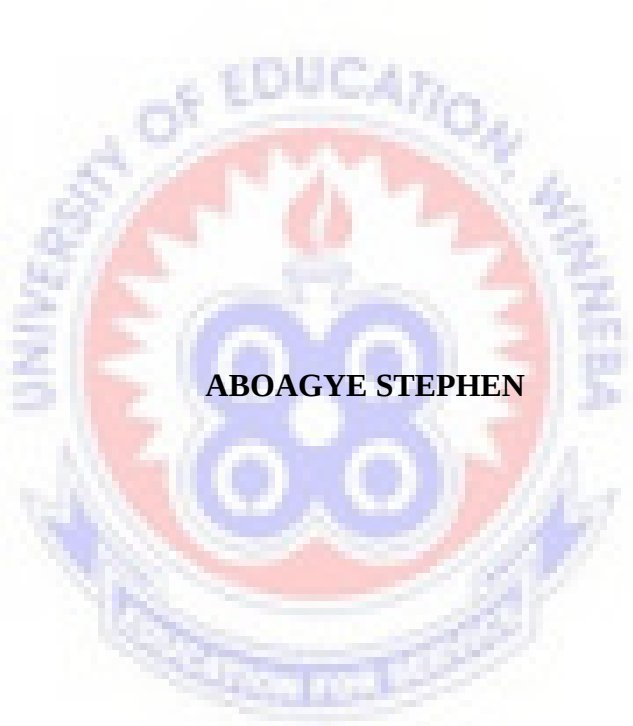
UNIVERSITY OF EDUCATION, WINNEBA

A COMPARATIVE STUDY OF THE PERFORMANCE IN THE CORE SUBJECTS BY STUDENTS WHO COMPLETED IN 3 AND 4 YEARS IN THE 2013 WASSCE AT ASUOM SENIOR HIGH SCHOOL



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UNIVERSITY OF EDUCATION WINNEBA

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A Thesis In the Department of Social Studies Education, Faculty of Social Sciences Education, submitted to the School of Graduate Studies, University of Education, Winneba in partial fulfilment of the requirements for the award of the Master of Philosophy (SOCIAL STUDIES) degree.

September, 2015

DECLARATION

STUDENT'S DECLARATION

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

SIGNATURE: ……

DATE: ……

SUPERVISOR'S DECLARATION

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

NAME OF SUPERVISOR:……

SIGNATURE:……

DATE……

DEDICATION

This piece of work is dedicated to my lovely sons, Nhyiraba Nana Aboagye and Papa Yeboah Aboagye. The work is also dedicated to my wonderful wife Mrs Vida Amankwaah Aboagye.

ACKNOWLEDGEMENTS

Despite the difficulty involved in duly appreciating the efforts and contributions of all and sundry to the success of this thesis, I will still have to recognize the contributions of some individuals.

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LIST OF ABBREVIATIONS

ASEC	Asuom Senior High School
BECE	Basic Education Certificate of Examination
DfES	Department for Education and Skills
GCE	General Certificate Examination
JHS	Junior High School
SHS	Senior High School
SSSCE	Senior Secondary School Certificate Examination
WAEC	West African Examination Council
WASSCE	West African Senior school Certificate Examination
SAT-M	Scholastic Assessment Test-Mathematics
IQ	Intelligence Quotient
ICT	Information and Communication Technology
METU	Middle East Technical University
IEA	International Association for the Evaluation of Educational Achievement
TIMSS	Trends in International Mathematics and Science Study
GPA	Grade Point Average
SLA	Second Language Acquisition
OECD	Organisation for Economic Cooperation and Development
PISA	Programme for International Student Achievement

ABSTRACT

This study examined the possible relationship between the academic performance in the Core Subjects of the 3rd and 4th year students who sat for the 2013 WASSCE in Asuom Senior High School. The design used by the researcher for the study was a comparative research design which adopted the quantitative approach to analyse the data. The test results for the performance of students in Social Studies indicated that the number of years spent by a candidate in school has an association with the performance in the subject. Even though the test results for English Language, Mathematics and Integrated Science showed no association between number of years a candidate spent in school and the performance in these three subjects. The study results for gender also indicated that with the exception of English Language which saw a relatively better performance of both genders, the boys performed better than the girls in the rest of the core subjects. The test results for Social Studies indicated that there is an association between grade obtained and the gender of candidates. This was also true in Integrated Science and Mathematics where the boys' performance was better than the girls. Meanwhile, the test results in English Language showed no association between boys and girls. In general, the performance of girls in English Language was better compared to the boys. Finally, on the residential status of students the study results indicated that there were no association between the students' residential status and their performance in English Language and Social Studies, but there was an association between students' residential status and their performance in Mathematics and Integrated Science with the boarders performing better than the day students. Implications from the results suggest a need to include gender sensitivity training for teachers, increased mathematics support for girls' students.

CHAPTER ONE

INTRODUCTION

1.0. Background to the Study

Academic performance of students plays an important role in the life of the individual and in the socio-economic development of a nation (Aggarwal, 1997). It is therefore essential to embrace education, for it is still regarded as an important bridge of social, economic and political mobility (Amutabi & Oketch, 2003). Throughout the world, people look to education as a conduit to achieve social change and sustainable development.

The history of formal education in Ghana dates back to 1592. Over the centuries education has had different goals, from spreading the Gospel to creating an elite group to run the colony. Since Ghana gained its independence in 1957, the education system, then modelled on the British system, has undergone a series of reforms. (Ministry of Education, 1971). Successive governments of Ghana, like their counterparts in other developing countries, have placed much faith in education as a major instrument for rapid social and economic development. With this faith, the education sector has formed the largest share of government recurrent expenditure. At various times the education sector was allocated as much as 40% of the national recurrent expenditure. Beginning with the Accelerated Development Plan for Education in 1951, access and participation increased at all levels rapidly until the economic decline of the late mid 1970s. The 1987 Educational reforms were initiated to revamp the educational system, which had suffered considerable deterioration, following the Economic Recovery Programme that was launched in 1983 to arrest the economic decline (Acheampong, 2008).

Ghana's education sector in 2002 owes much to the 1987 educational reforms, which were essentially based on the Dzobo Report of 1973. This report led to the publication of the New Structure and Content of Education in 1974, which introduced the concept of the Junior Secondary School (JSS) and the Senior Secondary School (SSS). Since the reforms began there has been widespread dissatisfaction with many aspects of its implementation. These have led to calls for a review of the reforms to deal with perceptions of poor academic outcomes at the basic level, poor physical infrastructure of many primary and JSS, widening gap in teaching and literacy levels between public schools and private schools, poor achievement levels at the SSS, limited access to quality SSS education, and funding issues in tertiary education. These criticisms have been articulated in spite of the substantial increases in government and donor funding of education.

In the face of mounting criticism of Ghana's educational system, President Kuffuor, on assumption of power in 2001, declared his government's intention to review the system. That intention was carried out in 2002 when the government set up the Presidential Committee on Educational Reforms under the chairmanship of Prof. Jophus Anamoah-Mensah, then Vice Chancellor of the University of Education, Winneba. The 29-member committee presented its report to the government in October 2002, after which the government issued a White Paper on the recommendation of the report. However, it was not until September 2007 that the government started implementing recommendations of the report. This reform led to the increase of the duration of secondary school education from 3 years to 4 years (Ministry of Education, 2008). However, an Educational (Amendment) Act passed on August 2nd, 2010 by a majority vote in Parliament reversed the duration of the Senior High School from four years back to three years. The Government had its way, pushing through Parliament a

pledge in its election manifesto. Whether this singular act amounts to a win for the governing party or a defeat for the minority party is not the issue. The problem is that the politicizing of education is very disturbing to our education system.

For the first time, we had candidates from two different levels writing the same examination in 2013, thus students from the four-year SHS system and the three-year SHS system. This was not the first time students at different levels wrote the same examination. The structure of the education system in Ghana before the introduction of reforms in the mid-1980s was such that to complete pre-university education could take between 13 and 15 years. This variation in the number of minimum years was because there was essentially a three-track system in place. Children who managed to complete primary schooling could take the middle school track and end their education after completing four years of middle school. It was possible to skip middle school and enter secondary school after sitting the common entrance examination in primary six. The alternative was to do one or two years at middle school before sitting for the Common Entrance Examination to secondary school. Thus, students at what was then the middle-school level took either the Middle School Leaving Certificate Examination and terminated their studies, or, at any time from primary 6 to Form 3, the Common Entrance Examination, which admitted them to secondary or technical study (Acheampong, Djangmah, Oduro, Seidu & Hunt 2007).

Students at different levels have written the same exam (Common Entrance Examination) before. The difference then however is that with the common entrance, students sat for the examination as and when they thought they are ready. From primary 6 to Form 3 unlike with what happened in 2013, the students had specific durations within which they were to write the examination (3 years and 4 years). It is

on this note that the researcher seeks to compare the grades obtained in the core subjects by students of Asuom Senior High School in the 2013 WASSCE.

1.1. Statement of the Research Problem

Over the years, debates on the duration of Senior High School in Ghana had created considerable public furore in the country. The debate took different dimensions, some looked at it politically and others economically. Politically because the 3 and 4 years duration was implemented by the two main political parties in Ghana and economically because the extra one year meant that government and parents were going to spend more money on the education of students and more so, government's ability to expand SHS to the masses. Those in support of the four-year duration were of the view that increasing the number of years would help reverse the high number of students who were currently unable to qualify for the universities and other tertiary institutions.

On the other hand, the proponents of the three-year programme maintained that the dismal academic performance at the senior high school level did not lie in the extension of the duration. Rather, they argued, problems such as inadequate infrastructure and teacher motivation needed to be addressed at the basic level in order that the current weak foundation could be corrected. Another argument was that, once Ghana was writing the West African Senior Secondary Examinations with other West African Countries that were spending three years in SHS, it was only fair to revert to three years and improve on the existing infrastructure. These debates are popular and are known to many Ghanaians but what is not known is the reality on the ground, have we taken the pains of studying the grades of students under these two popular educational reforms? The 2013 WASSCE offered this opportunity because students under these two reforms wrote the same examination. It is on this note that the researcher sought to compare the

grades obtained in the Core Subjects by 3 and 4 year students who sat for the 2013 WASSCE in Asuom Senior High School.

1.2. Purpose of the Study

To provide the empirical evidence for the assessment the significance of the 3-year versus 4-year SHS duration, and the influence of gender and residential status of students on the performance of students in the 2013 WASSCE.

1.3. Objectives

The study seeks to achieve the following objectives:

- To compare examination grades obtained in the Core Subjects by students who completed in the 3 years to that of those who completed in the 4 years
- To compare examination grades obtained in the Core Subjects by male and female candidates who sat for 2013 WASSCE in Asuom Senior High
- To explain the difference in the grades obtained in the Core Subject by Boarders and Day students of Asuom Senior High School in the 2013 WASSCE.

1.4. Hypothesis

- H1: There is no significant difference between the grades obtained in the Core Subjects by the 3rd and 4th year students of Asuom Senior High School in the 2013 WASSCE.
- H2: There is no significant difference between the grades obtained in the Core Subjects by the boys and the girls of Asuom Senior High School in the 2013 WASSCE.
- H3: There is no significant difference between the grades obtained in the Core Subjects by the boarders and day students of Asuom Senior High School in the 2013 WASSCE.

- H4: There is no significant difference between the grades obtained in the Core Subjects by students who offered different programmes in Asuom Senior High School in the 2013 WASSCE.

1.5. Significance of the study

This research will be a vital contribution to the available research on educational reforms in Ghana. Its focus on comparing the grades obtained in the Core Subjects by students who completed in 3 years to that of those who completed in 4 years at Asuom Senior High School in the 2013 WASSCE will go a long way to provide useful information to policy makers in helping to identify which of these two educational reforms produced the best results. It will also serve as a vital source of information for experts who are in charge of curriculum implementation and evaluation, so that they can make informed decisions on education. It is also going to add to the existing literature on the influence of gender on the performance of students and the need to address gender inequalities in students' performance.

This research is also going to put parents and educationists in the position to make informed decisions as to whether to make students day students or boarders in the Senior High Schools. Since, it is going to compare the performance of Boarders and Day students from Asuom Senior High in the 2013 WASSCE.

1.6. Justification of the research

There have been several studies on educational reforms in Ghana; however, none of these studies have compared the grades obtained in the Core Subjects by 3 and 4 year students who sat for the 2013 WASSCE in Asuom Senior High School in sufficient detail to create adequate understanding and information on the performance of students in that examination, this is what makes the topic unique and worth researching.

1.7. Delimitations of the Study

Glatthorn and Joyner (2005) defined study delimitations as "the boundaries of the study, and ways in which the findings may lack generalizability" (p. 168). The primary delimitation of this study was related to the participants themselves. This study is limited to students from Asuom Senior High School who sat for the 2013 WASSCE.

Secondly, there are several Senior High Schools in the area (Kwaebibirim District) but the study concentrated only on students who wrote the WASSCE in 2013 in Asuom SHS and also only on the core subjects because of time constraint.

1.8. Limitations of the study

There were difficulties in getting access to the students who wrote the 2013 WASSCE in order to interview them. Since the students completed in 2013, they were long gone before the study started. To address these challenges, the teachers who taught both the 3rd and 4th year students were rather interviewed. This was fruitful because they handled these students for three and four years respectively and for that matter knew the students at least, somehow. The advantage here was that the teachers were better placed to provide detailed information the students involved in the study.

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

2.0. Introduction

Scholars usually choose to reserve the term educational reform for those changes involving normative national and broad structural change, while they reserve the term educational innovation or some other term for lower-level programmatic alterations in education (Simmons 1974; Paulston 1976; Sack 1981 cited in Rust et al 1994). In defining reform, this paper will adopt the definition by Simmons (1974) who sees reform as changes in educational policy that bring about shifts in the way that education budget is allocated; the way the pyramid of enrolment is shaped; what students are taught in school; and the way that economic incentives such as wages and employment affect the supply and demand for education. Ghana at various points in time has initiated reforms to achieve these goals and as observed by Simmons, they are not easy to achieve in the face of economic constraints particularly in the developing countries.

2.1. Educational Reforms in Ghana

The Ghanaian educational system after independence followed the structure that was left by the British Colonial Administration. The structure that was in operation before independence was still maintained even on the attainment of independence. What might have changed was perhaps the management of the schools and some new curriculum content which have been included (McWilliam & Kwamena-Poh, 1975). The structure of the educational system was made up of a six-year Basic Primary Course followed by a four-year Middle School Course. Leavers then proceeded to pursue either a five-year Secondary/Secondary Technical School course or a two-year Teacher Training for Certificate B and two-year Certificate A.

Middle school leavers also had the alternative of attending Technical Institutes after which they can enter the Kwame Nkrumah University of Science and Technology. Secondary School leavers had the option of pursuing a two-year Sixth Form Course to enter the university or a two-year Certificate "A" teacher training course. Students from the Secondary Technical schools can either choose to enter the Kwame Nkrumah University of Science and Technology or pursue two-year Sixth Form Course to enter the University of Ghana.

The structure of education in the country as described above made the provision for people to go through formal education by using several alternatives available to ultimately enter the university. This made the educational structure lengthier in terms of duration than subsequent reforms which were later introduced. There was therefore a major departure from this structure as the recommendations of the 1974 Educational Review Committee were implemented (McWilliam & Kwamena-Poh, 1975). The current study was necessitated because of the frequent educational reforms in Ghana.

2.1.0. Dzobo Education Reforms of 1974

In the early 1970s, the National Redemption Council (NRC) government of Colonel Ignatius Kutu Acheampong established an Educational Review Committee to recommend reforms in the educational system of the country. The committee was chaired by Professor N. K. Dzobo of the Faculty of Education, University of Cape Coast. The reasons underlying the reforms were as follows. Firstly, it was argued that as a result of the colonial experience Ghana had inherited an educational system, which prepared people only to run an administration and an economy totally reliant on demands of other countries instead of that of Ghana. In view of this, it was strongly felt that there was the need for a new system of education that would teach Ghanaian youth to be reliant on their own resources for their rapid development. Secondly, the

schooling provided by the colonial system inherited was a wrong type because it did not equip people with skills that will enable them to secure appropriate employment. Thirdly, basic education needed to focus on how Ghanaians can deal with the problems of the environment, disease, deforestation and low agricultural productivity. It was therefore argued that the prevailing educational system did not address the socio-economic development needs of Ghana. Also, though it had been recognised long ago by previous governments that basic education should be free and compulsory; many children of school-going age were still not in school. There was the need, therefore, to develop a system that ensured that all children gained access to school. Lastly, there was the need to place emphasis on science and technological education which was not the case in the prevailing educational system (McWilliam & Kwamena-Poh, 1975).

The main features of the 1974 Reforms, which were to take effect from September 1975, included a Two-Year Kindergarten Education for children between the ages of four (4) and six (6) years which will be followed by a Nine-Year Basic First Cycle Education: six (6) years Primary for children between the ages of six (6) and twelve (12); and three (3) years Junior Secondary School (JSS) for children between twelve (12) and fifteen (15) years. From the Junior Secondary School, there would be selection into the following terminal courses, namely Two-Years Senior Secondary (Lower) course leading to the GCE 'O' Level, Three-Years Technical, Vocational and Commercial courses. Students from Senior Secondary (Lower) would then pursue another Two-Years Senior Secondary (Upper) course to obtain the GCE 'A' Level or enter the Teacher Training Colleges and the Polytechnics. Also, those from the Technical, Vocational and Commercial schools will enter the Polytechnics or Technical Teacher Training Colleges. Students from the Senior Secondary (Upper) will proceed to

the University to pursue a three (3) year programme. Those from the other streams would eventually end up at the University level (Ministry of Education, 1970).

The content of the reforms at the primary school included Ghanaian Languages, English, Mathematics, Social Studies, Elementary Science, Cultural Studies, Physical Education and Youth Programmes. At the Junior Secondary School level, the curriculum consisted of a Ghanaian Language, a second Ghanaian Language, Modern or Classical Language, English, French, Social Studies, Mathematics, General Science, Cultural Studies, Physical Education, Agricultural Science, Home Science and Youth Programmes. In addition to the above, students were to select at least two (2) from the following subjects: Woodwork, Masonry, Metalwork, Pottery, Technical Drawing, Crafts, Commercial Subjects, Marine Science (Fishing), Automobile Practice, Beauty, Culture, Tailoring, Dressmaking and Catering. Students at the Senior Secondary (Lower) level were to be taken through the following courses; a Ghanaian Language, English Language, French, Modern/Classical Languages, Mathematics, Science, Social Studies, Literature, Agriculture, Home Science, Pre-nursing, Religious Knowledge, Music, Art, Cultural Studies, Youth Programmes and Commercial/Vocational/Technical subjects. The Senior Secondary (Upper) courses were to focus on specialisations in the Arts, Sciences and Business.

Let us turn our attention to the relevance of the 1974 Reforms to national development. The reforms completely eliminated the four-year middle school system, which had become a major waste of resources. It introduced three (3) years of basic and comprehensive Junior Secondary education for all children of school-going age. It therefore shortened pre-university education from seventeen (17) to thirteen (13) years. This reduced the number of years spent by students in school, and further reduced the net expenditure on students by the state. Again, the introductions of technical and

vocational courses were aimed at providing the manpower needs of the nation. These courses were to provide practical skills for school leavers to be self-employed or equip them with the requisite skills to seek employment in existing establishments.

The reforms had several strengths: Firstly, the reforms placed emphasis on practical courses which was a departure from the pre-existing educational system which was the grammar type of education. This was aimed at equipping school leavers with the needed skills to be employed in the productive sectors of the economy. Secondly, there was the provision of various courses to cater for the individual differences and interests of students. There were technical, vocational and commercial courses aside the grammar type education. This ensured that students who were not academically good in the arts find their way into technical, vocational and commercial schools. Again, there were various exit points in the educational system. This ensured that people who could not continue find something profitable doing. Leavers from the Junior Secondary School were to be equipped with some technical and vocational skills to enable them polish these skills through a few years of apprenticeship. Students from the Senior Secondary (Lower) and the Technical, Vocational and Commercial schools who did not pursue further education were expected to possess certain skills and knowledge to be employed in various sectors of the economy. Students from the Senior Secondary (Upper) who did not enter the university were to train for middle level professions in available institutions such as Polytechnics, Specialist and Teacher Training Colleges (Ministry of Education, 1970).

In spite of the strengths of the reforms which have been enumerated above, there were weaknesses associated with its implementation. Some of these are discussed below. In the first place, the government did not have the political will to implement the programme nationwide. It established only 113 Junior Secondary Schools throughout

the country. Secondly, the reform was implemented on a pilot basis. That is, it co-existed with the old system it was supposed to replace and reform. The middle schools continued to exist while the few pilot Junior Secondary Schools also existed side by side. Many parents continued to send their wards to the schools that operated the old system. Thirdly, the Junior Secondary School component of the reform was implemented in such a way that the entire initiative was defeatist in itself. Students from the Junior Secondary Schools were absorbed in the old system. That is, the Senior Secondary School component of the entire reform package, which should have absorbed students from the Junior Secondary Schools, was never implemented. This reform is related to the present study in the senses that just like the Anamuah-Mensah Reforms of 2007 which is one of the reforms being compared in the study, it also sought to address the developmental and economic problems of Ghana (McWilliam & Kwamena-Poh, 1975).

2.1.1. Junior Secondary School Education (Evans-Anfom) Reforms of 1987

In 1987, the Provisional National Defence Council (PNDC) government of Flt Lt Jerry John Rawlings implemented new educational reforms. The reforms were based on the report of the Education Commission headed by Dr E. Evans-Anfom. The Education Commission published its report in August, 1986, and it was to address the concerns and criticisms about the educational system, almost the same concerns and criticisms that necessitated the 1974 reforms.

The main features of the reforms are discussed below:

Firstly, it changed the structure of the educational system from seventeen (17) years to twelve (12) years at the pre-university level. Thus, instead of the six (6) years Primary, three (3) years Junior Secondary, two (2) years Senior Secondary (Lower) and two (2)

years Senior Secondary (Upper) proposed by the Dzobo Report of 1974, the Evans-Anfom Report of 1986 recommended six (6) years Primary, three (3) years Junior Secondary and three (3) years Senior Secondary education. The reforms led to a total replacement of the old pre-university educational system. The middle schools were eliminated. The Common Entrance Examination (CEE) used for selection into Secondary Schools was replaced by the Basic Education Certificate Education (BECE). At the secondary level, the General Certificate of Education (GCE) Ordinary ('O') level and Advanced ('A') level were replaced by the Senior Secondary School Certificate Examination (SSSCE).

New curriculum contents were introduced by the reforms. The new curriculum was to familiarise students with science and technology, and various vocations were to be pursued. In this regard, agricultural science, pre-technical and pre-vocational courses were introduced. Ghanaian Languages, French, Cultural Studies, Social and Environmental Studies, and health protection courses were also included in the curriculum. Emphasis was placed on skills acquisition, creativity and the arts of enquiry and problem solving (Ministry of Education, 1970). The reforms were relevant to national development in various ways. The 1987 reforms were aimed at providing broad-ranging manpower supply for the various sectors of the country's economy. This included the training of people to engage in agriculture to provide the needed raw materials to feed the industries and provide adequate food for the nation. It was also intended to train people in science and technology for the advancement of science and technology in the Ghanaian society, protection and conservation of the environment and raising health standards (Tonah, 2009).

The 1987 Reforms had strengths as well as weaknesses. One of the strengths was that it provided a comprehensive basic education which improved access to education for more children of school-going age. Junior Secondary Schools were provided throughout the country and this helped to increase literacy levels. The reform also introduced Continuous Assessment which formed part of the final examination. This ensured that internal assessment in schools was included in the final examinations and this ended the single-shot examination existing in the old system. The 1987 reform had several weaknesses which included insufficient textbooks for all basic schools in the country, inadequate infrastructure and teaching-learning materials, inadequate trained teachers for the Junior Secondary Schools and these affected the quality of basic education in the country (Tonah, 2009). In reference to the current study, this reform also reduced the number of years spent in the educational structure from 17 years to 12 years. This is related because the present study is seeking to provide empirical evidence for assessing the 3 year and 4 year SHS duration.

2.1.2. The Anamuah-Mensah Reforms of 2007

On January 17, 2002, the New Patriotic Party (NPP) government of John Agyekum Kuffour inaugurated a Presidential Committee on Review of Education Reforms in Ghana. The committee was under the chairmanship of Professor Jophus Anamuah-Mensah, the then Vice-Chancellor of University of Education, and Winneba. It was tasked to review the entire educational system in the country with the view to making it responsive to current challenges. The committee presented its report in October 2002. The underlying factors for the introduction of the current Junior High and Senior High School reforms were to address the inadequacies and shortcomings in the previous reforms as discussed above. The reform was also introduced for the following: formation of human capital for industrial growth and for ensuring competitiveness in

the global economy; ability to make use of recent developments in Science and Technology, especially Information and Communication Technology (ICT); 'radical transformation in the field of work and employment; and the preservation of cultural identity and traditional indigenous knowledge and creativity. The reform was intended to ensuring 100 percent access to basic education, placing high premium on technical/vocational education and training and improving the quality of instruction and making it flexible enough to accommodate diverse student abilities to ensure that no student is left behind (Ministry of Education, 2004).

The Anamuah-Mensah Report recommended similar structure of education just like the Evans-Anfom Report of 1986. The difference was the inclusion of two (2) years of Kindergarten education as part of Basic Education and Apprenticeship training for leavers of the Junior Secondary School who were unable to or do not want to continue in the formal sector. Kindergarten was not an integral part of Basic Education and the reform incorporated it to prepare children between the ages of four (4) and six (6) years before they enter primary school. The Apprenticeship training was to formalise the training of school leavers in the various trades. The committee maintained the three (3) years Senior Secondary School but the government decided to increase it to four (4) years and rename the educational system Junior High School and Senior High School to replace the existing Junior Secondary and Senior Secondary Schools. The change from the three (3) years Senior Secondary School to the four (4) years Senior High School was to ensure that students have adequate time to prepare for the West Africa Senior School Certificate Examination (WASSCE). This was as a result of the large percentage of students who fail at the final examination. The new curriculum content that was introduced by the reform included French and Information and Communication

Technology (ICT) as core courses at the Junior High School and Senior High School levels.

The implementation of the Anamuah-Mensah Reforms began in September 2007, and it was faced with initial problems. These problems included inadequate classrooms, delay in the supply of syllabuses and textbooks for the smooth take-off of the programme, and teachers were not adequately prepared in terms of training to implement the reforms. These problems were later dealt with as the implementation of the reforms progressed (Ministry of Education, 2004).

Fortunately or unfortunately in the 2008 elections, the government who implemented the Anamuah-Mensah Reforms lost and the new government through a majority vote in Parliament passed an Educational (Amendment) Act on August 2nd, 2010 which reversed the duration of the Senior High School from four years back to three years. The Government had its way, pushing through Parliament, a pledge in its election manifesto without waiting for the first batch of students under the 4 year educational programme to write the WASSCE to make it possible for the two programmes to be compared. This made this study important because it compared the performance of the students who completed in 3 years to that of those who completed in 4 years. This reform borders on the current study and forms the basis for this study.

2.2. Factors that Influence Academic Performance of Students

Educational services are often not tangible and are difficult to measure because they result in the form of transformation of knowledge, life skills and behaviour modifications of learners (Tsinidou, Gerogiannis, & Fitsilis, 2010). So there is no commonly agreed upon definition of quality that is applied to the education field. The definition of quality of education varies from culture to culture (Michael, 1998). The

environment and the personal characteristics of learners play an important role in their academic success. The school personnel, members of the families and communities provide help and support to students for the quality of their academic performance. This social assistance has a crucial role for the accomplishment of performance goals of students at school (Goddard, 2003). The concept of academic performance has become a source of concern to researchers, especially as the academic performance of the students is declining. Academic performance is defined or regarded as participants' examination grades at the end of a particular term or semester or programme. It could also be seen as the level of performance in a particular field of study. Higher scores indicate better academic performance (Egbule, 2004).

The standard of students' performance is at major priority for educators. It is meant for making a difference locally, regionally, nationally and globally (Farooq, Chaudhry, Shafiq & Berhanu, 2011). Educators, trainers, and researchers have long been interested in investigating the factors contributing effectively for standard of performance of learners Farooq et al, (2011). These factors are inside and outside school that affect students' quality of academic achievement Farooq et al, (2011). These factors may be termed as student factors, family factors, school factors and peer factors, Crosnoe et al (2004) cited in (Farooq, Chaudhry, Shafiq & Berhanu, 2011). From the statement above, it can be deduced that there are several factors which influence academic performance of students at the secondary school level. The formal investigation about the role of these demographic factors rooted back in 17th century (Mann, 1985 cited Farooq et al, 2011). Generally, these factors include age/maturity, gender/sex, geographical belongingness and others. These are usually discussed under the umbrella of demography (Ballatine, (1993) cited in Farooq et al, 2011). In a broader context demography is referred to as a way to explore the nature and effects of demographic

variables in the biological and social context (Farooq et al, 2011). Unfortunately, defining and measuring the standard of education is not a simple issue and the difficulty of this process increases due to the changing values of quality attributes associated with the different stakeholders' view point, Blevins and Parri (Farooq et al, 2011).

There are a range of factors that affect the quality of performance of students (Waters & Marzano, 2006). A series of variables are to be considered when to identify the affecting factors towards quality of academic success. Identifying the most contributing variables in quality of academic performance is a very difficult and challenging job. But, Hopkins et al, in their assessment of the performance of students studying at the University of Plymouth, identified the key variables affecting student performance to be age, gender, residence of students, qualifications and discipline studied (Hopkins et al, 1997). From the above discussions it can be deduced that apart from what goes on in the classrooms, factors like sex of students, duration, residential status of students and many other factors can affect the performance of students. Relating to the current study, the factors being considered are the number of years spent in school (duration of school), gender and the residential status of students as they affect academic performance.

2.2.0 The influence of school duration on academic performance

The idea that increasing instructional time will result in increased student learning is a central notion in education (Berliner, 1990; Brown & Saks, 1987). Consequently, fixing the length of the school duration is a critical decision for school administrators and policy makers. Interestingly, instructional time at the secondary level varies markedly among countries (OECD, 2001). Although proposals to extend the school duration have been ineffective in the United States, they have been adopted in other regions, including Latin America (Gajardo, 1994; Martinic, 1997). While school duration has largely not

been a topic of serious discussion in education policy, it has recently drawn more attention. Relatively little work has investigated the impact of school length, but the few done has continued in the same spirit of discord (Krueger and Alan, 1999). This means that the debate on school length and how it affect academic performance is inconclusive. Teachers seek to provide students with the most effective learning experience. One aspect of this challenge revolves around how long students and their instructors meet face to face in the classroom for a given course or programme.

According to Brookfield (2003), conventional educational wisdom is that increased face-to-face time is necessary for learners to develop intellectual rigor and analytical depth. Teachers are said to need sufficient time to model the analytical behaviours they wish to encourage in learners. Extended contact time and a teacher's skilled help are also believed to be necessary so that learners are able to uncover dimensions and applications of ideas. Learners in short school duration might need to address many more than five to nine issues or subjects simultaneously. In such a situation, cognitive overload (Cook, 2012) would occur, resulting in isolation and withdrawal (Chametzky, 2013). Anderson and Anderson (2012) determined that extra time in a course increased students' performance. Given the increased stress very possibly caused by the shorter school duration, as well as the compounded anxiety because of the shortened school duration, but without addressing anxiety, cognition cannot adequately happen (Chametzky, 2013).

According to Krueger and Alan (1999), other studies have found a positive and statistically significant relationship between instructional time and student academic achievement, although the strength of this relationship is relatively small. There is also evidence to suggest that the relationship between instructional time and student achievement is stronger for students with initially low academic achievement. Ukueze

(2007) also opined that cognitive development and maturity (which are associated with age) are necessary for a worthwhile performance of students. Age of the individual, as it increases, usually affects the various developmental changes. It also affects every area of human performance. This means that the longer the students stay in school; they become matured intellectually and therefore will be adequately prepared than students who complete under a shorter duration. Similarly, Richardson (1994) observed that, when compared to students with short school duration, student under longer school duration were rather more likely than younger students to adopt a deep approach or a meaning orientation towards their academic work, and were conversely less likely to adopt a surface approach to solving problems. Coleman (1966) also supported the arguments above when he reported that, longer school years provide the potential for increased instruction time, review, and attention for individual students.

Krueger and Alan (1999) compared workers raised in different states, finding those from states with relatively longer school years earn more. Pischke and Jorn-Ste¤en (2003) takes advantage of short school years mandated in Germany to unify their schooling system. He concludes that shorter school years increase grade repetition, but have no long-term effects on employment or wages. Crosser (1991), and La Paro & Pianta (2000) presented evidence that older/mature students fare better academically than their younger, age appropriate peers. On the other hand, Uphoff & Gilmore (1985) used research evidence about the connection between age and achievement as well as other evidence to argue that the older and/or more mature students in a class fare better than younger classmates. Similarly, Krashinsky (2006) studies the elimination of the fifth year of high school in Ontario, Canada. He concluded students with four years of high school had substantially lower grade point averages in college than those who attended high school for five years. What happened in Canada is similar to Ghana

situation where Senior High School education was also reduced from 4 years to 3 years and hence the current study. The views of these authorities discussed above suggests that extending the school years can be a method of increasing student performance and the current study provides an empirical evidence to either support these views or debunk them.

Contrary to the various studies above which supports longer school duration, recent international cross-section studies by Lee and Barro (2001) and Wobmann (2000) concluded that school year length has no impact on test scores and for that matter student performance. Eren and Mittlemet (2005) in a study, the National Longitudinal Survey of Youth, concluded that the best performing students benefit from longer school years while low performing students do worse with increased instructional time. Here, Eren and Mittlemet are saying that with low performing students longer school duration do not improve their performance.

While a correlation between school duration and learner success might be evident in some environments, such a correlation is not present in all situations (Carrington, 2010) thereby causing potential generalizability issues. Further, educational and psychological researchers have interpreted the literature in the fields of education and psychology on school duration and academic performance with mixed results (Carrington, 2010). Chametzky (2013) also asserts that the best that a person might say is that studying a subject for a long time from various analyses and demonstrations might yield certain results given the presence of a number of conditions.

Finally, it is not clear to what extent pedagogy must be modified in order to capitalize on the impact of changes in instructional time on student achievement (Fredrick & Walberg, 1980). In a short school duration course, unless learners are well versed in the subject matter, one potential downside to reduced school duration might be a "watering

down" (Weeber, 2011, p. 5) of the workload required. In other words, are the standards of the institution and the course being upheld in shortened-term courses as they are in longer-term courses? A parallel might be made between studying for a major exam a little each night versus cramming for three hours the night before. In one situation, the result is less optimal than the other. Therefore, it is reasonable to ask whether the grade of "A" earned in a shorter-term course has the same value as a grade of "A" earned in a longer-length course (Seamon, 2004). The answer to this question depends on numerous factors including confounding factors and is not easily answered (Kucsera & Zimmaro, 2010). This current study offers quasi-experimental evidence on school year length and its consequences for student performance in Ghana and specifically Asuom Senior High School.

2.2.1 The Influence of Gender on Academic Performance of Students

Gender relates to the difference in sex (that is, either male or female) and how this quality affects their dispositions and perception toward life and academic activities (Okeke, 2003). Gender therefore refers to the sex-role identity used by humans to emphasize the distinctions between males and females. The words gender and sex are often used interchangeably, but *sex* relates specifically to the biological, physical characteristics which make a person male or female at birth, whereas gender refers to a social construct associated with members of that sex.

Umoh (2003) also defines gender as a psychological term used in describing behaviours and attributes expected of individuals on the basis of being born as either male or female. According to Okeke (2003), the study of gender is not just mere identification of male and female sexes. Scholars have gone further to identify responsibilities assigned to opposite sexes and to analyze the conditions under which those responsibilities are assigned.

Furthermore, Okeke (2003) specifically notes that the study of gender means the analysis of the relationship of men and women including the division of labour, access to resources and other factors which are determined by society as opposed to being determined by sex. It further involves the study of the socio-cultural environment under which responsibilities are assigned and the relationships emanating from it. Thus, gender equally projects the properties that distinguish and classify organisms on the basis of their reproductive and cultural expectant roles. It relates to the cultural and psychological attributes of men and women through their socio-economic contributions, expectations and limitations. Thus the concept of gender does not support or suggest the dominance of male over female or vice versa in academics and other human resource development areas but it stresses equality and equity in enhancing effective and efficient recognition, development and utilization of competencies and endowed capabilities of both sexes.

Gender, is a significant contributor to student achievement (McCoy, 2005; Peng & Hall, 1995). From the statements of McCoy and Peng and Hall it can be deduced that gender plays an important role in the academic performance of students. This is in line with the second objective of this study which was to find out whether gender played an important role in the performance of students in Asuom Senior High School in the 2013 WASSCE.

The relationship between gender and the academic achievement of students has been discussed for decades (Eitle, 2005). In one of the earliest studies Morris (1959) referring to the psychic and social differences between sexes, claims that the education outcomes of men and women will, at least in part, be different at the collegiate and graduate level. The debate on gender differences in cognitive abilities has actually evolved out of the debate on biological vs. social determinism. The biological

perspective on sex differences and cognitive performance considers social factors to be trivial or subordinate to biological factors like brain structure. Lynn in several of his studies (Lynn, 1998, 1999; Allik, Must and Lynn, 1999; Colom and Lynn, 2004) asserts that males have larger average brain sizes than females and therefore, would be expected to have higher average IQs. Hence, males are expected to perform better than females. This is very controversial and it is one of the reasons why this study sought to find out whether there is a difference in the academic performance of males and females.

Young and Fisler (2000) examining SAT-M scores of high school students, find males to score better than females. However, they noted that males generally come from households where the parents' socioeconomic status as measured by examinee reported educational levels and income, is higher. In contrast, female test takers are more diverse and include more low-income students than the boys group. Others have argued that the content of the test or of its administration favours males (Bridgeman & Wendler, 1991). Yet other researchers have explained the gap by adhering to such factors as differences in course taking behaviour, classroom experiences and cognitive processing (Byrnes, Hong & Xing, 1997; Young & Fisler, 2000).

Examining sex-related difference in classroom grades, Kimball (1989) finds that in contrast to standardized measures of Mathematics achievement tests like SAT-M (Scholastic Assessment Test-Mathematics), female students outperform males in math classes. Wilberg and Lynn (1999) arrive at a similar conclusion for history classes vs. history tests. The authors explain this pattern by stating that females tend to work more conscientiously and have a stronger work ethic than males. They also tend to have better language abilities including essay writing skills, vocabulary and word fluency which contribute to better course work (Stage and Kloosterman, 1995). This was

supported by Chambers & Schreiber (2004) when they said, a gap between the achievement of boys and girls has been found, with girls showing better performance than boys in certain instances.

Most studies show that, on average, girls do better in school than boys. Girls get higher grades and complete high school at a higher rate compared to boys (Jacobs, 2002). Standardized achievement tests also show that females are better at spelling and perform better on tests of literacy, writing, and general knowledge (National Center for Education Statistics, 2003). An international aptitude test administered to fourth graders in 35 countries, for example, showed that females outscored males on reading literacy in every country. Although there were no differences between boys and girls in fourth grade on mathematics, boys began to perform better than girls on science tests in fourth grade (International Association for the Evaluation of Education Achievement, n.d.). Girls continue to exhibit higher verbal ability throughout high school, but they begin to lose ground to boys after fourth grade on tests of both mathematical and science ability. These gender differences in math and science achievement have implications for girls' future careers and have been a source of concern for educators everywhere.

During the past decade, there has been a concerted effort to find out why there is a shortage of women in the science, math, engineering, and technical fields (AAUW, 1992). In 1995, 22% of America's scientists and engineers were women, compared to half of the social scientists. Women who do pursue careers in science, engineering, and mathematics most often choose fields in the biological sciences, where they represent 40% of the workforce, with smaller percentages found in mathematics or computer science (33%), the physical sciences (22%), and engineering (9%) (National Science Foundation (2005). Part of the explanation can be traced to gender differences in the cognitive abilities of middle-school students. In late elementary school, females

outperform males on several verbal skills tasks: verbal reasoning, verbal fluency, comprehension, and understanding logical relations (Hedges & Nowell, 1995). Males, on the other hand, outperform females on spatial skills tasks such as mental rotation, spatial perception, and spatial visualization (Voyer, Voyer, & Bryden, 1995). Males also perform better on mathematical achievement tests than females. However, gender differences do not apply to all aspects of mathematical skill. Males and females do equally well in basic Mathematics knowledge, and girls actually have better computational skills. Performance in mathematical reasoning and geometry shows the greatest difference (Fennema and Leder 1990). Males also display greater confidence in their math skills, which is a strong predictor of math performance (Casey, Nuttall, & Pezaris, 2001).

The poorer mathematical reasoning skills exhibited by many female adolescents have several educational implications. Beginning at age 12, girls begin to like Mathematics and Science less and to like Language Arts and Social Studies more than do boys (Kahle & Lakes, 2003; Sadker & Sadker, 1994). They also do not expect to do as well in these subjects and attribute their failures to lack of ability (Eccles, Barber, Jozefowicz, Malenchuk, & Vida, 1999). By high school, girls self-select out of higher-level, "academic-track" Mathematics and Science courses, such as Calculus and Chemistry. One of the long-term consequences of these choices is that girls lack the prerequisite high school Mathematics and Science courses necessary to pursue certain majors in college (e.g., engineering, computer science). Consequently, the number of women who pursue advanced degrees in these fields is significantly reduced (Halpern, 2004). Tonah, (2009) note that although gender differences in Mathematics

achievement continue to exist on high cognitive level tasks at the high school level, such differences appear to be declining.

A significant component of the literature on student's performance, particularly in the Caribbean, has focused upon the role played by gender. Much of this literature has addressed the differential performance, by gender, of students in the Caribbean high school system. One school of thought, best captured in the work of Errol Miller, has posited that the underachievement of males in the school system is linked to a historical process of male marginalisation (Miller, 1986). Other scholars of Caribbean society adopt a differing perspective. In particular, Mark Figueroa argues that male underperformance in education is not a result of male marginalization. Instead, Figueroa suggests that it is the historical privileging of Caribbean males that has led to the phenomenon of male educational under-performance (Figueroa, 1996).

In essence male academic underperformance is rooted, Figueroa states, in male privilege and the manner in which this has been played out in relation to education at a time of social change within some institutions, values and norms. He recommends that the problem of male underperformance be attacked at three levels: at the home/community, school and workplace. Figueroa (1996) purports that, so long as academic disciplines continue to be defined as 'male' or 'female' boys will be at a disadvantage in choosing a career in keeping with their aptitude.

Figueroa (2000), using primary research and analysing data for secondary and tertiary level institutions, developed on his previous work. He asserted that, there were a number of complexities found in the explanation of the underachievement of the male gender. Male students, he explained, generally underachieve relative to females, with the gap widening at the higher levels. He further explains that the *mismatch* between male gender identity and the educational system has grown. The situation is further exacerbated, he argues, by the persisting strong view that men should discipline boys, despite the fact that 42% of the household in Jamaica are female headed households.

Compounding this issue is the fact that boys are less subject to community controls and would eventually acquire "street skills", which, along with the role models they meet and the media, are detrimental to the schooling process. Other scholars have also pointed to the extent to which gender is a critical factor in educational achievement. Evans, for example, identifies gendered home and school socialization as a key element explaining the underachievement of boys in the Jamaican secondary school system (Figueroa, 1996). Bailey and Brown are not as convinced about the role of socialization and suggest, from the findings of their pilot study, that the critical factors accounting for male underperformance were financial constraints and home and community violence (Bailey & Brown, 1999).

While much of the focus of male academic under-performance has been on performance in the high school system, there has also been an attempt to examine the extent to which gender explains differences in performance in tertiary education. This has occurred both within the Caribbean region and outside. Extra-regionally, for example, Dayioglu and Turut-Asik (Dayioglu & Turut-Asik, 2004) attempted to determine whether there were any significant gender differences in academic performance among undergraduate students at the Middle East Technical University (METU) and if so what factors gave rise to those determinants. Academic performance was hypothesized to be determined by a host of factors, which included individual and household characteristics such as student ability, motivation, the quality of secondary education obtained as well as the gender of the student. Dayioglu and Turut-Asik, asserted that childhood training and experience, differences in attitudes, parental and teacher expectations and behaviour, differences in courses pursued and biological differences are all instrumental in giving rise to gender differences in achievement. The results from the study showed that the gender gap was in favour of male students as it

related to university entrance scores. This was possibly due to the fact that female students were less successful in the placement examination, so that they entered their respective departments with lower scores.

Additionally, female students preferred less competitive departments that admitted students with low scores. This might serve to further reduce their level of performance. In the final analysis, however, the researchers found that despite lower university entrance scores and under-representation in most departments, female undergraduate students outperformed their male counterparts while at college. Research on gender differences in tertiary education within the Caribbean has focused primarily not on academic performance at the tertiary level, but rather on gender distribution by faculty, which is more tightly linked to pre-university academic performance. That is, the Caribbean-based research, to date, has tended to view performance in the context of gender differences in the proportion of students entering tertiary institutions and undertaking different courses of study (Bailey and Brown, 2002). Where attempts have been made to focus on performance, as reflected in quality of degree, these attempts have sought to identify the extent to which gender explains graduation rates. Mackintosh (1998), on the other hand, claims that there is no sex difference in general intelligence. Mackintosh proposes that general intelligence should be defined as reasoning ability and that the best measure of this is the Progressive Matrices. Examining two tests administered by The Israeli Defence Forces which qualify as IQ tests - one of them is an adaptation of Progressive Matrices- Flynn (1998) finds no sex difference.

The debate on the difference in gender as it affects students' and academic performance is inconclusive (Buadi, 2000). This has necessitated the need to find out if there is any significant difference between male and female as reflected in their academic

performance. This was why this study compared the grades obtained by males and females of Asuom Senior High School in the 2013 WASSCE to find out whether gender has influence on academic performance of students.

2.2.2 Gender and student's performance in Mathematics

Orton (1987) asserts that: Mathematics is the gate and key of science - neglect of mathematics works injury of all knowledge since he who is ignorant of it cannot view the other sciences or the things in the world. From the foregoing, it is clear that female, like male; need mathematics in their private life, working life, socio– economic and political life of the country of which they are citizens (Cockcroft, 1993). He further asserts that mathematics is a strategic subject in the development of science and technology and it's fundamental in the study of physical sciences and engineering of all types. Van Den Heuvel-Panhuizen (2003) also asserted that mathematics plays an important role in character building, boosting self–esteem and providing opportunities for developing curiosity and creativity. From the above statement it can be deduced that mathematics is very vital in the life of every individual irrespective of the gender and therefore must be taken serious by both males and females. Gender differences in mathematics performance has been a contentious issue in educational domain and research documents show great inconsistencies among girls and boys performance in school mathematics (Sprigler & Alsup (2003).

Globally, mathematics has been viewed as a subject favouring male students (Fennemma, & Leder, 1990). They went on to support the idea that there were differences between female and male students and learning of mathematics, tend to exist particularly in activities that required complex reasoning; that the differences increases with the onset of adolescence; and that the difference were recognized by many leading mathematics educators. The same experience is realized in Africa

according to Africa Academy of Sciences (AAS) in collaboration with the Association for the Development of Education in Africa (ADEA) on issues of women's performance in mathematics to which it also applies to Ghana and for that matter Asuom Senior High School. The differences in mathematics achievement that occur in the early years are in favour of females whereas differences in mathematics achievements as well as in attitudes favouring males generally occur during the Senior High School years. O'Connor-Petruso, S., M. Schiering, B. Hayes and B Serrano (2004) have also shown that gender differences in Mathematics achievement become visible at the secondary level when female students begin to exhibit less confidence in their math ability and perform lower than males on problem solving and higher level mathematics tasks. Such differences are well documented for Britain as well as many other countries of the world.

Various demographic factors are known to be related to mathematics achievement. Gender, duration of course and residential status, are factors that were analyzed in this study as predictors of mathematics achievement. Many variables have long been studied as predictors of Mathematics achievement. However, gender issues on Mathematics achievement are studied most frequently by researchers. For example, a study through a meta-analysis reveals that males tend to do better on Mathematics tests that involve problem-solving (Hyde, Fennema and Lamon 1990). Females tend to do better in Computation, and there is no significant gender difference in understanding Mathematics concepts. Another study shows that females tend to earn better grades than males in Mathematics (Kimball, 1989). Some recent studies by Campbell, Gray and Mullis, et al have revealed that gender differences in Mathematics education seem to be narrowing in many countries. However, studies indicate that as students reach higher grades, gender differences favour increase in Mathematics achievement by males

(Campbell, 1995; Mullis, et al., 2000). For instance, the results from the Third International Mathematics and Science Study showed that Mathematics achievement scores of each gender group were close to each other at the primary and middle school years (Beaton et al., 1996).

However, in the final year of secondary school, evidence was found for gender differences in Mathematics achievement. Another study, which was conducted to analyze factors that affect mathematics achievement of 11th-graders in mathematics classes with an identified gender gap, also showed that males scored higher than females on 11th grade Mathematics achievement test, but this difference decreased from 10th grade (Campbell, 1995). In addition, gender differences in attitudes and perceptions of the usefulness of Mathematics for middle school students were found statistically important (Lockheed et al., 1985; Oakes 1990). For example, female students show less interest in Mathematics and have negative attitude toward Mathematics. It is also reported that girls tend to learn mathematical concepts by means of rules or cooperative activities, while boys have a tendency to be in a competition to master mathematical concepts (Fennema & Peterson, 1985; Hopkins et al 1997). The literature on gender differences provides evidences that gender issues impact achievement in Mathematics. Hence, it is crucial for educators and researchers to pay attention to gender differences in the design of Mathematics instruction.

Research history in this area (gender and achievements in Mathematics) shows that male advantage in mathematics achievement is a common phenomenon (Janson, 1996, Mullis et al., 2000). While early research by Fennema and Leder, (1990) indicated that males outperformed females in Mathematics achievement at the Junior High and Senior High school levels, there were also significant differences in attitudes toward Mathematics between the two groups. Gallagher and Kaufman (2006) recognized that

the Mathematics achievement and interest of boys are better than the girls. However they explained that they don't know the main cause of these differences.

Belenky, Clinchy, Goldberger & Tarule, (1986) assert that, in women's ways of knowing describes a series of stages in knowing that differ in fundamental ways from how men come to know. These stages represent progression from dependence to autonomy.

Fennema and Leder (1990) asserts that in the classroom situation, females prefer to use a conversational styles that foster group consensus and build ideas on top of each other, the inter – relationship of the thoughts and actions is paramount. Males, conversely, learn through argument and individual activity behaviours fostered early. Most classroom discourse is organized to accommodate male learning patterns. In addition, females are not likely to believe that mathematics has utility in their lives (Fennema & Peterson, 1985); they see mathematics as unconnected to a relationship model of thinking. Even if they persist in taking mathematics course, females apt to find that they don't like them and liking a subject is key to succeeding at it (Lockhead et al, 1985). Since these findings were done outside Ghana, there is need to establish whether the same findings could hold true for Asuom Senior High School in the Kwaebibirim District, Ghana. Gopal Rao (1973) in a survey on subject preference in secondary schools revealed that males put mathematics higher up the scale than females, though he never made any attempt to find out factors that could be influencing the nature of attitudes males and females have towards mathematics. The classroom structure, designed to foster independent non–collaborative thinking, is most supportive of males and it continues through university.

Whereas the above studies point to negative feelings towards mathematics among female but some researchers have proved wrong. They found that there is evidence on

females' possession of superior or similar attitudes to those of male towards mathematics. One such evidence is from the first International Study of Mathematics Achievements (ISMA/IEA) according to their results of survey. A sample of female in England and France showed a higher level of interest in mathematics than male even if it was vice versa in other continents. This led to the females' greater achievement in mathematics. The second evidence is provided by Griffiths (1974), who conducted an inquiry at primary school level into students' attitude towards mathematics using Likert-Like scale. His findings showed no difference in males' and females' attitude towards learning mathematics. Griffiths study was at primary school level, where this study is carried out. Third evidence is provided by Edward (1973) who found no difference in the attitude of male and female college students towards mathematics. His study was done in the United States. Although the findings of the above quoted studies show a general trend of gender difference in attitudes towards mathematics, Herman (1963) in Ogoma (1987), and Griffiths (1974) differed with the trend. According to Herman (1963), arithmetic is typically in the middle subjects, are ranked from least to most preferred by both male and female. There was therefore need to conduct this study in order to confirm or negate the findings of others. In conclusion, there seem to be gender difference in mathematics performance. From most of the reviewed studies, female students appear to have more unfavourable feelings towards mathematics than male students. Whereas this could be true, the reasons for gender difference in the attitudes advanced by the quoted study might not hold true for schools in Ghana and particularly Asuom Senior High School. This study apart from attempting to confirm whether the findings hold true for Asuom Senior High School, also intends to investigate other possible factors that could influence male and female students' performance in mathematics.

Despite these research evidences for male's superiority in math achievement, some research findings do not support the difference between these two genders in Mathematics achievement. As an example, Sprigler & Alsup (2003) refer to researcher indications that show no gender difference on the mathematical reasoning ability at elementary level. Findings from longitudinal study about gender differences in Mathematics show that there is no difference among boys and girls in Mathematics achievement (Ding, C., S: Song, K. & Richardson ,L. I ,2007). This study shows that growth trend in mathematics among two genders was the same during the study times. According to a recent international study conducted by IEA, on average across all countries, there was basically no difference in achievement between boys and girls at either the eighth or fourth grade (Mullis et al., 2004). Finding of two recent consecutive International studies (TIMSS 1999 &2003) in Iranian educational system (a system that co-education is prohibited and female teachers teach in the girls' schools and male teachers teach in the boys' schools) also confirms that there is no significant differences between boys and girls in mathematics achievement. Data from these studies show the significant decrease in the boys' Mathematics achievement score from the time of TIMSS 1999 and the significant improvement in the girls' achievement over the same period. Teacher job satisfaction and the positive perspective of female teachers regarding teaching of mathematics may be the factors behind the better Mathematics performance of Iranian girls than boys at Grade 8 in Iran (Kiamanesh, 2006).

Over the last three decades, diverse theories and frameworks have been developed and many have tried to identify factors that influence Mathematics performance in order to reduce gender inequality in math achievement (O'Connor-Petruso & Miranda, 2004). Research evidences show that gender differences in Mathematics achievement are due to various factors such as biological factors (Geary et al., 2000), Mathematics learning

strategies (Carr and Jessup. 1997), sex hormones on brain organization (Kimura, 2002) and symbolic gender (Nielsen, 2003). The studies above also attribute students' performance in Mathematics to biological factors, learning strategies. This is why this current study is seeking to provide empirical evidence as to whether gender has influence on students' performance in Mathematics as a Core Subject in SHS education in Ghana and specifically Asuom Senior High School.

2.2.3. Gender and academic performance of students in Science

Gendering of science is symbolic in that the predominantly remote and abstract presentation of physical science is associated with the masculine, whereas more "humanised" biological sciences are often constructed as feminine or gender-ambiguous. This gender symbolism informs curriculum discourses and practices which in turn reproduce and legitimize gender divisions (Hughes, 2001, p. 276). Similarly, Gilbert & Calvert (2003) assert that the way science is practiced is largely a product of the way science has developed and since science was primarily developed by males, it is strongly enmeshed with practices that favour male success.

Lederman (2003) also writes that science as we know it have traditionally been, male, and Western. It is they who define the rules, methods, instrumentation, descriptions of results, and criteria for knowledge production. It is they who define what counts as science, both theoretically and in practice. It is they who are the gatekeepers for access to, and definers of, a life in science. Chambers and Andre, (1997) add that, in typical classroom activities, boys often dominate and girls receive less experience. This is of particular concern since females enter into the classroom with less prior knowledge and fewer prior experiences with physics (Bell, 2001; Chambers & Andre, 1997). Urry (2003) also opined that, "in physics departments around the country, women are feeling ill at ease, out of place, not at home" (p. 12). Another study that examined physics

problem solving in cooperative three-person groups found that "groups comprised of two males and one female tended to be dominated by the male students. . . even when the female member was articulate and the highest ability student in the group" (Heller & Hollabaugh, 1992, p. 641). The fact that Science is seen as a male subject was also confirmed by Rosborough, and Poodry, (1999) when they found that women in the physics laboratory "complained of domineering partners, clashes in temperament, being subjected to ridicule, fears that their partners didn't respect them, and feelings that their partners understood far more than they" (p.5).

Additionally, Haussler and Hoffmann (2002) assert that the Science content interesting to girls is almost always interesting to boys but the reverse is not necessarily true and that the content interesting to girls is "by far underrepresented in the curriculum. Similarly, Stadler et al (2000) report that physics "contexts that are meaningful for girls are usually also meaningful for boys, though the reverse does not hold" (p. 417). High school females have been found to resist some types of active physics which is a part of Science as core subject (Carlone, 2004, p. 410).

The question is, do males perform better in Science than females? Dimitrov (1999) found that only among high-ability fifth graders did boys outperform girls and only on open-ended physical science items (with fixed grading schemes) from a standardized test. No significant differences were found for low- and medium-ability students. At the college level, Hazel, Logan, and Gallagher (1997) found that males outperformed females on traditional forms of physics questions, especially multiple-choice questions. However, more flexible questions led to greater gender equity as did questions that were "decontextualized" in the sense of having neither a male- nor a female-biased context. Supporting the importance of context, McCullough (2004) found that gender performance differences for some questions on the Force Concept Inventory test were

reduced when stereotypic male contexts (rockets, cannonballs, hockey, and male figures) were replaced with stereotypic female contexts (shopping, cooking, jewelry, stuffed animals, and female figures). This was also supported by Zohar and Sela (2003) they divided students' final physics scores into teacher-given scores and standardized test scores and found that boys' test scores were higher than girls' test scores, whereas girls' teacher-given scores were higher. Bell (2001) additionally found that gender differences favouring males for physics questions and females for human biology questions exist, but only for questions that involve the retrieval from memory of declarative knowledge and not for the deployment of procedural knowledge (knowledge of experimental design and statistics used in practical work). He also mentions the possibility of attitude and prior experience having an effect (Bell, 2001).

In confirmation of gender differences in Science performance, a study of university students by Chambers and Andre (1997) found that gender had a significant effect on performance for direct current concepts but that this effect was eliminated when interest level, experience, and prior knowledge were included in the analysis. The Trends in International Mathematics and Science Study documents international trends related to science achievement among 46 countries. Among U.S.A. fourth graders in 2007, males continued to outperform females in science, however differences were not significant. Among eighth-graders, males scored significantly higher overall than females in science (Mullis, Martin, & Foy, 2008).

Furthermore, Ekeh (2003), discovered that male secondary school students performed better than females in science and that these differences in performance can be attributed to gender stereotyping which encourages male and female students to show interest in subjects relevant and related to the roles expected of them in the society. The National Assessment of Educational Progress (Nigeria) in 1992 showed that males had

higher average scores than girls between the ages of 9, 13 and 17. Studies have shown that co-education has negative impact on cognitive performance of students as girls perform better without the boys and vice versa (Okwon, 2005). She also stated that the association formed between genders as it applies to co-educational institution causes psychological inferiority complex and this hinders effective classroom participation.

According to Udousoro (2011), it is a known fact that attitude developed by young people during their study of science can be as important as the skills they acquire and the knowledge they obtain. This is because attitude regulates behaviour not only in the classroom but in all other areas of human experience. Okwon (2005), however maintains that gender has no significant influence on students' performance in science. This contradicts the assertion of the National Science Foundation (2005), when they opined that males continue to surpass females in the number of undergraduate degrees awarded in science and engineering fields. In particular, computer science, physical science, and engineering show the greatest differences with males attaining more baccalaureate degrees (bachelor's degree) in these fields while females attain degrees in biology and psychology at rates equal to or greater than male peers. Ingels and Dalton, (2008) adds that, females have demonstrated that they are equally capable as their male counterparts of learning and mastering science concepts and knowledge. Also, females tend to enroll in advanced coursework and pursue degrees in science fields that have a direct application to improving the human condition (Ingels & Dalton, 2008; NAEP, 2005). In addition, in the 2003 Trends in International Mathematics and Science Study (TIMSS) among 34 nations, there was substantial variability in the size of the sex difference, and 8th-grade girls in 3 nations significantly outperformed boys in Science. This variability across time and place suggests that sex differences in Science achievement is shaped by socio-cultural factors.

Science has been assigned as masculine subject and very difficult (Ekpo, 2006). This is reflected on the analysis made by Onaen and Obiora 2001 in the enrolment and achievement of boys and girls in chemistry WAEC examination between 1994-1998 in Anambra state, it showed that out of 4,163 girls and boys that registered within the period, only 1,352 girls registered and only 9.30% of the girls had credit and above. Yet Udousoro (2003), stated that there is no significant difference in the academic achievement of male and female students in chemistry. But Jegede (2007) found that the female students show higher anxiety towards the learning of chemistry in secondary schools than male students. In another study, Okereke and Onwukwe (2011) showed that the male students achieved better than the female students. These show that the issue of gender in Science achievement has not yet been resolved. Hence the need for further studies which make this current study very necessary. Also it appears that almost all the studies under gender and academic performance were done outside Ghana and this study will throw more light on the situation in Ghana and specifically Asuom Senior High School in the Eastern Region of Ghana.

2.2.4. Gender and students' performance in English Language

Of all areas of the curriculum, children's progress in English and literacy is most closely monitored by teachers and parents during the first stages of schooling. Indeed, learning to read and write is seen as the central task for children as they begin school (DCSF, 2009). They further opined that, it is sometimes assumed that girls as a group outperform boys across the curriculum, but in fact, boys broadly match girls in mathematics and science. The one area of the curriculum where boys do tend to underachieve is English. The mean attainment of girls in English is higher than the mean attainment for boys (DCSF, 2009).

Many studies have shown that girls perform better in school than boys in all major subjects (Epstein, D., Elwood, J., Hey, V., and Maw J, 1998). This view was confirmed by the DCSF (2009) when they reported that, on average across OECD countries, 46 percent of boys said they read only if they had to, compared to 26 percent of girls. Forty-five percent of girls reported that they read for enjoyment for more than 30 minutes each day compared to 30 percent of boys." Evidence suggests that the numbers reading for enjoyment diminish during secondary school. Yet research also shows that the reading culture of the teaching group has a far more significant impact on patterns of independent reading than gender considered on its own (Moss and McDonald, 2004).

Furthermore, theorists of Second Language Acquisition (SLA) believe that female learners show possible superiority in their second language learning process (Burstall, 1975; Boyle, 1987; Ehrlich, 2001). PIRLS 2006 research data also showed that at their fourth year of schooling, girls had significantly higher reading achievement than boys in all countries except in Spain and Luxembourg. In these two countries the differences between sexes were not significant (Mullis et al., 2007). In recent years, as educational opportunities for females have increased in countries around the world, a pattern has emerged in several contexts for female youth to perform at higher levels than male youth in literacy tasks (OECD, 2001). The view that females outperform males in English Language was accepted by Ellis (1994) and Graham (2002) when they stated that in skills such as L2 (Second Language) rhetorical usage, female students have tended to perform better than their male counterpart. A number of other studies on male/female differences also suggest a trend for female superiority in some aspects of writing. For instance, Ho (1987) researched into the English writing and speaking skills of 117 male and female Chinese students of English at the University of Hong Kong. He found that gender is one of the most powerful factors for success in language

learning (the others are personality and attitude). The performance of females was notably better in writing than males, but even better in speaking.

The most recent demonstration of these differences comes from the international studies on literacy achievement carried out by the Organisation for Economic Cooperation and Development (OECD) in its Programme for International Student Achievement (PISA) (OECD, 2001). They found out that:

> "throughout much of the 20th century, concern about gender differences in education focused on girls' underachievement. More recently, however, the scrutiny has shifted to boys' underachievement in reading. In the PISA 2000 reading assessment, girls outperform boys in every participating country by an average, among OECD countries, of 39 PISA score points – equivalent to more than half a proficiency level or one year of schooling". (p. 7).

These findings go a long way to confirm the female superiority so far as English language is concerned. Maccoby and Jacklin (1974) affirmed that females are superior in verbal skills. This was also supported by (Zwick ,2002) who stated that the means of females' differences were slightly higher than those of males. Research has shown that boys and girls who are described "poor readers" by their teachers react differently to this designation (Moss, 2007). Boys described "poor readers" are more likely to react against their perceived low status in class than girls working in the same group. In an effort to bolster their standing with their peers this group of boys may avoid spending much time on a task they find difficult. Girls reading at the same level are more willing to be seen reading "easy books" and are happier to receive help from other more experienced readers. These strategies mean that girls labelled weak readers continue to practice their skills and become better. By contrast by spending less time on the task, boys labelled weak readers fall further behind their peers, so compounding their difficulties (Cunningham and Stanovich, 1997).

The literature reviewed so far clearly shows that females have the upper hand so far as students' performance in English language is concerned. But the question is, is the situation the same in Ghana? The answer is what this current study sought to provide by examining the 2013 WAESSCE results in Asuom Senior High School.

2.2.5. Gender and students' performance in Social Studies

Social Studies is one of the compulsory subjects studied in senior high schools in Ghana. Udoh (1993) and Mansaray and Ajiboye (1996) point out that "the subject is a discipline that can be used in solving problems of relationship and interaction in man's dynamic environment". For Bergesom (2003), Social Studies must be centred on innovative methods that aim at seeking the truth which include problem detecting, problem solving, and learning by experimenting and discovery.

Martorella (1994) stipulated that the enduring goal of Social Studies is to produce reflective, competent, concerned and participatory citizens who are both willing and capable of contributing positively toward the progress of a democratic life of their societies. This is in line with Banks (2001) as he points out that the major goal of Social Studies is to prepare citizens who can make reflective decisions and participate successfully in the civic life of their communities and the nation.

The Social Studies teaching syllabus for senior high school (2007) identified the following as the general aims of Social Studies:

- To develop the ability to adapt to the developing and ever-changing Ghanaian society.
- To develop positive attitudes and values towards individual and societal issues.
- To develop critical and analytical skills in assessing issues for objective decision-making.

- To develop national consciousness and unity.
- To develop enquiry and problem-solving skills for solving personal and societal problems.
- To become responsible citizens capable and willing to contribute to societal advancement.

The importance of Social Studies in the Ghanaian Educational System cannot be overemphasized. It is therefore important to review the literature as to whether gender has impact on the performance of students in Social Studies.

In a study on differences in the cognitive achievement towards Social Studies by females and males, Akinbote (1999) opined that there is no significant difference between the cognitive achievement and attitude towards Social Studies of males and that of the females. Contrary to this, Coley (2001) studied gender differences within ethnic groups of varying ages and it revealed that twelfth grade Hispanic females outperformed their like aged Hispanic males in Social Studies achievement. But Adeosun (2002) corroborated what Akinbote (1999) said by asserting that, there is no significant difference in the achievement score between males and females while conducting studies on effects of multimedia packages on students achievement and retention in Social Studies. Abdu-Raheem (2010) also concluded that gender does not play any significant role on students' achievement in Social Studies. This is contrary to Janson (1996) who found that girls have better retention than boys in Social Studies. The discussion above is indicative of the fact that the debate on the influence of gender on academic performance in Social Studies is inconclusive, and as such, more research is needed to provide empirical evidence on whether gender impacts on the academic performance of students in Social Studies. This is exactly what this study sought to do

by comparing the grades obtained in the 2013 WASSCE (Core Subject) in Asuom Senior High School.

2.2.6. The influence of residential status of students on academic performance

Residence halls or boarding house systems have served as an essential aspect of collegiate life since the early colonial colleges. Closely associated with the learning environment, early dorms housed faculty in the facilities to serve in the roles of counsellors, supervisors, and educators. As colleges and universities grew to open-access institutions, in the 1950's, live-in Faculty were largely replaced by student affairs professionals. One constant that spans time is that boarding houses or residence halls continue to be seen as a venue for learning. Today, student affairs practitioners show that boarding houses or residence halls provide a smooth learning environment for students and work to encourage faculty engagement (Pascarella & Terenzini, 1981). Today's students residential options at institutions have increased to include off-campus apartments or condominiums, privatized housing (either via purchase or rent), or commuting from home. The question remains, is a student's academic success influenced by his or her residential status?

Decades of studies show the answer to be yes. Researchers consistently have found that living on campus, and more specifically living in residence halls, positively impacts students in a variety of ways including higher grades, higher retention rates, and higher matriculation rates (Astin, 1977, 1982; Blimling, 1993, 1999; Nicpon, et al 2006). Considering that between 30-40 percent of college students drop out without obtaining a college degree (Consolvo, 2002), higher education officials are increasingly being asked why these figures are acceptable. The greatest period of retention risk for students is during the first year. In fact, almost 57 percent of all dropouts from four-year institutions leave before the start of their second year (Tinto, 1996). This makes the

first-year experience gravely important to institutional retention and graduation rates. With increasing pressure on schools to increase these rates, educators need to explore all options that influence student success. The Boarding House System is one of these variables. This is so significant that higher education institutions are striving to identify what it means to be a residential campus. At Ohio State University, President E. Gordon Gee has put forward a plan to mandate both first-year and second year students live in on-campus residence halls.

In comparison to the University of Idaho's peer institutions, eight of the seventeen have mandatory residence hall live-on requirements. In fact many of the nearest peers including the University of Wyoming, Colorado State University, Montana State University and Washington State University require at least first-year students to live in campus housing. Officials at these institutions repeatedly cite the academic gains of living on campus and the ability to create "a more intellectual academic community for students" (Clare, 2008). The arguments above go a long way to establish the importance of the Boarding House System.

The body of research on the effects of living on campus points to four distinct benefits for students who live in residence halls or boarding houses. First, students living in the boarding house or residence halls are more likely to persist in college than those who do not live on campus (Thompson, Samiratedu, & Rafter, 1993). Second, students who live on campus are more likely to develop a sense of personal accomplishment and other social skills (Chickering & Kuper, 1971; Pascarella & Terenzini, 1991; Pascarella, Terenzini, & Blimling, 1993; Pike, 2002). Third, Boarders are more likely to be involved in campus programmes and to take part in co-curricular activities (Blimling, 1993; Chickering, 1974; Pascarella, 1985). Finally, research also suggests that students who live on campus achieve higher grade point averages and scores on standardized

achievement tests (Kanoy & Bruhn, 1996; Nowack & Hanson, 1985; Pascarella, Bohr, Nora, Zusman, Inman, & Desler, 1993). All these authorities mentioned above support the view that students staying on campus are more likely to perform better than their off-campus colleagues.

Research has consistently demonstrated that students living in residence halls are more involved and/or integrated into the various cultural, social, and co-curricular activities on campus. Further, residential students (boarders) have significantly more social interaction with peers and faculty (Pascarella, 1984; Billson and Terry, 1982, Enochs and Roland, 2006). Even when controlling for pre-college characteristics including socioeconomic status, aptitude, and high school involvement, students living in residence halls show greater social interaction and integration on campus regardless of school size, institution selectivity, and private/public affiliation (Pascarella, 1985).

Pascarella, E., Pierson, C. T., Wolniak, G. C., and Terenzini, P. T (2004) found that students in the boarding house benefitted more from co-curricular activities and engagement with peers. Peers can serve as a source of support and encouragement for first- generation college students who might need more affirmation about their place in college, obviously on-campus housing options help to facilitate peer networking (Inkelas, K. K., Johnson, D., Lee, Z., Daver, Z., Longerbeam, S. and Vogt, K 2006).

Student involvement becomes an important element for student success in higher education. Alexander Astin posited a widely acknowledged theory regarding student involvement. In extensive research, Astin found that involvement had a strong relationship with student retention and social and intellectual development.

Vincent Tinto's model of student integration (1987) further studied student persistence and looked at both the academic and social factors as to student's decision to leave the

institution. In general, Tinto stated that the more involved students became with the institution and community, the more likely they were to overcome any obstacles they faced coming into or during college. In a study on social networks and academic persistence, feeling connected and having a sense of belonging was determined to be a strong deterrent to non-persistence (Nicpon et al, 2006). Based on the architectural design of residence halls or boarding houses and programmatic goals of residence life programs, encouraging student involvement is easier to attain than most other living options like the day system (off-campus students).

The work of Astin (1985) and Tinto (1993) along with other research shows that social integration is a significant determinant of both student retention and matriculation. Research further shows that students who live in residence halls consistently persist and graduate at significantly higher rates than students who have not lived in a residence hall (Astin, 1975, Pascarella and Chapman, 1983; Velez, 1985) even when controlling for student characteristics. Utilizing national longitudinal data collected by the Higher Education Research Institution at the University of California, Los Angeles, Astin (1977) estimated that living in a residence hall adds about a 12 percent net advantage to first year students' chance of persisting and graduating. In fact, residence hall communities or the Boarding House System have been shown to have a significant effect on student academic performance and retention (Stassen, 2003; Derby & Smith, 2004; Potts, and Schultz et al, 2003). Potts & Schultz (2008) identified the most significant negative impact on first-year retention was students with a low high school rank and, most importantly, living off-campus during the first semester.

Considering that students living in residence halls are more likely to persist and graduate, it is relatively intuitive to figure that they would also have higher GPAs than students living in other living off-campus. While there is some varied research results

regarding this question, many researchers have shown students living in residence halls perform better academically (Nowack and Hanson, 1985; Simono et al, 1984; Thompson et al, 1993; Nicpon et al, 2006). Blimling (1999, September/October) conducted a meta-analysis of the influence of residence halls on academic performance and found that through nine different studies residence hall students performed slightly better academically than students living off-campus. Research of Inkelas & Weisman (2003) has shown the critical impact of living in residence halls and how they lead to higher involvement by college students in the university community. Other research has demonstrated that students living on campus communities were more likely to persist, have higher academic achievement, be involved in campus activities, and interact with teachers and peers (Pike, 2000; Stassen, 2003; Pike et al, 1997).

Living-learning communities or the boarding house system typically have shown an added value for student success. Living-learning communities resemble early American higher education and Oxford/Cambridge models of residential living (Schroeder and Mable, 1994). The Boarding House System work to develop a seamless relationship between a student's living environment and their learning environment often through direct faculty interaction. They "promote higher levels of student involvement in out-of-class activities, greater interaction between teachers and students, and a more supportive peer environment" (Pike, 2000, p. 7). Zheng et al, (2002) found that students involved in the Boarding House System performed better academically than those who were not involved. Current research shows positive effects of the Boarding House System and their impact on student learning and indirect effects from faculty-student interaction (Pike et al, 1997; Pascarella & Terenzini, 1981; Johnson & Romanoff, 1999). These findings support the need for institutions to continue to

expand their partnerships across campus with academic units and establish intentional living learning communities.

The impact of the Living environment has also been studied for minority students. Edwards and McKelfresh, (2002) demonstrated that living-learning communities or the Boarding House system can strengthen institutional retention for traditionally marginalized groups without any negative impact for the majority. Other researches by Inkelas, Johnson, Lee, Daver, Longerbeam, Vogt, and Leonard, 2006; Chang, Witt, Jones, and Hakuta, 2003 demonstrate that diverse interactions and perceptions were correlated with growth in learning and development in living-learning communities. Flowers (2004) found that African American students' personal and social development was enhanced by living in university housing on campus. These findings are significant in that the positive attributes of living in a residence hall are not only consistent for white-skinned students but also for students of colour. Typically, first-year students are not likely to choose their living option based on its academic impact, but more likely to be influenced by its social opportunities which has been the traditional strength of on-campus housing. Luzzo and McDonald, (1996) surveyed students on the aspects that most influenced their choice of living environment. They found that freedom, friendship, and cost were much more strongly correlated with their decision than academics. Contrary, students who choose to live in on-campus accommodation state the social connections, friendships, and opportunity for service and philanthropy as their motivations for choosing to live on campus. Pike (2000) found that on-campus students reported higher levels of social involvement than off-campus students. When compared to off-campus students, on-campus residents experienced a sense of companionship and reassurance living with peers (Johnson, Staton, & Jorgensen-Earp, 1995).

Since 2003, University Housing has studied term grade point average, cumulative grade point average, and retention rate of first-year students. The data was to look at first-year students who lived in residence halls versus other off-campus first-year students at the University of Idaho. The data has been thoroughly reviewed and analyzed by the office of Institutional Research and Assessment. It shows that residence hall first-year students have maintained a higher cumulative grade point average versus first-year students not living in on campus in every semester since Fall 2003. In only two semesters since that time has the term GPA for on-campus first-year students been lower than other first-year students. In Spring 2005, residence hall first-year students averaged a 2.77 semester grade point average while all other first-year students averaged a 2.79 semester GPA. In Spring 2007, residence hall first-year students averaged a 2.79 semester GPA versus the 2.84 semester GPA that other first-year students received. On average first-year residence hall students have a term grade point average .088 higher than all other first-year students and a cumulative grade point average .099 higher. In fact in Fall 2007, residence hall first-year students had a term and cumulative GPA that was .22 higher.

In terms of first-year student retention to the second year, the data varies from year to year. Between Fall 2004 and Spring 2006, first-year students living in residence halls had higher retention rates on average by 3.25% than students not living in a residence hall. In Fall 2006 and Spring 2007, residence hall first-year students were one percent below the total first-year population for retention. Overall, on-campus students enjoy positive academic successes during their first year.

The study of college student development often includes students' residences (i.e., residence halls, off-campus apartments, parents' homes, etc.) because of the realization that there are other influences on college student development apart from classroom or

classroom-related activities. Attending school does not just mean attending classes. Researchers often emphasize the role of boarding houses in college student development because the boarding houses provide "more opportunities to influence student growth and development in the first year or two of college than almost any other program in student affairs" (Blimling, 1993, p. 1), likely because a student spends more time in his or her living environment than anywhere else. The importance of a student's residential environment has been supported by many researchers (including: Astin, 1977; Feldman & Newcomb, 1969; Pascarella & Terenzini, 1991). To illustrate, Chickering (1969), in his psychosocial theory of college student development, argues development can be influenced by six major institutional factors of a college or school, including residence hall arrangements (others include clarity and consistency of institutional objectives; institutional size; curriculum, teaching, and evaluation; faculty and administration; and student culture). Through these institutional factors, students are aided in their development along seven vectors, namely achieving competence, managing emotions, becoming autonomous, establishing identity, freeing interpersonal relationships, clarifying purposes, and developing integrity. Residential environments are typically studied in relation to students' academic development and social development.

Although an abundance of literature exists regarding the social climate of residence halls, the academic climate of residence halls is examined far less frequently (Denzine, 1998). Living in the boarding house is often anecdotally associated with gains in students' academic development, although the research in this area is less certain. This is why this study sought to find out whether the residential status of students had an influence on the performance of students who sat for the 2013 WASSCE in Asuom Senior High School. In his meta-analysis of 21 studies that compared residence hall

students with those living at home, Blimling (1989) found students living in the on-campus or boarding house seem to perform better academically than students who live at home. However, when prior academic achievement was controlled, research did not generally support the notion that students living in residence halls would perform better academically than students living at home. High-achieving students still performed well regardless of their living arrangements. In his meta-analysis of nine studies that compared residence hall students with students living in fraternity or sorority houses, those students living in residence halls were likely to perform better academically than students living in fraternity or sorority houses. Other researchers have found a clear correlation between living in residence halls and academic achievement in the form of grade point average (Astin, 1973; Rinn, 2003).

Although the evidence is uncertain regarding the relationship between on-campus living and academic, research has supported the belief that living on-campus is associated with persistence and graduation from college. Chickering (1974) found on-campus living had a significant positive effect on completion of the bachelor's degree, even when controlling for individual differences such as academic ability. In addition, living on campus increases students' chances for aspiring to attain a graduate or professional degree (Astin, 1977). Several pre-college traits may be accountable for persistence and the attainment of a degree, such as academic aptitude, family socioeconomic status, and educational aspirations, although Astin (1977) provides an estimate that living in a residence hall contributes to about 12% of the variance involved in attaining a bachelor's degree.

Research generally supports the notion that students living in campus-organized housing tend to be more socially adjusted and tend to participate more often in co-curricular and campus activities than students living off campus (Feldman & Newcomb,

1969; Lundgren & Schwab, 1979). Living in dormitories maximizes opportunities for students to become involved in social and co-curricular activities because they are placed in the centre of activity (i.e., on campus), are literally surrounded by their peers, and have easier access to teachers and other facilities. This involvement largely accounts for student growth and development, including a general increase in self-concept (Pascarella & Terenzini, 1991), simply by exposure to other students and opportunities.

In fact, students often cite social opportunities and the opportunity to meet other students as reasons for living on campus (Cleave, 1996). Of course, living in a boarding house is not guaranteed to provide a community-like atmosphere for students. Clark and Hirt (1998) show that living in a small residence hall does not provide a better community atmosphere than living in a large residence hall. Students who live in a residence hall may be inclined to identify with other students in their residence hall, thus viewing themselves as part of a group. In a study of 142 students living in residence halls, Bettencourt, Charlton, Eubanks, Kernahan, and Fuller (1999) found that social identification within a residence hall group increased adjustment to college, including both academic and social adjustment. Residence halls promote a sense of community that is both inclusive and exclusive. Residential communities are inclusive because they impart a sense of belonging among group members and exclusive because only certain group members can belong to the community, those who live in the residence hall. The safety a student feels within a residence hall community can thus serve as a starting point for student exploration. Students have the freedom to explore the campus but also the safety net of their residence hall. The residence hall then becomes the “psychological home and the locus of identity development during the

most concentrated and intense learning period in the lives of students" (Hughes, 2001, p. 191).

Students involved in social organizations, report fewer feelings of loneliness and isolation than students not involved in social organizations (Lane & Daugherty, 1999). Moran, Yengo, and Algier found students involved in campus student organizations are also less likely to feel isolated than non-involved students (as cited in Lane & Daugherty). Commuter students, who are generally less likely to be involved in campus activities, report feeling more isolated from peers and less socially active than those students living on campus (Lundgren & Schwab, 1979). These research findings offer further support for the importance of residence hall living in the social development of students.

Residence halls in the United States are also a result of the British collegiate model, whereby students and faculty both lived and worked together (Blimling, 1993; Zeller, 1998). In 1973, Halverson reported the educational and institutional objectives of on-campus living, which included provisions of both academic opportunities and "an environment that will encourage the aspirations of and the achievements by students and that will foster in them dignity, self-esteem, and a sense of their potential" (as cited in Astin, 1995, p. 11). The importance of the environment in education is reason for the implementation of the boarding house system which usually house a lounge, study areas, computers, and so on (Astin, 1995).

2.2.7. Benefits of living in the boarding house

Most research tends to support the notion that living-learning centers or boarding houses have a positive influence on a student's academic and social development. Students residing in boarding houses have been shown to achieve higher grade point

averages than students living in other housing arrangements (Kanoy & Bruhn, 1996) and report greater satisfaction with their environment (Clarke, 1988). Pascarella and Terenzini (1991) found that students living in Boarding houses, as compared to conventional residence, "rated the institutional environment significantly stronger in intellectual press and sense of community and also reported significantly greater freshman year gains on the measure of cognitive development" (p.151). Pemberton (1969) found similar results and also noted that the transition from high school to college appeared easier for students in living learning centres because of the supportive atmosphere. In fact, one of the most often cited important features of a living-learning centre is a student's self-reported feeling of connectedness to his or her living environment (Schein & Bowers, 1992). These findings offer a base from which to reflect on the effects of living in the boarding house.

Just as living in a residence hall increases a student's odds of persistence in college and eventual graduation, participation in on-campus programmes increases persistence in college and also aspirations for graduate or professional degrees (Astin, 1977). Therefore, the combined effects of participating in on-campus programmes and living in the boarding house would appear to result in large positive gains for the academic achievement and aspirations of gifted college students. This increase in academic achievement and aspirations could occur for several reasons. When students live together in the same dormitories, they are likely to facilitate and reinforce the academic achievement of one another. Several research studies have supported the idea that residence halls homogeneously assigned by academic ability results in higher academic achievement and greater satisfaction with living quarters than other residential arrangements (Blimling, 1989; DeCoster, 1964).

Students who are assigned to residence halls would then be more satisfied with their living arrangements and achieve at higher levels than those students living in other residence or off-campus. While the academic achievement in homogeneous residence halls is higher, the perceived intellectual environment is also greater (Golden & Smith, 1983). Students may be performing better, and they are also aware that their environment is supporting their achievement. As previously mentioned, though, some researchers have shown that high ability students will perform well in college regardless of their living environment (Stewart, 1980; Taylor & Hanson, 1971).

A similar debate exists regarding whether or not matching roommates by academic major will influence academic achievement. Taylor & Hanson (1971) argue that homogeneously grouping students by their major results in higher achievement than randomly placed students. Schroeder and Belmonte (1979) found that students assigned to residence halls by their academic major performed better academically than students in the same major who were assigned randomly to a residence hall. On the other hand, Elton and Bate (1966) argue the housing of students does not affect their academic achievement at the end of their first semester in college. Another possible reason for an increase in achievement among students living in the boarding house is the environmental press theory. Using 1,722 students enrolled at 140 different colleges and universities.

Thistlethwaite and Wheeler (1966) studied the effects of the college environment, especially teacher and peer subcultures, on students' aspirations to seek graduate level degrees. In controlling for sex, degree aspirations at the beginning of college, National Merit Qualifying Test score, father's educational level, mother's educational level, number of freshman scholarship applications in 1959, family financial resources in 1959, and probable major field of study, the authors examined students' intentions to

pursue graduate training, as measured through college press scales. They concluded that the selectivity of an institution, or the average grade point average of an entering freshman class, has a direct positive effect on aspirations "since an undergraduate will perform best and aim highest at a school where most of his fellow students have high aspirations and are superior academically" (Drew & Astin, 1972, p. 1152). Thus, if students with high achievement and high aspirations surround a gifted student in an on campus accommodation facility, the student is likely to raise his aspirations to meet those of students around him.

The influence of the environmental press appears to be self-perpetuating, or to reinforce itself over time. Environments that are highly differentiated, such as the boarding house, residence hall, tend to attract people who already share similar characteristics with the dominant group, thus reinforcing and strengthening the characteristics of the dominant group, creating a cyclical pattern (Strange, 1993). In a Boarding house, students, by definition, have historically performed well and value their academic performance in college. Because boarding halls are usually open only to on-campus students, residence hall will likely remain academically oriented and the students will likely continue to reinforce the academic achievement of one another. Therefore, it might be "incorrect to attribute behavioural variation among student groups to differential group influence, since it represents mainly the effects of differential selection and anticipatory socialization" (LeVine, 1966, p. 108). In other words, on-campus living might not lead to a particular behaviour: Students may have joined the boarding system exhibiting that behaviour already. Many researchers, including Pascarella (1980) and Rossi (1966), agree that students tend to change in the direction of the environment, thereby reducing the differences between themselves and others. While the academic effects of the environment are well noted and tend to be

positive, the social effects are typically less evaluated. In other words, the literature is unclear as to whether or not intellectual environment can positively or negatively influence the social development of students.

Upon initial arrival at college, students involved in the boarding house system may experience an easier social adjustment to university life through interaction with other students and the formation of a community (Rutland Gillison, 2000). In the initial stages of transition to university life, especially if a student does not know any other students, the transition can be eased by the formation of structured peer groups, especially through residence hall arrangements. Instead of leaving students to develop their own friendships and social groups in a new environment, students might benefit from being automatically placed in a group. After students have time to settle in their new environment, they can then begin forming their own peer groups and friendships. In a study of the development of peer networks, such as those just described, university freshmen that participated in the structured networks reported making a more successful transition to university life, both academically and socially, than students who did not participate (Peat, Dalziel, & Grant, 2001). Students, who fail to develop successful peer relationships, particularly with their residence hall roommates, may receive lower grade point averages and have lower retention rates than students with successful peer relationships (Pace, 1970; Waldo, 1986). Participation in the boarding house system and living in the boarding house can provide a structured peer group for students. Some research has provided evidence for the importance of peer groups in education. College students representing 28 Universities ranked peer support and interaction as the third most fulfilling experience of on-campus living, following other academic activities.

In addition, the advantages of participation in the boarding house system included intellectual commonality and cohesiveness among the students (McClung & Stevenson,

1988). These ratings speak to the importance of being near like-minded peers upon entrance to school. Conversely, one major disadvantage to participation in the boarding house system is isolation from the community (McClung & Stevenson, 1988). Like living-learning centres, the boarding house only attracts a certain group of students.

Although students report positive experiences in living-learning centers, an often-cited complaint is the seclusion from the rest of the off-campus students (Leean & Miller, 1981). Equally, students appreciate the community experience of a boarding house and the proximity of other students, but they may also experience seclusion and isolation from the rest of the community. Even though students list seclusion as a disadvantage, is it possible that the students in the boarding house themselves form the seclusion? If so, is this seclusion and isolation an advantage or disadvantage? Some argue that theme dorms, or dorms that expand an area of interest beyond the classroom, can promote self-segregation (Hill, 1996). These theme dorms, like residence halls, attract highly distinct groups and do not offer much diversity. For example, some theme dorms are academically oriented, and many theme dorms are ethnically based. While this may allow students to build group solidarity and ease the pressures of being a minority, theme dorms also can encourage stereotypes and lessen the opportunities for students to broaden their horizons and develop friendships with other groups. For example, the University of Massachusetts Amherst and the University of Maine have residence halls for those students who are gay, lesbian, bisexual, or transgender (Herbst & Malaney, 1999; Ocamb, 1996), and Rutgers University offers a residence hall for women majoring in science, engineering, or mathematics (Stinson, 1990). Many other universities offer theme dorms based on ethnic interests, substance- free commitments, and various artistic and music interests, among others. In comparing the effects of various residence hall arrangements on the academic and social experiences of college

students, Clarke (1988) found that those students living in theme dorms reported less satisfaction with their peer relationships than students living in other residence hall arrangements.

It is important to keep in mind that students who live in theme dorms choose to live in those dorms and perhaps may be creating self-segregation for themselves. Students living in theme dorms may perceive themselves to be somewhat isolated from other students living in conventional residence halls. Likewise, if all students live in the same dormitories, they might be deprived of contact with students of other ability levels (DeCoster, 1964) and will perceive the same feelings of isolation. This segregation, whether self-imposed or not, can play a large role in the development of friendships, peer groups, and reference groups. The development of friendship usually occurs when people who have common interests are brought together in an environment. "Frequency of contact…depends on proximity, so friendship develops more easily if people live near each other, work in the same office, or meet at the same church or club" (Argyle, 1992, p. 50). Similarly, students living in the same residence hall are likely to become friends.

In a study of 325 college males, Brown (1972) found the nature of a group living in a residence hall played a large role in the development of friendships. By placing students on a dormitory floor by their major, Brown was able to determine that the similarity of interests among the residents, as well as the close proximity, led to friendships among those students living on the same floor. In a hypothetical situation, although not far from reality, suppose a gifted student is accepted to a boarding house in a college at a large, public university. Although the student does not know anyone else attending this university, he decides to attend because of the excellent reputation of the boarding house. He is pleased to discover that he is meeting other students and developing

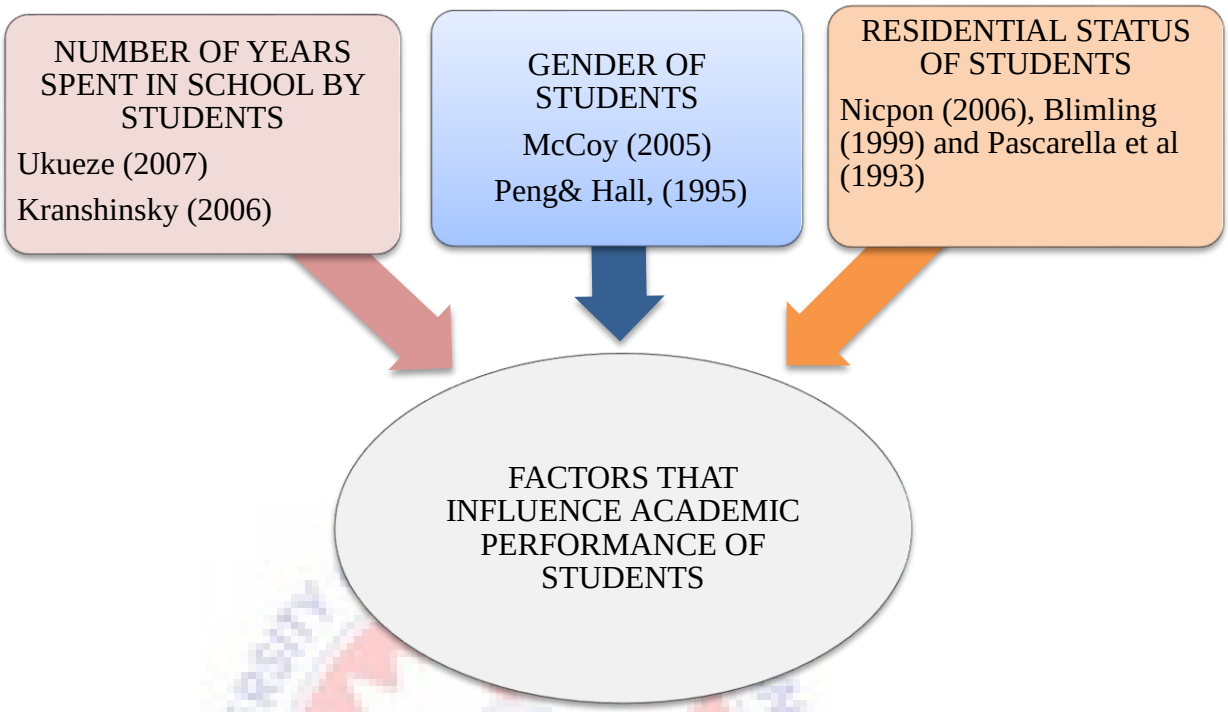
friendships much more quickly than he imagined upon arrival on campus. Why is he meeting people and developing friendships? Perhaps the student finds it easier to socialize because he has been placed in a residence hall full of people like himself. Because of the proximity of the other students and the similarity of interests among the students, this hypothetical student should not have much difficulty developing relationships with other students. However, suppose this hypothetical student finds himself satisfied with his newfound friendships in the residence hall and finds himself with little desire to try to interact with off-campus students. Can this self-segregation be harmful, either academically or socially? What are the consequences or benefits of not interacting with off-campus students? Probably, this hypothetical student is having the experience of belonging to an in-group, and he is viewing off-campus students as an out-group. "We tend to see members of out-groups as more similar to each other than members of our own group the in-group. In-group favouritism refers to the tendency to see one's own group as better on any number of dimensions and to allocate rewards to one's own group, these tendencies can form the basis of racial and ethnic prejudice" (Aronson, 1999, p.145).

On-campus students may begin to view off-campus students as "out-group" members. Similarly, off-campus students may view on-campus students as "out-group" members. In addition, Gudykunst (1999) notes that out-group members may be perceived as too different from in-group members, thereby lessening the motivation to communicate with the out-group members (as cited in Buttny, 1999). On-campus students and off-campus students may eventually come to the conclusion that the other group is too different from themselves and not attempt to initiate contact with them. At the same time though, the development of a common group identity, such as that which defines on-campus students, can "diffuse the effects of stigmatization, improve intergroup

attitudes, and enhance institutional satisfaction and commitment among students" (Dovidio, Gaertner, Niemann, & Snider, 2001, p. 167). Membership in the boarding house might provide a social identity for gifted students. Upon entrance to school, a college student will likely seek out relationships and activities that affirm the social identity he or she believes is important. The development of a social identity within a common group identity can thus be very beneficial.

Although attention has been paid to factors affecting student performance in other countries and in the Ghanaian context, but it seems there is no study on academic performance in Senior High education in Ghana that seeks to assess student performance against a range of possible predictors, such as gender, duration, and residence of students, and that assesses this information systematically through use of a quantitative research methodology. It is against the background of the strategic need to inform the variables driving student performance and the gaps in the Ghanaian literature on this subject that this study was conducted. The question as to whether the residential status of students affects students' and academic performance in Ghana and specifically Asuom Senior High School is uncertain. This necessitated the need to find out if there is any significant difference between boarders and day students as reflected in the academic performance of students in the 2013 WASSCE.

2.2.8. Conceptual Framework



Source: Author's construction, (2015).

The diagram above shows the factors that affect students' performance. First, Ukueze, (2007) and Kranshinsky, (2006) opined that the number of years spent in school by student is one of the factors that affect students performance and this is in line with the first objective of the study which sought to find out whether there was a difference in performance for students who sat for the 2013 WASSCE at ASEC.

Secondly, McCoy (2005) and Peng & Hall, (1995) also asserted that the gender of students has influence on the academic performance of students. This is also related to the second objective of the current study which sought to provide empirical evidence on the influence of *gender* on the academic performance of students in the 2013 WASSCE at ASEC.

Moreover, according to Nicpon (2006), Blimling (1999) and Pascarella et al, (1993) academic performance of students has an association with their residential status. This

also corresponds to the third objective of this study which sought to ascertain whether the residential status of student had an influence on the performance of students in the 2013 WASSCE. These authorities mentioned earlier have confirmed that *number of years spent in school by students, gender of students* and *the residential status of students* are among the factors which affect academic performance of students. It is therefore important to find out whether the academic performance of students were also influenced by these factors (number of years spent in school by students, gender of students and the residential status of students) in the 2013 WASSCE.

CHAPTER THREE

METHODOLOGY

3.0. Introduction

The objective of this chapter was to describe the methodology that was utilized to reveal the statistical details about the performance of students' of Asuom Senior High School in the 2013 WASSCE in Ghana. It also looked at the research methods and the instruments of data collection and analysis used in undertaking the study. It highlights the research design, population of the study, sampling technique and size, data types, data sources and data analysis tools.

The study focused on three different parts. First to compare the WASSCE grades obtained in the core subjects by students who completed in the 3rd year to that of those who completed in the 4th year; second, to compare the grades obtained in the Core Subjects by male and female candidates who sat for 2013 WASSCE in Asuom Senior High; and third, to explain the difference in the grades obtained in the Core Subject by boarders and day students of Asuom Senior High School in the 2013 WASSCE.

3.1. Research Approach

The research approach employed for this study is the quantitative approach. Quantitative approach because it is useful for obtaining data that allow quantitative analysis to be made. It enables the researcher to construct a situation that eliminates the confounding influence of many variables, allowing one to more credibly establish cause-and-effect relationships. Also, the results of the study can be generalized when it has been replicated on many different populations and subpopulations. Again, it provides precise, quantitative, numerical data that can be analysed using statistical software like the SPSS. The research results from quantitative research are relatively

independent of the researcher (e.g., statistical significance), it has higher credibility with many people in power (e.g., administrators, politicians, people who fund programs) and is useful for studying large numbers of people and events.

The quantitative approach is appropriate for my study because the study involves a large sample of five hundred and forty six students (546); also the study involves the academic performance of students which are represented by grades, and the quantitative approach was the best way to go about it in order to achieve the objectives of the study. The study also used hypothesis and the quantitative approach which enabled the researcher to make predictions through the hypothesis which were tested.

3.2. Research Design

The study was purely based on quantitative comparison study. Comparison is inherent in all science, including the social sciences, where comparative research has historically played a significant role in their development as scientific disciplines (International and Comparative Librarianship, 2011). Often referred as a comparative study, the comparison study involves a systematized endeavour to compare two items, with an eye toward identifying points that the items hold in common, along with citing areas where the two items differ. These studies take place in a number of different environments, and usually have a specific purpose in mind. The comparison study is also often used in the education process. In some instances, the study may form the basis for a school project, such as comparing two authors or works of literature, comparing the performances of different groups of students. The underlying purpose of this type of study is to become better acquainted with the two items under consideration, and hopefully learn how to utilize the tools afforded by both approaches in the task of education.

At the root of the research design of a comparison study is the rubric. Essentially, a rubric is the set of criteria that is used to evaluate each aspect of the two items under comparison. Often, the systematic rubric model will include some sort of a grading process for each aspect. The grading process may involve a simple scoring range, or be more comprehensive. At the root of the rubric analysis is the determination to arrange the value of each aspect so that is possible to compare the level of quality and the relevance of the aspect to the person or group that is conducting the comparison study (Curtis & Curtis, 2011). This design was suitable for the study because it enabled the researcher to compare the performance between students who completed in three and four years, males and females and Boarders and Day students as stated in the objectives of the study.

3.3. Study Population

Population is a collective term used to describe the total quantity of cases of the type which are the subject of your study (Williaman, 2011). According to Owu-Ewie (2004), there are various ways to construct a population depending on the characteristics of interest. The purpose of any research is to discover any principle that has universal application.

The population for this study included all WASSCE candidates (both form 3 and form 4) who completed in the year 2013 across the country. One million six hundred seventy one thousand, two hundred and sixty eight (1,671,268) candidates sat for the 2013 WASSCE (WAEC, 2013) Thus, due to accessibility the sample for the study was candidates of Asuom Senior High School in the year 2013. Accessible populations are groups that convenient for the researcher and representative of the overall target population (Best and Kahn, 2006).

3.4. Types and Sources of Data

The study employed both primary and secondary sources of data. Primary sources normally associated with the survey strategy and case study research (Williaman, 2011). Primary data was obtained from the school authority and principally based on the results obtained by candidates who sat for the 2013 WASSCE.

All research studies require secondary sources of data for the background to the study (Williaman, 2011), and an important reason for using secondary data is that information has been produced by a team of expert researchers who have been peered reviewed thus the reliability of such an information is assured. Lastly, according to Williaman (2011), secondary data can also be used to compare with primary data you may have collected, in order to triangulate the findings and put the data into larger context. Various types of secondary data were also relied on for the study. The main secondary data that were relevant to the study include; the various Chief Examiners Reports produced by WAEC annually from 2009 when the new certificate examination began. Other secondary sources of data include publications such as journals, books, government publications of all kinds, newspapers, and organizational records and minutes of meetings. Non-written materials such as radio programmes, and survey data from the Ministry of Education were also relied on for the work.

3.5. Sample Size and Distribution

A sample is a small population of the population that is selected for observation and analysis. It is also an act, process, or the technique of selecting a suitable sample, or a representative part of a population for purpose of determining parameters or characteristics of the whole population (Tuckman, 1999). The researcher can make inferences about the characteristics of the larger population by observing the

characteristics of the sample. The larger the sample size, the more representative it will be to the larger population. Due to financial constraints, limited time and accessibility issues, a sample size of 548 representing the total number of candidates Asuom Senior High School registered for the WASSCE was used in undertaking the research. My choice of a sample of 548 was influenced by the work of Krejcie and Morgan (1970), which state that for a population of one hundred and fifty million and above (1, 000000 plus), a sample size of five hundred and above is required.

3.6. Sampling Technique and Procedure

The study opted for a comprehensive study sample where all candidates who were registered for the examination became object of analysis. A comprehensive study involves an in-depth assessment of situation or problem with large scope and content. Purposive sampling technique was then used to select a comprehensive sample of five hundred and forty eight students (548) who wrote the 2013 WASSCE in Asuom Senior High School.

3.7. Data collection

The main data collection instrument (document) was based on the official WAEC results of the 2013 year groups released to the school.

3.8. Data analysis

According to Dixion et al. (1987), for proper conclusion to be drawn, careful analysis and interpretation of the data collected is important. The data was first coded into those who completed in three and four years, females and male and boarders and day students and the core subjects (social studies, english language, integrated science and Mathematics) were also coded. The Statistical Package for Social Sciences (SPSS) and Microsoft Excel were used to analyse the data generated from WAEC (grades of

students in the 2013 WASSCE). The key statistical techniques were used to assess the relationship between dependent and independent variables.

The Pearson Chi-square test was used to measure the significance and relationship between gender, programme offered, and year group and candidates performances in the four Core Subjects (Social Studies, English Language, Integrated Science and Mathematics). The analysis was aimed at how the number of years spent in school, sex of students and residential status students affected their performance in the 2013 WASSCE and the Statistical Package for Social Sciences (SPSS) was used to calculate frequencies, percentages, and charts which were used to support the discussion.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.0. Introduction

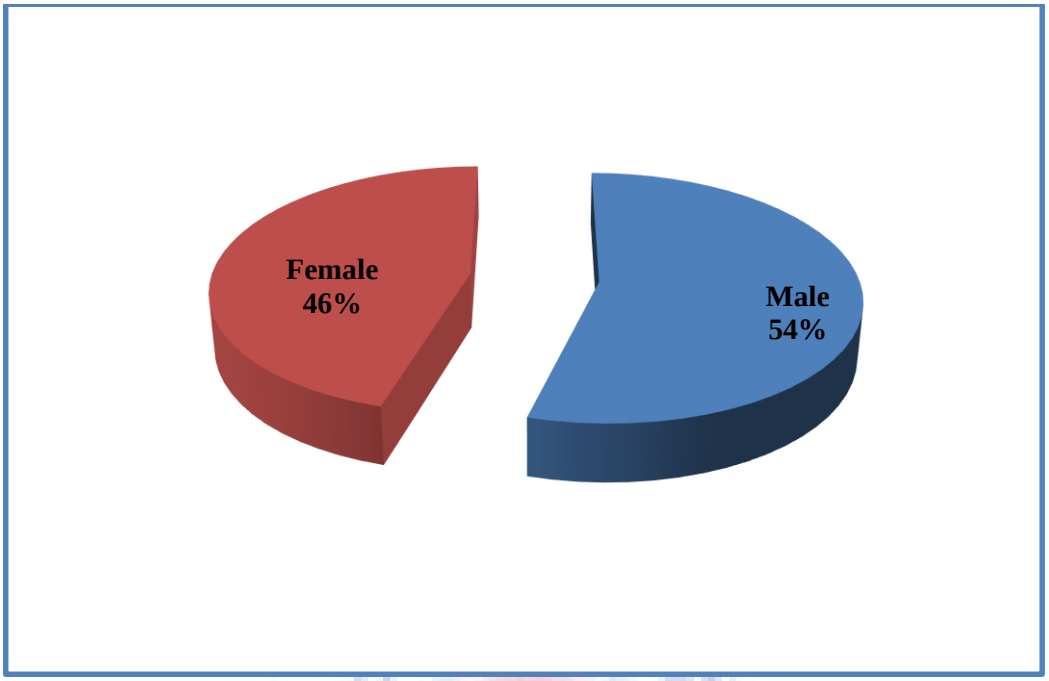
This chapter is on analysis of the data collected for the work. It is divided into sections. Each section begins with an introduction and the subsequent write up including tables, charts and divided circle which give graphical representation of the data gathered. The sections of the analysis are done based on the objectives set out for the work. The entire chapter is in seven sections.

4.1. Characteristics of candidates

This section presents an analysis of the background characteristics of candidates. The section looks at the sex of candidates, programmes offered by candidates, residential status of candidates and duration in school. The above characteristics of candidates were used as variables to test the relationship between them and performance of candidate in the 2013 WASSCE.

4.1.1. Gender of candidates

Objective 2 of the study sought to compare the performance between males and females and, therefore, an analysis of the gender of candidates was necessary. Figure 1 presents the gender of candidates. A total of 548 candidates sat for the examination, majority (54%) were boys and minority (46%) girls (Figure 1).

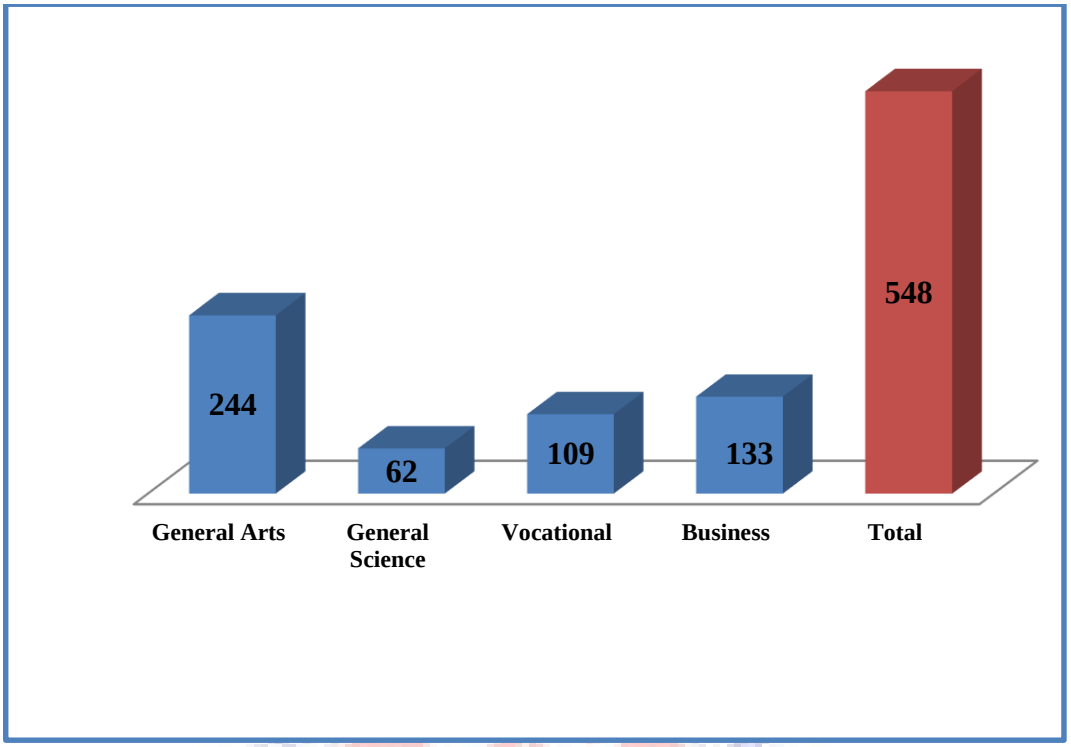


Source: Fieldwork, 2014.

Figure 1: Gender of Candidates

4.1.2 Programmes Offered by Students

Programmes offered in the school are based on the four academic departments; General Arts, Mathematics and General Science, Vocational Skills and Business. Out of the total number of 548 who sat for the exams 244 offered General Arts, 133 were Business students, 109 offered Vocational and 62 offered General Science (Figure 2).



Source: Fieldwork, 2014.

Figure 2: Programmes Offered by Candidates

4.1.3. The Residential Status and Duration in School

Residential statuses of candidates were as follows: 281candidates representing 51.3% were boarders and 267 were day students representing48.7%. the mainstay of the work which was based on the duration candidates spent in school was according to the following: out of the 548 candidates who sat for the examination 249 representing 45.4% were 3 year candidates and 299 representing54.6% were 4 year candidates (Table 1).

Table 1: Residential Status and Duration in School

		Frequency	Percent (%)
Residential status	Boarders	281	51.3
	Day	267	48.7
	Total	**548**	**100.0**
Duration in school	3 years	249	45.4
	4 years	299	54.6
	Total	**548**	**100.0**

Source: Fieldwork, 2014.

4.1.4. Gender and Residential Status of Candidates

A relative comparison of male and female candidates was also done. From (Table 2) majority of boys who sat for the examination were day students (53.4%) while majority of girls were (51.3%) were boarders.

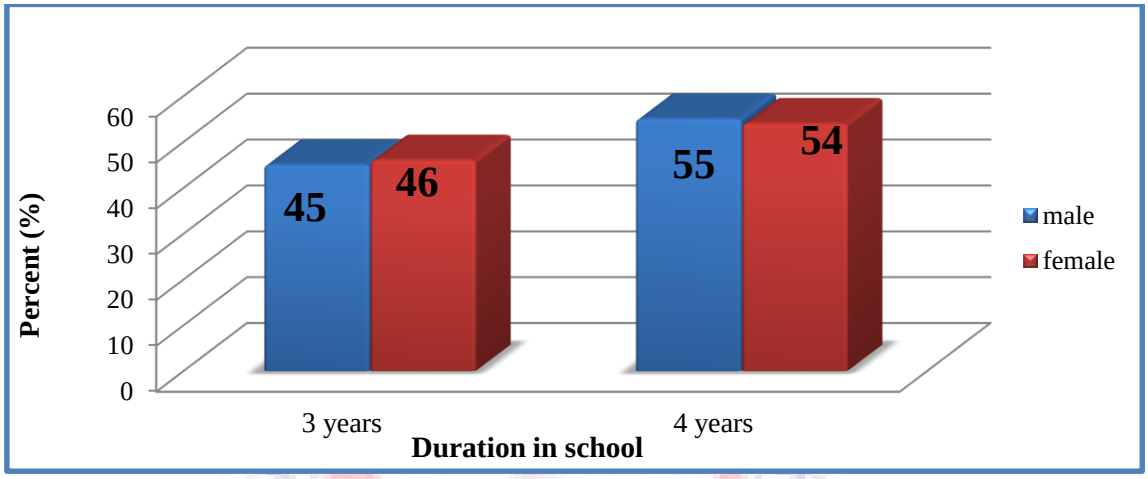
Table 2: Comparison of Gender of Candidates and their Residential Status

		Residential status (%)		
		Boarder	Day	**Total**
Gender	Male	46.6	53.4	100.0
	Female	56.8	43.2	100.0
	Total	**51.3**	**48.7**	**100.0**

Source: Fieldwork, 2014.

4.1.5. Gender and Duration in School

Majority (55%) of male students who sat for the examination spent 4 years in school and 45% spent 3 years. In a like vein majority of female candidates (54%) were of the four year group and 46% were the three year group (Figure 2).



Source: Fieldwork, 2014.

Figure 3: Gender and Duration in School of Candidates Compared

4.1.6. Comparism of Residential Status and Gender with Programme of Candidates

Majority of General Arts (46.8%) and Business (25.8%) were day students whereas those of General Science (13.2%) and Vocational (21.7%) were boarding students. There were more females (54.0%) in the General Arts than males (36.6%), and in Vocational (Visual Arts and Home Economics) 26.8% females and 14.1% males. The rest are General Science (16.1%) males and (5.6%) females; Business (33.2%) males and 13.6% females (Table 4).

Table 3: Residential Status and Gender Compared with Programme of Candidates

		Programme of student				Total
		General Arts	General Science	Vocational	Business	
Residential status	Boarder	42.3	13.2	21.7	22.8	100.0
	Day	46.8	9.4	18.0	25.8	100.0
	Total	**44.5**	**11.3**	**19.9**	**24.3**	**100.0**
Gender	Male	36.6	16.1	14.1	33.2	100.0
	Female	54.0	5.6	26.8	13.6	100.0
	Total	**44.5**	**11.3**	**19.9**	**24.3**	**100.0**

Source: Fieldwork, 2014.

4.2. Overall Performance of Candidates in the Respective Subjects

The general performance of all candidates in the four respective Core Subjects (Social Studies, Mathematics, Integrated Science and English Language) is analyzed in this section. The analysis here will be based on 546 candidates instead of 548 registered candidates for the examination since two candidates did not write the examination at all.

4.2.1 Social Studies and English Language

Out of the 546 candidates who took part in the examination 3.1% had A1, 13.5% had B2 and 43.1% had B3, and only 1.1% failed or scored F9. The best grade in the English Language was B3 and was obtained by 2 candidates, 8 candidates had C4 and majority of the candidates (214) had C6 and 39 candidates failed (Table 4).

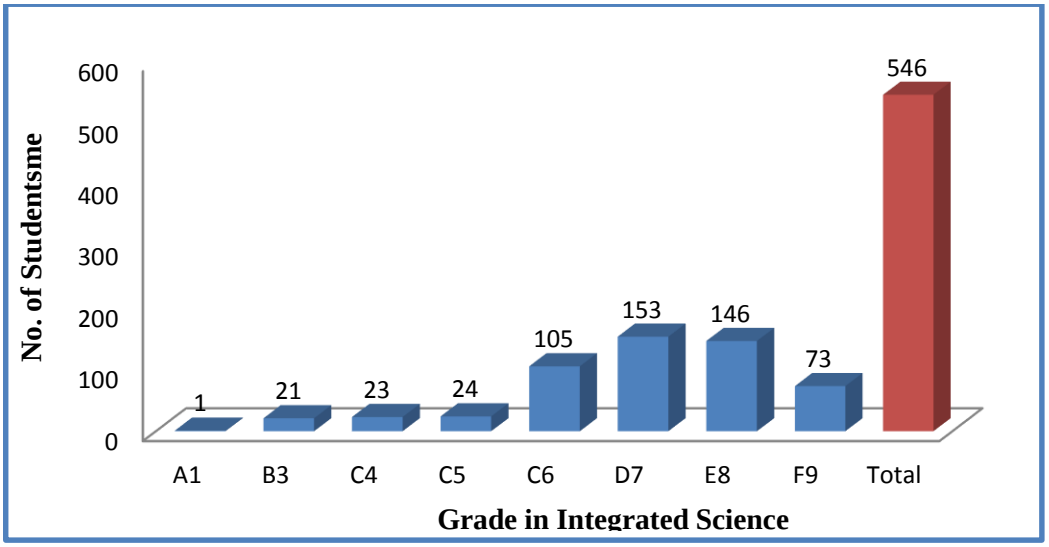
Table 4 A and B: General Performances in Social Studies and English Language

	Grade	Frequency	Percent		Grade	Frequency	Percent
A	A1	17	3.1	**B**	B3	2	.4
	B2	74	13.5		C4	8	1.5
	B3	236	43.1		C5	46	8.4
Social	C4	56	10.2	**English**	C6	214	39.1
Studies	C5	72	13.1	**Language**	D7	168	30.7
	C6	57	10.4		E8	69	12.6
	D7	22	4.0		F9	39	7.1
	E8	6	1.1		**Total**	**546**	**100**
	F9	6	1.1				
	Total	**546**	**100**				

Source: Fieldwork, 2014.

4.2.2 Integrated Science

The grades obtained in the Integrated Science (Figure 4) are as follows; one person had A1, 21 candidates secured B2 and 23 had B3. Majority of candidates (153) had D7 and 105 had C6, 73 candidates had F9.

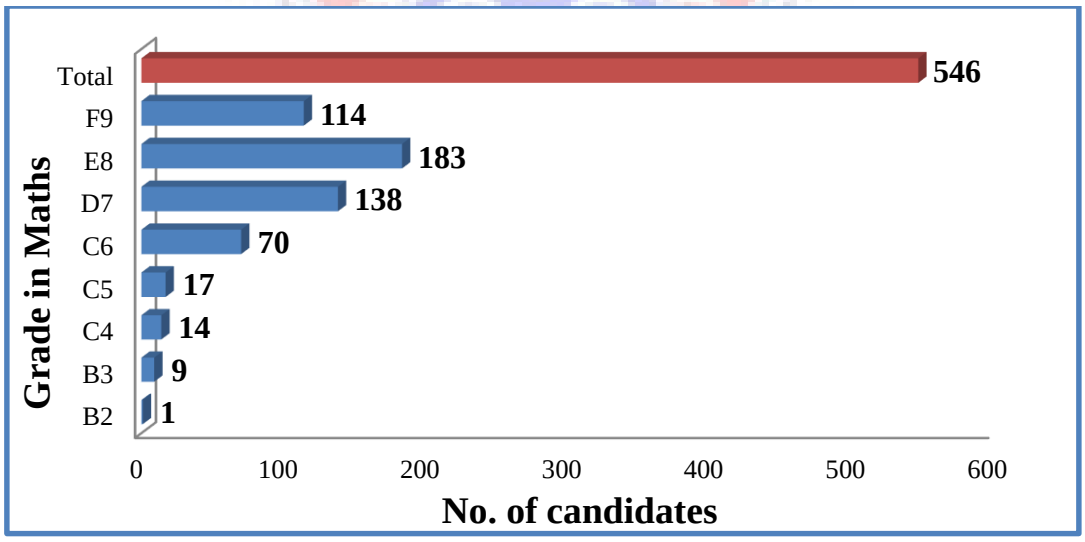


Source: Fieldwork, 2014.

Figure 4: General performance in integrated science

4.2.3 Mathematics

Majority of the candidates (183) scored E8 in Core Mathematics, and another 138 had D7 and 114 had F9 in the examination. One person had B2 and 9 had B3 (refer to Figure 5).



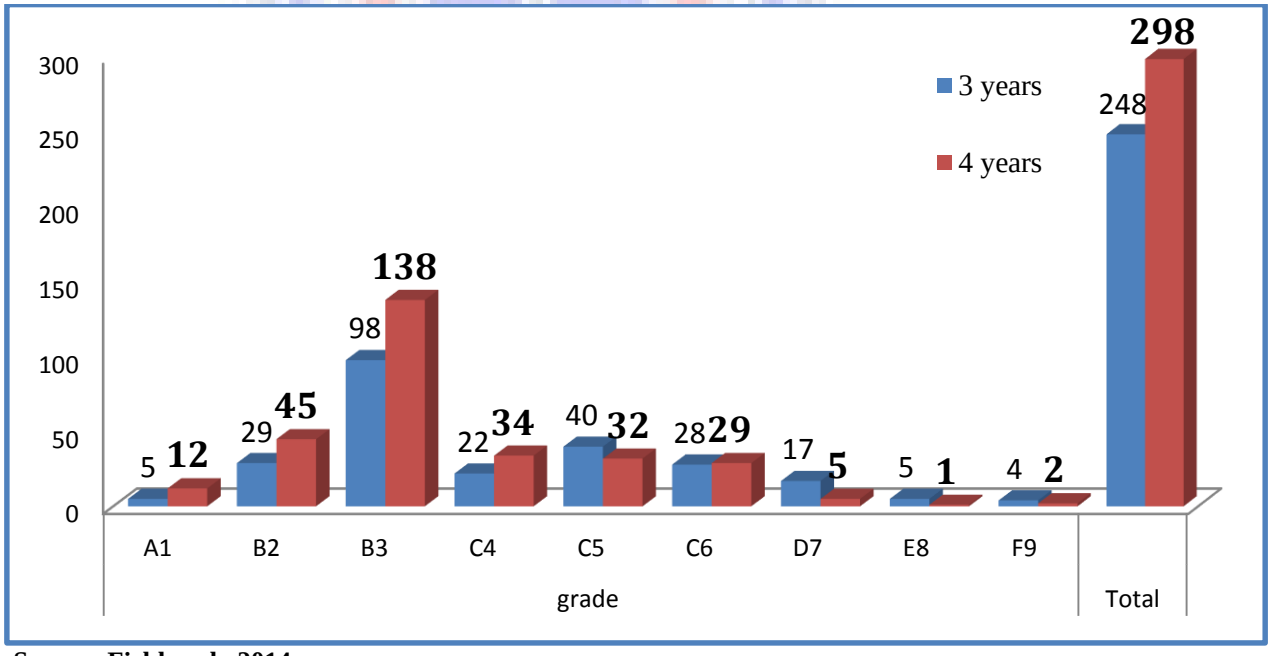
Source: Fieldwork, 2014.

Figure 5: General performance in Core mathematics

4.3. Comparing the grades obtained in the Core Subjects by 3 and 4 year students

This section aims at presenting results for objective one of the study: comparing the grades obtained by the three and four year candidates. The analysis mainly used chi-square test results to help build statistically credible outcomes.

Out of the 17 candidates who score grade A1 in Social Studies (check Table 4A above), 12 were 4 year candidates and 5 were 3 year candidates. The total number of candidates who scored grade B2 were 74, and majority (45) were 4 year candidates and 29 were 3 year students. Whereas 138 of the 4 years got B3, the 3 year candidates who scored B3 were 98. 40 3 year candidates had C5 and 32 of the 4 year students had C4. The break-down for C6 is as follows; 3 year group (40) and 4 year group (32). Whereas only 2 of 4 year candidates failed Social Studies 4 students of the 3 year group had F9 (Figure 6). The test results (***N***=" 548," $\boldsymbol{X^2}$=" 22.085," *df=8*, ***P−Value***="0.005") shows association between years spent in school and the performance of a candidate in Social Studies using statistical significant level ($\boldsymbol{\alpha}$)=**0.05 *or* 5%** (***Since*** *P (0.005 <* $\boldsymbol{\alpha}$ *(0.05).*



Source: Fieldwork, 2014.

Figure 6: Relative Performance of 3rd and 4th Year Candidates in Social Studies

From Table 5 performance of both 3 and 4 year candidates are almost at par. The best grade which was B3 was recorded by two candidates in all with each year group recording one apiece. Whereas only one candidate of the three year group had C4, 7 of the 4 year group had C4. Out of the 46 candidates who recorded C5, 26 were from the 4 year group and 20 were from the 3 year group. Twenty one candidates of the 3 year group failed and 18 of the 4 year group failed. The test results (N=548, χ^2=9.857, df=6, P- Value= 0.131) show no association between the number of years a candidate spent in school and performance in English Language. **Since (since α (0.05) <P (0.131)** at a Statistical Significant level (α) **= 0.05 or 5%:**

Table 5: Performance of 3rd and 4th Years in English Language Compared

		Grade in English Language							Total
		B3	C4	C5	C6	D7	E8	F9	
Duration in School	3 years	1	1	20	92	73	40	21	**248**
	4 years	1	7	26	122	95	29	18	**298**

Source: Fieldwork, 2014.

Performance in Integrated Science vis-à-vis duration in school, the only A1 grade was from a 4 year group. The next good grade after the A1 was B3 where 15 and 6 candidates from the 4 year group and 3 year group respectively had it. Sixteen candidates who had C4 were 4 year group and 7 from the 3 year group had same. Another 16 candidates from form 4 had C5 and 8 candidates from form 3 had same. Whereas 40 candidates from the 3 year group failed integrated Science, 33 of form 4 candidates failed (Table 6). The Chi-Square test results (*N*=548 χ^2=13.030 *df=7 P-*

Value=0.071) show no association between the number of years a candidate spent in school and performance in Integrated Science **(since P>α).**

Table 6: Relative Comparison of 3rd and 4th Year Performance in Integrated Science

		Grade in Inter Sc.								
		A1	B3	C4	C5	C6	D7	E8	F9	**Total**
Duration in School	3 years	0	6	7	8	48	63	76	40	**248**
	4 years	1	15	16	16	57	90	70	33	**298**

Source: Fieldwork, 2014.

The school recorded only one B2 and the candidate was from the 4 year group, 6 candidates from the form 4 group had B3 while 3 from among the form 3 batch had B3. Ten candidates from the 4 year group had C4 and 4 from the 3 year group had C4. Twelve from the 4 year group had C5 and 39 had C6, for the 3 year group it was 5 and 31 respectively. In all 66 candidates failed in Mathematics from the 3 year group and 48 from the 4 year group also failed in Mathematics. The split grades (*N*=548 χ^2=**12.886**, *df*=7 *P- Value*= 0.075) by candidates in Mathematics was evident (Table 7).

Table 7: Comparison of Results Obtained by 3rd and 4th Years in Mathematics

		Grade in Mathematics								Total
		B2	B3	C4	C5	C6	D7	E8	F9	
Duration in School	3 years	0	3	4	5	31	57	82	66	**248**
	4 years	1	6	10	12	39	81	101	48	**298**

Source: Fieldwork, 2014.

4.4. Objective 2- Comparing the Grades Obtained in the Core Subjects by Male and Female Candidates

This section looks at a comparative analysis of the performance of male and female candidates in the four Core Subjects. More importantly it relies on chi-square test results as basis for any conclusive analysis.

Table 8: Male and Female Candidates' Performance in Social Studies Compared

		Grade in social studies (%)								Total (%)
		A1	B2	B3	C4	C5	C6	D7	E8	F9	
Gender	Male	5.1	16.9	45.3	8.4	9.8	9.8	3.4	0.7	0.7	**100.0**
	Female	0.8	9.6	40.8	12.4	17.2	11.2	4.8	1.6	1.6	**100.0**

Source: Fieldwork, 2014.

From Table 8, 5.1% of the total candidates who scored A1 were male candidates and 0.8% were female candidates. Out of those who had grade B2, 16.9% were male and 9.6% were female and 45.3% of the male candidates had B3 and 40.8% of female had same. Break down of those who had C4, C5 and C6 were 8.4%, 9.8% and 9.85 for

males and 12.4%, 17.2% and 11.2% for females, respectively. Out of the total number of candidates who failed, 0.7% was males and 1.6% was females. The Pearson Chi-Square results (***N***=548, χ^2=24.612, ***df***=8, ***P- Value***=0.002, (α) = 0.05 or 5%) show that there is an association between gender candidates' performance in Social Studies. That is, male students are likely to perform better in Social Studies than female students.

Table 9: Male and Female Candidates' Performance in English Language

		Grade in English Language (%)							Total
		B3	**C4**	**C5**	**C6**	**D7**	**E8**	**F9**	
Gender	Male	0.0	1.0	8.1	38.9	29.7	13.9	8.4	**100.0**
	Female	0.8	2.0	8.8	39.6	32.0	11.2	5.6	**100.0**

Source: Fieldwork, 2014.

An analysis of the two B3 grade recorded (0.8%) in English Language were all female candidates. The next good grade in English Language was C4 of which 2.0% were female and 1.0% male candidates, 8.8% of the candidates who obtained C5 were females, whilst 8.1% were male candidates. 39.6% of candidates who recorded C6 were females and 38.9% were males. While 5.6% of recorded failures were females, 8.4% of male candidates failed in English Language. Even though the general performance of female candidates in English Language was slightly better than that of male candidates (Table 9), the test results (***N***=548, χ^2=5.882, ***df***=, ***P- Value***=0.437) show no association between gender and performance in English Language since the difference in performance was not significantly wide between females and males, though the females performed slightly better than the males.

Table 10: Male and Female Candidates' Performance in Integrated Science Compared

		Grade in Integrated Science (%)								Total
		A1	B3	C4	C5	C6	D7	E8	F9	
Gender	Male	0.3	6.8	4.1	5.4	21.6	27.4	24.3	10.1	100.0
	Female	0.0	0.4	4.4	3.2	16.4	28.8	29.6	17.2	100.0

Source: Fieldwork, 2014.

Performance of the genders in Integrated Science was as follows; the only A1 recorded (0.3%) was a male candidate, B3 male (6.8%) and female (0.4%). Of all the candidates who obtained C4, male candidates were 4.1% and 4.4% female candidates. Further, 5.4% and 3.2% of male and female candidates respectively recorded C5, while 21.6% and 16.4% male and female candidates respectively had C6. Of the candidates who failed in Integrated Science 10.1% were males and female candidates were 17.2% (Table 10). The results of Integrated Science vis-à-vis male and female performance (N=548, χ^2=25.113, df=7, P- $Value$=0.001) shows an association. That is male candidates will likely perform better in the subject than female candidates.

Table 11: Relative Comparison of Male and Female Candidates in Mathematics

		Grade in Mathematics (%)								Total
		B2	B3	C4	C5	C6	D7	E8	F9	
Gender	Male	0.3	3.0	3.0	4.4	13.9	27.4	29.1	18.9	**100.0**
	Female	0.0	0.0	2.0	1.6	11.6	22.8	38.8	23.2	**100.0**

Source: Fieldwork, 2014.

As far as performance in Mathematics in concerned (table 11), the best grade recorded was B2 and the only candidate (0.3%) who recorded the feat was a male candidate, and another 3.0% of which the total number who had B3 were also male candidates. For C4, C5 and C6 3.0%, 4.4% and 13.9% respectively were male and 2.0%, 1.6% and 11.6% respectively females. About 18.9% of the failures recorded were male and 23.2% were females. The high performance of male candidates over female candidates in Core Mathematics (***N***=548**,** $\mathbf{X^2}$ =19.095, ***df*** =7, ***P- Value***=0.008) was evident.

4.5 Objective 3- Differences in the Grades Obtained in the Core Subjects by Boarders and Day Students)

This section compares the performance of day candidates and candidates who were boarders to establish an association between a candidate's residential status and his/her performance in the core subjects.

Table 12: Boarding and Day Candidates' Performance in Social Studies

		Grade in social studies (%)								Total
		A1	B2	B3	C4	C5	C6	D7	E8	F9	
Residential Status	**Boarding**	2.5	16.4	44.3	10.0	11.8	10.0	3.2	1.1	0.7	100.0
	Day	3.8	10.5	42.1	10.5	14.7	10.9	4.9	1.1	1.5	100.0

Source: Fieldwork, 2014.

Whereas 3.8% of day students/candidates had A1, 2.5% of students who were boarders had A1. About 16.4% of boarding candidates had B2 while 10.5% day candidates recorded B2 and 44.3% of boarding candidates got B3 and that of the day candidates were 42.1%. The rest were 10.0%, 11.8% and 10.0% of boarding candidates and 10.5%14.7% and 10.9% day candidates recorded C4, C5 and C6 respectively in Social

Studies. Whilst 1.5% of day candidates failed, 0.7% boarding candidates failed. The outcome (Table 12) shows no association between a candidate's performance in Social Studies and residential status (N=548, χ^2=7.075, df =8, P-$value$=0.529).

Table 13: Performances in English Language of Boarding and Day Candidates Compared

		Grade in English Language (Core) (%)							Total
		B3	C4	C5	C6	D7	E8	F9	
Residential Status	Boarding	0.4	1.4	9.6	42.1	29.6	12.9	3.9	100.0
	Day	0.4	1.5	7.1	36.1	32.0	12.4	10.5	100.0

Source: Fieldwork, 2014.

The performance of day and boarding candidates was as follows; the best grade obtained was B3 both day (0.4%) and boarding (0.4%) and 1.5% of day as against 1.4% boarders obtained grade C4. The percentage of day and boarders who obtained C5 and C6 were 7.1% and 9.6% respectively. While 10.5% of day candidates failed, only 3.9% of boarders failed (Table 13). The likelihood that one's residential status may affect his or her performance in English language was found to be insignificant (N=548, X^2=10.866, df=6, P- $Value$=0. 093).

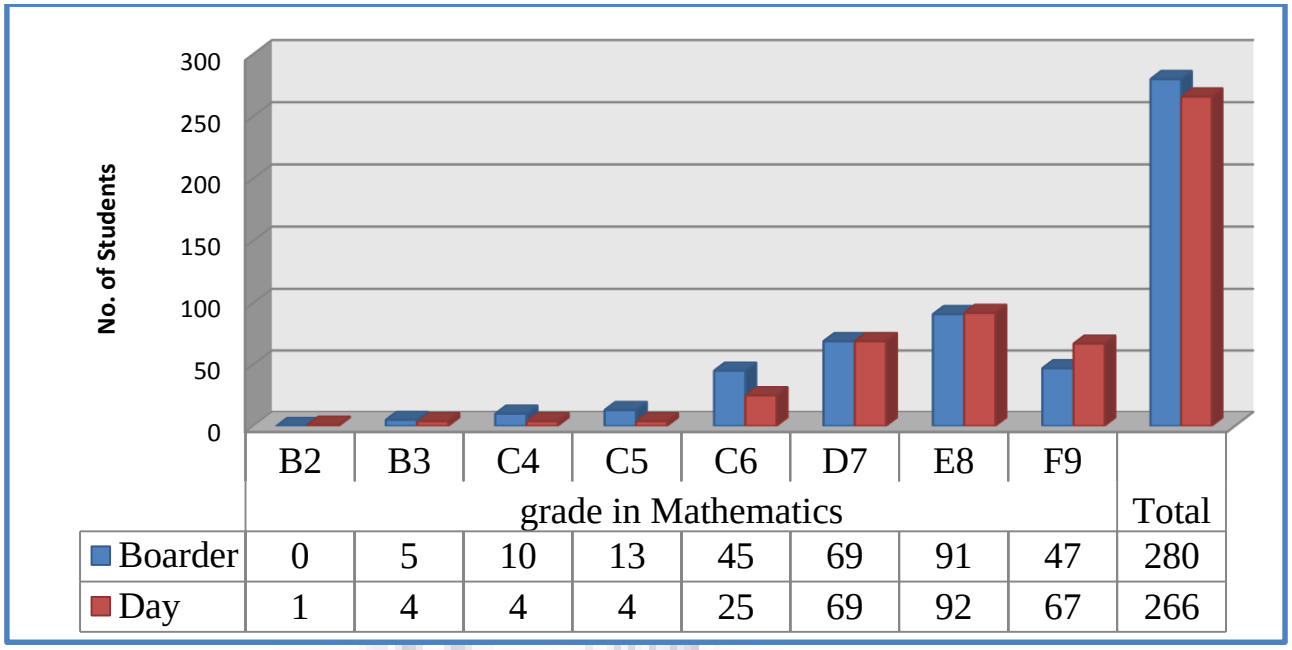
Table 14: Boarding and Day Candidates Performances in integrated Science compared

		grade in Integrated Science								
		A1	B3	C4	C5	C6	D7	E8	F9	**Total**
Residential status	Boarder	0	16	14	13	61	81	67	28	280
	Day	1	5	9	11	44	72	79	45	266
	Total	1	21	23	24	105	153	146	73	546

Source: Fieldwork, 2014.

The only A1 recorded in the Integrated Science was obtained by a day student. However, whereas 16 boarding candidates obtained B3, 5 day candidates had B3 and 14, 13 and 61 boarding candidates and 9, 11 and 44 day candidates' recorded C4, C5 and C6 respectively. Out of the 73 candidates who failed in the subject, 45 were day students and 28 boarding students. Thus, there was an association between a candidate's residential status and performance in Integrated Science (***N*=548, χ^2**=15.894***, df=7, P-Value*=0.026).

A candidate's residential status had influence his/her performance in mathematics (***N*=548, χ^2**=17.328***, df=7, P- Value*=0.015). From Figure 7 below, even though the best grade recorded B2 was from a day student, 5 boarding candidates had B3 as against 4 day candidates. Further, 10 boarding students had C4 while 4 day candidates had C4 and 13, and 45 boarding candidates against 4 and 25 day candidates had C5 and C6 respectively. Finally whereas 47 candidates who were boarders failed Mathematics as many as 97 day candidates recorded F9. The trend here is that more of the day students were consistently receiving grade F9.



	B2	B3	C4	C5	C6	D7	E8	F9	
	grade in Mathematics								Total
Boarder	0	5	10	13	45	69	91	47	280
Day	1	4	4	4	25	69	92	67	266

Source: Fieldwork, 2014.

Figure 7: Relative Comparison of Boarding and Day Candidates in Mathematics

4.6 Comparing grades obtained by the different Departments

This section deals with relative comparison of the four programmes (General Arts, Business, General Science and Vocational Skills) offered in the school and respective candidates' performances in the four core subjects.

Table 15: Comparison of grades of candidates in Social Studies based of programmes offered

		Grade in social studies (%)									Total
		A1	B2	B3	C4	C5	C6	D7	E8	F9	
Programme of student	General Arts	3.3	16.1	45.5	9.1	13.2	7.0	3.3	1.2	1.2	100.0
	General Science	0.0	14.5	41.9	12.9	9.7	17.7	1.6	0.0	1.6	100.0
	Vocational	0.9	1.8	33.9	16.5	15.6	21.1	7.3	1.8	0.9	100.0
	Business	6.0	18.0	47.4	6.0	12.8	4.5	3.8	0.8	0.8	100.0
	Total	3.1	13.6	43.2	10.3	13.2	10.4	4.0	1.1	1.1	100.0

Source: Fieldwork, 2014.

As far as Social Studies was concerned, 3.3% of General Arts students recorded A1, 6.0% Business students had A1, whilst 0.9% of Vocational students had A1. Break-down of candidates per programme who scored B2 were: Business (18.0%), General Arts (16.1%), General Science (14.5%) and Vocational (1.8%). For grade B3 the respective performance was; Business (47.4%), General Arts (45.5%), General Science (14.5%) and Vocational (1.8%). The rest were 9.1%, 13.2% and 7.0% General Arts candidates, 6.0%, 12.8% and 4.5% Business students, 12.9%, 9.7% and 17.7% General Science Students and 16.5%, 15.6% and 21.8% of the Vocational Candidates had C4, C5 and C6 respectively. The break-down of the failures was; General Arts (1.2%), Business (0.8%), General Science (1.6%) and Vocational (0.9%), (see Table 15). There is an association between the programme offered by a candidate and the performance in Social Studies (***N*=548, X^2=60.993, *df*=24, *P- Value*=0.000**).

Table 16: Comparing Performance in English Language based on Programme offered

		Grade in English							Total
		B3	C4	C5	C6	D7	E8	F9	
Programme of student	General Arts	1	6	20	109	74	23	9	242
	General Science	0	2	9	20	19	9	3	62
	Vocational	0	0	2	30	38	25	14	109
	Business	1	0	15	55	37	12	13	133
	Total	2	8	46	214	168	69	39	546

Source: Fieldwork, 2014.

The test results of the performance in English and of a student offering a programme, shows an association between the two variables, that is their grade in English and the programme they offered. ((***N*=548, χ^2**=48.428, *df* =18, *P- Value*=0.**001). From Table 16, one general Arts and one Business student recorded B3 which was the best grade, whilst 6 General Arts candidates and 2 General Science candidates had C4, the rest were: 20, and 109 General Arts, 9 and 20 General Science candidates, 2 and 30 Vocational students and 15 and 55 Business candidates had C5 and C6 respectively. For the failures: 9 General Arts students, 3 General Science students, 14 Vocational Students and 13 Business candidates had F9.

Table 17: Relative Performance of Candidates in Integrated Science According to Programmes offered

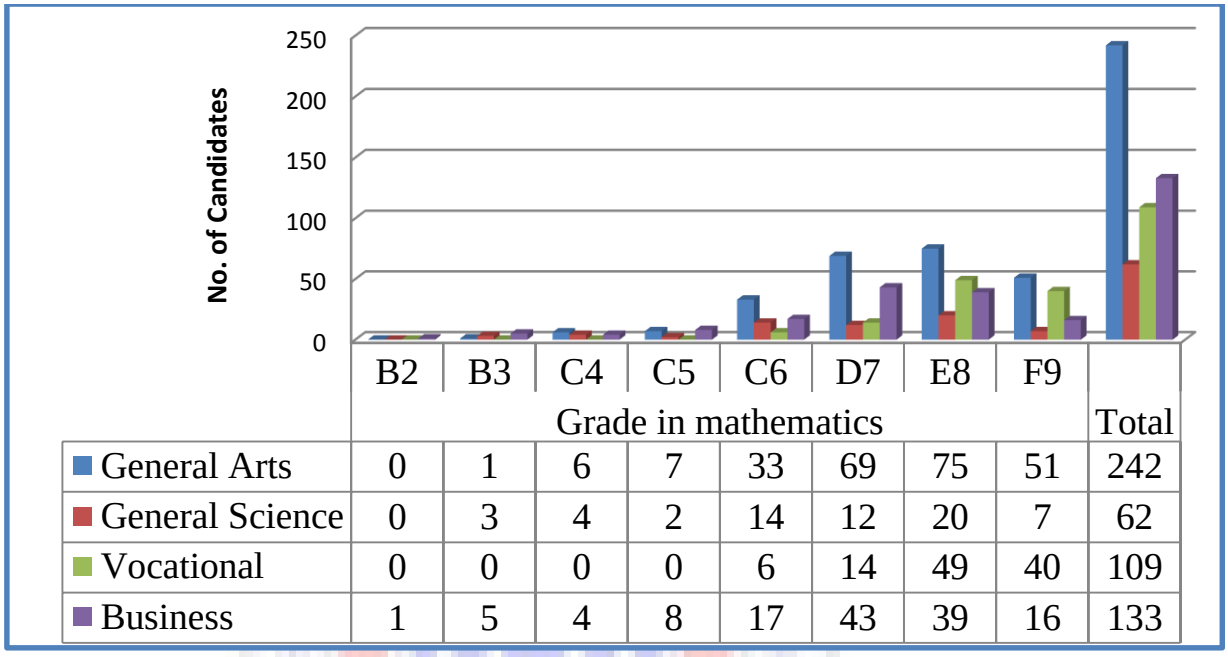
		grade in integrated science								Total
		A1	B3	C4	C5	C6	D7	E8	F9	
Programe of student	General Arts	0	6	13	12	51	68	65	27	242
	General Science	0	9	6	4	14	16	9	4	62
	Vocational	0	1	2	0	12	24	42	28	109
	Business	1	5	2	8	28	45	30	14	133
	Total	1	21	23	24	105	153	146	73	546

Source: Fieldwork, 2014.

The only A1 obtained in Integrated Science was a Business students and 6 General Science, 6 General Arts, 5 Business and 1 Vocational student had B3. The rest were; 13, 12 and 51 General Arts students, 4, 14 and 16 General Science students, 2, 0, and 12 Vocational and 2, 8 and 28 Business students obtained C4, C5 and C6 respectively. 27 General Arts, 4 General Science, 28 Vocational and 14 Business students failed (Table 17). Here too there was an association between one's programme offered and the performance in Integrated Science (***N*=548, X^2=74.620, *df*=21, *P- Value*=0.000**).

From (Figure 8) the best grade obtained in Mathematics B2 was by a Business student, and another 5 Business students, 3 General Science students and 1 General Arts student had B3. Whereas 6 General Arts students had C4, 4 general Science and 4 Business students had C4, the rest were; 8 and 17 Business students, 7 and 33 General Arts

students,2 and 14 General Science Students had C5 and C6 respectively and 6 Vocational candidates had C6. 51 General Arts, 40 Vocational, 16 Business and 7 General Science candidates failed in Mathematics. There was an association between candidates performance in Mathematics and the programme offered at school (***N*=548,** $\mathbf{X^2}$=74.811**,** ***df*=21, *P- Value*=0.**001).



	B2	B3	C4	C5	C6	D7	E8	F9	Total
	Grade in mathematics								
General Arts	0	1	6	7	33	69	75	51	242
General Science	0	3	4	2	14	12	20	7	62
Vocational	0	0	0	0	6	14	49	40	109
Business	1	5	4	8	17	43	39	16	133

Source: Fieldwork, 2014.

Figure 8: Relative Comparison of Grades of Candidates Based of Programmes Offered

CHAPTER FIVE

DISCUSSION

5. Introduction

The chapter is the interpretation of the results presented in Chapter Four. The chapter is divided into sections as in the results presentation. Each section deals specifically with a theme, concerning mainly the objectives set out to achieve in this study.

5.1. Characteristics of candidates

The long held and well researched issue of girl-child education lagging behind that of boy-child was evident in the result of the data gathered for the work. More boys registered and sat for the examination in 2013 than girls in the school. The reasons for this situation may be varied and complex socio-cultural, economic and biological factors. Socio-culturally, most girls drop out of schools to take care of the house and younger siblings. Moreover, if there is the family's choice to either let a boy or a girl drop out of school for one reason or the other; boys are preferred to continue schooling at the expense of the girls. As a result of economic challenges in rural Ghana, most girls end up truncating their education for financial reasons through teenage pregnancy, whilst others are forced into early marriages partly due to inability to pay school fees or taking proper care of themselves. Biologically, some girls have interrupted school sessions due to the severity of their menstrual pains they go through every month. All these culminate to affect negatively the performance of girl child in our schools.

From Figure 8 (page 91) majority of candidates who sat for the 2013 WASSCE in the school offered General Arts because offering the programme at a community based school is somehow more profitable than the Sciences (General Science and Agricultural Science). It appears that, in most of these schools resources for studying General

Science are not there or may be so limited that most parents do not prefer their students to offer the programme upon admission but rather would want their wards to offer programmes that do not involve many practical sessions. The large number of day students who registered and sat for the examination was also symptomatic of the lack of general residential facilities of the school and what pertains in community based senior high schools across the country.

5.2. Overall Performance of Candidates in the respective subjects

In all candidates performed relatively better in Social Studies than in the other three core subjects (Mathematics, English Language and Integrated Science), with about 13% of candidates scoring A1 and only 1.1% failing in Social Studies as compared to (0.4%) scoring B3 in English and (7.1%) fails Mathematics (only 1 candidate scored B2 and 114 failed) and Integrated Science (1 scored A1 and 73 failed). The possible reasons for candidates' high performance in Social Studies vis-à-vis the other three core subjects may be varied. First of all, the subject relates to our everyday social and community experiences thus, students may likely understand the concepts treated better than the rest of the core subjects. Meanwhile, other subjects like English Language may be difficult for students in the school because in the first place, these students do not communicate in the language, neither in the house nor in school. Moreover, they do not have the habit of reading story books, the dailies, and other journals in their spare time and which make reading and writing very difficult for most of the candidates. This is taken to the examination resulting in high failure rates in English Language. Mathematics has always been a challenge across space and time due to its abstraction and complex, rigid procedures and methods. Thus, teaching and learning Mathematics at this stage have always been a challenge especially where teaching aids have also not been provided to make the subject more practical and down to earth. Integrated Science

on the other hand has been one of the difficult subjects for candidates for a number of reasons; first the subject is voluminous combining topics of originally two separate broad programmes Agriculture and General Science. Covering the entire syllabus within the stipulated period has always been a challenge for both teachers and students. Moreover, most of the scientific terminologies, principles and methods are alien to students and hence, they find it difficult to comprehend.

5.3. Objective 1- Comparison of the grades obtained in the Core Subjects by 3rd and 4th year students

Altogether the 4th year students performed creditably better than the 3rd year students. For instance, whereas 12 students from the 4 year group scored A1 in Social Studies only 5 from the 3 year group had A1 and the chi-square test (***N***=" 548, " $\boldsymbol{X^2}$=" 22.085 ," *df=8, P<a*). Results of Social studies indicated that the number of years spent by a candidate in school has an association with the performance in the subject. Hence the Null Hypothesis that there is no significant difference between the grades obtained in the Core Subjects by the 3rd and 4th year students of Asuom Senior High School in the 2013 WASSCE is rejected for Social Studies. This finding confirms the argument of Crosser (1991) and La Paro & Pianta (2000) who presented evidence that older/matured children fare better academically than their younger, age appropriate peers. Uphoff & Gilmore (1985) also used research evidence about the relationship between maturity and achievement as well as other evidence to argue that the older and/or more matured students in a class fare better than younger classmates.

Even though the test results for English Language (N=548, χ^2=9.857, df=6, P- Value= 0.131), Mathematics (*N*=548 χ^2=12.886, *df*=7 *P- Value*= 0.075) and Integrated Science (*N*=548, χ^2=13.030 *df=7, P- Value*=0.071) showed no association between number of

years a candidate spent in school and the performance in these three subjects. Therefore null hypothesis there is no significant difference between the grades obtained in the Core Subjects by the 3rd and 4th year students of Asuom Senior High School in the 2013 WASSCE is accepted for English Language, Mathematics and Integrated Science. These findings corroborates the assertion by Lee and Barro, (2001) and Wobmann, (2000) in their international cross-section studies when they concluded school year length has no impact on test scores and for that matter student performance. But contradicts the findings of Krashinsky (2006) he studied the elimination of the fifth year of high school in Ontario, Canada and concluded that students with four years of high school had substantially lower grade point averages in college than those who attended high school for five years.

The aggregation of the respective subject performance in this study indicated a relatively better performance of the 4th year group over the 3rd years'. From the test results, for a candidate to perform in English, Mathematics and Integrated Science the performance was determined little by the number of years spent in school. However, a detailed analysis from Tables 5, 6 and 7 shows students from the 4 year group performed slightly better than their colleagues who completed in 3 years.

Other possible reason for a generally good performance by the 4 year group over the 3 year group may be longevity in school. The longer one spent in school, they become more mature and are able to reason, and comprehend faster whatever they are given than those who spent less time in school. Moreover, the teachers also have ample time to spend with the students and cover much of the syllabus hence, their relatively good performance in these subjects. Lastly as students spent more time in school, they are able to adjust their learning skills so if they even were not serious in the first two years in school, they begin to pick up in the remaining years.

This is opposed to the three year students who spent less time in school due to a change in policy direction of the government. Much of the syllabi are not covered limiting their ability to answer satisfactorily the examination. Further, they tend to mature after school by which time things would be too late for them. This result was also confirmed by the number of candidates offered scholarship by Kwame Nkrumah University of Science and Technology (KNUST). As the school is classified by the university as a less endowed school in the country thus six students each year are selected for free entry and the 2013 year group had four candidates selected from the 4 year group as opposed to 2 from the 3 year group.

5.4. Objective 2- comparing the grades obtained in the Core Subjects by male and female candidates

As noted by McCoy (2005), Peng and Hall (1995) gender is a significant contributor to student achievement. The general performance of boys in the examination, as the test results showed, was better than that of the girls in almost all the core subjects. With the exception of English Language which saw a relatively better performance of both genders, the boys performed better than the girls in the rest of the core subjects. The test results for Social Studies (N=548, χ^2=24.612, df=8, P- $Value$=0.002, (α) = 0.05 or 5%) indicated that there is an association between grade obtained and the gender of candidates and Table 8 clearly shows a generally good performance by boys than the girls. This was also true in Integrated Science (N=548, χ^2=25.113, df=7, P-$Value$=0.001), and Mathematics (N=548, χ^2 =19.095, df =7, P- $Value$=0.008) where the boys' performance was better than the girls (Tables 10 and 11 respectively). Meanwhile, the test results ($\boldsymbol{N}$=548, $\boldsymbol{\chi^2}$=5.882, ***df*=**, ***P*- *Value***=0.437) in English Language showed no association between boys and girls. In general the performance of girls in English Language was better compared to the boys' as seen in table 9.

The findings on the performance of male and female students in Social Studies is contrary the findings of Akinbote, (1999) that there is no significant difference between the cognitive achievement and attitude towards Social Studies of males and that of the females. Coley (2001), who studied gender differences within ethnic groups of varying ages, revealed that twelfth grade Hispanic females outperformed their like aged Hispanic males in Social Studies achievement. The findings on the performance of male and female students (Mathematics) in this study are in line with the literature that exists on the performance of males and females in Mathematics. O'Connor-Petruso et al (2004) have shown that gender differences in Mathematics achievement become visible at the secondary level when female students begin to exhibit less confidence in their math ability and perform lower than males on problem solving and higher level mathematics tasks. This finding also agrees with Fennema and Sherman (1977) when they indicated that males outperformed females in Mathematics achievement at the junior high and senior high school levels. Another study by Young and Fisler (2000) examining SAT-M scores of high school students, find males to score better than females.

The findings on the performance of male and female students in Integrated Science is in agreement with Logan and Gallagher (1997) who found that males outperformed females on traditional forms of physics questions, especially multiple-choice questions. Ekeh (2003) also discovered that male secondary school students performed better than females in science and that these differences in performance can be attributed to gender stereotyping which encourages male and female students to show interest in subjects relevant and related to the roles expected of them in the society. In addition, the National Assessment of Educational Progress (Nigeria) in 1992 showed that males had higher average scores than girls between the ages of 9, 13 and 17. McCullough (2004),

Zohar and Sela (2003), Bell (2001) and Mullis et al (2008) all concluded that male students perform better than female in science.

There are other reasons that might have contributed to the relative poor performance of girls' vis-à-vis boys in the 2013 WASSCE in the school. The first possible reason for the weak performance of girls in mathematics and integrated science may be due to the general perception that these subjects are mainly male subjects and therefore girls have not been motivated well enough to identify with them. More often girls tend to dislike elective subjects that are mathematics based and this attitude is extended to the core subjects which should not have been the case, reducing further their interest in mathematics and science. Another possible reason for the relatively poor performance of girls may be engagement in house responsibilities which takes much of their time relative to the boys. Most girls especially the day students perform house chores either early in the morning before school and/or after school and thus make them tired thereafter. This affects the general performance of girls in school as compared to boys. This rigid social construction will take a long time to change since it is deeply rooted in the cultural setting of society especially in Africa and Ghana to be precise.

The girls performed relatively better than boys in the English language. This finding is confirmed by Hedges and Nowell (1995) when they concluded that in late elementary school females perform better than males on several verbal skills tasks: verbal reasoning, verbal fluency, comprehension, and understanding logical relations. This view was confirmed by the DfES, (2007) when they reported that, on average across OECD countries, 46 percent of boys said they read only if they had to, compared to 26 percent of girls. Forty-five percent of girls reported that they read for enjoyment for more than 30 minutes each day compared to 30 percent of boys. Evidence suggests that the numbers reading for enjoyment diminish during secondary school. Also theorists of

Second Language Acquisition (SLA) believe that female learners show possible superiority in their second language learning process (Burstall, 1975; Boyle, 1987; Ehrlich, 2001). PIRLS (2006) research data also showed that at their fourth year of schooling, girls had significantly higher reading achievement than boys in all countries except in Spain and Luxembourg. In these two countries the differences between sexes were not significant (Mullis et al., 2007).

5.5. Objective 3- differences in the grades obtained in the Core Subject by boarders and day students)

The grades obtained by boarders and day candidates were mixed. Whereas there were no association between boarders and day students in English Language (*N*=548, X^2=10.866, *df=6*, *P- Value*=0. 093) and Social Studies (*N*=548, χ^2=7.075, *df* =8, *P-value*=0.529), there was an association between day and boarders in Mathematics (***N*=548,** χ^2=17.328**,** ***df=7, P- Value*=0.**015) and Integrated Science (***N*=548,** χ^2=15.894**,** ***df=7, P- Value*=0.**026). The Findings in Mathematics and Integrated Science is in line with Kanoy & Bruhn (1996), Nowack & Hanson (1985), and Pascarella et al (1993), when they opined that students who live on campus achieve higher grade point averages and scores on standardized achievement. The findings are also supported by Nowack and Hanson (1985), Simono et al. (1984), Thompson et al. (1993) and Nicpon et al. (2006),when they asserted that students living on campus perform better academically as compared to their counterparts living off-campus. But, the findings for residential status and students' performance in English Language and Social Studies contradict the views of these same researchers above.

The general performance of candidates in English Language was poor and for that matter, being day or boarder did not matter much about the grade one should expect. English Language is generally perceived by students to be a subject which does not

require serious studies, and thus, students spent less time reading and learning (studying) it. Meanwhile they do not also communicate in the language, hence exacerbating the already dire situation therefore the generally poor performance recorded in the subject. Moreover, house duties performed by most day students limits their learning hours and this goes a long way to affect their performance in the final examination, so any subject that entails more time to grasp the concepts and understanding becomes a problem to them. That is, they fetch water, cook, go to farm, and are sent on errands. Even though it is also true that the students in boarding house also perform certain duties and responsibilities, they are very limited to specific periods of the day and not also regular. Sometimes the day students are even sent by their parents during school days and therefore they are not able to attend school, but boarders do not suffer this kind of situation and therefore make their attendance rather consistent. All these might have accounted for why the day students generally underperformed in Mathematics and Integrated Science which are more demanding.

5.6. Objective 4- comparing grades obtained by students offering different programmes

For the test results obtained, there was association between the programme one offered and the relative performances in all the four core subjects, Social Studies (N=548, X^2=60.993, df=24, P- $Value$=0.000), English Language (N=548, χ^2=48.428, df =18, P- $Value$=0.001), Mathematics (N=548, X^2=74.811, df=21, P- $Value$=0.001), and Integrated Science (N=548, X^2=74.620, df=21, P- $Value$=0.000). From Table 15 and 16, the performances by candidates in Business and General Arts were better than those of General Science and Vocational and Social Studies. The strong performances by candidates who offered General Arts might partly be due to the generally common topics in Social Studies that cut across most General Arts subjects such as Government, History, Religious Studies, Economics and Geography. As far as English Language was

concerned, because most of the subjects in General Arts are “reading subjects” they were able to perform better in English than students from other department. The business students of the school were generally good students (based on their BECE performance) and therefore it was no surprise when they also performed better in Social Studies, Mathematics (Figure 8) and Integrated Science (Table 17).

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6. Introduction

This chapter highlights a summary of the key findings of the study that looked at the comparison of performance (grades) of students who completed S.H.S in *three* and *four* years in the 2013 WASSCE at Asuom Senior High School and how *gender* and *residential status* affected the performance (grades) of these same students. It also states the conclusions of the study and provides recommendations on how these issues can be addressed.

6.1. Summary of Findings

Based on the results of the study, the key findings have been discussed according to the following themes: performance of students in Social Studies verses the number of years spent in school, gender and residential status; performance of students in English Language verses the number of years spent in school, gender and residential status.; performance of students in Integrated Science verses the number of years spent in school, gender and residential status; performance of students in Mathematics verses the number of years spent in school, gender and residential status.

6.1.1. Performance of students in Social Studies Versus Number of Years Spent in School, Gender and Residential Status

The study revealed that out of the 546 candidates who took part in the examination, 3.1% had A1, 13.5% had B2 and 43.1% had B3, and only 1.1% failed or scored F9 in Social Studies. The chi-square results also showed that there was a significant

difference in the grades obtained in Social Studies by students who sat for the 2013 WASSCE in 3 years and 4 years with those who completed in 4 years performing better than their counterparts who completed in 3 years. Thus, the findings shows association between years spent in school and the performance of a candidate in Social Studies.

The study also revealed an association between gender and candidates' performance in Social Studies. That is, male students performing significantly better in Social Studies than the female students. But, there was no association between a candidate's performance in Social Studies and residential status. That is, there was no significant difference in the grades obtained by the day students and boarders in the 2013 WASSCE at Asuom Senior High School.

6.1.2. Performance of students in English Language versus number of years spent in school, sex and residential status

The best grade in the English Language was B3 and was obtained by 2 candidates, 8 candidates had C4 and majority of the candidates (214) had C6 and 39 candidates failed. The chi-square results showed no association between the number of years a candidate spent in school and performance in English Language. Thus, the study exposed the fact that the grades obtained by students in the 2013 WASSCE at SHS was not influenced by the number of years they spent in School. There was also no association between the gender of students and their performance (grades) in English Language since the difference in performance was not significantly wide between females and males. Similarly, the study also revealed no association between a candidate's performance in English Language and residential status.

6.1.3. Performance in Integrated Science versus number of years spent in school, sex and residential status

The grades obtained in the Integrated Science are as follows; one person had A1, 21 candidates secured B2 and 23 had B3. Majority of candidates (153) had D7 and 105 had C6, 73 candidates had F9. The chi-square test results showed no association between the number of years a candidate spent in school and performance in Integrated Science. That is, there was no significant difference in the performance of the three and four year students in the 2013 WASSCE at Asuom SHS. But, the chi-square test results of Integrated Science vis-à-vis male and female performance showed an association, with the male candidates performing significantly better than their female counterparts. Similarly, there was also an association between a candidate's residential status and performance in Integrated Science, with the boarders performing better than the day students.

6.1.4. Performance in Mathematics versus number of years spent in school, sex and residential status

Majority of the candidates (183) scored E8 in Core Mathematics, and another 138 had D7 and 114 had F9 in the examination. One person had B2 and 9 had B3. The chi-square test results of Mathematics vis-à-vis number of years spent in school (3years versus 4 years) and performance showed no association. Thus, there was no difference in the grades obtained by students who sat for the 2013 WASSCE in 3years and 4years at Asuom SHS. Contrary, the chi-square test results for performance in Core Mathematics and the sex of students showed an association, with the difference in performance favouring the male students. Thus, the male students significantly outperformed the female students in Mathematics at Asuom SHS in the 2013 WASSCE. Similarly, a candidate's residential status and his/her performance in

Mathematics were in association. That is, there was difference in the performance of students' vis-à-vis their residential status with the Boarders outperforming the Day students. In all, the performance of the students who completed in 4 years was slightly better than their colleagues who completed in 3 years.

6.2 Conclusions

From the discussion of the results presented above, the following were concluded. First of all, there is a difference in academic performance of students who completed in 3 years and 4 years in the 2013 WASSCE in Social Studies and that student's performance in Social Studies is likely to be influenced by the number of years spent in school. But, there is no significant difference in the performance of students who completed in 3 and 4 years in Mathematics, English Language and Integrated Science in the 2013 WASSCE.

Secondly, there is a difference in academic performance of male and female students in the 2013 WASSCE. The performance of students in Social Studies, Mathematics, is influenced by gender in favour of the male students in Asuom Senior High School. Hence students' performance in the above mentioned subjects is dependent on their gender.

Thirdly, there is no difference in performance of students in Boarding house and Day students, in Social Studies and English Language, but there is a difference in performance of students in Boarding house and day students in Mathematics and Integrated Science in favour of the Boarders in the 2013 WASSCE as reflected in the findings.

Finally, based on the findings from the study, it can be concluded that there is an association between the programme students' offered and the relative performances in

all the four core subjects. The performances by candidates in Business and General Arts were better than those of General Science and Vocational in Social Studies. The strong performances by candidates who offered General Arts might partly be due to the generally common topics in Social Studies that cut across most General Arts subjects such as Government, History, Religious Studies, Economics and Geography. As far as English Language was concerned, because most of the subjects in General Arts are reading subjects they are able to performed better in English than students from other department. The overall performance of candidates in the Mathematics, English Language and Integrated Science was poor and this may greatly affect candidates' prospects in perusing further education. This was more severe with the three year group whose performances were far below their four year colleagues.

6.3 Recommendations

Based on the conclusions the following are recommended; firstly, SHS education should be maintained. This is because, among the four core subjects, it was only in social studies where the 4 year group performed significantly better than the 3 year group. Rather, inadequate materials, tools and equipment for effective teaching and learning should be provided. There is also the need for further research to be conducted but this time, with a wider scope on the 3 and 4 year SHS duration.

Moreover, there is a need to include gender sensitivity training for teachers, increased mathematics and Science support for female students and support for males in English Language. There is need for conscious effort by educational authorities in the country to either redefine the time students go to school factoring in the girl child responsibilities in the house before school begins. Again there should be a concerted effort to stress the need to give males and females equal opportunity as well as responsibilities in order not to put them in an undue disadvantage. This will require swift societal changes through

constant public education. This will go a long way to reduce the gender inequalities in student's performance in Mathematics, Science and English Language as shown in the findings of this study.

Lastly, if possible all the students at the SHS level should be given the opportunity to stay on campus (Boarding House). This is because many studies including this current study has established that students staying on campus are more likely to perform better than their off-campus colleagues. Boarders are also more likely to be involved in campus programmes, take part in co-curricular activities and form study groups. All these will ensure the total development of the students. There is also the need for teacher motivation to enhance academic work, especially in the classroom. This will free teachers from engaging in other activities and focus on their work and the students.

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APPENDIX

A Sample of Students Results in the 2013 WASSCE at Asuom Senior High School