimates of the scales in the items

Variable	Number of items	Cronbach Alpha values
The available infrastructure in public senior high schools	34	0.858
Teaching-learning materials available in public senior high schools	15	0.826
Challenges of public senior high schools	19	0.899
Effects of free educational policy on infrastructure and learning-materials	38	0.977

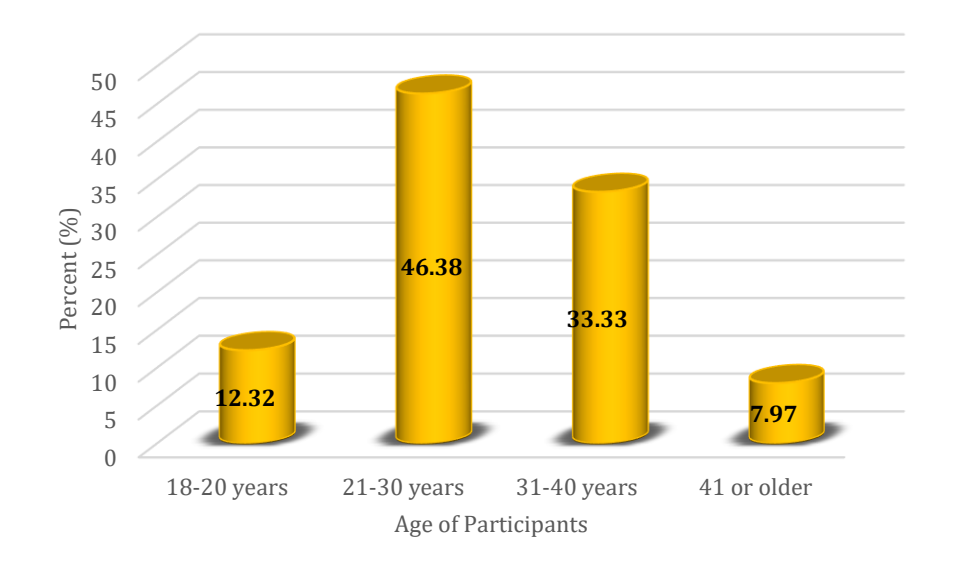
Source: Field survey, 2023.

4.1 BACKGROUND CHARACTERISTICS OF PARTICIPANTS

The first section outlines the main participants' characteristics in the study. The demographic characteristics were structured using indicators including age, sex, religion, marital status and education level. Data on the demographic features of the partakers were analyzed into frequencies and corresponding percentages.

4.1.1 AGE DISTRIBUTION OF RESPONDENTS

Figure 4.1 summaries the respondents' age distribution. In view of the results (Figure 4.1**)**, majority of the respondents' ages fell within the age groups of 31-40 years (33.33%) and 21-30 years (46.38%) and least ages were 18-20 years (12.32%) and 41 or older (7.97%). Implying that most of the participants' ages fell in the active working ages.



Source: Field survey, 2023.

Figure 4.1: Age distribution of respondents

4.1.2 SEX DISTRIBUTION OF RESPONDENTS

The result on the sex of participants is shown in Figure 4.2. Figure 4.2 displayed that out of 138 respondents interviewed, 94% of the respondents were males, whereas 6% were females. Explicitly, demonstrating that men participation was more in the study than women. This observation could be attributed to the use of convenience sampling.

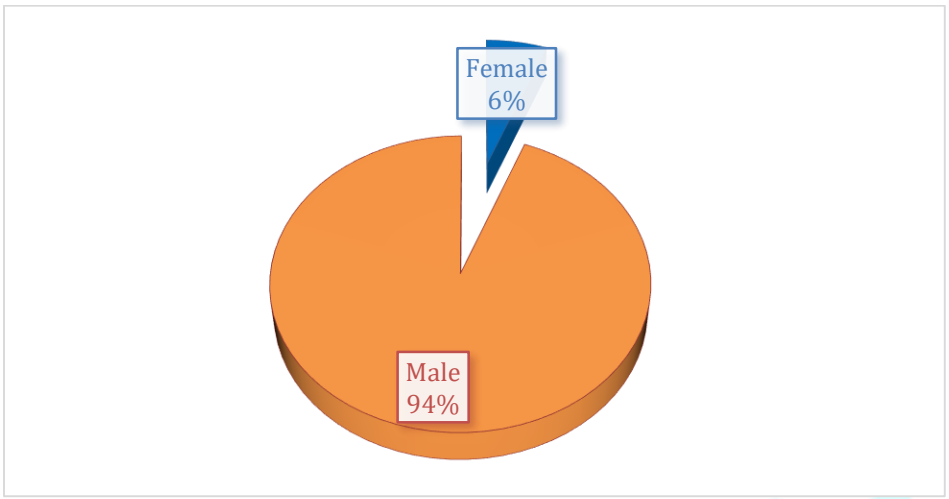


Figure 4.2: The sex distribution of respondents

Source: Field survey, 2023.

4.1.3 MARITAL STATUS OF PARTICIPANTS

The result on marital status of participants is shown in Figure 4.3 below. In Figure 4.3, most respondents were married (53.96%), 39.57% were singles and only 6.47% have divorced but no widowed participated. This data suggests that there were more married respondents within the schools.

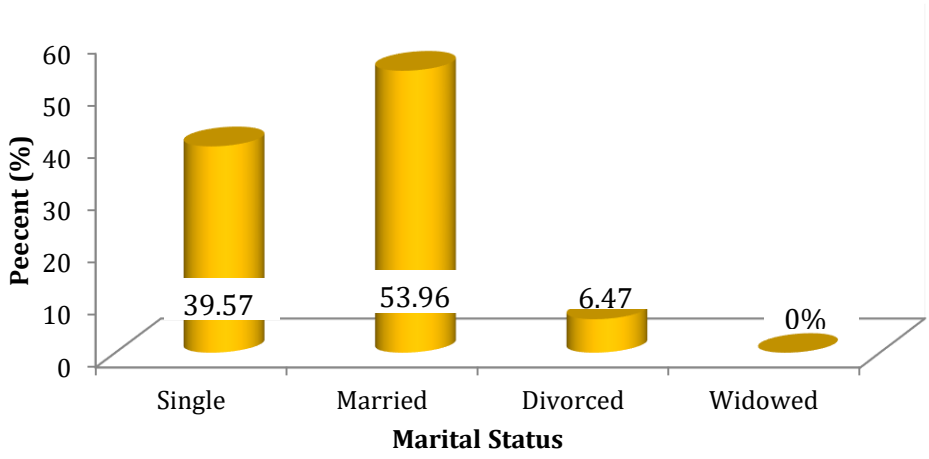


Figure 4.3: Marital status of respondents

Source: Field survey, 2023.

4.1.4 RELIGION OF RESPONDENTS

Considering the results in Figure 4.4, most respondents, 92.0% were Muslims, and 8.0% Christians. Showing that the dominant religions of these respondents were Islam and Christians, though there were more Muslims than Christians.

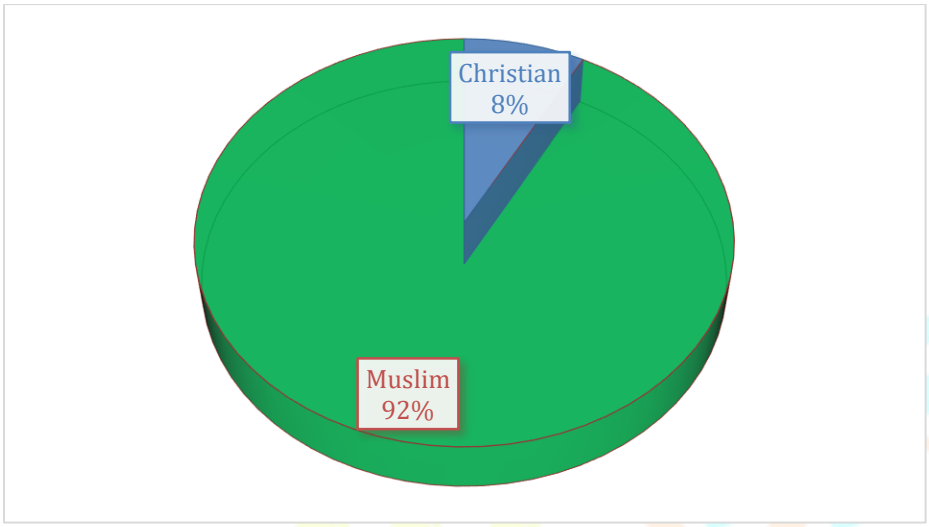


Figure 4.4: Religion of Respondents

Source: Field survey, 2023.

4.1.5: PERIOD OF TIME THE RESPONDENTS HAVE BEEN IN SCHOOLS

The result from Figure 4.1.5 disclosed that out 138 respondents interviewed, 57.55% have been in their schools for 1-5 years, while 29.5% ages fell within 6-10 years and 12.95% ages were within 11 years and above. The result specifies that most of respondents have been in their schools for some time and may have enough experiences concerning the affairs of their schools.

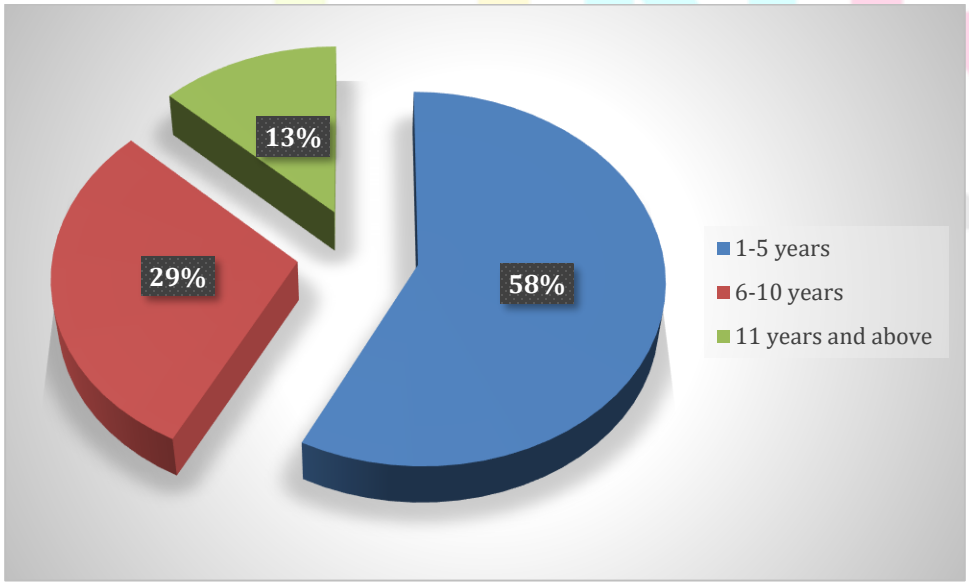


Figure 4.5: Period of time the respondents have been in schools

Source: Field survey, 2023.

4.1.6 EDUCATIONAL LEVEL OF RESPONDENTS

The result on the educational background of the respondents is shown in Figure 4.5. From Figure 4.5, most participants (65.95%) were degree holders, 19.56% have Masters, 14.49% are in senior high/vocational school, but none had PhD.

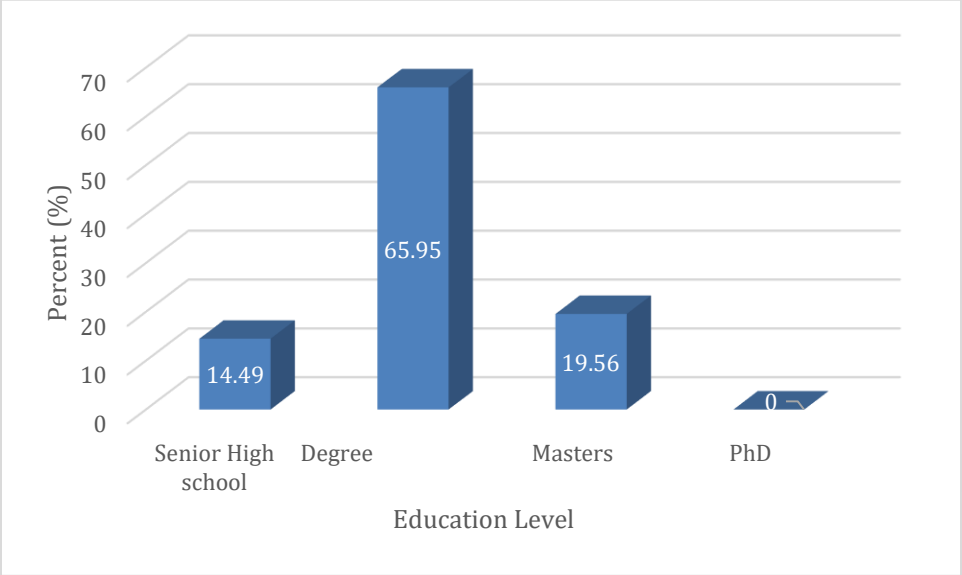


Figure 4.6: Educational level of participants

Source: Field survey, 2023.

4.2 ANALYSIS OF THE RESULTS

4.2.1 AVAILABLE INFRASTRUCTURE IN PUBLIC SENIOR HIGH SCHOOLS

This part, the researcher assessed availability of infrastructure in public senior high schools and the results analyzed is shown in Table 4.2.

From Table 4.2, it is quite clear that most of the respondents (67.4%) disagreed that there are no available classrooms; or teachers' quarters; or dormitories for boys and girls in schools. However, 14.47% of respondents accepted and 18.1% were uncertain.

Out of 138 respondents, 42.7% strongly disagree and 26.8% disagree respectively that assembly halls; or dining halls; or kitchens are available and are enough while only 7.3% and 7.3% agree with the statement, and 15.9% were neutral.

Additionally, Table 4.2 also showed that an aggregate of 36.9% and 47.8% of the respondents constitutes those who disagreed that they have enough and functional classroom doors and windows; or hand-washing stations; or water storage systems; or dust bins in their schools,

but 1.5% and 3.7% disagreed.

Again, a sum of 76.8% respondents agreed there is available access to electricity; or lightening in school compounds; or boundary walls; however, 6.5% disagree and 8.0% strongly disagree with this.

On availability of teachers' room; or headteachers' office; or library facility in the schools, 47.8% and 36.9% agree and strongly agree respectively, however, 1.5% and 3.7% disagree and strongly disagree respectively.

Also, concerning availability of adolescent girls changing and washing room in all toilet; or recreational halls; or internet facilities; or sewerage system; most participants, 40.6% and 30.4% strongly disagree and disagree respectively, but few 8.7% and 8.0% agree and strongly agree respectively.

Also, concerning availability toilet for girls; or toilet for boys; or urinal for boys; or urinal for girls; or bathrooms for boys; or bathrooms for girls, most participants, 36.9% and 22.5% strongly disagree and disagree respectively, but few 16.7% and 8.0% strongly disagree and disagree respectively.

Besides, 39.9% and 28.3% strongly disagree and disagree that there is available clean water; or science labs; or ICT labs however, others up to 9.4% and 10.1% agree and strongly agree to this statement.

Finally, more respondents, 47.1% and 34% strongly disagree and disagree that market place; or sports facility; or storage room are available in their schools, while 1.5% and 2.2% agree and strongly agree to this.

Table 4.2: Available infrastructure in public senior high schools

Variables	1	2	3	4	5	Total
Classroom	44 31.9%	49 35.5%	25 18.1%	7 5.07%	13 9.4%	138 100
Classroom doors and windows	51 36.9%	66 47.8%	14 10.1%	2 1.5%	5 3.7%	138 100
Lightening in school compound	51 36.9%	31 22.5%	22 15.9%	11 8%	23 16.7%	138 100
Teachers' quarters	44 31.9%	49 35.5%	25 18.1%	7 5.07%	13 9.4%	138 100
Headteachers' office	44 31.9%	49 35.5%	25 18.1%	7 5.07%	13 9.4%	138 100

Teachers' room	7 5%	11 8%	15 10.9%	39 28.3%	66 47.8%	138 100
Library facility	7 5%	11 8%	15 10.9%	39 28.3%	66 47.8%	138 100
Storage room	65 47.1%	47 34%	21 15.2%	2 1.5%	3 2.2%	138 100
ICT Labs	55 39.9%	39 28.3%	17 12.3%	13 9.4%	14 10.1%	138 100
Boundary Wall	51 36.9%	31 22.5%	22 15.9%	11 8%	23 16.7%	138 100
Recreational Halls	65 47.1%	47 34%	21 15.2%	2 1.5%	3 2.2%	138 100
Sports facility	7 5.07%	13 9.4%	25 18.1%	44 31.9%	49 35.5%	138 100
Assembly Hall	59 42.7%	37 26.8%	22 15.9%	10 7.3%	10 7.3%	138 100
Dining Hall	59 42.7%	37 26.8%	22 15.9%	10 7.3%	10 7.3%	138 100
Kitchen	59 42.7%	37 26.8%	22 15.9%	10 7.3%	10 7.3%	138 100
Dormitories for boys	7 5.07%	13 9.4%	25 18.1%	44 31.9%	49 35.5%	138 100
Dormitories for girls	7 5.07%	13 9.4%	25 18.1%	44 31.9%	49 35.5%	138 100
Market place	65 47.1%	47 34%	21 15.2%	2 1.5%	3 2.2%	138 100
Access to Electricity	51 36.9%	31 22.5%	22 15.9%	11 8%	23 16.7%	138 100
Science Labs	55 39.9%	39 28.3%	17 12.3%	13 9.4%	14 10.1%	138 100
Internet facilities	56 40.6%	42 30.4%	17 12.3%	12 8.7%	11 8%	138 100
water Storage systems	51 36.9%	66 47.8%	14 10.1%	2 1.5%	5 3.7%	138 100
Toilet for girls	11 8%	23 16.7%	22 15.9%	51 36.9%	31 22.5%	138 100
Toilet for boys	11 8%	23 16.7%	22 15.9%	51 36.9%	31 22.5%	138 100
Urinal for boys	11 8%	23 16.7%	22 15.9%	51 36.9%	31 22.5%	138 100
Urinal for girls	11 8%	23 16.7%	22 15.9%	51 36.9%	31 22.5%	138 100
Bathrooms for boys	11 8%	23 16.7%	22 15.9%	51 36.9%	31 22.5%	138 100
Bathrooms for girls	11 8%	23 16.7%	22 15.9%	51 36.9%	31 22.5%	138 100
Hand-washing stations	51 36.9%	66 47.8%	14 10.1%	2 1.5%	5 3.7%	138 100

Adolescent girls changing and washing room in all toilet	56 40.6%	42 30.4%	17 12.3%	12 8.7%	11 8%	138 100
Dust bins	51 36.9%	66 47.8%	14 10.1%	2 1.5%	5 3.7%	138 100
Safe drinking water	55 39.9%	39 28.3%	17 12.3%	13 9.4%	14 10.1%	138 100
Sewerage system	56 40.6%	42 30.4%	17 12.3%	12 8.7%	11 8%	138 100

To what extent are you aware of the following statements? Kindly rate where applicable, 1= strongly disagree, 2 = disagree 3= neither agree or disagree 4= agree, 5= strongly agree

Source: Field Data, 2023.

4.2.3 TEACHING-LEARNING MATERIALS AVAILABLE IN SCHOOLS

The current section seeks to examine the current teaching-learning materials available in public senior high schools.

This section presents all the results of the analyzed data collected on the current teaching-learning materials available in public senior high schools.

From Table 4.3, it can be observed that 35.5% and 31.9% of the respondents strongly disagreed and disagreed respectively that their classrooms and schools' ventilation is sufficient; however, 10.2% and 5% strongly agree and agree, respectively but 17.4% were uncertain.

Also, concerning overcrowding; lightening in classroom; writing board; chalks and markers pens; more than 50% (28.3% and 24.6%) of the respondents agree and strongly agree to that statement, whereas 16.7% and 15.9% agree to that statement.

Furthermore, 28.3% and 34% of respondents strongly agreed and agreed respectively that furniture in library; furniture in classrooms; furniture for teachers; though 18.8% and 8% strongly disagree and disagree respectively and 10.9% were neutral.

Out of the 138 respondents, only 5% and 7.3% strongly agreed and agreed that there are books in the libraries; teachers instructional guide; and available textbooks; while 10.2% were uncertain, most respondents strongly disagreed (36.2%) and disagreed (41.3%).

Also, from Table 4.3, most respondents (31.2% and 28.3%) strongly disagreed and disagreed that there is shelves or storage for books in schools; whereas 13.7% and 12.3% agree and strongly agree respectively.

About 24.6% and 16.7% of the respondents strongly disagreed and disagreed respectively that equipment and materials in labs are available, however 15.9% and 15.3% agreed, and 27.5% did not agree nor agree to this.

In terms of available audio-visual medium, majority of the respondents, representing 24.6% and 31.2% strongly disagreed and disagreed, while others (13.8% and 18.1%) agree to that statement.

Table 4.3: Teaching-learning materials available in schools

Variables	1	2	3	4	5	Total
Classroom & school ventilation	56 40.6%	31 22.5%	21 15.2%	11 8%	19 13.7%	138 100
Overcrowding	23 16.7%	22 15.9%	20 14.5%	39 28.3%	34 24.6%	23 16.7%
Lightening in Classroom	23 16.7%	22 15.9%	20 14.5%	39 28.3%	34 24.6%	138 100
Books in library	50 36.2%	57 41.3%	14 10.2%	7 5%	10 7.3%	138 100
Furniture in library	39 28.3%	47 34%	15 10.9%	26 18.8%	11 8%	138 100
Furniture in Classrooms	39 28.3%	47 34%	15 10.9%	26 18.8%	11 8%	39 28.3%
Furniture for teachers	39 28.3%	47 34%	15 10.9%	26 18.8%	11 8%	39 28.3%
writing board	23 16.7%	22 15.9%	20 14.5%	39 28.3%	34 24.6%	138 100
Chalks and markers pens	23 16.7%	22 15.9%	20 14.5%	39 28.3%	34 24.6%	138 100
Shelves or storage for books	43 31.2%	39 28.3%	20 14.5%	19 13.7%	17 12.3%	138 100
Available textbooks	50 36.2%	57 41.3%	14 10.2%	7 5%	10 7.3%	138 100
Teachers instructional guide	50 36%	31 22.5%	23 16.7%	9 6.6%	25 18.2%	138 100
Audio Visual Medium	34 24.6%	43 31.2%	17 12.3%	19 13.8%	25 18.1%	138 100
Availability of equipment and materials in Labs	34 24.6%	23 16.7%	38 27.5%	22 15.9%	21 15.3%	138 100

To what extent are you aware of the following statements? Kindly rate where applicable, 1= strongly disagree, 2 = disagree 3= neither agree or disagree 4= agree, 5= strongly agree

Source: Field Data, 2023.

4.2.4 CHALLENGES OF PUBLIC SENIOR HIGH SCHOOLS

As part of the objectives of this study, the investigator examined obstacles facing public senior high schools. The main findings regarding this aspect of the study are presented in Table 4.4 below. From Table 4.4 below it is illustrated that a sum of 40.6% and 22.5% of the respondents answered that there is deterioration of classroom facilities and school buildings, while 8% and 13.7% disagree and 15.2% were not sure.

The study further showed that majority of the participant, 36.2% and 41.3% accepted that there is congestion in classrooms, but lesser numbers (5% and 7.3%) disagreed to this, and the remaining participants (10.2%) were unsure.

Also, in Table 4.4 out of the 138 respondents, 33.3% and 26.1% strongly agreed and agreed that they faced problems concerning inadequate classrooms and classrooms furniture, representing the majority, and 13.1% and 15.2% strongly disagreed and disagreed to this.

Additionally, from Table 4.4, it can be observed that 27.5% and 22.5% of the partakers agreed and strongly agreed respectively that inadequate water supply is not an obstacle in their schools; however, 18.8% and 17.5% strongly disagreed and disagreed, respectively.

Majority of the participants, 31.2% and 28.3% constitute respondents who agreed and strongly agreed respectively that there is lack of equipment and dormitories, and another number (14.5%) were unable to accept nor disagree, though 13.7% and 12.3% of the respondents strongly disagree and disagree to this.

Further, Table 4.4 illustrated that an aggregate of 24.6% and 31.3% of partakers agreed and strongly agreed that there is lack of funds for operational cost and delayed in disbursement of funds for feeding in their schools, but 21.7% and 10.8% strongly disagree and disagree respectively to this, whereas 11.6% were uncertain.

In addition, 42% and 37.6% of partakers did not accept that there are issues of poor quality of food for students, however 4.4% and 3.6% of the participants did not accept, and 12.4% were uncertain.

Out of the 73 partakers, only 31.2% and 24.6% strongly agreed and agreed that they lack of toilets and other hygiene facilities in their schools, most partakers strongly disagreed (18.1%) and disagreed (13.8%) to that.

Furthermore, 24.6% and 16.7% of partakers strongly disagreed and disagreed respectively that they lack of subject's teachers in their schools; and whiles 15.9% and 15.3% of participants agreed and strongly agreed to this.

The results showed that up to 26.1% and 33.3% of partakers, representing the majority, strongly agreed and agreed that there are faced with insufficient learning materials in their schools, 13.1% and 15.2% strongly disagree and disagree respectively to that, but 12.3% were uncertain.

In terms of the insufficient Technology, majority of the partakers, representing 24.6% and 31.2% strongly agreed and agreed, while others (18.1% and 13.8%) disagreed to that statement.

Also, concerning decreased teacher resources; and lack of teacher motivation, more than 50% (31.1% and 30.4%) of the partakers agreed and strongly agreed to that statement. However, about 13.1% and 13.1% of the partakers strongly disagreed and disagreed respectively and 12.3% were uncertain.

The results further displayed that 23.2% and 28.2% of participants, representing the majority, strongly agreed and agreed that there are overused library resources in their schools, 13.1% and 15.2% strongly disagree and disagree respectively to that, but 12.3% were uncertain.

Finally, with regards to increase students' enrolments; or increased student-teacher ratio, in Table 4.4, most partakers (39.4% and 40.6%) unanimously agreed on the statement; whereas, 5.7% and 5.7% disagreed and strongly disagreed respectively on this. But 8.6% of the participants appear to be neutral.

Table 4.4: Teaching-learning materials available in schools

Variables	1	2	3	4	5	Total
Deterioration of classroom facilities and school buildings	11 8%	19 13.7%	21 15.2%	56 40.6%	31 22.5%	138 100
Congestion in classrooms	7 5%	10 7.3%	14 10.2%	50 36.2%	57 41.3%	138 100
Inadequate classrooms furniture	18 13.1%	21 15.2%	17 12.3%	36 26.1%	46 33.3%	138 100
Inadequate classrooms	18 13.1%	21 15.2%	17 12.3%	36 26.1%	46 33.3%	138 100
Inadequate water supply	26 18.8%	24 17.5%	19 13.7%	31 22.5%	38 27.5%	138 100
Lack of dormitories	19 13.7%	17 12.3%	20 14.5%	43 31.2%	39 28.3%	138 100
Delayed disbursement of funds for feeding	30 21.7%	15 10.8%	16 11.6%	34 24.6%	43 31.3%	138 100
Poor quality of food for students	6 4.4%	5 3.6%	17 12.4%	58 42%	52 37.6%	138 100
Lack of toilets and other hygiene facilities	19 13.8%	25 18.1%	17 12.3%	34 24.6%	43 31.2%	138 100
Lack of subject's teachers	22 15.9%	21 15.3%	38 27.5%	34 24.6%	23 16.7%	138 100
Insufficient learning materials	18 13.1%	21 15.2%	17 12.3%	36 26.1%	46 33.3%	138 100
Insufficient Technology	19 13.8%	25 18.1%	17 12.3%	34 24.6%	43 31.2%	138 100
Lack of funds for operational cost	30 21.7%	15 10.8%	16 11.6%	34 24.6%	43 31.3%	138 100
Lack of Equipment	19	17	20	43	39	138

	13.7%	12.3%	14.5%	31.2%	28.3%	100
Decreased Teacher Resources	18 13.1%	18 13.1%	17 12.3%	42 30.4%	43 31.1%	138 100
Lack of teacher motivation	18 13.1%	18 13.1%	17 12.3%	42 30.4%	43 31.1%	138 100
Overused Library Resources	25 18.2%	21 15.2%	21 15.2%	32 23.2%	39 28.2%	138 100
Increase students' enrolments	8 5.7%	8 5.7%	12 8.6%	56 40.6%	54 39.4%	138 100
Increased student-teacher ratio	8 5.7%	8 5.7%	12 8.6%	56 40.6%	54 39.4%	138 100

To what extent are you aware of the following statements? Kindly rate where applicable, 1= strongly disagree, 2 = disagree 3= neither agree or disagree 4= agree, 5= strongly agree

Source: Field Data, 2023.

4.2.5 EFFECTS OF FREE EDUCATIONAL POLICY ON INFRASTRUCTURE AND LEARNING-MATERIALS

The study further assessed the effects of free educational policy on infrastructure and learning-materials. The analyzed results on this part of the data are shown in Table 4.5.

4.2.5.1 POSITIVE EFFECTS

Table 4.5 illustrates that greater number of respondents (26.8% and 40.5%) disagreed that free education improved infrastructure or increased funding for operational cost in schools; nonetheless, few (8% and 8%) agreed to this and 16.7% were neutral.

From the results, a greater number (22.5% and 54.3%) of the respondents indicated that free education does not increased technology and access to computer or increased labs and equipment, while 8% and 6.5% disagree and 8.7% were neutral to this.

Furthermore, most respondents (37% and 47.8%) agreed that free education decreased financial pressure on students and their parents or decreased school dropout from schools, whereas 1.4% and 3.6% disagreed to this, and 10.2% were uncertain.

Additionally, an aggregated number of (28.3% and 47.8%) respondents disagreed that free education increases academic performance of students in schools, but 10.9% were neutral to this, whereas 5% and 8% participants agreed.

Further, Table 4.3 illustrates that an aggregate, 32.6% and 31.9% of respondents strongly disagreed and disagreed that free education improved library facilities or increased classrooms, but an aggregate of 10.2% and 13% agree and 12.3% were uncertain.

In addition, 28.3% and 38.4% of respondents disagreed and strongly disagreed that free education has increased sport facilities in their schools, however, 9.4% and 10.1% of respondents agreed and strongly agreed to this with 13.8% being neutral.

4.2.5.2 NEGATIVE EFFECTS

The results showed that a sum of 35.5% and 30.4% of the participants, representing the majority, strongly agree and agree respectively that free education is associated with inadequate classrooms; or lack of dormitories; or decreased quality of infrastructure, 11.6% and 11.6% strongly disagree and disagree respectively and 10.9% were neutral.

Table 4.5 exhibited that a summation of 39.9% and 34.1% of the participants, being the majority, strongly agreed and agreed, respectively, that free education influences students' congestion in classrooms; or poor quality of food for students, 7.2% and 6.5% strongly disagree and disagree respectively and 12.3% were impartial on these.

Majority of participants (31.9% and 35.5%) agree and strongly agree that free education increase exams malpractice in schools, though 13.8% were neutral, 10.1% and 5.1% of respondents disagreed.

Out of the 138 respondents, majority (40.5% and 26.8%) agreed and strongly agreed that free education delayed disbursement of funds for schools, even though 8% and 8% disagreed, 16.7% were neutral.

The results also showed that 37% and 47.8% of the respondents agreed that free education results in inadequate classrooms furniture; or lack of labs and equipment; however, 3.6% and 1.4% disagreed.

With regards to insufficient teaching-learning materials e.g., textbooks, majority of respondents (28.3% and 47.8%) strongly agree and agree but few (5% and 8%) disagreed and strongly disagreed, respectively.

Concerning free education effects on absence of subject's teachers or put pressure on library resources, 28.3% and 38.4% agreed and strongly agreed to each statement, however, 9.4% and 10.1% disagreed while 10.9% were neutral.

Table 4.5 below demonstrates that a larger number (28.3% and 30.4%) of the participants agreed that free education influences inadequate supply of water or lack of toilets and other hygiene facilities, whereas 10.1% and 9.4% disagreed. .

Finally, in Table 4.5, the totality of 36.2% and 41.3% respondents agreed that there increase students' enrolments, though 10.2% were neutral, 7.3% and 5% of respondents disagreed.

Table 4.5: Effects of free educational policy on infrastructure and learning-materials

Variables	1	2	3	4	5	Total
Positives effects						
Improved Infrastructure	37 26.8%	56 40.5%	23 16.7%	11 8%	11 8%	138 100
Increased technology and access computer	31 22.5%	75 54.3%	12 8.7%	9 6.5%	11 8%	138 100
Increased labs and equipment	31 22.5%	75 54.3%	12 8.7%	9 6.5%	11 8%	138 100
Decreased financial pressure on students and their parents	2 1.4%	5 3.6%	14 10.2%	51 37%	66 47.8%	138 100
Increase academic performance of students	39 28.3%	66 47.8%	15 10.9%	7 5%	11 8%	138 100
Increased Classrooms	45 32.6%	44 31.9%	17 12.3%	14 10.2%	18 13%	138 100
Decreased school dropout	2 1.4%	5 3.6%	14 10.2%	51 37%	66 47.8%	2 1.4%
Increased Sport facilities	39 28.3%	53 38.4%	19 13.8%	13 9.4%	14 10.1%	138 100
Increased funding for school operational cost	37 26.8%	56 40.5%	23 16.7%	11 8%	11 8%	138 100
Improved Library Facilities	45 32.6%	44 31.9%	17 12.3%	14 10.2%	18 13%	138 100
Negative effects						
Decreased quality of infrastructure	16 11.6%	16 11.6%	15 10.9%	49 35.5%	42 30.4%	138 100
Congestion in classrooms	9 6.5%	10 7.2%	17 12.3%	55 39.9%	47 34.1%	138 100
Increase exams malpractice	7 5.1%	14 10.1%	24 17.4%	44 31.9%	49 35.5%	138 100
Delayed disbursement of funds for schools	11 8%	11 8%	23 16.7%	37 26.8%	56 40.5%	138 100
Poor quality of food for students	9 6.5%	10 7.2%	17 12.3%	55 39.9%	47 34.1%	138 100
Inadequate classrooms furniture	2 1.4%	5 3.6%	14 10.2%	51 37%	66 47.8%	138 100

Insufficient Teaching-learning materials e.g. textbooks	7 5%	11 8%	15 10.9%	39 28.3%	66 47.8%	138 100
Lack of labs and Equipment	2 1.4%	5 3.6%	14 10.2%	51 37%	66 47.8%	138 100
Put pressure on Library Resources	13 9.4%	14 10.1%	19 13.8%	39 28.3%	53 38.4%	138 100
Inadequate classrooms	16 11.6%	16 11.6%	15 10.9%	49 35.5%	42 30.4%	138 100
Inadequate supply of water	13 9.4%	21 10.1%	15 13.8%	33 28.3%	42 30.4%	138 100
Lack of dormitories	16 11.6%	16 11.6%	15 10.9%	49 35.5%	42 30.4%	138 100
Lack of toilets and other hygiene facilities	13 9.4%	21 10.1%	15 13.8%	33 28.3%	56 38.4%	138 100
Lack of subject's teachers	13 9.4%	14 10.1%	19 13.8%	39 28.3%	53 38.4%	138 100
Increase students' enrolments	7 5%	10 7.3%	14 10.2%	50 36.2%	57 41.3%	138 100

To what extent are you aware of the following statements? Kindly rate where applicable, 1= strongly disagree, 2 = disagree 3= neither agree or disagree 4= agree, 5= strongly agree

Source: Field Data, 2023.

4.3 DISCUSSION OF FINDINGS

4.3.1 AVAILABLE INFRASTRUCTURE AND TEACHING-LEARNING MATERIALS IN PUBLIC SENIOR HIGH SCHOOLS

Teaching-learning materials are useful in supporting the teacher with the demonstration and communication of educational content and the attainment of educational objectives, whereas helping the schoolchildren in gaining knowledge, and profiling diverse capabilities in addition to values (Bušljeta, 2013). The main goals of utilizing teaching-learning materials during teaching is to enable teaching and enhance learning (Regmi & Jones, 2020). Frimpong, (2021) emphasized the significance of instructional materials availability in attaining effectiveness in school system (Yeboah, Abonyi, & Luguterah, 2019). Ndirangu and Udoto (2011) also stated that having an adequate supply of high-quality physical infrastructure makes learning more productive. Ngao, Rop, and Nyongesa (2015) founded schools owned by individuals to perform well because they have adequate infrastructure and learning and teaching resources. According to Bukoye, (2019, June), there is a very substantial beneficial relationship between infrastructure, learning materials and Academic performance. Therefore, this study

investigated the effect of Ghana's free educational policy on infrastructure and teaching-learning materials in public senior high schools.

Undoubtedly, infrastructure, teaching and learning materials are the backbone of formal education. Hence, in this study the first objective was to assess availability of infrastructure in public senior high schools and participants responds were analyzed. This study found that most respondents testified that they have insufficient infrastructure available in the schools including classrooms; teachers' quarters; dormitories for boys and girls; assembly halls; dining halls; kitchens, classroom doors and windows; hand-washing stations; water storage systems; dust bins; adolescent girls changing and washing room in all toilet; recreational halls; internet facilities; sewerage system; toilet for girls; toilet for boys; urinal for boys; urinal for girls; bathrooms for boys; bathrooms for girls; most participants; available clean water; science labs; ICT labs; market place; sports facility; proper storage room in the schools. Through observation, this study found that some of these facilities were insufficient, require repairs, and some were too damaged to be repaired. A similar observation was made by Asiyai, (2012) who investigated school infrastructure in public senior high schools and the findings exposed that school facilities were mostly in poor shape with insufficient maintenance. These study findings were previously reported and agreed with the work by Ngwaru, and Oluga, (2015); and Herath, Duffield, and Zhang, (2023). Also, Bariu (2020) stated that most schools have low investment in ICT infrastructure due to high costs of computer hardware, software and related accessories.

Furthermore, this study found that respondents agreed there is available lightening in school compounds; boundary walls; access to electricity; teachers' room; headteachers' office; library facility in the schools. Base on observations, most of these facilities were averagely in good state and functionally used in the schools.

The study further assessed the teaching-learning materials in public senior high schools. The findings on this section are discussed below. The results in this study demonstrates that most senior high schools do not have adequate teachers instructional guide; textbooks; shelves or storage for books; equipment and materials in labs; audio-visual medium; classrooms and schools' ventilation; furniture in library; furniture in classrooms; furniture for teachers; books in the libraries; and the schools are experiencing overcrowding in classrooms and in schools. Through observation, the study noticed that most of these resources were not in good form to be used to their fullest

capacity and others were even non-functional. This study findings are in agreements with the study by Ngwaru and Oluga, (2015) who mentioned that schools usually lack teaching-learning materials. The study results also agree with other works by Matey (2020); Olang'o et al., (2021); Mutungwa and Orodho, (2014); and Marishane, (2013).

4.3.2 CHALLENGES OF PUBLIC SENIOR HIGH SCHOOLS

The study further identified challenges facing public senior high schools in the era of free education.

The current study found that the obstacles facing senior high schools include deterioration of classroom facilities and school buildings; congestion in classrooms; inadequate classrooms and classrooms furniture; inadequate water supply; lack of equipment and dormitories; lack of funds for operational cost; delayed in disbursement of funds for feeding; poor quality of food for students; lack of toilets and other hygiene facilities; lack of subject's teachers; teaching-learning materials; insufficient Technology; decreased teacher resources; lack of teacher motivation; overused library resources; increase students' enrolments; increased student-teacher ratio. This study findings are indifferent from previous reports. Similarly, Parveen et al., (2022); Dorcas (2018); Gahungu (2018); Ngwaru and Oluga, (2015); Geverola et al. (2022) and Chanimbe and Dankwah (2021) have already reported challenges and struggles in public senior high school.

4.3.3 EFFECTS OF FREE EDUCATIONAL POLICY ON INFRASTRUCTURE AND LEARNING-MATERIALS

The purpose of the study was to assess the effect of Ghana's free educational policy on infrastructure-learning materials in public senior high schools in Tamale Metropolis. Free education policies have led to an increase in the number of students enrolled in schools due to the new strategic concept of mass promotion (Tamanja & Pajibo, 2019). Consequently, the boost in student numbers will need to be managed by the government through improvements in infrastructure and teaching-learning materials. Therefore, to uncover the situation on grounds, this study investigated the effect of Ghana's free educational policy on infrastructure-learning materials in public senior

high schools in Tamale Metropolis. The considered the positive and negative effects of Ghana's free educational policy on infrastructure-learning materials in public senior high schools

4.3.3.1 POSITIVE EFFECTS

This study results demonstrates that the free education policy has positive effects such as reduced financial pressure on students and their parents; and diminished school dropout from schools. These findings agree with the work done by Bhuwania, Huh, and Heymann, (2023) who the influence in reducing child marriage; early childbearing; as well as school dropout from schools.

The current study found that the free education policy does not positively affect or improved infrastructure; increased funding for operational cost in schools; increased technology and access to computers for students; increased labs and equipment; increases academic performance of students; improved library facilities; increased classrooms; and increased sport facilities in public senior high schools.

4.3.3.2 NEGATIVE EFFECTS

The results showed that free education policy is associated with inadequate classrooms; lack of dormitories; decreased quality of infrastructure, students' congestion in classrooms; poor quality of food for students; increase exams malpractice in schools; delayed disbursement of funds for schools; inadequate classrooms furniture; lack of labs and equipment; insufficient teaching-learning materials e.g., textbooks; absence of subject's teachers; put pressure on library resources; inadequate supply of water; lack of toilets and other hygiene facilities; and increase students' enrolments. The current study found that senior high schools face numerous obstacles which are associated to the implementation of the free education policy.

This study results are in agreements with others studies. In consistency, Sandholtz (2022); Kwegyiriba (2021); and World Bank (2009) mentioned that free education leads to increased enrollment, as demand for education is cost dependent. This study findings are in agreements with the study by Asante (2022) found that the abolition of fees increased secondary school enrollment by 6%. Similarly, in Gambia, abolishing school fees for girls, caused a 5% increase in girls' school enrollment**,** and a 0.2% corresponding increase in the total girls' enrollment in secondary schools (Gajigo, 2016)**,** and a 55% increase in the number of girls sitting for the high school final exam (Blimpo et

al., 2016**).** Wils (2015) found that providing general education up to the secondary level could cost up to 6.6% of GDP in low- and lower-middle-income .

CHAPTER FIVE

SUMMARY FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The final chapter of this study consists of a summary of the key findings pertaining to each objective and the conclusions drawn from them. This chapter highlights key issues that were uncovered by this study regarding: available infrastructure; and teaching-learning materials; challenges; and effects of free education policy on infrastructure and learning-materials.

5.2 SUMMARY OF THE FINDINGS

This study found the available infrastructure in senior high schools to include classrooms; teachers' quarters; dormitories for boys and girls; assembly halls; dining halls; kitchens, classroom doors and windows; hand-washing stations; water storage systems; dust bins; adolescent girls changing and washing room in all toilet; recreational halls; internet facilities; sewerage system; toilet for girls; toilet for boys; urinal for boys; urinal for girls; bathrooms for boys; bathrooms for girls; most participants; available clean water; science labs; ICT labs; market place; lightening in school compounds; boundary walls; access to electricity; teachers' room; headteachers' office; library facility; sports facility; storage room in the schools. Through observation, this study found that most of these facilities were insufficient, require repairs, and some were too damaged to be repaired.

This study demonstrates that the available teaching-learning materials in senior high schools include teachers instructional guide; textbooks; shelves or storage for books; equipment and materials in labs; audio-visual medium; classrooms and schools' ventilation; furniture in library; furniture in classrooms; furniture for teachers; books in the libraries; and the schools are experiencing overcrowding in classrooms and in schools. Through observation, the study noticed that most of these resources were not in good form to be used to their fullest capacity and others were even non-functional.

The current study found that the obstacles facing senior high schools include deterioration of classroom facilities and school buildings; congestion in classrooms; inadequate classrooms and classrooms furniture; inadequate water supply; lack of equipment and dormitories; lack of funds for operational cost; delayed in disbursement of funds for feeding; poor quality of food for students; lack of toilets and other hygiene facilities; lack of subject's teachers; teaching-learning materials; insufficient Technology; decreased teacher resources; lack of teacher motivation; overused library resources; increase students' enrolments; increased student-teacher ratio.

Also, this study results demonstrates that the free education policy has positive effects such as reduced financial pressure on students and their parents; increase students' enrolments and reduced school dropout from schools. The current study found that the free education policy does not positively affect or improved infrastructure; increased funding for operational cost in schools; increased technology and access to computers for students; increased labs and equipment; increases academic performance of students; improved library facilities; increased classrooms; and increased sport facilities in public senior high schools.

The results showed that free education policy is associated with inadequate classrooms; lack of dormitories; decreased quality of infrastructure, students' congestion in classrooms; poor quality of food for students; increase exams malpractice in schools; delayed disbursement of funds for schools; inadequate classrooms furniture; lack of labs and equipment; insufficient teaching-learning materials e.g., textbooks; absence of subject's teachers; put pressure on library resources; inadequate supply of water; and lack of toilets and other hygiene facilities.

5.4 CONCLUSION

The main focus of the study was to assess the effect of Ghana's free educational policy on infrastructure and teaching-learning materials in public senior high schools in Tamale Metropolis. The study formulated four objectives: to examine the availability of infrastructure; to examine the availability of teaching-learning materials; to identify the challenges; to investigate the effect of Ghana's free educational policy on infrastructure and learning materials in public senior high schools. The study used the mixed method and data was collected using pre-tested questionnaire and observation.

This study found the available infrastructure in senior high schools to include classrooms; teachers' quarters; dormitories for boys and girls; assembly halls; dining halls; kitchens, classroom doors and windows; hand-washing

stations; water storage systems; dust bins; adolescent girls changing and washing room in all toilet; recreational halls; internet facilities; sewerage system; toilet for girls; toilet for boys; urinal for boys; urinal for girls; bathrooms for boys; bathrooms for girls; most participants; available clean water; science labs; ICT labs; market place; lightening in school compounds; boundary walls; access to electricity; teachers' room; headteachers' office; library facility; sports facility; storage room in the schools. Through observation, this study found that most of these facilities were insufficient, require repairs, and some were too damaged to be repaired.

This study further demonstrates that the available teaching-learning materials in senior high schools include teachers instructional guide; textbooks; shelves or storage for books; equipment and materials in labs; audio-visual medium; classrooms and schools' ventilation; furniture in library; furniture in classrooms; furniture for teachers; books in the libraries; and the schools are experiencing overcrowding in classrooms and in schools. Through observation, the study noticed that most of these resources were not in good form to be used to their fullest capacity and others were even non-functional.

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Also, this study results demonstrates that the free education policy has positive effects such as reduced financial pressure on students and their parents; increase students' enrolments and reduced school dropout from schools. The current study found that the free education policy does not positively affect or improved infrastructure; increased funding for operational cost in schools; increased technology and access to computers for students; increased labs and equipment; increases academic performance of students; improved library facilities; increased classrooms; and increased sport facilities in public senior high schools.

The results showed that free education policy is associated with inadequate classrooms; lack of dormitories; decreased quality of infrastructure, students' congestion in classrooms; poor quality of food for students; increase

exams malpractice in schools; delayed disbursement of funds for schools; inadequate classrooms furniture; lack of labs and equipment; insufficient teaching-learning materials e.g., textbooks; absence of subject's teachers; put pressure on library resources; inadequate supply of water; and lack of toilets and other hygiene facilities.

In conclusion, while the findings of this research demonstrate that the introduction of the free education policy has been beneficial in making education accessible to all, it is clear that there is still a great deal to be done to improve educational infrastructure and learning materials at senior high schools.

5.5 RECOMMENDATIONS

This research investigated the effect of Ghana's free educational policy on infrastructure-learning materials in public senior high schools in Tamale Metropolis.

Based on the study findings, the study made the following recommendations:

This study found that infrastructure and teaching-learning materials in public senior high schools were insufficient, some require repairs, and others were too damaged to be repaired. Therefore, there is the need to respond quickly to save the situation.

To improve the infrastructure and teaching-learning materials in the schools:

- The Government, district assembly and school administration should provide or allocate funds for the regular maintenance of these facilities in the schools.
- The Government, district assembly and school administration should construct new infrastructure and provide fresh teaching-learning materials in the schools. These provisions would encourage effective sanitation and hygiene practices in the schools.
- For durability and sustainability of existing infrastructure and teaching-learning resources, monitoring and taking immediate respond to fix problems with regarding these resources is crucial. Therefore, the district assembly, school managements and the community should take up such duties together.

▪ The Government, district assembly and charity organizations should provide comprehensive standards, surveillance and monitoring indicators and technical capacity that embodies the overall managements of these facilities.

The current study found that senior high schools face numerous obstacles which are associated to the implementation of the free education policy.

▪ The study recommends that the school and other stakeholders in education should effectively collaborate and contribute significantly towards the development of learning infrastructure and environment, so as to create a more conducive working environment for a sustainable high-quality education assurance practice in secondary schools.

▪ One of the most important ways in which the Free Senior High School policy can impacted on education is that it should have a positive effect on the availability of infrastructure and teaching-learning materials at senior high schools. Hence the study encourages the government to invest more in educational resources for senior high schools, thus increasing access to infrastructure and teaching-learning materials for students.

▪ In particular, the government has to make efforts to improve the availability of textbooks. After the free SHS policy was implemented, textbooks were distributed but still not enough for the increasing enrolments, especially in rural areas. Hence, more books have to be distributed to schools, leading to an overall increase in the availability of learning materials.

▪ The government also have to continue to invested in other resources such as digital content and modern teaching equipment. This could enable teachers to engage students better and provided students with a more interactive learning experience. As a result, student performance would be improved and student engagement would be also increased significantly.

5.6 RECOMMENDATIONS FOR FURTHER RESEARCH

This study is narrow in that it was a survey study done within a short time in the Tamale Metropolis. Based on the study findings, the following recommendations are made:

- Further studies should be piloted on investigated the effect of Ghana's free educational policy on infrastructure-learning materials in public senior high schools across the entire region. A large and broad study on the region would yield a broader picture instead of case study in only one municipality which addresses specific contexts.
- The evidence for the importance of safe and healthy schools to promote learning is strong, but investigations are urgently needed into how to make this happen effectively in the context of existing country level regulations.
- There are persuasive arguments in favor of the contention that involving the whole range of stakeholders in all of the different stages of school planning has a positive effect on outcomes, but comparative case studies are needed to further explore this area.
- There is also the need to generate evidence from infrastructure projects implemented in different context: from urban to rural geographical locations, and with students from different cultural backgrounds.
- Also, further research on how to increase investments in educational infrastructure in ways that will overcome current challenges and reap all of the potential benefits, particularly those related to learning.

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APPENDIX 1
Questionnaire for administrators, teachers and students

Part IV: Challenges of public senior high schools

Please tick the number that corresponds with your level of agreement or disagreement with each of the following statements about the challenges of public senior high schools as indicated in the scale below: 1= strongly disagree, 2 = disagree 3= neither agree nor disagree 4= agree, 5= strongly agree.

No.	Challenges	1	2	3	4	5	Remarks
1.	Deterioration of classroom facilities and school buildings						
2.	Congestion in classrooms						
3.	Inadequate classrooms furniture						
4.	Inadequate classrooms						
5.	Inadequate water supply						
6.	Lack of dormitories						
7.	Delayed disbursement of funds for feeding						
8.	Poor quality of food for students						
9.	Lack of toilets and other hygiene facilities						
10.	Lack of subject's teachers						
11.	Insufficient learning materials						
12.	Insufficient Technology						
13.	Lack of funds for operational cost						
14.	Lack of Equipment						
15.	Decreased Teacher Resources						
16.	Lack of teacher motivation						
17.	Overused of Library Resources						
18.	Increase students' enrolments						
19.	Increased student-teacher ratio						

Part V: Effects of free educational policy on infrastructure and learning-materials

Please tick the number that corresponds with your level of agreement or disagreement with each of the following statements about the effect of Ghana's free educational policy on infrastructure and learning-materials in public senior high schools as indicated in the scale below: 1= strongly disagree, 2 = disagree 3= neither agree nor disagree 4= agree, 5= strongly agree.

	Positive Effects	1	2	3	4	5	Remarks
1.	Improved Infrastructure						
2.	Increased Computer lab and items						
3.	Increased Science lab and items						
4.	Decreased financial pressure on students and their parents						
5.	Increase academic performance of students						
6.	Increased Classrooms						
7.	Decreased school dropout						
8.	Increased Sport facilities						
9.	Increased funding for school operational cost						
10.	Improved Technology						
11.	Improved Equipment						
12.	Increase in Teacher Resources						
13.	Increased Access to Learning Materials						
14.	Increased Textbooks						
15.	Improved Library Facilities						
16.	Increase in Teaching Aids						
17.	Computer access						
	Negative Effects						
18.	Decreased Quality of Infrastructure						
19.	Deterioration of classroom facilities						
20.	Congestion in classrooms						
21.	Increase exams malpractice						
22.	Delayed disbursement of funds for feeding						
23.	Poor quality of food for students						
24.	Inadequate classrooms furniture						

25.	Decreased funding for school operational cost						
26.	Insufficient Teaching-learning materials						
27.	Insufficient Technology						
28.	Lack of Equipment						
29.	Decreased Teacher Resources						
30.	Strained Access to Learning Materials						
31.	Insufficient Textbooks						
32.	Put pressure on Library Resources						
33.	Inadequate classrooms						
34.	Inadequate supply of water						
35.	Lack of dormitories						
36.	Lack of toilets and other hygiene facilities						
37.	Lack of subject's teachers						
38.	Increase students' enrolments						