UNIVERSITY OF CAPE COAST

FEMALE PARTICIPATION IN TECHNICAL EDUCATION AND CAREER

CHOICE IN CAPE COAST METROPOLIS: IMPLICATIONS FOR

COUNSELLING

VERA ARHIN

2009

UNIVERSITY OF CAPE COAST

FEMALE PARTICIPATION IN TECHNICAL EDUCATION AND CAREER

CHOICE IN CAPE COAST METROPOLIS: IMPLICATIONS FOR

COUNSELLING

BY

VERA ARHIN

Thesis submitted to the Department of Educational Foundations of the Faculty of Education, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Philosophy degree in Guidance and Counselling.

FEBRUARY 2009

DECLARATION

CANDIDATE'S DECLARATION

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

Candidate's Signature………………   Date………………

Name: Vera Arhin

SUPERVISORS' DECLARATION

We thereby declare that the preparation and the presentation of the thesis were supervised in accordance with the guideline on supervision of thesis laid down by the University of Cape Coast.

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

Name: Prof. Francis K. Amedahe

Co- Supervisor's Signature………………..   Date…………….

Name: Dr. (Mrs) Linda Dzama Forde

ii

ABSTRACT

Many females in the junior high schools think that certain occupations are designated for males and others for females. The purpose of the study was to investigate the level of participation of females in technical education and find out strategies to be adopted to promote junior high school girls interest in technical education.

The study was guided by three research questions and four hypotheses. A random sample of 300 form three girls was drawn from 30 public junior high schools in the Cape Coast Metropolis for the study. Descriptive statistics was used to analyse the data pertaining to the research questions while inferential statistics (χ^2 and t-test) were used to analyse data regarding the hypotheses.

The results show that (a) Junior High School girls have positive perception of technical education (b) the girls' choice of career was influenced by their self-interest and gains and not by parental, teachers or peer influence, and (c) these girls lack of effective career guidance in the junior high schools by guidance co-ordinators affects their level of understanding in job trends. The test for hypothesis 1 indicated that school type influenced girls' participation in technical education. Hypothesis 2 indicated that girls who live in an environment that has positive regard towards technical education might have positive perception on technical education. Hypothesis 3 indicated that girls who live in stereotyped environment are gender stereotyped than girls' who live in non-stereotyped environment. Hypothesis 4 shows that girls type of programmes relate to their career choice. Each hypothesis was tested at 0.05 significant level.

ACKNOWLEDGEMENTS

No study of this kind could be successfully undertaken without help and encouragement from others. For this reason, I wish to express my profound gratitude to all whom in diverse ways contributed to the success of the thesis. I am highly indebted to my principal supervisor, Prof Francis Amedahe, for his encouragement and support during all the phases of the research. He provided the kind of intellectual interaction and suggestions for the success of this work. I also thank Dr. (Mrs.) Linda Forde my co - supervisor for her commitment, support and encouragement throughout my course.

I wish to register my special thanks to Dr. Nwandinigwe Ikechuku and Mr. Godwin Awabil for their advice and suggestions during this research. Also, I would like to show my appreciation to Mr Eric Anane, Mr Emmanuel Tenkorang and Mr Alex Marmah Ammartei for helping me with the statistical analysis.

My gratitude again extends to all staff at the counselling centre for their support, especially Mr. Sackey and Justina Davies for helping me with the typing of the scripts. Also, to all head teachers, teachers, girls of the 30 Junior High Schools for accepting to be part of this study. I say God bless you all.

Finally, to all and sundry who contributed in one way or the other to make this work what it is, I say thank you all.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Background to the Study

The development of any nation, to a large extent, depends on its technological advancement. Science and technology have pervaded almost every aspect of modern society and have underpinned the development and sustainability of the social model and the welfare of the society which are the characteristics of the developed world. Nations that have spent huge sums of money in the education of their citizens in science and technology have reaped benefits in terms of accelerated development.

In the modern world with rapid changes in technology and increased demand for skills, basic education is not sufficient in preparing people for jobs. More education or training is required; a reality that is recognised by international and donor agencies. The World Bank's Education Sector Strategy Update (ESSU), specifically mentions the growing importance of the knowledge economy and the need for a more skilled labour force in order to meet changing demands and maintain competitiveness (World Bank, 2005).

Entsua-Mensah (2006) opined that, to build a successful culture of technological thinking requires a nation to move outside the confines of the classroom to homes and communities using communal knowledge transfer. The early exposure of children to science and technology counteracts negative cultural beliefs and practices that are a bane to the adoption and application of

science and technology to national development (Entsua-Mensah, 2006).

Over the past decades, technical education in Ghana has primarily trained people in specific trades to fill the employment needs of industries. Technical programmes for basic graduates have been perceived as an alternative to other academic programmes. Since the choice seemed to be 'either' 'or', many students choose other academic programmes that would lead them to further their education, thereby shunning technical education in the process (Aidoo-Taylor, 1989).

Changes have been occurring simultaneously in education and social life in the outside world with technological development advancing at a pace previously paralleled to other disciplines. These developments have changed the way we work and play. While many of the world has embraced the technological evolution and has entered the global economy with a competitive edge, Ghanaian society is still struggling with her exports of raw materials, which could have been processed by technical-know-how personnel. Ghana's economic development is reflected in her exports centering on wood products, mined minerals, cocoa and other non traditional products like yam, pepper and pineapple (Ghana Export Promotion Council, 2007). Although these exporting businesses have been increasing steadily in quantity, they are not yielding the income needed to sustain the "standard of living" levels of Ghanaians. Ghana as a country needs to create indigenous capacity by training scientists, technicians and engineers in relevant fields to address local concerns in health, food security, infrastructure and manufacturing in order to be abreast with the fast changes going on around the world.

The Department for International Development (DFID) undertook a research in six developing countries under the heading, "Educating out of Poverty". The main objective of the study was to draw empirical evidence about the contribution of education and training to poverty reduction. The study was conducted in six countries and these were Ghana, India, Kenya, Rwanda, Tanzania and South Africa. The study revealed that poverty levels were high in all these countries with less so in South Africa. Comparison was made in the training systems of these six countries in Technical and Vocational Education and Training (TVET) against Secondary Education. "Rwanda appears to have the highest enrolment in TVET at the secondary level with (13%), followed by Tanzania (9%), South Africa (5%), Kenya (2%), Ghana (1.5%) and India (1%). According to UNESCO statistics Ghana had the lowest enrolment in TVET at the secondary level with (1.5%)" (Hayman, Palmer & Wodgwood, 2007, p.10). The results revealed that these countries (Ghana, India, Kenya Rwanda, South Africa and Tanzania) are relatively poor because of their low training in technical and vocational education. For poverty reduction to be achieved the Ghanaian economy must be diversified and decisively moved from dependence on marketing raw materials and imported cheap products to the manufacturing and exporting of finished or value added products. This requires reliance on a local workforce with competent science and technological skills to provide the necessary know-how for improved production, processing, marketing and management.

Forje (1989) asserted that most African countries have shortages of all kinds of qualified personnel in higher education with the shortages being worse in natural science, medicine and engineering fields. He was of the view

that African countries are classified as under-developed due to the relatively low level in their scientific and technological development. Forje (1989) also asserted that genuine integrated socio-economic transformation could not be achieved in African countries unless women are fully incorporated into science and technical fields at the main stream of higher education. Unfortunately, most Ghanaians have a mindset which stereotypes gender. Most Ghanaians also have low regard for technical and vocational training and place emphasis on passing examinations at the expense of knowledge acquisition and capacity building (Entsua-Mensah, 2006).

Statistics from the Ghana Statistical Service revealed that, in Ghana, at the primary school level, 47.3% of girls were enrolled as against 52.3% of boys. At the secondary school level 44.2% of girls against 55.8% of boys were enrolled. For vocational and technical, 13.9% of girls enrolled as against 86.1% of boys (Ghana Statistical Service, 2006). These statistics show gender inequality in enrolment for vocational and technical education. There is therefore the need to increase female participation in this discipline to bridge the gap that exists between genders in technical education. The need to bridge the gab that exists between genders in technical education is significant and reflects two world-trends. The first is the way in which technology is permeating all domains of activity in the contemporary world, with pervasive roles in national economic development changing in our everyday experiences and women need to get involve. The second is the recognition of the need for action by the international community in securing the advancement of women and the elimination of gender-based discrimination, particularly in the fields of education and employment (Entsua-Mensah, 2006).

UNESCO (1995) ascertained that poor enrolment of females into technological disciplines has resulted in an unequal access to wealth, power and education. It has also led to shortages of female personnel particularly for professions, which demand scientific and technological background. It, therefore, called for urgent education of African girls into such disciplines.

The traditional educational system in Africa is one that ensures that a woman like her male counterpart is equally given adequate education as to prepare her for her role in the society. Ironically, such education prepares the girl in domestic duties, farm work, local trading, cultural activities, home keeping and childcare. In most cases, the roles of the woman revolve around the home while that of the man is basically outside the home (Adeyoju & Aremu 1999). However, with Western education and civilization, African women like their Western counterparts, began to gradually encroach into professions like teaching, civil service and other occupations that were formerly dominated by men (Udegbe, 2003).

Though education has led to increased participation of women in the formal sector, with most of them competing keenly with men in all academic spheres, this has not appreciably challenged the gender conservation that characterized the colonial period in the field of technology (World Bank cited in Egenti, 2008). It has become a particular concern of the Training Department of International Labour Office to expand and diversify female training, in particular for occupations having higher level of skills, responsibility and pay (Odugbesan, 1990; Prytz, 1991).

The exigencies of development demands that all segments of the population be mobilized and the woman as an agent of development and

simply as a person has much right to education as the man. However, expected sex- roles by Ghanaian society hinder female participation in certain disciplines such as technical education. With the rapid advancement in new technologies and modernization, the encouragement for greater participation of females in the "non-traditional occupations" such as entering into technical education in a developing country like Ghana cannot be over emphasized. The move by the Ghana government to introduce Science, Technology and Mathematics Education (STME) clinics for girls and the incorporation of technical drawing and technical skills at the basic education level for both boys and girls is a welcome step towards encouraging girls to actively participate in science and technological activities.

Statement of the Problem

Despite concerted effort being made by government of Ghana, stakeholders in education and non-governmental institutions in Ghana to encourage female participation in technical education for the past decade, it is obvious that the low participation of females in technical education continue to be a grave problem. Delivering a speech on "More Attention for Gender Equality at the 60th Speech and Prize-giving Day at St Monica's Senior High School, the Vice President of the Republic of Ghana said the art of a nation-building requires the collective effort of men and women in bringing about the good things we desire for ourselves" (*Daily Graphic*, 2006, p.3). He stated that the government will continue to encourage gender equality in shaping the educational structure to enable it respond positively to global challenges Sight must not be lost of the fact that women's role in development of a nation and

for that matter Ghana, is of so much importance that this issue needs to be adequately addressed.

The 2000 population and housing census in Ghana categorized four major occupation areas and their percentages nationwide as: agriculture and related work 49.2%, production and transport equipment work 15.6%, sales work 14.2% and professional and technical work 8.9% (Ghana Statistical Service, 2002). These statistics show that Ghana lacks skilled workers in the professional and technical fields and women as agents of change must be encouraged to go into professional and technical fields.

Statistics from the Ghana Statistical Service (2006) revealed that enrolment for girls and boys into technical and vocational institutions for 2006 in Ghana were 13.9% and 86.1%, respectively. Statistics from the Cape Coast Metropolitan Education Service also revealed that enrolment for the three technical schools in Cape Coast Metropolis for 2006 showed a percentage of 0.6 females against 99.4 males pursuing technical programmes in the metropolis. These statistics indicated the low level of female participation in technical programmes in the metropolis.

The researcher visited the three technical institutions in the metropolis to find out more on the situation from the institutions. The visit revealed that, at Oguaa Senior High/ Technical School there was no female on the technical programme which had 43 males. Efutu Senior High/ Technical School had only one female offering applied electricity out of 330 males offering technical related programmes. According to the school records, this female was the first lady on the applied electricity programme since the inception of the programme in the school. Cape Coast Technical Institute has

eight females out of 1200 students offering technical related programmes in the institution. These females were offering different technical programmes in the school. One was offering carpentry and joinery, one on advanced mechanical engineering programme, two were offering mechanical engineering, two on draughtsmanship programme, and the other two were offering building and construction. This shows the low participatory rate of females pursuing technical related programmes in the metropolis.

The International Labour Office undertook a research to determine the level of female participation in non traditional occupations in some African countries of which Ghana was included. The countries were Bangladesh, India, Pakistan, Sri Lanka and those of the West Africa sub region were Ghana, the Gambia and Nigeria. The West Africa sub-region had Gambia obtaining 40%, Nigeria having seven percent and Ghana two percent. It was concluded from the research that Ghana recorded the lowest, with two percent, on female participation in non traditional occupations at the countries polytechnics. Alarmed by this rate, the government of Ghana proposed a policy document on technical and vocational education and training under the heading 'Measures to increase female participation in technical education'. The key thrust of the proposal was the vigorous efforts made to increase female participation in apprenticeship of the non traditional areas of technical education and training (Ghana Ministry of Education; Policy Document 1990:5). Interestingly, a decade after this there is still relatively low participation of females in technical education. It could be seen that much is needed to be done to encourage females to enter into technical education and the role of the guidance coordinator is inevitable. The research is therefore

concerned about the low participatory rate of females in technical and therefore wants to find out what militates against females from entering into technical education? What influence their choice of career and programme? This is because little has actually been done to understand and rationalize girls' basic needs and problems in the area we are encouraging them to go into.

Objectives of the Study

The general objective of the research is to find out reasons for low participation of females in technical education at the second cycle institutions in the Cape Coast Metropolis and strategies to be adopted to promote the interest of girls into technical professions. The specific objectives of the study are to:

1. determine the perception of girls on technical education.
2. find out the extent to which the type of schools girls attend influence their participation in technical education.
3. determine the perception of girls towards technical education due to living in an environment that has positive or negative societal regard for technical education.
4. determine the perceptions of girls towards technical education due to living in either a stereotyped or a non-stereotyped environment.
5. identify the extent to which girls' choice of programme relates with their choice of career.
6. identify the factors that influence girls' choice of career.
7. check the effectiveness of career guidance in junior high schools.

Research Questions

In order to find answers to issues raised in the objective of the study,

the following research questions have been formulated to guide the study.

1.   What are the perceptions of girls about technical education?

2.   What factors influence girls' choice of career?

3.   How effective is career guidance at the junior high schools?

Hypotheses

In order to find answers to the issues raised in the objective of the

study, the following hypotheses have been formulated for the study.

1. H_o: Type of schools for girls does not significantly influence girls'
     participation in technical education.

     H_1: Type of schools for girls significantly influences girls'
     participation in technical education.

2. H_o: There is no significant difference in the perceptions of girls
     towards technical education due to living in an environment of
     positive or negative societal regard for technical education.

     H_1: There is significant difference in the perceptions of girls
     towards technical education due to living in an environment of
     positive or negative societal regard for technical education.

3. H_o: There is no significant difference in the perceptions of girls
     towards technical education due to living in either a stereotyped or
     a non stereotyped environment.

     H_1: There is significant difference in the perceptions of girls
     towards technical education due to living in either a stereotyped or

a non stereotyped environment.

4. H_o: Girls' choice of programme in school does not significantly relate with their choice of career.

H_1: Girls' choice of programme in school significantly relate with their choice of career.

Significance of the Study

Despite present educational policy to encourage female participation in non-traditional programme, only few females are found in these areas such as welding, woodwork, engineering and gas fitting. It is therefore necessary to adopt strategies to increase the number of females in technical education. In this regard, the present study is very timely in the development attempts of Ghana to meet its millennium development goal; through "the power of science, technology and innovation". This cannot be achieved if the participatory rate of women into technical education is not increased.

This study provides important information to educational policy formulators, implementers and curriculum developers regarding girls' projection in technical education. The study is also useful to Non Governmental Organisations (NGOs) and organizers of Women in Technical Education (WITED) and Science, Technical, Mathematics Education (STME) clinics in encouraging girls to enter into technical education.

The aspirations and constraints of girls at the junior high schools from the results of the finding serve as a guideline for guidance coordinators and career counsellors in schools to assist the girl-child who has the specific attributes to enter into technical education to do so. It is anticipated that the study has contributed to the body of knowledge in areas of females'

involvement in non-traditional occupation and would serve as a reference point for future educational researchers interested in the participation of women in non-traditional fields, especially in technical education.

Delimitation of the Study

The scope of the study was limited to public Junior High Schools (JHS) in the Cape Coast Metropolis of the Central Region. A study of this nature should have involved almost all the female pupils in the junior high schools in the Cape Coast Metropolis irrespective of their forms. However the researcher restricted the selection of respondents to JHS 3 pupils in the 2006/2007 academic year because the JHS 3 pupils have chosen the programmes they would like to pursue at the second cycle and the researcher wanted to find out what influenced their choice of programmes and career. The study did not discuss girls' socio-economic background which can also affect their choice of career.

Limitation to the study

The researcher faced the problem of clarifying questions to some few students at two of the schools sampled during the administration of the instrument due to their level of mastering of the English language. It could happen that some of the respondents had problem with some of the items but did not ask for clarification. This would have affected the validity of the study.

Also, a study of this nature should have been conducted using quasi-experimental design. This would have helped the researcher to assess if Junior High School girls would have selected technical programmes if effective

counselling is given. However, time couldn't permit the researcher to use this design.

Definition of Terms

For the purpose of this study, the following meanings were assigned to some specific terms. These are explained below:

Technical Education: According to the "Draft TVET Policy Framework for Ghana, technical education "refers to education and training aimed at preparing individuals for middle-level positions, such as technicians, technologists and middle-level management personnel. Technical education takes place at upper secondary to tertiary levels" (Ministry of Education, Youth and Sports and Ministry of Manpower Development and Employment, 2004). Draft TVET Policy Framework for Ghana, p ix

Low Participation: This is used in the study to mean not getting involved or taking less active part in an activity.

Gender-Stereotype: This referred to peoples' perception and expectations about the behaviour and traits that males and females possess. It also refers to the belief people have about men and women in relation to how they are supposed to behave and the occupations they are expected to engage in by society. A person is said to be stereotyped if the person holds the view that certain activities are only meant for his or her gender.

Non–traditional occupation: This is used in the study to mean those occupations in which more than 75% of the work force is males.

Career was used to refer to what one is capable of doing to earn a living.

Organization of the Rest of the Report

Chapter two consists of the review of literature related to the study. It examines the views of authors and researchers on issues related to the study. Specifically it addresses issues like educational reforms, technical education, female education and gender stereotyping. Other areas addressed are barriers to female participation in technical education and issues relating to career choice and career guidance.

Chapter three discusses the methodology adopted for the study. It describes the research design, the population, sample and sampling procedure, as well as research instruments and pre-testing of instruments. It also describes data collection procedure and how the data was analyzed.

The fourth chapter contains the results and discussion of results obtained from the fieldwork. It examines the trends that emerged from the data by using descriptive statistics and inferential statistics. It also looks at implications for counselling.

The concluding chapter, chapter five, presents the summary, conclusions, implications and recommendations as well as suggestions for future research related to the topic.

CHAPTER 2

LITERATURE REVIEW

Introduction

There is an increasing concern now than ever for parents and the nation at large to invest in the education of the girl-child. With technological advancements at global levels, it has become obvious that the individual as well as the nation has major roles to play in order to improve upon the living conditions of its citizenry. There is no doubt that good education will emancipate women and their children who are the vulnerable groups in society and for that matter increase women's participation in developmental issues.

Many girls enrol in schools with their male counterparts but most of these girls are unable to go further for various reasons. Some of them discontinue their education because of lack of parental care resulting from broken homes, lack of motivation and poor traditional perception about the girl-child being in school (Konadu-Agyemang & Shabaya, 2004).

A woman is a potential in the home or family, society and nation. To start with the home, a mother's role is very important and demanding. The attitude of the future citizens of a nation depends upon the upbringing of the woman. No wonder Dr. Aggrey made an assertion that: "When you educate a man, you educate an individual, but when you educate a woman, you educate a nation" (Pra, 1992, p. 83). This statement shows the vital role of women in the socialization of the individual from childhood to adulthood in society.

A 1991 study by Lawrence Pfall and Associates in Michigan found that women rated higher than men in facilitating teamwork and more likely than men to utilize facilitative leadership, a style that enables and encourages others (Cary, Con & White, 1997). Educating women in the technical trades would promote female participation into such trades since women are facilitators as well as agents of development. There is, therefore, the need to encourage women into technical education to break the gender stereotyped occupations that exist between males and females.

A critical review of literature reveals some gaps between male and female in respect to non-tradition occupations. Most of them thus, dwelt on the need for equal opportunity to education for both males and females. The issue of equal opportunity, as pointed out by Wallace (1985), has been the subject of political debate and legislation through Sex Discriminating Act 1975 and as a point of departure for many writers on gender issues.

At the heart of current international development discourse, as captured in the Millennium Development Goals (MDGs) lies the worldwide consensus on the need to combat poverty. There is a complex series of potential interactions between education, skills and poverty reduction (Hayman et al, 2007). Though the involvement of females in a non-traditional occupation will not directly reduce poverty, it could contribute indirectly by generating growth and stimulating the employment market (Danso-Manu, 2004). With regard to this, the present study looks at female participation in technical education and career choice and its implication for counselling.

This chapter is devoted to theories and research literature related to the study. The following are the headings under which the literature has been

reviewed.

1. Educational Reforms in Ghana.

2. Technical Education.

3. Female Education and Gender stereotyping

4. The need for Female Education

5. Barriers to Female Participation in Technical Education.

6. Career Guidance and Career Choice.

Educational Reforms in Ghana

Education is a dynamic phenomenon. The defining characteristics and practical attributes of what was once considered as constituting relevant and quality education, about one hundred years ago, may not be the same today (Budu-Smith, 2007). Nwadinigwe (2005) defines education as the process of change in behaviour.

Ghana has since independence made significant strides in its education system. The education landscape in Ghana today is the result of major policy initiatives in education adopted by past governments as well as the present one. Some of the laws, policy documents and reports, which have helped in meeting the educational needs and aspirations of the people are:

- The Education Act of 1961

- The Dzobo Report of 1973 (Recommended the JSS Concept).

- The New Structure and Content of Education of 1974

- The Education Reform Programme of 1987 (Implementation of JSS concept)

- The Free Compulsory Universal Basic Education Programme of 1996

- The Ghana Education Trust Fund (GET Fund) Act of 2000

- The Government White Paper on Educational Reform 2004

These laws and policies have not only helped in structurally transforming the education system but also improved access and quality teaching and learning to some extent, as well as infrastructure delivery (Bonney, 2007). Though these educational programmes succeeded in solving some of the problems confronting the sector, including the reduction of the duration of pre-tertiary education and expanding access to education are, however, still beset with a number of problems. These include poor quality teaching and learning, weak management capacity at all levels of the educational system and inadequate access to education.

Due to the economic constraints that faced the country in the late 1970s and early 1980s, bureaucratic bottlenecks and sheer lack of interest and commitment from administrators, the 1974 educational reform recommended a new structure and content of education which never went beyond the experimental stage. There was stagnation and near demise of the experimental JSS system. By 1983 the education system was in such a crisis that it became necessary for a serious attempt to be made to salvage it. Among the many problems of the system were lack of educational materials, deterioration of school structures, low enrolment levels, high drop-out rates, poor educational administration and management, drastic reductions in government's educational financing and the lack of data and statistics on which to base any planning (Palmer, 2005).

Despite the numerous reforms in the structure and content of education in Ghana, it has been observed that the courses of study are not very relevant

to the Ghanaian experiences (Livingstone, 1986).   Livingstone (1986) suggested that it is necessary to adopt an educational and training system that meets the needs of the urban and rural markets. He described the educational system as often too academic, fostering a preference for "white-collar" jobs and wrong attitudes toward agricultural and manual work. Hence the introduction of the junior high school education became necessary to ensure that pupils appreciate the use of the hand as well as the mind in doing things.

In 2004, the Government of Ghana (GoG) came out with a white paper on a proposed educational reform which took off on the 11th of September, 2007. This new reform came about because it was believed that the 1987 education reform excluded pre-school education, it also over emphasised grammar type of education, very little attention was given to technical and vocational education and the large informal sector. It also provided limited opportunity for transfer within the various streams (Republic of Ghana, 2002). The previous education reform of 1987, which was intended to equip the youth with directly employable skills for the world of work through a vocationalised Junior Secondary School system- has been deemed a failure by many (Palmer, 2005).

The main objective for introducing pre-vocational and pre-technical skills was to provide opportunities for pupils to acquire pre-technical, pre-vocational and scientific knowledge and skills that will enable them to consolidate knowledge and skills acquired at the primary levels; discover their aptitude and potential; induce in them the desire for self improvement; understand the environment and the need for its sustainability so that they may become eager to contribute to its survival; and cultivate the desire for lifelong

learning. However, after almost 20 years into the reform Ghanaians are being told that the reform did not achieve its intended objectives (Republic of Ghana, 2002).

Osei–Mensah (2007), opined that, the implementation of the junior secondary school programme in 1987 was not preceded by public debate. There was no sufficient preparation and the generality of the public was sceptical about the soundness of the 1987 reform. What most people knew about the programme was that it was designed to produce artisans. Notwithstanding this, the reform was good because it has helped pupils at the basic school to appreciate the use of the hand and mind in doing things.

The new reform of 2007 is meant to put in place a second-cycle education system that better caters for majority of the youth (60%) who complete basic education and do not continue to formal senior high education. The former junior secondary system, that included – in theory, but frequently not in practice- an element of pre-vocational and pre-technical skills would be discontinued. In place of junior secondary is 'Junior High School' (JHS), with a more general and comprehensive curriculum. The government's intention is that the JHS should not be like the former junior secondary which served as a terminal programme for most pupils but to become and entry stage to further post-basic education and training in the new diversified system of Senior High Schools or in a new structured apprenticeship. The GoG intends to partner with the private sector to promote more formalised apprenticeship training programmes, with government assuming the full responsibility for the first year cost of the programme. Related to the new education reform is new technical and vocational training policy which is meant to reform skills

training in Ghana and dramatically expand the formal TVET sector (Hayman et al, 2007). The unique aspect of this reform is the introduction of core subjects, namely English, Mathematics, Social studies and Science (EMSS) at the Technical, Vocational and Agricultural institutions who formally did not write these subjects at the final examination (http://ghana gov.gh/Ghana/new educational reform, 2007).

According to Osei-Mensah (2007), the idea of blending the ordinary school subjects with pre-vocational and pre-technical skills is not a bad. This is because it would bring about an all-round development of the individual. For the aim of education is to provide individuals with the requisite knowledge, skills, values and aptitudes for self actualisation. This study, therefore, sought to find how the technical subject (pre-technical skills and pre- technical drawing) has influenced the cadre (a group of people chosen to study something for a purpose) of female pupils in Ghanaian junior high schools to pursue technical programmes at the second cycle of their education.

Technical Education

The term technical education refers to education which aims at preparing people in specific trades for the world of work. On the other hand, it is the practical application of science to commerce or industry, engineering, through the development and application of tools, machines, materials and processes to solve practical or human problems and it predates both science and technology (Entsua –Mensah, 2006).

Coillods (1993) defined technical education and training as all the programmes in the school or out of the school that prepare learners for specific

trades. The course content for technical education is both practical and theoretical and enables the person to enter the labour force. Accordingly, Budu-Smith (2007, p.4) defined technical education as "that type of education designed at upper secondary and lower tertiary post-secondary level to prepare technicians and middle management people and at the university level, to prepare engineers and technologies for higher managerial positions".

This study looks at technical education as education at the upper secondary and lower tertiary post-secondary level that provides skill training for competent craftsmen and women and technicians for the world of work. It is an education that is seen as a means to prepare people to master the complex task of contemporary life.

Over the years' technical and vocational education have been seen as less dignifying and only suitable for school dropouts and children of low-income groups. There is a wrong perception of technical and vocational education. Technical training is used when referring to boys and vocational training when referring to girls. The trend has been that any boy whose parent is poor or fails to gain admission to traditional comprehension secondary school because of poor grades gets enrolled in a technical school and such a girl, however, gets enrolled in a "vocational" school (Quaisie, 1995).

Graham (1976) observed that the beginning of TVET education dates back to ancient days where parents taught their younger ones their vocations. According to Barlow cited in Bonney (2007) from 1870 to 1906, concerted attention and action was focused upon the general problem of industrial education and out of the crucible of discussions of the new era in education came the establishment of agricultural and mechanical colleges during the

missionary school days in Ghana. Though the Christian missionaries took up the task by emphasizing agriculture and elementary technical skills, they failed initially as a result of some difficulties, notably, poor infrastructure. It is, however, on record that Kemp of Wesleyan mission opened a technical boarding school in Cape Coast where he took on 20 boys to train in handicrafts. These boys later became joiners, blacksmiths and painters. (Bonney, 2007).

Addae-Mensah (2000) asserted that when formal education began in the then Gold Coast, little attention was given to TVET education until 1850 when attempts were made to introduce subjects such as industrial, agricultural, and trade training into schools to off-set the apparently bookish nature of education. In 1877, the Basel Mission started a three year course in Accra to train boys in joinery, carpentry and iron work. The mission felt that no greater boon could be bestowed on the country than such an opening of employment for its youth, who hitherto were flooding the clerical market.

Governor Gordon Guggisberg provided a driving force towards the development of technical education in Ghana when he opened an engineering school at Achimota in 1920. This school produced the country's first engineers. The Accelerated Development Plan (ADP) of 1951 also made a remarkable contribution towards the development of technical education in Ghana. The ADP recommended the establishment of four technical schools at Tarkwa, Kumasi, Accra and Sekondi –Takoradi (Graham, 1976).

The boost of technical education in recent years came as a result of the 1987 educational reform. Under the reform, pre-technical skills started from basic education. Technical education started from upper secondary through

tertiary education to help build a solid human resource base for the economy. The human resource structure of the nation demands a large stock of trained workforce consisting of a large base of skilled labour, craftsmen, technicians and sub-professionals in addition to a relatively smaller number of "bookish" professionals (Ghana Ministry of Education, Policy Document, 1990).

In 1990, the National Coordinating Committee on Technical and Vocational Education and Training (NACVET) was established to advise government on a scheme that would meet the requirement of the Ghanaian economy and also prepare the youth not only for the formal sector but for the informal sector as well. Some mandates for the committee were as follows:

- Coordination of all aspects of vocational and technical education and training, as well as formulation of policies necessary for the education of technicians, craftsmen and other skilled middle level personnel to help build the nation.

- Determination of the financial needs of the training institutions to enable them satisfy the trained middle-level manpower needs of the country.

- Considering as many matters that pertain to vocational and technical education and training as may be referred to it from time to time.

The educational reform of 1987, though engineered technical education, did not give attention to technical institutions which were created to train master craftsmen and women and technicians for the world of work. To make matters worse, the Technical and Vocational Education Training

Division (TVET) of the Ghana Education Service (GES) was reduced to a unit and placed under the Director General's office in 1992. With the reduction of the TVET sector to a unit, funding for the sector dwindled even further, leading to a deterioration of equipment and infrastructure, with a general loss of interest in technical education (Bonney, 2007). Since quality education delivery remains Ghana's hope of reducing the high level of poverty in the society as well as becoming competitive in today's knowledge driven globalisation economy, it is, therefore, necessary that the technical institute streams be developed as a matter of policy to be parallel to the existing mainstream grammar type of education, so that JHS and SHS certificate holders who want to pursue technical education and training will find it attractive to do so (Republic of Ghana, 2002). With the recognition of technical education as being vital to the development of the country, a number of steps, including the construction of more technical schools, were embarked upon. However, from independence up till now, only 25 public technical schools have been established in the country, as against 496 public senior high schools (Bonney, 2007).

In spite of the challenges of not living up to expectation, Ghana's TVET sector has chalked up some successes. The JSS offers pre- technical and pre- vocational courses at the basic education level to expose pupils to technical and vocational subjects. Apart from the regular academic education, senior high /technical schools offer both general education and technical programmes in preparation for technical courses offered at the tertiary level. The 25 technical institutions also provide technical and vocational as well as academic courses with the aim of producing high-skilled workers, master

craftsmen and women and technicians in various fields including full-time, part-time and sandwich courses (Bonney, 2007).

Republic of Ghana (2002) says technical institutions offer a three year craft programme at first level leading to Crafts Certificate for the world of work or for progression to the second level programme. The second level programme consists of a three year technician programme leading to Technicians Certificate (Part 1, 2, and 3). Holders of Technicians Certificate Part 2 and 3 qualify for progression to the polytechnics. However, with the 2007 educational reform, a good student can progress to the tertiary institutions without progressing through the second level. This is due to the inclusion of EMSS in the technical education programme in the 2007 Educational Reform.

According to Emptage (1991) subjects that fall under technical education include the following; block work and concreting, building and draughtsmanship, carpentry, mechanical engineering, plumbing and auto mechanics. A visit to some technical schools in the metropolis revealed that similar subjects like auto mechanic, carpentry and joinery, mechanical engineering and building and draughtsmanship are offered. However students on technical programmes study physics, elective mathematics and chemistry.

Female Education and Gender Stereotyping

Our society has seen women entering the non-traditional occupations in recent times. The trend today is toward equalization of job opportunities, particularly those jobs that were predominantly held by men. This literature is reviewed under the following headings: definition, nature and scope of gender stereotyping, gender roles and stereotyping and influence of school on gender

stereotyping.

Definition, nature and scope of Gender Stereotyping

According to Nyenku (2004), gender connotes the emotional and psychological attributes which a given culture expects to coincide with physical maleness and femaleness. Bellew and King cited in Hill and King (1993) referred "gender" to the cultural, social and psychological expectations of being a boy and a girl.   It, thus, imposes social division between sexes.

"Gender stereotyping" has been defined as a rigid mental image or concept that summarizes the behaviour patterns, obligations and privileges for each sex (Scanzoni & Scanzoni, cited in Somi, 2003). Dickson (1985) defined gender stereotyping as the differences in male and female through the different roles assigned to them. He was of the view that there is no need disputing the fact that men and women are biologically different. The question social scientists ask is whether these biological differences explain the different roles played by women and men in society.

Salami (2000) was of the view that gender stereotyping leads to gender inequality which he defined as the difference between men and women in the distribution of social resources of power, prestige and property. The scope of gender stereotyping covers areas as gender equity and gender equality.

Gender equity is the process of being fair to men and women and gender equality refers to men and women having equal conditions for realising their full human rights and potentials to contribute to national, political, economic, social and cultural development and to benefit from the results (Tengey, cited in Somi, 2003).

Gender and technology have been and remain the focus of great

concern for extensive study (Haggerty cited in Ogunkola & Olatoye, 2005). The association between these two variables have been widely studied in various educational researches. Harding (1995) opined that in most cultures, participation in science, technology and mathematics education is strongly influenced by gender. They reported that there is the need to inculcate in individuals the awareness of gender equality in education.

The *Daily Graphic* (2006) quoted the then Vice President, Alhaji Aliu Mahama, for saying "the government will continue to encourage gender equality in shaping the educational structure to enable it respond positively to global challenges". He observed that if the country has given priority early to girl-child education, most of the challenges, such as the eradication of preventable diseases, reduction in infant mortality and morbidity, which were inhibiting the country's forward march towards achieving the Millennium Development Goals (MDGs) by 2015 would have been addressed.

It is important to note that in September, 2000, a special session of the General Assembly of the United Nations was held in New York where all Heads of State attended. A historical agenda referred to as the MDGs was signed. These MDGs have eight-point goals and the third-point goal is on the promotion of gender equality and the empowerment of women. The target of this third goal is to eliminate gender disparity in primary and secondary education, preferably by 2005 and at all levels of education not later than 2015 (World Bank 2002).

Gender roles and Stereotyping

Roles in Ghana are characteristically gender determined, gender directed and socially endorsed and perpetuated. The woman by definition and

by virtue of her gender is destined to play arduous domestic roles ranging from agricultural production, fetching water and fuel wood, preparing meals for the family and catering for the young and the elderly (Ajala, 2000). Bruess and Greenberg, cited in Somi (2003), noted that, gender roles are learned and not inborn. This is because sex roles differ from society to society. Somi was of the view that the acquisition of sex-type is not initiated by a single event in a child's life but rather it is a gradual process of learning that begins from infancy. She further argues that parents and adults shape the behaviour of children to conform to established gender roles by reinforcing 'appropriate' responses and discouraging 'inappropriate' responses. Bruess and Greenburg, cited in Somi (2003), found out that in many societies, girls are made to know that they are supposed to be neat and clean while boys are expected to engage in activities and play which results in making clothes dirty.

Van, cited in Pra (1992), traced the beginning of sex differential education to colonialism. Van recognized that colonialism operated within the boundaries of male biasness and indicated that:

> When they needed literate Africans to form a supportive, mediating structure for colonial governments, they sought young boys for schooling. Even when girls were sent to mission schools, they were not taught the same subjects. Girls training homes taught some domestic science and the Bible in vernacular (Pra, 1992, p. 83).

Cham'dimba and Chidam'modzi, cited in Gomile-Chidyaonga (2003), observed that the marginalization of women is rooted in traditional or cultural

practices through fundamental roles in ascribing statuses to men and women. They contended that men have been in the forefront of ascribing these roles to women and they the men benefit more from this status quo.

According to Cham'dimba and Chidam'modzi, parents simply accept traditional roles as the given order of things. They reinforce these roles in their male and female children as a way of socialising their sons and daughters into the society. They were also of the point of view that, gender role stereotyping is a societal issue and it is transmitted by all agents of socialisation – home, church, school, media and the society at large in order to maintain equilibrium in society.

Influence of the school on Gender Stereotyping

Bowles & Gintis cited in Erinosho (1997) asserted that gender stereotyping reinforces male domination and it is perpetuated and sustained through differences in the pedagogy and content of education which are imported at school and at home. At home, girls are oriented towards marriage and motherhood and are involved in domestic activities such as childcare, while boys are exposed to much more experiences outside the home. At school, the school provides a formal platform where gender divisions are reinforced. Schooling, first, moulds the consciousness of pupils, investing them with the habits of thought and practice which will be required of them and second, it helps to legitimize these habits, to make it appear natural and acceptable.

Reinforcing gender inequality by the school can be linked to curriculum materials. Though the educational system ostensibly gives equal access to both sexes, curriculum materials covertly moot the conscience of

pupils to identify with a particular sex. Analysts of textbooks have shown to a very large extent how school textbooks reflect sex bias, they omit the actions and achievements of females by using patronizing language and seldom expose girls to the literature that deals comprehensively with aspects of their own lives (Erinosho, 1997).

Stereotypes in school curriculum and textbooks limit the chances of girls to realize their full potential because sex stereotype plays an important role in behavioural development, motivation and self -concept. Children learn what is expected of their sex role through textbooks and other educational materials. A sample study on 79 textbooks with 1258 chapters by Erinosho (1997) using the simple frequency count of illustrations, content, questions, activities and equipment associated with males and females found out that there were a total of 21,865, representing 16,287 (74.5%) of male references in comparison with 5,578 (25.5%) female references in all the pages.

Teaching materials, according to Erinosho (1997), enlighten the learner on many issues. The tone and development of these teaching materials foster into the learner positive or negative attitudes about self, life expectancy, race, ethnic and social groups, occupation, education and religion. They stated that inadvertent bias in the use of these educational materials can influence the impact of educational programmes by reinforcing traditional sex role stereotyping.

Griffin (1999) when writing on teaching as a gendered experience, stated that descriptions in science and technology textbooks should depict society as it was, it is and should be when describing ideas and theories. In his view, textbooks should provide female students with female examples of those

directly involved in scientific and professional activities. This, he maintained may result in less distortion and stereotyping and give a more positive attitude of females in science and technological subjects.

Forje (1989) posited that it could be reasonably argued that females derive some kind of message from the way women in technical and science areas are portrayed in books. Forje, noted that in the few cases of women being mentioned, they were portrayed in ways that would not be considered models of success by female students reading the materials.

Hill and King (1993) looked at three popular physics textbooks in Britain and observed a clear demonstration of bias in favour of males. They observed that, whereas many references were made to males, there were very few references to females and when mentioned at all they were not depicted in activities of scientific and technological in nature.

In another instance, King (2003) posited that exposure to manual skill at school seemed to occur along gender specific lines. He stated that in the primary school, boys were easily tracked into playing with constructional materials using toys to make sample boxes, lorries and cars, whereas the girls found themselves anticipating the future domestic crafts like cooking, sewing and dressmaking. These practices, according to him affect the females' performance when they later decide to study technological programmes. He asserted that girls must be introduced to non tradition careers at the tender age.

Sadker and Sadker (1991) noted that textbook illustrations may be biased towards portraying girls for low paying skills while the males were depicted in occupations requiring higher skills. They analyzed the depiction of sex roles in picture books. In the sample they analyzed, they observed that

the ratio of males to females in illustration was 11:1 and in one –third of the books, there were no mentioning of women. They also found pervasive sex role stereotyping of characters with the male being depicted as independent and active person while the female was depicted as passive observer. Analyses of some textbooks and head teachers' handbooks used in Ghanaian schools by the researcher revealed that most of the textbooks and head teacher's handbooks are not gender balanced, for they are biased in favour of the male.

The *Daily Graphic* (1995) reported Gokah as saying that our educational policies should ensure widest possible access for females to secondary and tertiary institutions, as well as equal access to vocational and technical training. He commented further that school curricula and facilities should be structured in such a way that they would eliminate all gender biases.

The Need for Female Education

Statistics from the Ghana Statistical Service (2006) revealed that females form the greater percentage (51%) of the nation's population. There is, therefore, the need to empower women to be elevated to certain levels that will expose them to employable skills and other viable avenues which will enhance their status and bring them economic emancipation. Davson and Kanyuka cited in Gomile-Chidyaonga (2003), have argue that critical problems precluding developing nations will not be solved unless women's pivotal role in the development process and unequal access to development benefits are addressed. They see education as a key link in this process. Education in its broadest sense, formal, non-formal and informal is a powerful resource to women's development, especially in developing countries.

Education is a resource that can be more accessible to women than other resources such as land and capital (Aluko, 2005).

The issue of female education and the development of their human resources have attracted the attention of educators, social scientists, government and non-governmental agencies that are concerned with improving the welfare of the quality of the life of women. Several studies have shown that investing in female education is the most cost effective measure to improve the standard of living of citizens (Acheampong, 1992).

Anyanwu (1994) shared the view that education and training make females more creative, inventive and self confident. Goodale (1991) points out that values transmitted in the classroom serve to orient girls' expectation to formal sector, which is white-collar employment and undermined the value of other traditional occupations, including trade. He further pointed out that the educational training which girls receive is not only inadequate in terms of types of vocational skills they develop but also in terms of lack of appreciation for self-employment as a legitimate occupation. He, therefore, calls for education that would promote females into non-traditional trade.

Pin-pointing the importance of female education, Willer, cited in Anyanwu (1994) asserted that women's education has positive effect on their feelings of self- esteem and the value they attached to their personality. Another research indicates that women's education plays an important role in child care, especially in relation to infant mortality, high rate of school participation and relatively high levels of educational attainment, associated with reductions in fertility and mortality rate (Wak, 2002).

Accordingly, Egenti (2008) opined that well–educated girls who

become mothers will be able to manage their domestic affairs judiciously and also invest in the education of their children. She was of the view that adequate education will enlighten women and make them less superstitious and hence break some gender stereotyping attitude in society. This she said would reflect in the upbringing of their children. Such women would serve as mentors, motivators and impact positively on attitudes and characters among the rest in the society.

Participants in a conference on education and work opportunities for females in Africa in Morocco in 1971 noted that the African woman is indispensable in national development. It was concluded that, apart from helping to increase the productivity levels of females so as to help them participate effectively in the economic process, their education and training in technical fields must be encouraged (UNDP 1983 cited in Palmer, 2005).

The *Daily Graphic* (1995) reported Ama Doe urging women to recognize their potentials as the surest way of encouraging men to support them in their fight for equality. Hammering home the need for equal education, Coombe (1998) was of the view that low levels of education and training have contributed to the low level of participation of women in all spheres of national development. In support of this, Quaisie (1995) also stated that female education in science and technology increases females' horizons in choosing their future careers. This helps to reduce the stereotype attitudes that society have about the female.

Ayim (1998) pointed out that women's lack of education and training as well as stereotypes about their inability to master mechanical and technical skills have been the major barrier to their upward mobility. O'Reilly's

argument with Marshall, cited in Miller (1985), is worth noting. Marshall said;

> We hear on all sides, these girls are not going to remain at work for wages, they are soon to marry and therefore their vocational training should be along the line of homemaking.

O'Reilly on the contrary argued:

> Homemaking- I think, homes are made by men and women, not by women alone, and if that is a preparation, then training of boys and girls should be the same. That is, do not let us everlastingly put the girl off in a corner making bows when she might make a better carpenter than the boy. Forget, if you can, in education for while that is a female and that is a male. (Miller, 1985, p.58).

Biklen (1995) noted that the pace of technological innovation in industry is rapidly changing and employment patterns are also changing and, therefore, human resource of women needs to be developed to meet these challenges. King (2003) opines that the demand for labour would increase with new competition from low wage countries and consequently as low wages decrease, women's employment would increase and women would be increasingly substituted for male workers. Ghana, like most developing countries needs to improve upon science and technical education for her females to enable them develop skills that will encourage self employment and also to be ready for the global market challenge. There is the need to empower women with technological knowledge to elevate them to certain levels so that

the inadequacies in their education will not affect the country's development.

The girl-child needs to be encouraged to go further and acquire the requisite knowledge needed for self actualisation. This will expose females to employable skills and other viable avenues to open them up to job opportunities which will enhance their status and bring them to economic emancipation (Egenti, 2008).

Barriers to Female Participation in Technical Education

For the past two decades, significant efforts have been made to eliminate gender discrimination and gender stereotyping in vocational and technical education, thus insuring opportunities for education which had previously been denied to people because of their gender. Nevertheless, the overall status for females in non traditional programmes remains relatively low despite great efforts to change and create a more favourable environment for females (Burge and Culver cited in Swortzel, 1996).

The definition of participation is a matter which has attracted a considerable disagreement among development scholars and practitioners (Cohen & Uphoff, 1997; Cornea, 1991). Hornsby (2005) defined participation as the act of taking part in an activity or event. The World Bank (cited in Egenti, 2008) defined participation as mainly a process whereby those with legitimate interest in a project influence decisions which affect them. Novack and Novack (1995) saw participation as an end in itself.

At the junior high school, there is at least relative equality in participation in mathematics, science and technical subjects across gender lines. However, at the higher levels, the males outweigh the number of females participating in these subjects (Zietsman, 1997). White (1995) noted

that females face a "glass ceiling" over their aspirations which allows them to see where they might go but stops them from getting there.

Leach (cited in Ziestman, 1994) was of the view that factors influencing participation are diverse and often personal. He enumerated the following as the major factors that are perceived as influencing participation:

(a) belief about the usefulness of the subject

(b) seeing the subject as enjoyable and

(c) encouragement by teachers, role models and parents

(a) The student's belief about the usefulness of the subject (technical education). The belief about the usefulness of a subject in later life is perceived as a major contributing factor to ones continued participation in that subject. Thus, the interest one has in a subject will determine ones participation in it. What individuals' value is presumably internalised in their vocational development and influences their choices of career.

(b) Seeing the subject as enjoyable. Girls perceive themselves as less competent and are more likely to discontinue with the subject if it is not interesting to them. However the more enjoyable a subject is to an individual; the more he or she will participate in it.

(c) Encouragement by teachers, role models and parents. Osuagwu (1998) reported that, well documented research in Nigeria has shown that whereas children might lack male role models in primary and secondary schools, female learners definitely lack role models in Science, Technology and Mathematics (STM).

Wallace (1985) stated that the low participation of women in science and technology could be attributed to the fact that women have an erroneous

impression that science and mathematics are difficult subjects and they are only for men who they regard as intellectuals. Girls lack concentration, confidence and interest in these subjects, according to Wallace. They are lazy in doing assignments and practical work because they easily become discouraged and not as inquisitive as boys. Heggarty cited in Ogunkola and Olatoye (2005) contended that women are not only less likely to choose to study technical or a related career than men, but also less active participants than male students in science and technical classes, hence the reason why females are poorly represented in areas that requires technology related qualifications.

Ellis (1987) shows that women in the Caribbean attain higher levels of literacy and numeracy than males, yet the belief continues to persist that females are by nature technologically ignorant and unable to absorb scientific and technological information or to acquire technical skills. This is because at the point of choice, many women with university entrance qualification in these subjects opt for humanities and social science courses making women underrepresented in science and technology subjects at higher levels. The following are some major factors that prevent females' participation in technical education.

- Lack of interest in technical education.

- Lack of role models in the technical fields.

- Difficulty in studying subjects such as Mathematics and Physics.

- Societal attitude towards technical education.

- Expected sex-roles for females and

- Outmoded misconceptions about technical education.

Orton (1987) believed that societal attitude and expectation could be a cause for differences in participation observed in males and females. Stereotyped attitudes of society and sex roles expectations also contribute to the low level of female participation in non-traditional occupations (Prytz, 1991). Skypek (1980) believed that it is teachers that cause the differences in female participation in STME due to their instructional practices. Smith (2002), on his part, claimed that the traditional instructional practices employed by most teachers are the major reason for males participating more than females in STME. The real world examples used by teachers are taken from areas of study described by boys as areas of interest, thus, the girls do not see the subject as useful element in their choice of career.

Other studies show low female participation in science, mathematics and technology or under-representation of females in Science, Mathematics and Technical Education (STME) at the secondary school level (Yoloye, 1994). Yoloye, was of the view that girls prefer biology to physics and chemistry because they find these subjects to be difficult hence, their inability to enrol in science and technical fields. Balogun (1994) claimed that culturally defined roles given to females such as cooks, mothers, traders and house helps could be the reason for females not being motivated to learn non- traditional trades.

Studies have revealed that outmoded misconceptions and stereotyped attitudes are the major factors contributing to the negative attitude on the part of girls in the study of technical subjects (Ellis, 1987). The society in general and girls in particular consider technical education as a male-domain; that is,

technical education is either mechanical or too technical for girls. Girls are also considered as not being able to think or work scientifically (Agholor cited in Ogunkola and Olatoye, (2005).

Technical subjects are considered suitable for boys only and girls who study them are considered "un-ladylike". Boys who study the so called feminine subjects like secretarial course and cookery are laughed at by their friends and considered weak, poor and lazy (Ellis, 1987). Williams (1987), in a keynote address at the Commonwealth Africa workshop on gender stereotyping in science, technology and mathematics education in Accra, noted that the labelling of discipline as normal for one sex but abnormal for another was one major cause of the low recruitment of females into certain disciplines which are considered as male domain.

A study on access and barriers to education for Ghanaian women and girls by Manye (2008) revealed females agreed that housecraft was the most useful subjects for girls while science and technical subject were deemed good for boys, thus emphasizing the influence of sex difference stereotypes in participation and performance in science and technology. The participation of girls in technical and vocational education is generally low with some differences between countries. The disparity between girls and boys is further intensified when only soft options of courses such as tailoring, dressmaking, and secretarial assistance are made available to girls. She opines that females do not have concrete and realistic ideas about occupations they are likely to get and how to excel in these occupations, even if they are offered such occupations (Mayne, 2008).

The under-representation of girls in technical training has also been

the result of traditions. In Ethiopia, for instance, while technical schools are mainly opened to male students, girls are only encouraged to join separate fields of study such as secretarial and specific vocations assigned for women. There are also subject options in secondary schools specifically meant for girls: secretarial courses and home economics, whereas technical subjects such as industrial arts, mechanical drawing and electrical engineering are meant for boys. Even if girls are interested in the latter stream, they find it difficult to meet the academic demands of high grades in relevant subjects required for admission to these programmes. The failure of girls to meet the entry requirements for the technical programmes is cited as the major factor inhibiting their entry to these areas. The fact that technical programmes are regarded by men and women generally as "male preserves" is also cited as a major reason why women could not choose these subjects, even if they meet the entry requirements (Ellis, 1997).

Kuiper (1991) argued that girls in single-sex classrooms display greater confidence in themselves as well as their ability to solve problem than girls in mixed classrooms. However, there is no single sex classroom for girls in technical education hence their inability to participate in technical programmes. A similar result was found by Mallam (1993) in Nigeria, in a study on "the role of single-sex classrooms as opposed to co- educational classrooms" for technical programmes.

A study by Wallace (1985) envisaged that by the onset of adolescence, girls are already biased against technical career. The pupils' own biases are indeed compounded by the biases of their parents. Another study by Karen (1995) in Zambia observed that the "masculine" content of the subject matter

itself and the predominance of men in the teaching, studying and working environment related to the subject area are also factors alienating women.

Two additional critical factors influencing the under representation of girls in technical education is that first, there are no female teachers in technical education or if any, the number is very low. Second, technical schools are usually situated in regional towns and accommodation facilities are not easily available. This lack of lodging facilities makes parents reluctant to send their daughters away from home (Yoloye, 1994).

The limited access to technical and professional education is an important factor which prevents women from entering into this field of work. Over the years, those who attempt to cross the gender barrier do so against several odds and only a few bold ones manage to succeed. Even though, both boys and girls are expected to study all subjects at the basic level, boys who decide to study the so called feminine subjects like cookery at the senior secondary schools are given names such as "Mr. Apron." Girls who choose technical subjects are called "Mrs. Hammer." The resultant effect of this problem is the apparent vast areas of job opportunities which seem available for men and very limited opportunities for women (Agholor cited in Ogunkola and Olatoye 2005 & Bellew and King cited in Hill and King, 1993).

Other findings about misconceptions held by the society about female enrolment into non-traditional occupations and which girls also believe in are enumerated by the Commonwealth Secretariat (1987) and Hill and King (1993) include the following;

1. The traditional role of the woman is found in the home, therefore, in school, girls must be taught subjects such cooking and sewing.

2. Technical education includes subjects such as physics and mathematics which are considered to be difficult and require some kind of intellectual capability which women do not have.

3. Technical education requires physical energy which females lack.

4. Any girl who wants to pursue technical education must spend longer hours and years of difficult work by the end which there would be no suitor for her.

5. Girls never succeed when they attempt and give up on the way. Those that eventually succeed must be the most unattractive of their sex, may be witches or have manliness in them.

6. The school's environment and programme especially, the curriculum has not helped much. Until the onset of the educational reforms in the country, the school time table or subjects schedule, made boys and girls automatically find themselves choosing traditionally accepted school programmes. Textbooks, classroom language, examples, charts and models portray the male image.

7. The period when technical skill is introduced to the girls is the time when they are in their teen-age and their lives are crowded with all sorts of adolescent problems and they waste time on emotional and fashionable activities.

8. Lack of role-models: relatively there are no female teachers for technical subjects. Throughout their lives, girls are taught by male teachers', they, therefore, perceive technical subjects as male subjects. Very few women are in the field of science and technology (technical education) so girls seem to have no role models to look up to, no one to

identify with and no one to serve as a mentor.

Shah (1986) also enumerated the following barriers to technical and technological studies by females:

1. Lack of female teachers and attitudes of male teachers towards girls in science and technology classes.

2. Inflexible selection and entry requirement for girls.

3. Technical and technological studies often have large attendance requirement, for practical skills or laboratory based work.

4. Male oriented languages and male images in teaching materials.

5. Instructional and pedagogies and curriculum content which ignores the social context of technology.

Three cases studied in Africa, the Caribbean and South Asia illustrated the disjunctions in regional context in terms of female participation in science and technology. For the purpose of this study, the study that pertained to Africa by Williams was reviewed. Williams (1987) identified the following barriers to female participation in science and technology:

1. Relegation of women to the home.

2. Female seclusion practices and early marriage.

3. Double/conflicting demands on girls of traditional and social learning.

4. Irrelevance of curricular presentation in STME to girls' views and experiences of the world.

5. Masculine image of science projected in text books, media and popular assumptions.

6. Lack of role models and career counselling.

Harding (1995) in a study also indicated that lack of women role models in professorial and high administrative positions in medicine, engineering, technical as well as mathematics and science departments of universities and other tertiary institutions does not create a leading example for which female students might emulate. He maintained that the absence of female role models in male dominated fields could convey a message to female students that such roles or occupations are not feasible for them.

In a study on women in 'technical trades' in nine African countries among which are Ghana, Gambia and Nigeria, the International Labour Organization (ILO, 2002) noted that the levels of participation and performance of girls in technical subjects at secondary schools were limited by their poor background in mathematics and science. The report noted that, women's attitude with regard to their own roles and capabilities also influence their entry into certain technical fields and progressing in those fields. It stated that at a very tender age, most females have low confidence in themselves and have negative attitude towards science and technical subjects which affect their performance in these subjects.

In a survey conducted in two polytechnics in Ghana (Accra and Takoradi) by Odugbesan (1990) to determine the level of participation and performance in technical education, training and employment, she reported that females have the notion that science and mathematics are difficult and, therefore, make little effort to study them. The avoidance of science and mathematics makes it difficult for girls to perform well in technical courses, which require some background knowledge in mathematics and science.

Writing on the fate of the Ghanaian woman in technical and vocational

training, Kane (1990) stated that women prefer work which is respected and valued by the community as women's work, most of which is an extension of female household activities. She further stated that, most women look at the market as a place where one can go and make money when all else fails. She stated that females do not have clear picture of how to achieve success in their occupational aspirations and, therefore, have no concrete and realistic ideas about occupations they are likely to get and how to excel. These personal perceptions she notes, limit their aspirations in vocational and technical education.

To conclude, barriers to female participation in technical education were found to be of several kinds:

(a) Culturally: common patterns in roles and status of women emerged across countries, despite widely different circumstances. Cultural social norms and traditions by which the subservient statuses of women are maintained reflect on the participation of women in technical education.

(b) Attitudinal: perceived differences in male and female roles and capabilities, inculcated through socialisation in the home and family, reinforced through schooling and absence of female role models were noted to be barriers to female participation in technical education.

(c) Situational: girls are ignorance of the technical education programme, that it is the preserved of men. Lack of interest in physics and chemistry by girls is also a barrier to female participation in technical education.

Career Guidance and Career Choice

Choosing a career is a lifelong process that demands accurate perceptions of ability, potential and achievement (Kelly cited in Greene, 2002). A lifelong approach to career development is needed as career plans are based on a long series of decisions made throughout our lives (Watts, 1996).

Super (cited in King, 2007) proposed that vocational guidance be considered as the process of helping a person to develop and accept an integrated and adequate picture of himself and of his role in the world of work, to test this concept against reality and to convert it into a reality with satisfaction to himself or herself and benefit to society.

According to Osipow (1993), career guidance is the process of identifying and explicating the person and environmental events that shape individuals decision about careers made at major choice point in life. Bedu-Addo (2002) defined career guidance as the process of helping an individual to understand himself (personality, abilities, interests, strengths, weaknesses, potentials and aspirations) in relation to the world of work.

Career Guidance according to Camer and Herr (cited in Eshun, 2000) is a systematic programme of counsellor coordinated information and experiences designed to facilitate individual career development and, more specifically, career management; major components of career education are integrating family, community and school to facilitate individual's self-direction. It must, thus, begin from pre-school, through basic school, high school to tertiary level.

Oladele (1989) defined career as the totality of work one does in his lifetime and is person oriented. Shertzer and Stone (1976) viewed career as a

chosen pursuit, life work, success in one's profession; a sequence of major positions occupied by a person throughout his lifetime. Career, thus, refers to the activities and positions involved in vocations, occupations and jobs as well as related activities associated with an individual's life time of work.

Career education, according to Eshun (2000), is the totality of experiences through which one learns and prepares to engage in work as part of his or her way of living. Schools should, therefore, provide opportunities for career development for all pupils.

Hammers and Crammer, cited in Brooks and Brown (1990), asserted that career education was developed in response to criticism that pupils' education was too 'bookish' and unrelated to the realities of life. Career guidance programmes were then developed at the same time to help the youth make rational and informed decisions about suitable occupations. Thus career education and career guidance became partners in the effort to effectively distribute workers across the occupational structure.

The primary emphasis of career guidance and education became the study of occupations, rather than the study of the psychological aspects of the individual preferences, interests and values. It was believed that occupational information provided an adequate basis for career choice. Parsons thus adopted the approach to matching individuals to jobs and this has dominated the career guidance scene (Brooks & Brown, 1990).

The first attempt to establish formalized guidance in Ghana was in 1955 when the Ministries of Labour, Social Welfare and Education came together to establish a Youth Employment Department. The Youth Employment Department was created to cater for unemployed middle school

leavers who were not more than twenty years. This was done by giving them vocational guidance and later placing them into their suitable jobs (Ackumey, 1989). However serious counselling in schools begun in the late 60's when the Curriculum Research Development Unit (CRDU) was instituted to cater for programmes in school welfare services, education for the handicapped and guidance and counselling for senior secondary schools (Dankwa, 1981). In 1982, the Ghana Education Service (GES) gave directive for the establishment of Guidance and Counselling units in all first cycle institutions but nothing had been done for this to be realized (Essuman, 1989).

Eshun (2000) was of the view that pupils choose jobs because they think they have the ability for it or because they are interested in it. She emphasised that pupils need to be assisted to consider their needs, interests, capabilities, values and opportunities at the basic level because it is at this level that pupils choose programmes in Agriculture, Science, General Arts, Visual Arts, Business, Vocational and Technical. Choices of appropriate programmes are, therefore, necessary to enable them make informed choices in their career.

Essuman (1989) and Pecku (1977) writing on the issue of guidance in basic schools pointed out several reasons why it is needed. Some of the reasons are:

1. the basic school period is the best period to develop most of the socially accepted behaviours, values and attitudes of the community;

2. guidance in basic school helps to prevent deep-seated maladaptive behaviour from developing during the adolescent period of pupils;

and

3. basic school guidance helps in early identification of talents and assists in their development in good time.

Buku and Taylor (2006) enumerated the importance of career guidance for young people as:

1. career guidance enables young people to make informed occupational choices considering their interest, abilities, skills and values;

2. career guidance exposes students to unlimited knowledge of occupation and the wide range of career alternatives available;

3. career guidance places students in the position to either opt for wage or salary carrying jobs or self-employment and job generation;

4. career guidance helps students to address gender issues in occupation. This will help eliminate gender stereotyping from the society; and

5. career guidance will help students to become aware of today's global issue of technology and specialization and adjust to its changing demands.

Splete and Stewart (cited in Zunker, 1994) reviewed career development and made the following recommendations for basic school pupils:

▪ more emphasis must be placed on self-knowledge competencies;

▪ business persons must be involved with pupils to help them with educational and occupational exploration and career planning;

- increased attention to the benefit of educational achievement as the amount of   education for different occupations varies; and emphasis must be placed on skills necessary to seek and obtain jobs.

Super (cited in Santrock, 2000) believed that individuals go through the following stages in career development: Growth (birth-14 years of age), exploration (15-24years), establishment (25-44 years), maintenance (45-64 years) and decline (65+). Growth stage is Super's label for the period of physical and cognitive development that takes place from birth through adolescence. In this stage, children move from no interest in vocations (0-3 years of age), to extensive fantasies about careers (4-10years), to career interests based on likes and dislikes (10-12), to beginning to consider ability in their career choices (13-14). It is, therefore, the duty of the counsellor to encourage a wide-range of vocational or career thinking on the parts of pupils as they develop through the various stages.

The social learning theory of career decision making is designed to address the question of why people enter particular educational programmes or occupations, why they may change educational programmes or occupations at selected points in their lives and why they may express various preference from different occupational activities at selected points in their lives. In order to provide answer to these questions, the social theory examines the influence on career decision-making process through the following factors: genetic predisposition, environmental conditions and events, learning experiences and task approach skills.

Zunker (1994) posited that, genetic predisposition included the inherited qualities that may set limits on the individual's career opportunities. "These may include one's personality, interests and values". It is commonly accepted that certain people are unsuitable to some type of occupations and that personality is a major factor in determining this. Interest is the empirical sets of preferences that merely distinguish successful persons in various occupations from other people in general. Values refer to what individual's value in work itself as well as the reward the work will them offer influences their choice of occupation.

Environmental conditions and events are considered factors of influence that is often beyond the control of the individuals. What is emphasised is that certain events and circumstances in the individuals environment, influence skill development and career preferences. For example, the availability of certain natural resources in the individuals environment may determine to a large extent the opportunities and experiences available.

Learning experience include instrumental learning experiences and associative learning experiences. Instrumental learning experiences are those that the individual learns through reactions to consequences, through direct observable results of actions and through the reactions of others. Associative learning experiences include negative and positive reactions to pairs of previously mental situations. For example, the statement, plumbing is a man's work and nursing is a woman's work, influence the individual's predisposition to these occupations. These associations may also be learnt through observation, written materials and in films.

The fourth factor, which is the task approach skill, includes the sets of skills the individual has developed, such as problem-solving skills, work habits, mental sets, emotional responses and cognitive responses. These sets of developed skills, determine largely the outcome of problems and tasks faced by the individual. It could be seen that, the social learning theory emphasizes the importance of learning experiences and its effect on occupational selections.

Gottfredson (1981) reiterated the developmental theory of occupational aspiration applicable to boys and girls. Gottfredson did not explain how aspirations develop but rather explained well documented differences in aspirations by social group (e.g., sex, race and social class). Gottfredson (1981) theory contains several basic tenets of which five are relevant to this study:

(a)   people differentiate occupations along dimensions of sex type, level of work and field of work;

(b)   people assess the suitability of occupations according to their self-concept and the amount of effort they are willing to put forth to enter the occupation;

(c)   elements of self-concept that are vocationally relevant are gender, social class, intelligent, interest, values and abilities. Occupational aspirations are circumscribed according to these elements of self-concept;

(d)   people's occupational preferences are the product of job-self compatibility (what is within the zone) and the judgement about the accessibility of jobs; and

(e)   since the job people view as suitable for them may not always be available, they sometimes need to compromise. A typical pattern of compromise is to sacrifice interest, prestige level and then sacrifice sex type.

Gottfredson's (1981) explanation as to why females are not found in non-traditional trades is that their self-concepts and views about accessibility to such jobs would not enable them play their sex-roles in the society. Career decision making is thus considered as a lifelong process and very important skill to be taught in education and career counselling programme in our junior high schools should encourage females to enter into technical education.

Sanguiliano (cited in Zunker, 1994) emphasized that although women follow a serial life hibernation, renewal, postponement and actualization, life stage theorists such as Erickson, Kohlberg and Levinson reveal significant shortcomings in describing the development of women. According to Sanguiliano, women's life cycle does not follow a rigid progression of development tasks. She said the formulation of self-identity is one of the fundamental differences between the development patterns of men and women. Women's self–identification is significantly delayed because of the conflicting expectations ascribed to feminine identity. Men learn their masculinity early and are better prepared to adapt to changes but women do not have comparable, clearly defined boundaries and images of appropriate gender–linked roles. Men are reinforced in their efforts to attain their masculine roles while women depend on loosely defined feminine roles and have few support systems to enter into the so called masculine roles. Women as such need guidance at an early stage to build their image of self

identification.

Sanguiliano's principal argument is that women's individual patterns require special consideration. Attention should be focused on unique paths women take to break away from gender–role stereotyping.   Individual's progress toward self–identity is germane to Sanguiliano's approach to determining career counselling components for women. A solid sense for self is the underpinning element for clarifying plans and aspirations Chickering & Reisser (cited in Greene, 2002).

The identification of self-concept thus personality, interest, abilities and values are the major components in Zunker, Gottfredson and Saguiliano's theories on career development and these should positively be related to career planning for girls at the junior high schools. Modern career counselling should, therefore, assist women to have self-awareness and acquire decision making skills that will help them in the development of necessary attitudes, interests, capabilities, values and needs. Without addressing the career needs of girls in basic schools, the society will lose potential contributors in national development.

Summary of Literature Review

Literature reviewed under educational reforms in Ghana brought to light the usefulness of the 1987 educational reform. It helped in implementation the JSS concept which aimed at helping the youth to appreciate the used of the hand as well as mind in doing things but somehow failed in encouraging the youth to participate in technical education.

Wrong perception of technical education is not only attributed to the Ghanaian society alone. Literature reviewed showed the stereotyped mindset

of people about technical education in countries like Nigeria and Zambia. The term 'technical education' when used refers mainly to people as an education for boys. It is believed it is for males who want to become artisans and for those perform poorly at the end of the JHS. It is also mistaken to be for students who are academically weak and cannot perform when enrolled on other academic programmes. The literature revealed that it is an undisputable fact that there are more males than females pursuing technical education not only in Ghana but worldwide.

Literature reviewed also highlighted on the need for female education. This will help females serve as role models to other females and impact their knowledge to them. Lack of role models in teaching technical subjects as well as in other related technological careers make it difficult for girls to aspire higher in pursuing technical education. For Ghana to achieve its' developmental needs, females need to be encouraged to involve themselves more in technical education.

The gender stereotyping of schools and the society has negative effect on girls whereas it has positive effect on boys in relation to technical education. Societal attitude and expectation of sex roles is a course for differences in participation observed in males and females in technical education. This issue need to be addressed by counsellors.

Career counselling at the basic level of education is also a factor for low choice of programme in technical education. Literature reviewed showed that despite concerns for the Ghana education Service to set up Guidance and Counselling offices at the basic schools, nothing had been done about it up to date. Females' participation in technical education could be improved to

enable them match with their male counterparts if necessary measures are taken by counsellors to address the issue of personality, interest, ability and value of the girl child. One of such measures is to promote effectiveness career counselling for females at the basic level of education.

In conclusion, the social factors discussed, act as barriers and filter females out of the educational and training system in technical education. These somehow have resulted in the low participatory rate of females in technical education. The study is therefore being done to adopt strategies to enhance female participation in technical education.

CHAPTER 3

METHODOLOGY

Introduction

This study investigated female participation in technical education and career choice, and its implication for counselling at junior high schools in Ghana. The chapter focuses on the research design, population and sampling procedure, the instrument used for data collection and the procedures for data analysis to achieve the objective of the study.

Research Design

Research scientists' like Best and Khan (1998) and Schweigert (1998) believed that there is no one single scientific method for scientists to carry out their investigations. However, accuracy of observation and the qualities of creativity and objectivity are some of the ingredients in all scientific research methods. The research design used in this study is the descriptive survey research design.

According to Fraenkel and Wallen (2003) and Gay (2002), descriptive cross-sectional survey includes present facts or current conditions concerning the nature of a group of persons, a number of objects or a class of events and may include the procedure of induction, analysis, classification, enumeration or measurement. Descriptive cross-sectional survey also identifies standards or norms with which to compare present conditions in order to plan for the next

step and to determine how to take the next step after having determined where you are and where you wish to go. Against this background, the descriptive cross-sectional survey was chosen for the study to help the researcher obtain an in depth information on the topic under study.

Notwithstanding its advantages the criticism of descriptive cross-sectional survey method has been that, it is superficial and not worthy of recognition as a research approach to private and emotional matters which respondents may not be completely truthful to delve into (Fraenkel & Wallen, 2002).

Population and Sampling Procedure

The target population for the study was all form three girls in public junior high schools in the Cape Coast Metropolis, totalling 1126 (Cape Coast Metropolitan Education Directorate (2006). However, 300 form three junior high school girls in the metropolis were selected for the study. This sample size was determined based on Morgan and Kreicie (1976), sample size for research activities. There were 6 circuits in the Metropolis and all the 6 circuits were captured in the study. The girls were selected from 30 out of 62 public junior high schools in the Cape Coast Metropolis. The selection of participants was done through the cluster sampling. First the hat and draw method of random sampling strategy was used to select 5 schools from each circuit. Thirty schools out of the 62 public junior high schools in the metropolis were then selected; thereafter, 10 junior high school form three girls were selected from each of the 30 schools randomly through the hat and draw method. The distribution is shown in Table 1.

Table 1

Number of Girls Sampled for the Study

Name of Circuit	Total number of JHS in each circuit	Total number of JHS 3 girls in each circuit	Sampled schools from each circuit	Sampled JHS Form 3 girls from each school	Sampled girls from each circuit
Cape Coast	10	116	5	10	50
Aboom	12	175	5	10	50
Bakano	10	223	5	10	50
Pedu/Abura	12	193	5	10	50
OLA	9	325	5	10	50
Efutu	9	94	5	10	50
Total	62	1126	30	60	300

Instrumentation

A researcher-constructed questionnaire was used for the study. Follow-up questions were also solicited from some pupils and some of the heads for in-depth understanding. The instrument had four sections. Section A requested information on pupils' demographic characteristics. Section B dealt with the perceived effectiveness of career guidance. Section C also elicited information on choice of programme, choice of career, perceived factors that influence girls' choice of career and girls' participation in technical education. Section D

was mainly Likert type scale which sought for perception on technical education, societal regard for technical education and gender stereotyped attitude in society (See Appendix A).

Validation of the Instrument and Reliability

To ensure the validity of the instrument, a face and content validity was established. The questions were subjected to peer review, proof-read by supervisors and experts in measurement and evaluation for the necessary corrections to be made.

To determine the level of reliability of the result using the instrument, the instrument was subjected to try-out. It was administered to 37 form 3 girls from Mankessim Methodist 'A' and 'B' Junior High Schools. The try-out was a test re-tests study. The questionnaire was made up of 35 questions on a Likert scale. It was administered to the 37 pupils and after a period of eight weeks the same questions were given to respondents under the same administrative conditions as the first test. There after each participant's responses on the first and second tests were correlated using the Pearson-Product Moment correlation co-efficient formula to establish the level of relation between the two tests. The result of the analysis is presented in Table 2.

Table 2

Test-Retest Reliability Estimate of Index of Female Participation in Technical Education

Items	Test Position	X	SD	Rxx
Perception of Technical Education	1st	13.68	2.90	0.69
	2nd	13.73	3.07	
Societal regard for Technical Education	1st	7.57	1.89	0.73
	2nd	7.60	1.64	
Gender Stereotyping	1st	16.35	2.63	0.86
	2nd	15.54	3.46	
General Attitude	1st	37.68	5.38	0.92
	2nd	36.89	6.20	

From Table 2 it could be observed that the reliability coefficient alpha of index of female participation in Technical Education and Career Choice ranged between $r = 0.69$ to 0.92. This calculated r values were deemed to be relatively high given the complexity in human behaviour measurement. Consequently the result is accepted to be stable overtime hence appropriate for the use in this study.

Data Collection Procedure

The selected 30 schools were visited by the researcher and two trained research assistants. An introductory letter was collected from the head of the Department of Educational Foundations to introduce the researcher to the various heads of the selected junior high schools (See Appendix B).

In each school, permission was first sought from the school head with an introductory letter obtained from the Head of Department of the Educational Foundations of the University of Cape Coast a week to the administration and collection of data in each school. On the day of administration of the instrument, participants were organised in one classroom for the questionnaire to be administered. The researcher gave participants a gist of why the data was being collected. After the questions were read and explained to participants with the help of the two research assistants the questionnaires were given out to respondents to answer. In most schools, it took respondents roughly 25 minutes to complete except four schools where respondents took almost 40 minutes to complete. The data was collected within a period of four weeks, from the 3rd of March to 28th March, 2008. The completed questionnaires were collected the same day. Later an appreciation letter was sent to the various heads of the 30 institutions.

Procedure for Data Analysis

The data obtained was analysed using both the descriptive and inferential statistics. The descriptive statistics (mean, weighted mean, percentages and standard deviation) were used to analyze data pertaining to the research questions. Factors that were perceived to influence girls' choice of career, their perception of technical education, society regard for technical

education and gender stereotype attitude were measured using a 4-point Likert type scale.

Inferential statistics were used to test the four hypotheses formulated in the study. Statistical Package for Social Sciences (SPSS), Windows Version 11.0 Software was used to test the hypotheses. The statistical tools below were used for testing each hypothesis formulated.

Hypothesis 1: Type of schools for girls does not significantly influence their participation in technical education.

The independent variable used for this hypothesis was type of school girls' and the dependent variable was participation in technical education. The school type was categorised into girls only and mixed schools and participation was categorised into three: Yes, No and Not sure. Since both types of variables were categorical in nature, the chi-square test of independence was used to test the hypothesis.

Hypothesis 2: There is no significant difference in the perceptions of girls towards technical education due to living in an environment of positive or negative societal regard for technical education.

The independent variable was societal regard and the dependent variable was perception of technical education. Societal regard was made of 5 test items developed on the Likert scale. The responses were: *Strongly Agreed, Agreed, Disagreed and Strongly Disagreed.* All the items were put in the negative form and an agreement with the negative statement implied negative societal regard. The scale was scored as follows:

Strongly agree-   4

Agree-   3

Disagree-   2

Strongly disagree- 1

The scores on the societal regard for each respondent were then aggregated for the five items to obtain a numerical scale of 5-20 points. The most positive societal regard was 5 and the most negative societal regard was 20. Each individual score ranged between 5 and 20. Any respondent who scored 13 and above was classified as having negative societal regard and any respondent scoring below 13 had positive societal regard.

Perception of girls towards technical education was made of 5 test items developed on the Likert scale. The responses were strongly agreed, agreed, disagreed and strongly disagreed. All the items were in the negative form and an agreement with the negative statement implied negative societal regard. The scale was scored as follows:

Strongly agree-   4

Agree-   3

Disagree-   2

Strongly disagree- 1

The scores on the perception of girls towards technical education for each respondent were then aggregated for the five items to obtain a numerical scale of 5-20 points. The most positive perception was 5 and the most negative perception was 20. Each individual score ranged between 5 and 20.

The independent samples t-test of the comparison of means was used to test the hypothesis. Respondents were grouped according to the societal regard status and the corresponding mean of girl's perception on technical

education was determined for each group with the use of the t-test to compare the means.

Hypothesis 3: There is no significant difference in the perceptions of girls towards technical education due to living in either a stereotyped or a non stereotyped environment

The independent variable was gender stereotyped attitude and the dependent variable was perception on technical education. Gender stereotyped attitude was made of 6 test items developed on the Likert scale form. The responses were strongly agreed, agreed, disagreed and strongly disagreed. All the items were put in the positive form and an agreement with the positive statement implied positive gender stereotyping attitude. The scale was scored as follows:

Strongly agree-   4

Agree-   3

Disagree-   2

Strongly disagree- 1

The scores on gender stereotyping attitude for each respondent were then aggregated for the six items to obtain a numerical scale of 6-24 points. The most positive gender stereotyped attitude (stereotyped) was 24 and the most negative gender stereotyped attitude (non- stereotyped) was 6. Each individual score ranged between 5 and 30. Any respondent who scored 15 and above was classified as stereotyped and any respondent scored below 15 is non-stereotyped.

Perception of girls towards technical education was made of 5 test items developed on the Likert scale. The responses were strongly agreed,

agreed, disagreed and strongly disagreed. All the items were in the negative form and an agreement with the negative statement implied negative societal regard. The scale was scored as follows:

Strongly agree-　4

Agree-　　　　3

Disagree-　　　2

Strongly disagree- 1

The scores on the perception of girls towards technical education for each respondent were then aggregated for the five items to obtain a numerical scale of 5-20 points. The most positive perception was 5 and the most negative perception was 20. Each individual score ranged between 5 and 20.

The independent samples t-test of the comparison of means was used to test the hypothesis. Respondents were grouped according to gender stereotyping attitude and the corresponding mean of girl's perception on technical education was determined for each group with the use of the t-test to compare the means.

Hypothesis 4: Girls' choice of programme in school does not significantly relate with their choice of career. The independent variable used for this hypothesis was choice of programme and the dependent variable was choice of career. The choice of programme was categorised into eight programmes: General Arts, Visual Arts, Science, Agricultural Science, Business, Technical and Home Economics and choice of career was categorised into nine: Nurse, Auto mechanic, Fashion Designer, Engineer, Doctor, Electrician, Teacher, Accountant and Journalist. Programmes were later grouped into three: Arts, Business/ Technical /Vocational and Science

and Agricultural Science. Since both types of variables were categorical in nature, the contingency chi square test of independence was used to test the hypothesis.

The next chapter presents the results of the data analysis of the study.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter is devoted to the results and discussion of the findings for the study. Data was collected from 300 form three girls randomly selected from 30 public Junior High Schools in the Cape Coast Metropolis using a researcher-constructed questionnaire. The instrument had four sections. Section A requested information on pupils' demographic characteristics. Section B dealt with the perceived effectiveness of career guidance in the schools. Section C elicited information on choice of programme, choice of career, factors that influence girls' choice of career and girls' participation in technical education. Section D was mainly Likert type scale which sought for perception on technical education, society disregard for technical education and gender stereotyped attitude in society.

In the analyses of data, frequency and percentage tables were constructed to illustrate and support the results. The chapter has been divided into three major parts. The first part presents the demographic information of the respondents and the detailed results on the research questions and hypotheses for the study. The second part presents detailed discussion of the results and findings of the study and the third part looks at the implication for counselling.

Results

Demographic Information on Respondents

A total of 300 JHS form three girls participated in the study. Table 3 shows the distribution of number of respondents by school type.

Table 3

Distribution of Respondent by School Type

School type	Frequency	Percentage
Girls only	40	13.3
Mixed	260	86.7
Total	300	100.0

Source: Field work, 2008.

It can be observed from Table 3 that majority of respondents (86.7%) attended mixed school and only 13.3% attended girls only school. The difference in the sample size proportion of girls' school only and mixed school was due to the metropolis having more mixed schools than girls schools (Cape Coast Metropolitan Education Directorate).

Research Questions

Research Question One

What are the perceptions of girls on technical education?

This research question sought to find out the views that the respondents have about technical education. To answer this research question, responses to item 22-26 of the questionnaire were used. The results are shown in Table 4.

Table 4
Girls Perception on Technical Education

Perception	SA		A		D		SD		WM	SD
	Freq	%	Freq	%	Freq	%	Freq	%		
1. Technical education is suitable for boys only	37(12.3)		56(18.7)		139(46.3)		68(22.7)		2.21	0.93
2. Technical education is for pupils who perform poorly and do not gain admission to senior high school	15(5.0)		24(8.0)		119(39.7)		142(47.3)		1.71	0.81
3. Technical education demands physical energy which girls do not have	21(7.0)		66(22.0)		125(41.7)		88(29.3)		2.07	0.89
4. Girls who go into technical education do not get jobs after schooling	16(5.3)		44(14.7)		104(34.7)		136(45.3)		1.80	0.88
5. Jobs available in technical education make workers look dirty	14(4.7)		75(25.0)		97(32.3)		114(38.0)		1.96	0.90

Source: Field work, 2008.

Interpretation of weighted means (WM)

Not very positive: 3.1-4.0

Not positive: 2.1-3.0

Positive: 1.1-2.0

Very positive: 0.0-0.1

The first item in Table 4 required the respondents to indicate the extent to which they feel technical education is suitable for boys only. The responses indicate that 12.3% of the respondents strongly agreed, 18.7% were in agreement. Forty-six-point-three percent disagreed (46.3%) while 22.7% chose strongly disagreed. From the responses, it could be said that majority (69.0%) of the respondents have the idea that technical education is not suitable for boys only. This shows that the girls' have positive perception that technical education is not meant for boys only. The item recorded a weighted mean value of 2.21 and a standard deviation of 0.93.

The second item in the table, reads "technical education is for pupils who perform poorly and do not gain admission to senior high schools". The responses show that 5.0% of the respondents strongly agreed; 8.0% indicate agreement with the statement; 39.7% disagreed while 47.3% strongly disagreed. The analysis shows that a majority (87.0%) of the respondents indicate that technical education is not only for pupils who are not academically good. The item had a weighted mean of 1.71 and a standard deviation of 0.81. This shows that girls have positive perception that technical education is not for pupils who perform poorly and do not gain admission to senior high schools.

Item three of Table 4 required respondents to indicate the extent to which they feel technical education demands physical energy to which girls do not have. The responses given by the girls indicate that 7.0% strongly agreed, 22.0% agreed, 41.7% disagreed while 29.3% strongly disagreed. The analysis shows that 71.0% of the respondents were of the view that technical education does not demand physical energy which girls do not have. The item had a

weighted mean of 2.07 and a standard deviation of 0.89. This shows that girls have a very positive perception that technical education does not demand physical energy which girls do not have.

The fourth item on Table 4 required the respondents to indicate the extent to which they feel girls who go into technical education do not get jobs after schooling. Five point three percent of the respondents strongly agreed, 14.7% agreed, 34.7% disagreed while 45.3% strongly disagreed. From the analysis, majority (80.0%) of the respondents indicate that they do not agree that girls who go into technical education do not get job after schooling. A weighted mean of 1.80 and a standard deviation value of 0.88 were recorded for the item. This shows that girls have a positive perception that girls who go into technical education get jobs to do after school.

The last statement in Table 4 which reads "jobs available in technical education make workers look dirty" had the respondents choosing the various options. For strongly agree, 4.7% of the respondents chose it, 25.0% chose agree, 32.3% indicated disagreement while 38.0% chose strongly disagree. From the responses given, there is an indication that majority (70.3%) of the respondents were of the view that jobs available in technical education does not make workers look dirty. A weighted mean of 1.96 and a standard deviation value of 0.90 were recorded for the item. This shows that girls have very positive perception that jobs available in technical education do not make one dirty.

In sum, with regard to research question 1, it could be deduced from the responses given that girls have positive perception about technical education. The girls' are aware that technical education is not for boys only

and they the girls can equally participate in technical education. Hence, majority of the respondents were in disagreement to items 22- 26 on the questionnaire.

Research Question Two

What factors influence girls' choices of career?

In order to answer this research question, responses to items 12-17 on the questionnaire were used. The results are presented in Table 5.

The first statement in Table 5 had 13.7% of the respondents indicating strong agreement to the statement, 19.7% agreed, 56.0% disagreed and 10.6% strongly disagreed. This shows that 76% of the respondents' choice of career was not influenced by parents.

The second item on Table 5 required respondents to indicate the extent to which their teachers want them to pursue their career. From the responses, 23.3% of the respondents opted for strongly agree, 19.3% chose agree, 40.7% were in disagreement while 16.7% strongly disagreed. This shows that 56.4% of the respondents' choice of career was not influenced by teachers.

The third item in Table 5 had 12% indicating strong agreement, 14.3% agreed, 55.7% disagreed while 18% strongly disagreed. It could be inferred that 73.7% of the respondents indicated that in their choice of career, their peers do not influence them.

The fourth item in Table 5 had 18.7% indicating they strongly agreed, 21.3% agreed, 55% was in disagreement while 5% strongly disagreed. From the responses, 60% of the respondents indicated that in their choice of career, they are less attracted by the uniform of workers.

The fifth item in Table 5 required respondents to indicate the extent to which their own interest in a job influences them in the choice of their careers. The responses in Table 5 show that 47% of the respondents strongly agreed to the statement, 29.7% agreed, 18.3% and 5.0% disagreed and strongly disagreed, respectively. The analysis indicates that the majority of the respondents 78.7% were of the view that their own self interest in a career influences their choice of career.

The last item in Table 5 had 30% of the respondents who strongly agreed to the statement, 37.7% agreed, 23.7% disagreed while 8.6% strongly disagreed. The analysis shows that (67.7%) of the respondents were of the view that in their choice of career, financial consideration influences them.

The results of the analyses of the responses regarding research Question 2 show that, overall, in girls' choice of career, they are influenced by self- interest and financial gains. They are less influenced by peers, parents and teachers.

Research Question Three

How effective is career guidance at the junior high schools?

This research question sought to find out the effectiveness of career guidance at the junior high school level. In order to answer this research question, responses to items 3-8 were used. The result is shown in Table 6 for 'yes' and 'no' responses.

Table 5

Factors Influencing Girls' Choice of Career

Factors	S A		A		D		SD	
	Freq	%	Freq	%	Freq	%	Freq	%
1 My parents want me to pursue that career.	41(13.7)		59(19.7)		168(56.0)		32(10.6)	
2. My teacher wants me to pursue that career	70(23.3)		58(19.3)		122(40.7)		50(16.7)	
3. My peers want me to pursue that career	36(12)		43(14.3)		167(55.7)		54(18)	
4. I am attracted by the uniform of the workers	56(18.7)		64(21.3)		165(55)		15(5.0)	
5. I have self interest in that career	141(47)		89(29.7)		55(18.3)		15(5.0)	
6. There is money or financial gains in the career.	90(30)		113(37.7)		71(23.7)		26(8.6)	

Source: Field work, 2008.

Table 6

Effectiveness of Career Guidance in Junior High Schools

Item	Yes		No	
	Freq	%	Freq	%
1. Do you have a teacher who talks to you about work and other issues in your school?	240(80)		60(20)	
2. Has the teacher given you any help on how to select senior high schools and programmes?	230(76.7)		70(23.3)	
3. Do you have any person coming from outside the school to help you select your programme?	200(66.7)		100(33.3)	
4. Have you on your own sought help from the teacher who talks to students about work and other issues?	197(65.7)		103(34.3)	

Source: Field work, 2008.

The first item in Table 6 required respondents to indicate if they have a teacher who talks to them about work and other issues in the school. The responses given by the respondents are as follows: 80% indicated 'yes' while 20% indicated 'no'.

Item two in the Table sought to find out if the teacher has given them any help on how to select senior high schools and programmes. Majority of the respondents (76.7%) indicated 'yes' while 23.3% indicated 'no'.

The third item in Table 6 required respondents to indicate if they have any person coming from outside the school to help them select their programmes. Sixty six point seven percent (66.7%) of the respondents indicated 'yes' while 33.3% indicated 'no'. In a follow up question on how

often the person has been coming to respondents school, out of the 199 who responded 'yes', 23 (11.6%) of the respondents indicated "once a week", 18 (9.0%) indicated once a month while 154 (77.4%) indicated during the selection of schools and programmes.

Item four in Table 6 wanted to find out if respondents have on their own sought help from the teacher who talks to students about work and other issues. The responses show that 65.7% of the respondents did seek help while the rest (34.3%) did not seek help. In a follow up question to find out the reasons that took them to the teacher, respondents were asked to give reasons by choosing any one of the three reasons below:

   a. To find out more on the job I want to do in future.

   b. To help me select a school and programme

   c. To help me solve a personal problem.

 Out of the 197 who responded 'yes', 45 (22.8%) went for help on the job they would want to do in the future, 98 (49.7%) went for help on selection of senior high schools and programmes and 53 (27%) on personal issues.

The responses to research Question 3 indicated that, the guidance coordinators assigned to the junior high schools were not able to visit all the schools assigned to them. It also revealed that only 49.7% of respondents sought help in the selection of programmes and schools to the senior high schools. Though the analysis revealed that the teachers who talk to students on work/career and other issues are somehow effective in giving career guidance to students than the guidance coordinators, the teachers might lack the technical-know-how in counselling to assist students to make right choices in careers. Their knowledge on the sense of self for the girl-child and on new

trends of work might have been limited hence their inability to assist females to choose technical education programme.

Hypotheses

Hypothesis One

H_o: Type of school for girls' does not significantly influence their participation in technical education.

H_1: Type of school for girls' significantly influences their participation in technical education

In order to test the hypothesis, a contingency chi-square test was conducted to assess whether the type of school girls attended influence their participation in technical education. Responses to items 1 and 19 were used. The result is shown in Table 7.

Table 7

Influence of School type on Participation on Technical Education

	Influence of School Type				
School type:	Yes	No	Not sure	Total	Value
Girls only	16	4	20	40	
Mixed	141	77	42	260	24.436
Total	157	81	62	300	

Source: Field work, 2008.

Table 7 shows that, the chi-square yielded the following results: χ^2 (2, N =300) = 24.436, $p < 0.05$ when technical education programme was aggregated with school type attended by girls. This χ^2 value of 24.44 is significant since the p value is less than 0.05 at 2 degrees of freedom.

Consequently we reject the null hypothesis and fail to reject the alternative hypothesis. That is, type of school for girls' significantly influences their participation in technical education.

Hypothesis Two

H$_o$: There is no significant difference in the perceptions of girls towards technical education due to living in an environment of positive or negative societal regard for technical education.

H$_1$: There is significant difference in the perceptions of girls towards technical education due to living in an environment of positive or negative societal regard for technical education.

In order to test this hypothesis, the independent sample t-test was conducted to evaluate the hypothesis that there is no significant difference in the perceptions of girls towards technical education due to living in an environment of positive or negative societal regard for technical education. Responses to items 22, 23, 24,25,26,27,28,29,30 and 31 were used. The result is presented in Table 8.

Table 8

Independent t-test analysis of perception of girls towards technical education due to living in an environment of positive or negative societal regard for technical education

Societal Regard	Mean	SD	t	df	p
Positive regard	9.29	2.755			
Negative regard	13.06	2.607	-7.737	298	0.000

Source: Field work, 2008.

The t-test shows a significant difference in perception towards technical education between girls living in an environment with positive regard for technical education ($\underline{M}$ =9.29, $\underline{SD}$ = 2.755) and girls who are living in an environment that has negative regard on technical education ($\underline{M}$= 13.06, $\underline{SD}$ =2.607). (t (298) =-7.74; df =298, $\underline{p}$ < 0.05). This means that girls who live in an environment that has positive regard towards technical education will have positive perception on technical education and girls who live in an environment that have negative regard towards technical education will have negative perception on technical education. Consequently we reject the null hypothesis and we fail to reject the alternative hypothesis.

Hypothesis Three

H$_o$: There is no significant difference in the perceptions of girls towards technical education due to living in either a stereotyped or a non stereotyped environment.

H$_1$: There is significant difference in the perceptions of girls towards technical education due to living in either a stereotyped or a non stereotyped environment.

To test this hypothesis, an independent sample t-test was used. Responses to items 22, 23, 24, 25, 26, 32, 33, 34, 35, 36 and 37 were used. The results of the test are shown in Table 9.

Table 9

Independent sample t-test on perception of girls' towards technical education due to living in either a stereotyped or a non stereotyped environment

Stereotyping	Mean	SD	t	df	p
Non stereotyped	9.33	2.782			
Stereotyped	10.20	3.163	-2.549	298	0.011

Source: Field work, 2008.

The t-test shows a significant difference between girls who lived in non-stereotyped environment (M=9.33, SD = 2.782) and girls who lived in stereotyped environment on their perception on technical education (M= 10.20, SD =3.163). (t (298) =-2.549; df =298, <0.05) This means that girls who live in stereotyped environment are more gender stereotyped than girls who live in non-stereotyped environment. Consequently we reject the null hypothesis and we fail to reject the alternative hypothesis.

Hypothesis Four

H$_o$: Girls' choice of programme in school does not significantly relate to their choice of career.

H$_1$: Girls' choice of programme in school significantly relates to their choice of career.

To test this hypothesis, a contingency chi-square was used. Girls' choice of career was grouped into three. These are Science and Technical based, Business and Vocational based, and Arts based. The programmes were

also grouped into three, (a) Arts, (b) Business/ Technical/ Vocational, and (c) Science/ Agricultural Science. The result of the analysis is shown in Table 10.

Table 10

3X3 Contingency chi-square Table on girls' choice of School Programme and their Choice of Career

Programme	Choice of Career			Total	χ^2
	Sci/Tech based	Bus/Voc based	Arts based		
Arts	38	12	73	123	
Bus/Tech/Voc	30	57	3	90	208.97
Sci/Agric Sci	65	0	1	66	
Total	133	69	77	279	

Source: Fieldwork, 2008.

Table 10 shows that, the chi-square yielded the following results: χ^2 (2, N =279) = 208.97, $\underline{p}$ < 0.05. This χ^2 value of 208.97 is significant since the p-value is less than 0.05 at 4 degrees of freedom level of significant. Consequently we reject the null hypothesis and we fail to reject the alternative hypothesis.

Discussion of Results

Research Question One

Research question one is concerned with the perceptions of females regarding technical education. The results revealed that the girls who participated in the study have positive perception for technical education. This positive perception of the girls on technical education was in conflict with

different statements made by different researchers. This contradiction to other research findings might be due to the years that those researches were conducted. Ellis (1987), Hill and King (1993), Odugbesan (1990), Quaisie (1995) and Wallace (1985), conducted their research over a decade and the girls might have acquire different perception on technical education in their era. It could also be from the sensitization on the need for female participation in technical education in the media and schools.

The positive responses to the statements for the items for research question 1 are in conflict with the statement of Ellis (1987) who says that technical programmes are considered suitable for boys only and girls who study them are considered 'un-ladylike'.

It is also in contradiction to findings by Hill and King (1993) and Wallace (1985) who states that the low participation of women in science and technology is due to the fact that women have an erroneous impression that science and mathematics subjects are difficult and are only for men who are regarded as intellectuals. Hill and King (1993) also reported that technical courses demand physical energy which females lack. Odugbesan (1990) also reported that females have the notion that science and mathematics are difficult subjects and they make no effort to study them. Thus, the avoidance of these subjects makes it difficult for girls to perform well in technical courses which require background knowledge in mathematics and science. Quaisie (1995) also reported that people who fail to gain admission to traditional secondary school because of poor grades get enrolled in technical schools.

G93From the findings it has been deduced that the girls have positive perception about technical education. The girls' were also aware that they could go into technical education since it is not meant for boys only. Their positive attitude to the statements might stem from their geographical environment which is surrounded by two major technical institutes in the region, namely, Cape Coast Technical Institute and Asuansi Technical Institute. The girls might have relations in these schools or might have visited any of the institutions by way of fieldtrip or might have seen girls attending these institutions. It might also be due to public lectures the girls have had on the need for technical education. For example, during the maiden speech and prize giving day at Oguaa Secondary Technical School in the Cape Coast metropolis, Budu Smith, the guest speaker stressed on the need for technical education and that students should not see the programme as being for those that are academically poor. In another development the *Daily Graphic* (2008), reported Francis Aziaba, advising students not to consider vocational and technical programmes as inferior subjects meant for those who perform poorly in schools. He said that the misconception about these courses should be erased to make technical and vocational training attractive to students who want to further their education in that field after junior high school.

A television programme 'M'asem', literally translated into English to mean 'my story' has been interviewing women in the non-traditional occupations such as carpentry and auto-mechanics. Some of the girls might have watched this programme which might have depicted to them that they can also get work to do after pursuing technical education.

Looking at the responses of the respondents it can be concluded that efforts made by government, stakeholders as well as individuals in sensitising the public on the need for technical education might have contributed to this positive perception on technical education exhibited by the girls in their responses.

Research Question Two

Research question two looked at the factors that influenced girls' choice of career. The results showed that girls' self-interest and financial gains were the major factors that influenced their choice of career. This is in agreement with Gottfredson's (1981) theory which states that people differentiate occupations along dimensions of sex type, level of work and field of work and also assess the suitability of occupations according to their self-concept and the amount of effort they are willing to put forth to enter that occupation. It could also be that, the girls are in the age range (13-14 years) which Super cited in Santrock (2000) to be the growth stage, where people's career interest is based on likes and dislikes. Hence the reason for majority response that their self-interest in the career influenced their choice might be due to their like for that career.

From Table 6, it could be seen that 67.7% of the respondents were influenced by financial gains. This shows the need for career guidance to create awareness for various occupations that girls can undertake. As envisaged by Buku and Taylor (2006), there is the need for career guidance in our basic schools to enable students to make informed choices that would place them in the position to either opt for wage or salary earning jobs or self-employment jobs to meet their financial needs.

Research Question Three

The results for research question three in Table 7 showed that most of the respondents indicated that they had a teacher who talked to them about work and other related issues. The majority response was in the affirmative; that was, they had a teacher who talked to them on work and other issues. This shows that at the junior high schools there are teachers who had been assigned or had assumed the roles of guidance co-ordinators.

The majority response showed that the teachers assigned these roles had provided some guidance services to the students. However, their services might not have been adequate and enough to expose the girls to their capabilities, interests and values in relation to their career aspirations. Since towards the end of the junior high school students are made to select schools and programmes, they need information on the schools they would want to attend and the programmes available at the various schools so that they can take good decisions and make informed choices that will not affect them in future. This information need to be given from the very day they enter junior high school.

The responses to item three in Table 7 "do you have any person coming from outside the school to help you select your programme", shows that there are guidance co-ordinators assigned to the various basic schools in each circuit in the metropolis. The probing question asked to find out how often these guidance co-ordinators visit their assigned schools revealed that they visit the schools when it's time for the selection of schools and programmes for senior high or technical and vocational schools. This is in conflict with the definition given by Camer and Herr cited in Eshun (2000)

that career guidance is a systematic programme of coordinated information and experiences designed to facilitate the individual's career development and self-direction and it is a life-long process. Since the guidance co-ordinators visit the schools only when it's time for selection of schools and programmes (as indicated by respondents), it will be very difficult for any meaningful career counselling to go on in the junior high schools since career counselling is not a day or a month affair.

The researcher visited the Cape Coast Metropolitan Education Service office to find out more on the role of the guidance co-ordinators assigned to the various junior high schools, but was told by the Assistant Metropolitan Director that there are only few of the trained guidance co-ordinators in the metropolis for the junior schools hence their inability to meet the demands of students.

This shows that girls in the junior high schools lack effective career guidance from competent trained staffs and as such are not abreast with information on new trends in occupations. This might have been their reasons for not choosing a technical programme.

Hypothesis One

The overall result shows that the type of school girls attend may influence their participation in technical education; the null hypothesis which states that girls' type of school does not significantly influence their participation in technical education was rejected. We, therefore, accept the alternative hypothesis which states that type of school girls attend (single sex or mixed) influences their participation in technical education.

From the results, it seems that female only type of school respondents, (single sex classrooms) were at a fix as to whether to attend technical school or not. The girls at the mixed schools might have been influenced by the attitude of the boys in their schools towards the technical subjects they study in school.

A chat with five of the girls from single sex schools by the researcher revealed that though the girls might have an idea that there is the need for technical education, no one has ever told them of the jobs available in technical education. They also do not know how far they can pursue a career in this field. According to them, the core subjects, English language, Mathematics and Science (which they termed EMS) are not written at the final examination at the technical schools. They have to register on their own before they can further their education. However, in a chat with the headmaster of the Cape Coast Technical Institute, he agreed with the comments made by the students but said the problem had been solved by the 2007 Educational Reform which made provision for the core subjects (Mathematics, English and Science, as well as Social Studies) to be integrated into the curriculum of technical schools/institutions.

Five of the girls from the mixed schools have the same to say as their counterparts from the single sex schools. This means that if career counsellors and stake holders in education work hard to sensitise the public on the importance of technical education and put in more effort to deal with the misconceptions of technical education, girl's enrolment into technical education would become a success.

Hypothesis Two

The overall results pertaining to this hypothesis show that girls who live in an environment that has positive regard towards technical education will have positive perception on technical education and girls who live in an environment that have negative regards towards technical education will have negative perception on technical education.

From the results it could be said that if society has positive regard for technical education girls in that society will also have positive regard for technical education and if society have negative regard for technical education, girls in that society will also have negative regard for technical education. However, majority of the respondents were in agreement that societal regard for technical education has influence on the perception of girls on technical education. However this recorded a mean of 13.06, on a rating scale of 5-20. This shows that girls' positive perception on technical education might have resulted from the social structure they live in.

An environment that has positive regard for technical education is likely to provide incentives for its citizens who want to participate in technical education. On the other hand, an environment that has negative regard for technical education would not show any concern for the development of its citizens in technical education.

The Ghanaian social structure can be said to have negative societal regard towards technical education and this largely has affected all the regions in the country, with Central Region not being an exemption. Heads of second circle institutions place students with aggregate more than 20 into vocational and technical classes for females and males respectively. Their main reason is

that technical and vocational programmes are for those who are academically weak. The computer selection programme should assist to put more girls on the technical education programmes. A visit to the three technical institutions in the Cape Coast Metropolis revealed that only one female was offered a technical programme by the computer selection. When this is taken into consideration, then the system could be said to have positive attitude for technical education. This negative attitude for technical education in general, might have affected the respondents regard for technical education because they live mainly in a negative environment.

Hypothesis Three

The overall results of the test show that girls who live in stereotyped environments have stereotyped perception towards technical education than those who live in non-stereotyped environment. Girls who live in non-stereotyped environment have positive perception on technical education. Consequently, the null hypothesis was rejected and the alternative hypothesis accepted. This result is in line with the statements of Erinosho (1997) Sadker and Sadker (1991), Novack and Novack (1996), who were all of the view that sex role stereotyping in society influence girls' perception in scientific and technological subjects. They, therefore, called for education, which is free of gender stereotyping.

The Ghanaian economy can be said to be a stereotyped social structure and this might have affected the responses given by the girls due to living in a stereotyped environment. The Ghanaian social structure has the female taking care of children and the home. The mind of the Ghanaian female is pre-set against certain careers as being the preserve of men right from childhood.

Children they say do what they see and not what they hear. The girls for not seeing a lot of females teaching the technical subjects might conclude that technical programmes are for boys.

Lastly, the respondents interviewed by the researcher wondered as to why there are vocational schools for girls only but no technical institution build for girls only. Much work need to be done to get our girls participate in technical education.

Hypothesis Four

The result for the analyses for hypothesis four showed that girls' choice of programme significantly relates to their choice of career. Consequently, the null hypothesis was rejected and the alternative hypothesis which states that 'girl's choice of programmes in school is significantly related to their choice of career was accepted.

The programmes were grouped into three categories namely, a) Arts, b) Business, Technical and Vocational, and c) Agricultural Science and Science. This is because the various technical schools offer these three programmes (Business, Technical and Vocational (Emptage, 1991; Budu Smith, 2007). Agricultural science and Science were put together because they are somehow related.

 Twenty one percent, representing (7%) of the respondents, however said they would like to become teachers; teaching was not included in the analyses because irrespective of one's programme, one can become a teacher.

None of the girls in reality chose technical education. This might be as Wallace (1985) put it, that from the onset adolescent girls are biased against technical careers. Girls own biasness, coupled with their lack of interest, might

be the reasons why none of them chose a technical programme. Another reason could be due to the statement made by the girls themselves that they have no idea of jobs available in technical education. This statement made by the respondents is in line with the statement made by Manye (2008) that females do not have concrete and realistic ideas about occupations they are likely to get and how to excel in these occupations, even if they are offered such occupations.

However, the girls' choices of career were in relation to their choice of programme. This might be that, they are aware of the familiar programmes and the careers they can enter into with the programmes. It could be also that limited career knowledge by the teachers, who assisted them in selecting their programmes, resulted in the girls choosing those programmes to enter into their alternative 'known' careers.

The results also revealed that, 38 respondents though opted for Arts programme, chose careers that are science and technical based. This shows that the career guidance coordinator's work cannot be overemphasized in our junior high schools. The female youth, and the youth in general, at our junior high schools need career guidance, to make informed decisions in selection of programmes to senior high/ technical institutions.

Implications for Counselling

The study revealed that though respondents think girls as well as boys can attend technical school, none of them chose a technical programme for a further study. The study also revealed that gender stereotyping has influence on girls' choice of career. It, therefore, implies that as early as primary school age, children's literature need to be unbiased; not portraying boys to be

working outside the home and doing other tedious work more than girls. School reading materials should not portray girls as weaker and helpless beings to be helped by their male counterparts. Writers should not cite concrete examples with the use of male pronouns 'he'. The pronoun 'she' should be often used to show to girls what they are also capable of doing.

Children at the basic schools should be exposed to guidance and counselling to know themselves better to be able to aspire to occupations that can be productive, irrespective of their gender. It also means counsellors should be available especially at the Junior High Schools (JHS) to help the children at the early age and stage to value all fields of work and also to help eliminate some of the problems faced by respondents.

Vocational guidance and counselling is necessary in our JHS to provide experiences that could enable our young girls to:

(a). Identify, understand and interpret their values and interests

(b). Acquire more effective career decision making skills.

(c). Expand their knowledge of the world of work.

(d).Understand the present factors in the Ghanaian economy as well as their society which can affect their world of work and gender.

(e).Do away with the various misconceptions about work and be abreast with the new trend in work.

(f). Establish meaningful relationship between self awareness and future career endeavours.

(a). Identify, understand and interpret their values and interests. Choosing a career is a lifelong process that demands accurate perceptions of ability, potential and achievement. The results of the findings on what influence

respondents in their choice of career shows that majority of the respondents were influenced by their self interest. It is, therefore, the duty of the counsellor to assist the girl child to constantly revise her career decisions to meet the demand of the changing world based on the child's interest and ability.

(b). Acquire more effective career decision making skills. While many career counselling issues are the same for both genders, career decision making process for girls may present more challenges for girls than boys because of girls earlier puberty and emotional maturation, along with greater self concept discrepancies, higher and multiple societal ideal imposed on them. For these reasons, majority of the respondents were at a fix as to whether to attend technical school or not. Effective counselling at the JHS would have put the respondents at the proper position to respond 'yes' or 'no' to the question 19.

(c). Expand their knowledge of the world of work. Females should be exposed to information on both traditional and non-traditional occupations. Some respondents were of the view that they did not choose technical education because no one had talked to them about the job prospects in that field. It is, therefore, necessary for all pupils to understand and have adequate information on the areas of work they want to enter.

(d). Understand the present factors in the Ghanaian economy as well as their society which can affect their world of work and gender. Though majority of the respondents have positive perception on technical education, the ineffectiveness of career guidance might have contributed to why none of them chose the programme. Majority of the respondents said the guidance coordinator only came to the school when they were about to select their

programmes.

(e). Do away with the various misconceptions about work and be abreast with the new trend in work. When given the necessary assistance, the girl-child will be able to understand the need to change her perception on certain issues based on what is going on around her to form her own concrete judgement. The results indicate that stereotyped attitude is a cause of why girls will not want to enter into technical schools. We live in a stereotyped society which has influence on people's perception in their choice of work. Counsellors should sensitise females as well as the community to do away with stereotype attitude as it relates to work.

(f). Establish meaningful relationship between self awareness and future career endeavours. Female adolescent may face more challenges in their career development than their age peer males due to possible additional psychosocial issues that affect their sense of identity (Kerr, 1994). A solid sense of self is the underpinning factor for clarifying plans and aspirations for the girl child.

The result of this research further implies that without adequate information about the world of work at an early age, our girls will lack interest in occupations that would have fitted their personality. Modern career counselling should therefore be effective in our JHS to create self-awareness and decision making to help females develop the necessary attitudes, skills and academic pursuits for career exploration and planning. By not adequately addressing the career needs of our girls in the JHS, our society will lose potential female contributors in the field of technology and many of our girls

in JHS may continue to be anxious, confused or frustrated about their career paths.

Guidance coordinators need to continue their efforts to eliminate gender stereotyping related to occupational decision making and to emphasise the importance of considering non-traditional career choices for females since they will be the largest group of new entrants to the workforce in the near future.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary of the study, conclusions and recommendations. The chapter, therefore, is in three main sections.

Summary

Despite concerted effort being made by the Government of Ghana and non-governmental institutions in Ghana to encourage female participation in technical education for the past decade, the low participation of females in technical education continues to be a grave concern. The purpose of the study was, therefore, to investigate the low participation of females in technical education and find out strategies to be adopted to promote junior high school girls interest in technical education.

In the light of this assertion, the thrust of the study was to examine:

a. The perception of girls on technical education.

b. The extent to which girls' school type influences their participation in technical education.

c. The perception of girls towards technical education due to living in an environment that has positive or negative societal regard for technical education.

d. The perceptions of girls towards technical education due to

living in either a stereotyped or a non-stereotyped environment.

e. The extent to which girls' choice of programme relates to their choice of career.

f. The factors that influence girls' choice of career.

g. The effectiveness of career guidance in junior high schools

There were three research questions and four hypotheses for the study.

The research questions were:

a. What are the perceptions of girls about technical education?

b. What factors influence girls' choice of career?

c. How effective is career guidance at the junior high schools?

Hypotheses tested were:

a. H_o: Type of school for girls does not significantly influence girls' participation in technical education.

H_1: Type of school for girls significantly influences girls' participation in technical education.

b. H_o: There is no significant difference in the perceptions of girls towards technical education due to living in an environment of positive or negative societal regard for technical education

H_1: There is significant difference in the perceptions of girls towards technical education due to living in an environment of positive or negative societal regard for technical education.

c. H_o: There is no significant difference in the perceptions of

girls towards technical education due to living in either a stereotyped or a non stereotyped environment.

H_1: There is significant difference in the perceptions of girls towards technical education due to living in either a stereotyped or a non stereotyped environment.

d. H_o: Girls' choice of programme in school does not significantly relate with their choice of career.

H_1: Girls' choice of programme in school significantly relate with their choice of career.

The sample size of 300 was made up of Form Three Girls from 30 public schools junior high schools in the Cape Coast Metropolis. The cluster sampling was used to select ten girls from each school. A questionnaire was used to collect data for the study. Data analyses involved the use of descriptive and, inferential statistics. The t-test was used to test two of the null hypotheses, (hypotheses two and three at 0.05 alpha level of significant) while the chi-square test for independence was used to test hypotheses one and four. From the data analysis it was found that:

1. The girls at the junior high schools in the Cape Coast Metropolis have positive perception on technical education.

2. The girls own self-interest and the quest for career that yields much income influenced their career choice.

3. The girls lack adequate career guidance in the junior high schools, living in an environment that has negative regard for technical education and gender stereotyping attitude of the society in which they live in, might have influence their participate in technical education.

4. Females only type of school significantly influenced their participation in technical education.

5. There is significant difference in the perception of girls due to living in an environment that has positive or negative societal regard for technical education.

6. There is significant difference in the perception of girls on technical education due to living in a stereotyped or non stereotyped environment.

7. The girls choice of programme selected for the senior high schools, significantly relate to their choice of career.

Conclusions

From the findings, it is concluded, that though females had positive perception on technical education, societal regard for technical education, lack of adequate career guidance, self-interest and financial gains in choice of career as well as sex-role stereotyping are major reasons for them not participating in technical education. The girls also lack adequate career guidance and are not aware of the new trends in occupation. They are only interested in the work that they have interest in and can give them financial gains. There are a lot of works and financial prospects in technical education. There is, therefore, the need for effective guidance service at the junior high schools, to assist our girls make informed choices in their career and be abreast with the new trends in occupations that they can enjoy their finances in future.

Recommendations

With changes in the composition of the work force and changes in the labour market, career guidance programmes need to be made effective at the Junior High Schools to assist students develop positive perceptions that can help them self-actualised themselves. The following recommendations are made with respect to the findings of the study to all stakeholders in education especially to the Ghana Education Service officials and authorities including, the head of counselling unit of the Ghana Education Service, all guidance co-ordinators in junior high schools and curriculum developers of basic schools and junior high school text books and reading materials.

1. Guidance offices must be established in all junior high schools in the Cape Coast Metropolis with well equipped materials such as career information books, bulletins and computers so that the girl-child or even her male counterpart can walk in freely for assistance.

2. Trained guidance co-ordinators or school counsellors must be in each junior high school in the Cape Coast Metropolis to implement guidance services that will help girls to know themselves and job opportunities in their environment and the nation, as well as the new trends in the world of work.

3. Guidance and counselling programmes in junior high schools should de-emphasise gender role stereotyping by encouraging girls to know their capabilities, interests and values to relate to their career aspirations.

4. Workshops and seminars must be organised by guidance co-ordinators or school counsellors for teachers, parents and pupils to enlighten them on new trends in jobs and to disabuse their mind from the so called 'masculine' and 'feminine' occupations.

5. Government and stakeholders in education should go beyond sensitising the public on the need for technical education and start instituting packages for females who want to pursue technical education.

6. The Ghana Education Service should give special quota to teachers who would like to pursue Guidance and Counselling degrees at the universities in order to recruit more guidance co-ordinators to the junior high schools.

7. The computer placement process should place girls who have good grades in Mathematics and General Science into technical institutions. Such girls should be sponsored by Ministry of Education throughout their programme duration.

8. Model technical institution should be build for girls in the central region to encourage girls to pursue technical education.

The role of the guidance co-ordinators in promoting female participation in technical education and career choice is therefore inevitable. It, thus, calls for outreach programmes by counsellors and guidance coordinators to help address this issue.

Areas for further Research

Subsequent researchers who want to investigate females' choice of career in the so called 'traditional occupations' at both the Junior High and Senior High Schools can find this work useful. Qualitative research could be conducted on why girls' have positive perception on technical education but would not like to pursue a programme in technical education. Studies can be conducted on counselling needs of girls' at the Junior High Schools. The socio-economy background of parents of girls at the Junior High Schools and

their choice of career can be investigated to see how parents' socio-economic background affects girls' choice of career.

Other studies can be conducted on the aspirations and constraints of females pursuing technical education.

REFERENCES

Acheampong, P. (1992). *Factors that prevent females from attaining high level   education*: A   case study of females in schools and dropouts in Mataheko. University of Ghana, Accra; Unpublished dissertation.

Ackumey, M. A. (1989). *An evaluation of the guidance and counselling course of the bachelor of education degree programmes at the University of Cape Coast*. Unpublished M.Ed. thesis, Faculty of Education, University of Cape Coast, Cape Coast.

Addae-Mensah, I. (2000). *Education in Ghana: A tool for social mobility or social stratification*, Accra; J.B. Danquah Memorial Lectures.

Adeyoju, C.A., & Aremu, A.O. (1999). Career women's perceptions of family patterns and   societal expectations: The need for socio-psychological agenda. *Ife Journal of Behavioural Research.* 1(2) 48-52.

Aidoo-Taylor, N. (1989, April). *The teaching of technical education in the education reform program.* A Paper Presented at a Technical Teachers Course. Kumasi: Kumasi Technical Institute.

Ajala,A.O.,(2000) *The girl-child situation; determinants, patterns and perceptions.*Series No. 6, Ibadan: Nigeria Institute of Social and Economic Research (NISER).

Aluko, Y.A. (2005). Social factors underlying gender variations in school enrolment in Nigeria. In *Ife Psychologia* (Ed) *International Journal of Africa* (pp.74-100). Ile-Ife: Centre for Psychological Studies.

Anyanwu, J. C. (1994). Women's education and the use of bank credit in Nigeria, challenges for the twenty first Century. In A. Marrino, (Ed), *Access of girls and women to scientific, technical and vocational education in Africa* (pp. 78-99*). Dakar. UNESCO

Ayim, S. A. (1998), *Building the capacities of trainees in the technical institutes.* Accra. Anansesem Publication. Ltd.

Balogun, T. A. (1994). Gender issues in teaching science, technology and mathematics. In S.Y. Erinosho, (Ed), *Perspectives on women in science and technology in Nigeria* (pp. 47-51). Ibadan: Sam Bookman Educational and Communication Services.

Bedu-Addo P.K.A. (2002), *Guidance and counselling 'unmasked'* (2nd ed), Accra: Type Company Ltd.

Best, N. S. & Khan, S. R (1998) *Analysis of school dropout rates and output in Pakistan;* Islamabad: Pakistan Institute of Development Economics Research Report 149.

Biklen, K. (1995) *School work: Gender and the cultural cited construction of teaching.* New York: Teachers College Press.

Bonney, E. (2007). Technical Education–Key to National Development. *Daily Graphic*, Wednesday, April 25, pp 16 and 33. Graphic Communications Group: Accra. ISSN: 0855-1529

Brooks, L. & Brown, D. (1990). *Career choice and development: Applying contemporary theories to practice*. (2nd ed). San Francisco: Jossey-Bass Publishers.

Budu-Smith, J. (2007, February). *The need for Ghana to focus on technical and vocational education and training.* A Paper Presented on the Maiden Speech and Prize-giving Day at Oguaa Senior High and Technical School, Cape Coast.

Buku. D.K., & Taylor, A. I. (2006), *Basics in guidance and counselling.* (2nd ed). University of Education, Winneba: Department of Psychology.

Cary, L. C., Con, C. and White, B. (1997). A portrait of successful women. *Women in Management Review*, 12(1), 45-53.

Coillods, F. (1993), Mode of vocational education and training. In D. Atchoavena (Ed). *Policy and planning for vocational education and training report of a sub regional training* (pp. 122-165). Barbados. UNESCO, I.E.P.

Cornea, M. (1991). *Putting people first: Sociological variables in rural development.* New York: Oxford University Press.

Cohen, J. M. & Uphoff, N. T., (1997). *Rural development participation: Concepts and measures for project design implementation and evaluation.* New York: Council University.

Coombe, C. (1998) *Surveys of vocationally–oriented education*. London: Commonwealth Secretariat Publication.

Commonwealth Secretariat (1987). *Gender stereotyping in science, technology and mathematics education.* Report of a Commonwealth Africa Regional Workshop, Ghana.

Creswell, J. W. (1994), *Research design: qualitative and quantitative approach*. California: Sage Publications Inc.

Daily Graphic, (1995). Thursday, March 9 pp. 9, 10. Women urged to

fight equality. Graphic Communications Group: ISSN: 0855-1529.

Daily Graphic, (1995). Wednesday, April 12, p7. Gender discrimination

affects social development Graphic Communications Group:

ISSN: 0855-1529.

Daily Graphic, (2006). Monday, November 13, p 3. More attention for

gender equality. Graphic Communications Group: Accra. ISSN: 0855-

1529.

Daily Graphic, (2008). Monday, June 2, p 11 Vocational, technical subjects

are not inferior. Graphic Communications Group: Accra. ISSN: 0855-

1529.

Danso-Manu, K. (2004). *Education, poverty and public expenditure in Ghana,*

2003. Accra: Statistical Service.

Dankwa, D. O. K. (1981). *Guidance and counselling in the Ghana Education*

Service: History and policy. An Unpublished Document, University of

Cape Coast.

Dickson, S. (1985). *Women in Society.* Essex: Longman Group Ltd

Egenti, M. N. (2008) Personal and Environmental path predicts of girls child

retention in Lagos State schools, Lagos; *International Journal of*

Educational Research, 4(1), 127–133.

Ellis, P. (1987). *Measures increasing the participation of girls and women in*

technical and vocational education and training: a Caribbean Study.

London: Commonwealth Secretariat.

Emptage, R. (1991). *Manufacturing technology: Directions for the future.*

Toronto: McGraw-Hill.

Entsua-Mensah, P. (2006). How to spread scientific, technology and innovative culture. *Daily Graphic,* Thursday, November 2. pp. 19 & 32 Graphic Communications Group: Accra. ISSN: 0855-1529

Erinosho, S. Y. (1997). *Female participation in the sciences: An analysis of secondary School science curriculum materials in Nigeria:* Abridged Research Report Number 29.

Eshun, M. S. (2000). *Attaining success through counselling.* Takoradi: Ajumakoman Press Ltd.

Essuman, J. K. (1989). The history of guidance and counselling in Ghana. *Ife Psychologia. An International Journal 7(2) 22-43.*

Forje, J. W. (1989). *Science and technology in Africa.* London: Longman Group Ltd.

Fraenkel, J. R. & Wallen, N.E. (2002). *How to design and evaluate research in education* (4th ed.). Boston: McGraw Hill.

Fraenkel, J. R. & Wallen, N.E. (2003). *How to design and evaluate research in education* (5th ed.). Boston: McGraw Hill.

Gay, L. R. (2002), *Educational research: Competencies for analysis and application.* (4th ed.). New York: Merrill/Macmillan.

Ghana Export Promotion Council (2007), Accra. *Author*

Ghana, Ministry of Education (1990), *Policy document on technical and vocational education and training,* A proposed document. Accra: Government Press.

Ghana Statistical Service (2002). *2000 Population and Housing Census.* Accra: Ghana Statistical Services.

Ghana Statistical Service (2006). Woman and men in Ghana: A statistical Compendium. *Data Analysis Report* 1, 4-13.

Goodale, G. (1991) *Training for women in the informal sector*. ILO Training Discussion. Publication number 36, Geneva.

Gomile–Chidyaonga, F. A. (2003, September). *Encouraging greater enrolments of women in science and technology: Malawi polytechnic experience*. A case study prepared for a Regional Training Conference on improving Tertiary Education in sub-Saharan Africa in Accra-Ghana.

Gottfredson, L. (1981). Circumscription and compromise: A development theory of vocational aspirations. *Journal of Counselling Psychology,* 28, 245–579.

Government of Ghana (2002). *Meeting the challenges of education in the 21st Century*. Accra: Adwinsa Publications (Gh) Ltd.

Government of Ghana (2004). W*hite Paper on education reforms.* Accra; Government Press.

Graham, C. A. (1976). *The history of education in Ghana.* Accra Tema: Ghana Publishing Corporation.

Greene, M. J. (2002). *Recurring themes in career counselling of gifted and talented students,* University of Connecticut: The National Research Center on the Gifted and Talented.

Griffin L. (1999). Teaching as a gendered experience. *Journal of Teacher Education,* 48, 7- 8.

Harding, J. (1995). *Switch off: The science education of girls.* London: Longmans Publication.

Hayman, R., Palmer, R., & Wodgwood. R, (2007). *Educating out of poverty?*
A synthesis report on Ghana, India, Kenya, Rwanda, Tanzania and South African Studies, Edinburgh: University of Edinburgh

Henderson, S, Hesketh, B. & Toffin, K. (1988) A test of Gothfredson theory of circumscription. *Journal of Vocational Behaviour,* 32, 37-48.

Hill, M. A. & King E. M. (eds) (1993). *Women's education in developing countries: Barriers, benefits and policies.* Washington, D.C.: World Bank.

Holt P.A., (1989). Differential effects of status and interest in the process of compromise. *Journal of Counselling Psychology,* 36(1), 42-47

Hornsby, A. S. (2005), *Oxford advanced learner's dictionary of current English*, (7th ed.), New York: Oxford University Press.

http://ghana gov.gh/Ghana/new educational reform 2007

Institute of Statistical Social and Economic Research (1998) *Women in public life in Ghana.* Accra: Department for International Development.

International Labour Organisation (2002). *Learning and training for work in the knowledge society: 91st session of the International Labour Conference,* Geneva: ILO.

Ipaye T. (1986). *Educational Vocational guidance concepts and approach.* Ibada: Bazekos Printing Press.

Kane, M. J. (1990). Gender-role as a constraint to female involvement in physical education. *Journal of Physical Education, Rrecreation and Dance.* 61 (1), 52-56.

Karen, E., (1995). *Barriers to participation of women in technological education.* London: Commonwealth of Learning Secretariat.

Kerr, B. (1994). *Smart girls: A new psychology of girls, women and giftedness.* Scottsdale, AZ: Gifted Psychology Press.

King, K. (2003). The international steering of education systems: the case of the World Bank in the fields of work, education and occupation. In J. Oelkers (Ed). *Features of education II (pp. 67-108),* Bern: Peter Long Press.

King, K. P. (2007). *Innovation in career and technical education: strategic approaches towards workforce competencies around the globe.* Charlottesville, NC: Information Age Publishing.

Konadu-Agyemang, K. & Shabaya, J. (2004). Unequal access, unequal participation: some spatial and socio-economic dimensions of gender gap in education in Africa with special reference to Ghana, Zimbabwe and Kenya. *Compare.* 34(4), 395-424

Kuiper, M. (1991). *Women in technical education.* Training discussion papers. Geneva: ILO Training Policy Branch.

Livingstone, I. (1986, March). *Youth employment problems in Africa: The case of Somali.* "A paper presented at annual conference of the ILO jobs and skills programme for Africa.

Mallam, W. A. (1993). Impact of school-type and sex of teacher on female attitudes toward mathematics in Nigerian secondary schools. *Journal onEeducational Studies in Mathematics*, 24(2), 223-229.

Manye, M. (2008). *Access and barriers to education for Ghanaian women and girls. Faculty of Education,* University of Alberta: Springer Netherlands Publishers.

Miller, M. D. (1985). *Principles and a philosophy for vocational education.* Ohio: The National Centre for Research.

Morgan, D. W, & Kreicie, R. V. (1976). *Determining Sample size for research activities: Educational and Psychological Measurement*. New York: Sage Publication.

National Population Council fact sheet (2005). *Population and Housing Census*. Accra: Author

Novack, L. L. & Novack D. R (1995). Being female in the eighties and nineties: conflicts between new opportunities and traditional expectations among White, Middle class and heterosexual women. *Sex Roles: A Journal of Research*, 35, 57–72.

Nwadinigwe, I. P. (2005). *Fundamentals of research methods and statistics.* (3rd ed). Lagos: Sibon Books Ltd.

Nyenku, C. (2004). Women in globalization. In C. Akani, (Ed). *Globalization and peoples of Africa* (pp. 13-45)*.* Enugu: Forth Dimension Publishers Co.

Odugbesan, F. A. (1990) *Women in technical education, training and jobs in Africa, Lagos*: Training Policy Branch.

Ogunkola, B .J & Olatoye, R. A. (2005). *Strategies for improving participation and performance of girls in secondary school science in Nigeria: Science teachers' opinions.* Ago-Iwaye: Institute of Education.

Ogunyemi, B. (2006). Gender, Socio-economic status and educational level as determinants of career maturity of Nigerian adolescents. *Gender & Behaviour,* 4 (1), 686 – 696.

Oladele, J. O. (1989). *Fundamental of psychological foundations of education:Hand book for education students and teachers.* (3rd ed). Lagos: Johns-Lab publishers.

Orton, A. (1987). Learning mathematics issues. In B. J. Ogunkola & R. A. Olatoye, Strategies *for improving participation and performance of girls in secondary school science in Nigeria: Science teachers' opinions* (pp. 453-464). Ago-Iwaye: Institute of Education.

Osei-Mensah, P. (2007). The Educational reforms another dimension. *Daily Graphic,* Wednesday June 6, pg 11. ISSN: 0855-1529.

Osipow, H. O. (1993). *Theories of career development* (2nd ed.) New Jersey: Prentice Hall.

Osuagwu, L. (1980). *Factors associated with vocational interest among a group of Nigerian Secondary School Students.* An Unpublished thesis. University of Ibadan.

Palmer, R. (2005). *Beyond the basics: Post-basic education and training in Ghana,* Workshop Paper Series No.4. Edinburgh; Center of African Studies.

Pecku, N. K. (1977). *The need for guidance services in our primary and middle schools.* Serminar for headteachers of primary and middle schools, I. E. P. A. University of Cape Coast, Cape Coast. Unpublished Paper.

Pra, M. (1992), *Women and development* .Gender Analysis Workshop Report. DAWS/IAS, Accra.

Prytz, L. M. (1991). *Promoting women in non-traditional occupations*: *Bangladesh, India, Pakistan and Sri Lanka.* Training Discussion Paper No. 66. Geneva: Training Policy Branch.

Quaisie, G. (1995). National Co-ordinator *Science Technology and Mathematics   Education (STME) Clinics for Girls*. Accra; G.E.S.

Republic of Ghana, (2002*).* Meeting the challenges of education in the twenty first century. *Report of the president's review committee of education reforms in Ghana.* Accra: Author.

Sadker, M. & Sadker, D. (1991). The issue of gender in elementary and secondary education. *Review of research education,* 17 (2), 309-315.

Salami, S. O. (2000). Career salience, parental socio-economic status, age, gender and work values among adolescents in Nigeria. *Nigerian Journal of Clinical Psychology*, 6 (2), 118-130.

Santrock, W.J. (2000). *Alternative and enhancement chapters' psychology* (5th ed) New York: McGraw-Hill.

Schweigert, W. A. (1998). *Research methods in psychology,* Bradley University: Brooks/Cole Publishing Company.

Shah, N. B. (1986). *Pakistan women: A socioeconomic and demographic profile.* Honolulu : E-W Population Institute.

Shertzer, B & Stone, C. S. (1976). *Fundamentals of counselling*. (3rd ed) Boston: Houghton Miffin Company.

Skypek, D. H. (1980). Girls need mathematics too. *Journal of Arithmetic Teacher*, 27 (6), 5–7.

Smith, A. E. (2002). *The view from female principals' desk*. New York: Spring Publications.

Somi, V. (2003). *Influence of gender stereotyping on career choice among senior secondary school students in the Cape Coast Municipality,* Ghana Unpublished thesis. University of Cape Coast.

Swortzel, K, (1996*). Perceptions held by vocational educators toward female participation in non-traditional programs. *Journal of Vocational and Technical,* 13(1), 2-18.

Technical Committee (2004). *Draft TVET policy frame work for tertiary institutions in Ghana.* Unpublished document.

Udegbe, I. B. (1998). The constitutional consensus: Political restructuring and women's access to power. In K. Amuwo. *Federalism and Political Restructuring in Nigeria* (pp.147-163). Ibadan: Spectrum Books\ IFRA

UNESCO, (1995). *Education strategies for the 90's*: Orientation and achievement report on the state of education in Africa. Dakar, Senegal: UNESCO.

Wak, G. (2002). *Determinants of infant mortality in the Kasena-Nankana district, Ghana.* Unpublished MA dissertation, University of Ghana, Legon.

Wallace, R. G. (1985), *Introducing technical and vocational education*. London. Macmillan Education Limited.

Watts, A. G. (1996). Towards a policy for lifelong career development*:* A transatlantic perspective. *The Career Development Quarterly*, 45, 41-53.

White, B. (1995). The Career development of successful women. *Women in Management Review,* 10(3), 1995.

Williams, G.A. (1987). *Science, technology and mathematics education for all, including women and girls in Africa*. Keynote address at the Commonwealth Africa Workshop on Gender Stereotyping in science, technology and mathematics education. Accra, Ghana. Report of a Commonwealth Africa Regional Workshop.

World Bank, (1996)). *World Bank participation source book*. Washington D. C. World Bank.

World Bank, (2002). *The environment and the millennium development goals*. Washington DC: Author.

World Bank (2005). *Education* s*trategy sector strategy update*. Washington DC: Author.

Yoloye, E. (1994) Intervention Strategies in Promoting Women Participation in Science and Technology. In S.Y. Erinosho (Ed.). *Perspectives on women, science and technology in Nigeria* (pp. 78-95). Ibadan: Sam Bookman Education and Communication.

Zietsman, (1997). Girls in mathematics and science classrooms. *A case study in Malawi and South Africa*. Nairobi: Prager publications.

Zunker V. G. (1994) *Career counselling applied concepts of life planning* (4th ed.). Pacific Grove, California: Brooks/Cole Publishing Company.

APPENDIX A

QUESTIONNAIRE FOR JUNIOR HIGH SCHOOL FORM

THREE GIRLS IN CAPE COAST METROPOLIS

This research is a study on female participation in technical education and career choice for form three girls in the metropolis. Please provide responses to the following questions by ticking where applicable or fill in the spaces provided. You will not be punished for any answer you give. Feel free and be honest to yourself.

SECTION A

Please tick [√] where applicable.

DEMOGRAPHIC DATA

1. School type: Girls only   [   ]   Mixed [   ]

2. Age: 10 – 15yrs   [   ]

              16 – 20yrs   [   ]

              21 - 25yrs   [   ]

SECTION B

PERCEIVED EFFECTIVENESS OF CAREER GUIDANCE

(Tick [√] only one response)

3.   Do you have a teacher who talks to you about work and other issues in your school?

         Yes [   ]   No [   ]

4. Has the teacher given you any help on how to select senior high school programmes?

      Yes [   ]   No [   ]

5. Do you have any person coming from outside the school to help you select your programmes?

      Yes [   ]   No [   ]

6. If 'yes' for how long has this person been coming to your school?

      Once a week [   ] Once a month [   ]

      During the selection of schools   [   ]

7. Have you on your own sought help from the teacher who talks to students about work and other issues?

      Yes [   ]   No [   ]

8. If "yes" which of the following reasons took you to him or her?

      To help me select a school and programme   [   ]

      To find out more on the job I want to do in future [   ]

      To help me solve a personal problem   [   ]

SECTION C

CHOICE OF PROGRAMME

(Tick [√] only one response)

9. Which of the following subjects do you like best?

      Mathematics   [   ]

      Social Studies   [   ]

      Pre-technical Skills [   ]

      English Language   [   ]

Agricultural Science   [   ]

Religious and Moral E [   ]

Fante   [   ]

French   [   ]

10. What programme would you like to do at the senior high school?

General Arts   [   ]

Visual Arts   [   ]

Business   [   ]

Technical   [   ]

Home Economics [   ]

Science   [   ]

Agric Science   [   ]

CHOICE OF CAREER

(Tick [√] only one response)

11. Which of the following jobs would you like to do in future?

Nurse   [   ]

Auto mechanic   [   ]

Fashion and Designing   [   ]

Engineer   [   ]

Doctor   [   ]

Electrician   [   ]

Teacher   [   ]

Accountant   [   ]

Journalist   [   ]

Any other (specify)………………………………………….

FACTORS THAT INFLUENCE GIRLS' CHOICE OF CAREER

(Tick [√] only one response

	Strongly Agree	Agree	Disagree	Strongly Disagree
12. My parents want me to pursue that career				
13. My teachers want me to pursue that career				
14. My peers want me to pursue that career				
15. I am attracted by the uniform of the workers				
16. I have self interest in that career				
17. There is money or financial gains in that career				

GIRLS PARTICIPATION IN TECHNICAL EDUCATION

18. Do you have any idea on technical education?

Yes [   ]   No [   ]   Not sure [   ]

19. Do you think it is proper for you to go into technical education?

Yes [   ]   No [   ]   Not sure [   ]

20. Would you enter into a technical school if you get good BECE

results?

Yes [   ]   No [   ]   Not sure [   ]

21. Could you encourage other girls to go to a technical school?

Yes [   ]   No [   ]   Not sure [   ]

SECTION D

GIRLS PERCEPTION OF TECHNICAL EDUCATON

	Strongly Agree	Agree	Disagree	Strongly Disagree
22. Technical education is suitable for boys only				
23. Technical education is for pupils who perform poorly and do not gain admission to senior high schools.				
24. Technical education demands physical energy which girls do not have.				
25. Girls who go into technical education do not get job after schooling.				
26. Jobs available in technical education make workers look dirty.				

SOCIETY REGARD FOR TECHNICAL EDUCATION

	Strongly Agree	Agree	Disagree	Strongly Disagree
27. Technical education is not good for girls.				
28. Only the poor and needy in society go to technical schools				
29. Students in technical schools are labelled as "academically poor" students.				
30. My community disrespect females who do technical education				
31. Girls who do technical education are given nick names as "Adjoa hammer and Ama carpenter".				

GENDER STEREOTYPING ATTITUDE

	Strongly Agree	Agree	Disagree	Strongly Disagree
32. Societal expected roles for girls, in terms of job, limit girls' participation in technical education				
33. Teaching methods used by teachers show girls clearly the work group they belong to.				
34. Pictures in books show girls doing household chores and as such the work they can do in future.				
35. The use of pronouns like 'he' and 'she' in books tells girls what they are capable of doing.				
36. Girls are created to perform certain jobs which differ from that of men.				
37. At homes our parents give different tasks (work) to boys and girls. This tells girls what they are capable of doing.				

APPENDIX B

UNIVERSITY OF CAPE COAST

FACULTY OF EDUCATION

DEPARTMENT OF EDUCATIONAL FOUNDATIONS

RESEARCH WORK

LETTER OF INTRODUCTION

Mr./ Mrs./ Ms……………………………………………………..

is a student pursuing Master of philosophy (Guidance and Counselling)

programme in this department. As part of his /her degree requirements,

he/she is expected to work on a research entitled "………………………

……………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

………………………………………………………………………"

He/she has opted to make a study at your Institution/ Establishment for

the research. We would be most grateful if you could afford him/her the

opportunity to make the study.

Any information provided will be treated as strictly confidential.

Thank you.

(DR. Y.K.A. ETSEY)

HEAD