UNIVERSITY OF CAPE COAST

FACTORS MILITATING AGAINST THE PARTICIPATION OF

WOMEN ARTISANS IN MALE DOMINATED OCCUPATIONS

BY

JULIANA NKRUMAH

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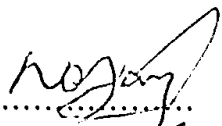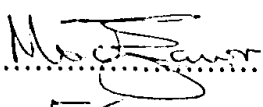
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I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

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Principal Supervisor's Signature............... Date.16-02-09

Name..DR. NICHOLAS ADDOO-TAYLOR..........

Co-Supervisor's Signature................ Date..23-03-09.

Name...Modesta Efua Gavor.............

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## ABSTRACT

Job opportunities for women in technical fields have remained relatively unexplored. Therefore, the purpose of this study was to explore and identify the factors considered by women technicians and artisans to be militating against their participation in technical and engineering related occupations which are male dominated.

The instruments used in the study were questionnaires and interview schedules. The respondents comprised women employees in technical organisations, self employed women technicians and artisans, female trainees enrolled in technical programmes in polytechnics and technical institutes and women apprentices in local garages and workshops. In all 186 respondents were purposively selected from three metropolitan cities of Ghana, namely Accra, Kumasi, and Sekondi-Takoradi. Data collected were analysed using frequencies, t-test and means.

The main factors found to explain the exclusion of women in technical careers include (i) social and organisation barriers, (ii) lack of opportunities for staff development and self development, and (iii) family commitment. The study also revealed that young women are now penetrating into the male dominated technical jobs and they derived job satisfaction from their chosen occupations despite the difficulties posed by the factors they identified.

Based on the findings from the study, it was concluded that both sexes (men and women) can equally participate in technical and engineering related occupations, provided equal motivations and opportunities for participation are made available to both sexes. Consequently, a recommendation was made that women affirmative actions need to be stepped up to include job placement in technical and engineering careers.

# ACKNOWLEDGEMENTS

# DEDICATION

This work is dedicated to my husband for his motivation and support which carried me through the long absence from home as well as my children. Also, I dedicate this work to my brother Andrews Antwi Bosiako.

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CAWMSETD     Committee on the Advancement of Women and Minorities in

                         Science, Engineering and Technology Development

ITWC             Information Technology Work Force Convocation

NSW             New South Wales

STE              Science Technology and Engineering

NELS            National Educational Longitudinal Study

CWSE          Committee on Women in Science and Engineering

# CHAPTER ONE

## INTRODUCTION

### Background to the study

The Ghanaian society goes by norms and values that have conditioned societal attitude towards the education of girls, and have also significantly dictated the roles and activities of males and females. This attitude of society is not unique to Ghana. It exists in most cultures, the world over, and has contributed to denying females, who form about half of the world's population, from realising their full potentials and capabilities.

The cultural values affect the psychological behaviour of girls as well as their perceptions in life. Globally, there is also the traditional view that women are fragile and should not be made to perform strenuous work. The place of the woman is thought to be in the kitchen and taking care of children in the home. In other words, they are not expected to be breadwinners, much more to become scientists, technologists and technicians who usually function outside the home (Nyanteng, 1996).

Of late, there has been a lot of agitation from women for social recognition in all spheres of life. From the well known Beijing conference and other subsequent similar conferences, women have recognised the need to

back words with action and to take up the challenges to disprove the general belief that strenuous work is not for the woman. If women are strong enough to till the land from dawn to dusk and carry mortar and blocks to men during + construction work, why are they not equally strong enough to undertake or practice other occupations and trades which are dominated by men, like electrical installations work, repairs of television sets and maintenance of refrigeration equipment? The latter, incidentally, are known to be more permanent and paying occupations than the traditional female trades which can be seasonal.

## Traditional dichotomy of males and females occupations

Many women continue to depend on traditional trades which are popular among females for economic life. Some of these are bead making, baking, pottery, soap making, palm and copra oil extraction. These trades generally provide casual jobs and are low paying. Hence, in most cases, women do not have very secure occupations that can provide them with a steady and adequate income. On the other hand, certain jobs like welding and fabrication, auto-mechanics and auto-electrical, furniture making and upholstery, block work, carpentry and joinery, spraying, plumbing and electrical installation, which are found to provide permanent occupations and to be well paying, are usually identified as male preserved occupations. But such trades can equally provide the modern women with jobs which will enable them become self-sufficient. Furthermore, the acquisition of practical knowledge and skill in the non-traditional female trades will help women to be able to set up small and medium scale businesses. In this way they can train

and provide future employment to other women, since it is the mother who spends more time with her children and the female members of the extended family. From this perspective, women will contribute their quota to reducing the problem of unemployment in the country. Thus, numerous benefits can be derived from women's participation in the non-traditional female occupations or male dominated occupations.

## Current trends in technology and demands for occupations

Globally, it is believed that women are now successfully making in-roads into the so-called male preserved occupations. A report by Equal Opportunity Commission (2001) confirmed that in other professions, such as medicine and law, women have made significant inroads to the traditional male domination. Whereas for women this achievement will enhance their confidence and self-concept, it could be frowned upon by their male counterparts in these fields. There is the likelihood that males may feel threatened of job security, and as to whether they may want to continue to stay in the job alongside with women or otherwise, is another issue.

The importance now attached to increasing the participation of women in technology and technological education reflects two trends worldwide. The first trend is the way in which technology is permeating all domains of activity in the contemporary world, and its role in our everyday experiences and in national economic development. Not only occupations involving technology are on the increase, but the general world population (men and women) is constantly engaging in the processes, products and effects of technology on a day to day basis. The second trend is the recognition of the need for action by

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the international community in securing the advancement of women and the elimination of gender-based discrimination, particularly in the fields of education and employment.

Although women unemployment is frequently explained from the supply side of the equation, it is becoming increasingly clear that reasons related to the demand for labour vis-à-vis the type of skills needed are also factors. The discrepancy between career expectations and the realities of the job market is a contributing factor in female under-representation in scientific and technologically-based occupations. Poor female career orientation by the conditioning agents (family, school and society) has compounded the problem of female participation in technical training in general and in particular, in the fields that have hitherto been the preserve of men (Masinde, 1992).

**The need to encourage female participation**

In order for females to be fully recognised with national development, there is an urgent need to encourage and attract more females into science and technology-based training and occupations so that they can play an effective role in the socio-economic and technological advancement of the Ghanaian society. In his contribution to the debate, Nyanteng (1996) states:

> To contribute meaningful to the socio-economic development, require a good grasp of technology, since the world today is revolving on a technological sphere. To become a 'fore woman' for example, means that the woman must have gone through the 'mill', she must have knowledge on what is it to

combine, what materials and at what ratios, to produce for lastingness, safety and durability (Nyanteng, 1996).

It is believed that for women to lay claim on agitation for effective social recognition, they need to have ability to rub shoulders with men in areas of simple technological applications, such as to detect and repair faults on household electrical appliances. Again women should demonstrate some technological independence by taking up simple technological responsibilities at home and at the work place. For instance, they must be able to repair a leaking roof or change a vehicle tyre.

The country's efforts at ensuring accelerated socio-economic development will not yield the expected result without personnel who have the requisite technical know-how. It is, therefore, a challenge to Ghanaian women, who according to statistics form 51% of the population, to contribute their quota to speed up technological development. The matter raises both economic and political issues. Thus, Bryne (1991) argued that "51% of the brains of the world are in female skulls. It therefore, follows that investing in women is not a women's question. It is economic question of central political importance". (Bryne 1991:43)

In the name of fair play, there is the need to ensure that half of humanity has opportunity of contributing to technological and national development. As mothers, women attend to the physical and cultural nurture of the family which in turn is one of the indispensable elements of a nation. Women, therefore, form an important cornerstone in the structure of any nation. If so, then their participation in technological activities should become an important concern to society and especially national planners for economic

development. It is in light of this that this study seeks to investigate the level of participation of women artisans in certain male dominated technical occupations.

### Statement of the problem

In Ghana there seems to be a shortage of skilled female human resource at all levels. Aggravating this problem is the perception of society on the division of work into females' job and males' job. This in turn, has resulted in low rate of women participating in certain occupations perceived as non-traditional jobs for women. This implies that, the Ghanaian economy is deprived of almost more than one-half of its human resources needed to solve its problems. For reasons of sex bias, women are disadvantaged in many areas of life and particularly, in the non-traditional female artisan and technical occupations like welding and fabrication, furniture making and electrical installations.

According to Badekale (1996), studies in Nigeria have revealed that the non-traditional female artisan jobs remain the highest employment sector but with the lowest female participation, despite efforts to attract them. These studies also show that there are contradictions which remain intolerable, and these make non-traditional female occupations "a male quasi-monopoly" (Michel, 1988).

Women are largely absent in the fields of technical training, with the exception of home economics and secretarial courses. The few women who have made headway into other technical fields have not been studied. There is very little information about them. Not much effort is made to understand the

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successes, failures and problems of these women in male dominated artisan and technician occupations. But it seems the under-representation of females in science and technology-based subjects at all levels of education and training, are likely to make them become increasingly marginalised and possibly excluded from the mainstream of national development in the present highly technological world.

### Assumptions underlying the study

The underlying assumption for this study is that there are some socio-economic factors which tend to encourage or discourage women from full participation in male dominated artisan and technical occupations. For example, it is worth knowing which category of women, those who conform or deviate from existing social norms and patterns tend to participate in male dominated occupations.

It is in the light of this that this study seeks to identify some factors and examine their influence on the few women who go into occupations dominated by males. It is believed that the availability of such information will help to deal with the problem of women under-representation in male dominated occupations.

### Purpose of the study

The study investigated the educational and socio-economic profiles of women artisans and technicians and examined the factors which militate against the participation of these women in male dominated occupations. The

study was carried out in three selected metropolis of Ghana (Accra, Kumasi and Sekondi -Takoradi).

Thus, the purpose of the study was to describe the socio-economic profiles of women artisans and technicians in male dominated occupations, and also to identify the constraints that act as obstacles to full participation of women in those occupations. Furthermore, the study examined the type of education that has influence on the women in choosing careers in male dominated technical occupations.

**Research questions**

In line with the identified problem, the following research questions were formulated to focus the study:

1. How does the type and level of education of women influence their choice as artisans and technicians in the male dominated occupations?

2. Which socio-economic factors facilitate the participation of women in the male dominated occupations?

3. Which factors discriminate against the participation of women artisans and technicians in the non-traditional female occupations?

4. What is the level of job satisfaction among the women artisans and technicians in the non-traditional female or male dominated occupations?

## Significance of the study

The study is expected to provide insights and useful information for identifying and clarifying issues on women occupations, especially those which require science-based education and training. Among others, it is hoped to:

- Contribute to knowledge on gender-related career in the technical trades and science related occupations.

- Indicate whether women tend to conform to or deviate from acceptable patterns and existing norms for choice or participation in technical trades and science related occupations.

- Provide information to educational policy makers and planners for designing, developing and implementing gender-sensitive programmes.

- Create awareness for women, girls, parents, teachers, career counsellors, employers and the general public on available options opened to women in different occupational fields and to help alleviate high unemployment and instead empower women economically.

- Contribute to educational research on the perceptions of women about themselves and the prospect in choosing technology and related occupations.

It is hoped that the study may encourage other researchers to carry out similar studies in other towns and metropolitan areas. In this way, it may help to improve awareness and thus encourage more females to seek employment in technical occupations other than jobs in female dominated areas.

## Delimitations

The study was delimited to Accra, Kumasi and Sekondi-Takoradi metropolitan areas. The reason is that most of the women artisans and technicians are found in these cities. Also, the major local garages which employed technicians and self-employed private garages are mostly located in these metropolitan areas. Again, the study was confined to the women in technology and engineering occupations which are male dominated. Moreover, the study considered women trainees in polytechnics, technical institutions and some apprentices from private garages and workshops in the three metropolitan areas.

## Limitations

The researcher encountered some difficulties in retrieving the questionnaires. The respondents in employment were mostly not accommodated at one place of employment and most the trainees were also not accommodated in institutional hostels. This made it difficult to retrieve all the questionnaires. However, this problem was reduced to a minimum since the distributions of questionnaire to the trainees were done only when the training institutions were in session. In this case, four journeys to the institutions and to the work places enabled the researcher to retrieve most of the responded questionnaires.

Again, some of the respondents were not willing to report on certain important and pertinent issues necessary for the study because of job security. This limitation was minimised by assuring the respondents of confidentiality of their responses. Some of the respondents, especially those from the

industries, were not prepared to reveal information regarding gender discrimination in their workplaces. The practising women artisans, technicians and technologists constitute a small population in the technical field in industry and, as such trainees from polytechnics and technical institutes as well as apprentices from private garages formed a higher percentage of the sample in this study.

## Definition of operational terms

The terms used in the study may be defined as stated below.

Artisans - Skilled workers with special abilities, knowledge and talent in their fields of work.

Technicians – An expert in the practical application of a science. Thus, a technician refers to a person with know-how and who is skilled in method of execution or manner of performance in the chosen occupation.

Non-Traditional Female Occupations / Male Dominated Occupations – The two terms are used interchangeably in this study. The definition of the Department of Labour of the United States of American was adopted and it applies to those occupations where women represent less than twenty-five percent (25%) of the workforce.

Job satisfaction - The level of contentment among women artisans and technicians in their chosen trades.

Employees - Any person who works for another person or for the state and who receives any remuneration which may be in the form of wages, salaries, commissions, piece rate or in kind payments.

Self-employed - A worker who does not work for an employer but works for himself / herself or having his / her own business or shop and who may employ others.

Trainee - A person who is learning or studying in a formal or informal establishment to acquire the skills required for the performance of a particular job, for example, an electrician. In this study, trainees refer to students and apprentices.

Student – A person who is learning or studying in a training institution.

Apprentice -A person who is learning a trade under the tutelage of a master craftsman /craftswoman.

Craftsman / Craftswoman - A skillful person in a particular craft.

Craft - A job or activity which requires skill and experience in relation to making objects. For example, the craft of furniture making

## Organisation of the study

This study is structured into five chapters. Chapter One presents the background to the study, and the statement of the problem. It also considers the purpose of the study, research questions, delimitations, limitations, significance of the study and definitions of terms. The review of related literature in Chapter Two addresses issues including (a) career choice of women and theories of occupational sex segregation; (b) women participation in science, technology education and engineering; and (c) socio-cultural dichotomy of masculinity and femininity. Chapter Three presents the research methodology. It includes a description of the respondents, the instruments

used, data collection procedures, and data analysis. Chapter Four contains the findings and their discussion while in Chapter Five, summary of main findings, recommendations and conclusions are presented.

# CHAPTER TWO

## REVIEW OF RELATED LITERATURE

This chapter presents a review of the literature on some thoughts, ideas and theories related to the factors militating against women artisans in male dominated occupations. It focuses on the literature that identifies factors which create barriers to women participation in science, technology education and engineering. The presentation is organised along the following lines:

i. Career Choice of Women and Theories of Occupational Sex Segregation

ii. Women Participation in Science and Technology Education

iii. Socio-Cultural Dichotomy of Masculinity and Femininity

## Career choice of women and theories of Occupational Sex Segregation

### Factors influencing career choice

Vocational choice is a gradual process, essentially involving the acquisition of self-understanding and the knowledge of the world of work, so that in the long run, an effective choice can be made. The process begins at a very early age of life as it is a life-long process of becoming aware of the world of work, experiencing work related activities, developing interests and values, increasing self-knowledge and making a series of educational and career choices.

Most psychologists use the term career development to express their belief in thinking, planning and making decisions about career as a continuous and life-long process. The psychologist Super (1951) and the economist and manpower experts Ginzbery, Ginsgery, Axelrad and Herma (1972) view the process as a systematic one that progresses through distinct stages of human development. Basically the process begins with "fantasy choices" made in the early childhood and continues with "exploration" of interest and capacities and the making of "tentative choices".

Throughout the process, a person tries to bring out those choices that are in line with realized opportunity based on his or her ability and the potential for securing proper training. Ginzbery (1972) and Super (1951) agreed that the process results in compromise between an individual's abilities, interests and opportunities as well as social factors, job requirements, and realistic potential. Super (1951) stressed that the occupational choice of a person is largely determined by his or her self-concept. The development of a self-concept culminates in choosing an occupation according to the kind of person you belief yourself to be, and the way you perceive your abilities, values and preferences.

Similarly, Holland (1974) believed that choosing an occupation is an expression of one's personality. According to his theory, making a good occupational choice means matching your personality to an occupation that suits it. Along these lines, he keyed over 400 occupations to six personality types and environments. For instance, he defines realistic occupations as those which emphasize concreteness and primary dealings with things rather than

people or ideals. Realistic occupations include the skilled trades, many technical and some service occupations.

**Sex role**

A number of authors (Stockward & Woode, Alexander & Eckland), cited by Amissah (1991) observed that "Sex places more restriction on what vocation people choose". They further affirmed that socialisation process, coupled with mental set, influence choice of vocation and are vocational stereotyping. Burton's (cited by Cass 1983) work on redefining merit has been important in the context of drawing attention to the structural barriers to women's full participation. Burton once more pointed to the implicit and unexamined assumptions that lay behind notions of merit. She suggested that a person's job history is often used as an indicator of ability and yet the norm employed reflects a gendered pattern of life and experience that worked against women. The intervention at times in selection and reward processes of women are sex stereotypes about differences between the abilities of men and women.

Burton went further to explain that the success of women in circumstances regarding rewards and promotion processes are attributed to their hard work; the success of men on the other hand, to their abilities. Such arguments have been the talk of the 'politics of merit', suggesting that particular attributes or ways of operating that tend to be associated with men are implicitly valued. This, Burton again argues, "can at times stem simply from a preference for 'what has come before', a conservatism in organisational culture".

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The gender discourse is particularly important because women dominate the informal sector and thus a response to the informal sector is largely a response to women. According to an ILO report in 2002, 'obstacles to organisational processes are normally more severe for women than for men because of women's multiple roles and responsibilities at the workplace and in the home. And within mixed-sex organisations, functions and positions tend to be influenced by gender so that women are under-represented in decision-making positions.'

The arguments above are clearly pertinent to the issue of women in technology and related occupations. In particular, they point to the importance of questioning whether certain unexamined assumptions operate in the world of work about appropriate career histories in science and technology as well as appropriate attitudes and approaches to technological work Affirmative action programmes are needed to challenge the expectation, that merit for an appointment or promotion is demonstrated by a career track.

Adults are generally influenced by social expectations with respect to the type of careers male and female pursue. According to Amissah (1991), Sanders found in his study of women in the labour force that, in spite of the gains in sex equalization effort, women still outnumber men 1.7:1 in service occupations, 3:1 in clerical jobs, and 7:5 in elementary school teaching. Also, 80% of librarians are women and 61% of recreational and social workers are women. Yet, only 10% of lawyers and judges and 12% of medical doctors were women in the study. By 1985, the American labour force consisted of 79% males and only 21% females.

Citing Gesinde, Bilson (1995) explained that the lower number of women in the labour force is the result of different socialising experiences boys and girls undergo. Through these experiences they learn different sex roles and behaviour patterns and thereby develop different interests, which manifest themselves in career choices. In the studies by Yuh, Sosabya and Osuagwu, Gesinde concluded that while Nigerian males preferred realistic investigative out-door and mechanized careers, females were significantly more interested in persuasive, artistic, literacy, social services and clerical activities (Ipaye (Ed), 1986).

Cegelka, Omiling and Lanmore (as cited by Shertzer and Stone, 1976) investigated the extent to which the vocational interest of 125 male and 138 female, ninth-grade students in U.S. differed as a function of aptitude. The study found a significant difference between males and females in the choice of career. Shertzer and Stone (1976) asserted that the actual physical sex differences appear not to be very important as a factor in the choice of a career. Rather, attitude and interest are of considerable importance in career development and decision-making process. The researchers believed that in spite of the fact that, much larger percentage of women are working today than before, there still persists a certain degree of resistance of women entrance into the labour force. This resistance is applied subtly as encouragement given to women to enter field designed as feminine and as discouragement given them from entering into predominantly male dominated fields.

According to Amissah (1991), Odoom established from three investigations conducted in Nigeria by Achebe, Olayinka and Abiri that

variations exist in the vocational interest or choice of male and female secondary school students. The result of the studies shows that males choose high-level status occupations while females give attention to middle-level status occupations. More males chose engineering while female chose nursing in a similar study on career aspirations.

Amissah (1991) stated that Odoom identified sex as one of the strong factors related to career aspirations from the study conducted by Williams and Woodward on factors influencing career aspirations of new entrants into a stratified occupational system. In the study by Odoom Amissah reported that Essuman observed from a study in Nigeria involving 3,334 post primary school students that occupations which require muscular effort and thinking are thought to be masculine, while those requiring affection (welfare service) are considered to be feminine vocation. Additionally, Odoom concluded that: (i) females do choose high-level occupations; (ii) males, on the other hand, prefer mechanical-technological activities more than females; (iii) males show higher interest in science activities and occupations than females; and (iv) females show higher interest in literacy and musical activities than their male counterparts.

### Theories of career choice and occupational sex segregation

Career choice is not made in a vacuum and theories, such as that of Roe (1951), take this fact into account. Roe stresses that the quality of early child-parent relationships affect the development of the child's interests, and in turn, adult occupational choices. Warm and loving relationships, she believes, leads to orientation toward persons in life generally and in career

choice. On the other hand, cold relationships lead to non-person orientation and career choice; scientist being a prime example of the latter orientation (Roe 1951).

Central to these theories is that a person can thoroughly explore all the possibilities, giving equal and full consideration to all his or her interest and inclinations. Thus, a woman is free to compromise and make a career decision. However, when it comes to the choice of occupations by women other factors come to play. These factors have been explained in theories of occupational sex segregation.

The main theme that emerged from the study conducted by sociologists Angrist, Almquist and Osipow (cited by Dolphyne 1987) into factors which affect career choice is that the sex-role socialisation colours a woman's career choice. The early socialisation of women and the sex-segregation structure of the labour force combine to place major limitations on women, resulting in their perceiving only a narrow range of alternatives.

According to this school of thought, women are not free to explore all their alternatives because they are conditioned by a 'feminine' socialisation to prefer and enter a limited number of occupations. Traditionally, little girls are raised to be passive, nurturing, helpful and subservient, thereby extending this self-concept to their role as workers. Those occupational fields which are largely male-dominated may be seen as masculine and, therefore, 'unsuitable for females'.

Angrist and Almquist, according to Dolphyne (1987), pointed out that those female-dominated occupations are attuned to women's motherhood, family and domestic orientation and can be seen as an extension of their

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nurturing and helping functions. Since the occupational structure parallels family structure, to a great extent, women tend to avoid situations that require initiative, and often consent to meek positions. Osipow (1973) identified parental models, husband's attitude, support and timing, and the age of children as other combined factors that tend to progress or hinder a woman's occupational career choice.

Recognising the crucial part that role models play in the career choice and development of women, Dolphyne (1987) further stated that Angrist and Almquist contend that women can more easily perceive themselves in careers when those around them act as influential models, demonstrating that occupation is an important personal commitment. This influential model is particularly significant when the role model is of the same sex, because then, the model clearly illustrates that a woman can play more than one central role, for instance being a mother and an engineer.

### Occupational sex segregation

Women choose to enrol in greater proportions in arts, human studies and social sciences than they do in mathematics, science and technology, the world over. The origin of this under representation of women has been largely structural, created in and through the social structures of institutions, the segmentation of the labour market, and internalised in values and beliefs about appropriate roles and expectations. These factors are manifested in a host of barriers to women's participation in various occupations in general, and specific to the technological domain. A number of theories have thus, been put forward to explain occupational sex segregation. Among them are:

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i.    Supply–side theory: (a) Neoclassical Economics; and (b) Gender
      Role Socialisation

ii.   Demand–side theory: Demand for Workers


Neoclassical economics as supply-side theory: Neoclassical economic theories assume that employees and employers are rational actors, and that observed patterns in the labour force can be explained by observing how each actor attempts to maximize his or her utility (usually defined as lifetime earnings) in a given situation (Sheridan, 1997). Based on this assumption Polachek (1979; 1981), used the human capital theory to explain that women choose female-dominated jobs because these jobs reward them better, given their family commitments, intermittent labour force participation, and part-time work requirements. The theory assumes that, because of their commitments to home and family, women must spend some of their childbearing years out of the labour force. Because they are not working, their unused skills become rusty, or depreciate." At the same time, by being out of the labour force, women are not able to accrue work experience or invest in on-the-job training and so they experience the "foregone appreciation" of human capital (England, Kilbourne, Farkas, and Dou 1988; England 1982).

Human capital theory suggests that women gravitate into women's jobs because they do not require a great deal of effort or commitment, and the skills needed to do these jobs do not deteriorate when they are not used for a period of time. Furthermore, women's jobs have a lower return for labour force experience and less on-the-job training. Thus, the theory explains the movement of women into these female-dominated jobs, because depreciation

of skills is penalized less, and the foregone appreciation of human capital, which occurs when women leave the labour force, is less than in male jobs (Reskin & Padavic, 1994; England et al. 1988; England 1982).

Researchers evaluating the human capital theory as an explanation for occupational sex segregation, have looked at both the characteristics of women (their family commitments, levels of education, time out of the labour force) and the characteristics of female-dominated occupations (wages, part-time work). However, both types of analysis find the human capital model unconvincing. From the side of women, the presence of children appears to increase rather than decrease the movement of women into male dominated occupations (Beller 1982; Rosenfeld 1983; Rosenfeld and Spenner 1992) and also marriage seems to have little relationship to the sex-type of a woman's occupation (Rosenfeld 1983; Beller 1982).

Similarly, those researchers who have evaluated the characteristics of female jobs, and the notion that female-dominated jobs have advantages for mothers have similar criticisms of the human capital model of occupational sex segregation. England (1984; 1982) and England et al. (1988) have convincingly challenged the idea that female-dominated occupations penalize women less than male-dominated ones for time spent out of the labour force. England (1982: 366) found that clerical workers actually suffer higher penalties for time spent out of the labour force than non-teaching professionals or operatives, and concluded that there were "no significant tendencies for predominantly female occupations to offer women lower rates of depreciation or foregone appreciation".

<u>Gender role socialisation as supply-side theory:</u> Another supply-side theory for occupational sex segregation is gender role socialisation. This theory suggests that women choose to work in female-dominated occupations because they are socialised to act in certain "feminine" ways, and female-dominated jobs utilize these traits, while male-dominated jobs do not. For example, Sears, Roebuck, & Co. was sued by the Equal Employment Opportunities Commission in the 1980s because Sears employed men in the higher-paying commission-sales positions, and women in the lower-paying retail sales positions. The judge in the case ruled that women chose the lower-paying jobs because "Women tend to be more interested than men in the social and cooperative aspects of the workplace".

The ruling suggests that women tend to see themselves as less competitive. They often view non-commission sales as more attractive than commission sales, because they can enter and leave the job more easily; and also because there is more social contact and friendship, and less stress in noncommissioned selling" (court case:EEOC v. Sears, Roebuck, & Co. 1988, as cited in Reskin & Padavic,1994). Thus, women's socialisation to have traits such as passivity and cooperation leads them to choose the jobs that complement their "feminine" qualities.

Unlike neoclassical economic theory, gender-role socialisation theory has been more fruitful in explaining women's mobility out of female-dominated jobs. Quantitative studies which used measures of sex-role socialisation other than occupational aspirations report interesting results. Waite and Berryman (according to Sheridan, 1997) found that girls whose mothers worked in a blue-collar job were more likely to end up in a male-

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dominated occupation. Similarly, Rosenfeld and Spenner (1992) found that girls with strong work orientations were slower to leave male occupations, and those girls who expected to hold high-status jobs were quicker to leave female jobs when they began working.

When occupational aspirations are used as a proxy for the rigidity of a person's gender-role socialisation, researchers have had mixed conclusions. Gerson, (1985) in her qualitative study on women's career choices, found that "over two-thirds of the women who expressed rising aspirations toward non-traditional pursuits experienced some form of upward mobility out of dead-end jobs, and especially out of job categories dominated by females". Jacobs (1989) argues that women who have aspirations for a female job when younger are almost as likely to work in a male-dominated occupation at some point in their lives with male aspirations. He concludes that occupational aspirations and sex role socialisation are just one element of the social control which keeps women from entering and staying in male-dominated occupations, and that other mechanisms become more important over the life course (Jacobs, 1989).

These studies indicate that while the gender role socialisation of girls appears to have some impact on their eventual choice of a sex-atypical occupation, other mechanisms are required to recreate the current levels of occupational sex segregation.

Demand for workers as demand-side theory: One demand-side theory explains occupational sex segregation by looking at the demand for workers in the labour force. It posits that when the pool of preferred workers for a sex-typed

occupation is restricted, employers increasingly turn to other workers to fill the jobs (Reskin and Roos 1990). Thus, occupational growth and low unemployment should increase women's access to male-dominated jobs. Occupational growth does appear to enhance women's access to male dominated occupations. Jacobs' (1992) study of the growth of managerial jobs estimated that occupational growth accounted for one-fourth of the decline in occupational sex segregation between 1970 and 1990. Industrial growth, on the other hand, is associated with a decline in women's access to occupations (Glass, Tienda and Smith cited by Sheridan 1997). Finally, although unemployment rates are an indicator of labour supply, they have not been associated with changes in occupational sex composition (Jones and Rosenfeld 1989; Reskin and Roos 1990).

## Conceptual framework

The study is designed to examine the constrains that act as obstacles to full participation of women in male-dominated occupations, in particular, as women artisans and technicians in science and technology related occupations. The conceptual framework for the study is derived from various concepts in the literature that have been used to explain the under-representation of women in occupations dominated by men. However, the main theoretical framework used in the study is the occupational sex-role segregation.

Almquist and Osipow (cited by Dolphyne 1987) observed that sex-role segregation is a factor affecting women occupational choice. They contended that social patterns are structured in such a way that men have a wide range of occupational choice, while women have narrowed and limited choice. Angrist

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and Almquist (cited by Dolphyne 1987), argued that females identified certain jobs as an extension of their motherhood, nurturing and helping functions

The human capital theory, in relation to sex-role segregation, suggests that women gravitate into women jobs because they do not require a great deal of effort for participation. Furthermore, the skills needed to do these jobs do not deteriorate when they are not used for a period of time. Thus, the theory explains the movement of women into these female-dominated jobs on the basis that depreciation of skills is penalized less in such occupations. Also the foregone appreciation of human capital, which occurs when women leave the labour force, is less for these jobs than it is for male jobs (Reskin & Padavic, 1994; England et al. 1988; England 1982).

However, Rosenfield and Spenner (1992) argued that girls with strong work orientation and high expectations in attaining higher status jobs preferred jobs in the male domain. Hence, Jacobs (1989) concluded that sex-role socialisation and occupational aspirations are the element of social control which has implications for women's occupational career choice.

## Women participation in science and technology education

There are several ways in which science and engineering pose difficulties for women, some of which appear at school level and continue to operate and others do not appear until women start practicing a trade. Of those which appear at school level, the most important include difficulty of identifying with an activity which is clearly male dominated; and the disagreement between the intellectual demands of science and technology and the feminine personality (Folguera, 2002). These difficulties constitute barriers

to women participation in science education at the school level and subsequently at the post school level and at the work place.

### Barriers to women's participation in science and technology education

Several factors can explain why there are so few women in science and technology and why many of them drop out after initial decision to enter the field. Prejudices are particularly strong in the world of science and technology. Science is seen as an essentially masculine activity, not only because, historically, almost all scientists have been men, but also because the attributes of science itself are defined in terms of the attributes of males. Folguera (2002) acknowledged that "the scientific and the technological mind are viewed as active, rational and logical, whereas the feminine has traditionally been characterised as passive, emotional and intuitive" (p.5). In this scenario, the traditional conceptions of femininity do not fit easily with science and technology. She continued that the cultural stereotype of science, as linked with masculinity is crucial in explaining the small number of women in science. If science is seen as an activity appropriate for men, then it is hardly surprising that girls and young women usually do not want to develop the skills and behaviours considered necessary for success in science.

The consequences that such environment creates for women, Hihson (1976) added, include: discrimination, sexual harassment, isolation and exclusion from informal networks. These problems Teichler (1998) agreed, are linked to the different modes of communication between men and women and lack of opportunities for career development along scientific and

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technological lines. According to Busquin (2003), these create informal barriers where women are singled out, overlooked, ignored or discounted

Harding (1986) argued that there is evidence to support the claim that the under-representation of women in education generally, and in the wide field of science and technology in particular, has been given deserved attention. As a result of this worldwide attention, varied efforts have been made to find solutions to the inadequate number of women in the field. One of such efforts is the increased importance on science and technology for national economic development. Another is the growing commitment to influence the move towards equality of men and women.

Several causal factors have been identified for women's low participation in science and technology education. Rübsamen-Waigmann and Folguera (2003) summarize the barriers that play a role in under representation of women in science and technology to include: (i) lack of information on Science and Technology (S&T) careers, (ii) women's lack of self-confidence, (iii) entry requirements, (iv) lack of career opportunities for women, (v) biases in hiring practices (recruitment), (vi) lack of role models and (vii) a gender pay gap and gender stereotypes.

McGregor and Harding (2001) were of the view that women feel they are judged by an entirely different set of standards. As a result, women develop a lack of self-confidence, low expectations or low aspirations, and have to work harder than men to prove themselves. This, they noted contributes to stress and the creation of an unfriendly environment, in which it takes time and energy to ignore or to deal with these forms of behaviour. Again, the Committee on the Advancement of Women and Minorities in

Science, Engineering and Technology Development (CAWMSETD) in a survey on women in industrial research in the year 2000, noted that "since women scientists are under-represented among senior managers in science and engineering, it leads to a lack of mentors and female role models". However, the report further indicated that mentors are valuable to women's career development. Also, commenting on the importance of mentors to women career development, the Committee on Women in Science and Engineering (CWSE) reported in 1994 that "researchers have shown that women with successful S&T careers had mentors who supported and encouraged them, particularly through the early phase of their career choice".

Harding (1986) classified the factors accounting for the low participation of women in science and technology into three: (a) the assumptions that society makes about males and females in terms of their abilities, behaviours, roles, and aspirations; (b) the objectives and organisation of education; and (c) the practice of science, technology and mathematics. These factors, she highlighted, are embedded in the political and cultural context of society. She also cited the study by Maccoby and Jacklin which concluded that males display superior spatial skills, and females show greater verbal skills (in both cases with the sex differential increasing with age sample). However, in none, did the sex of the person contribute more than four percent to the total variance within the sample. Furthermore, there was much more variation in spatial abilities within one sex than between the sexes. In the view of Harding, the situations described above favour the presence and entry of men into engineering and other science and technology fields, hence the comparatively low female participation in the field. Thus, she summarized:

Despite these findings, however, there persist schools of thoughts which are still firmly based on "perceived" biological sex differences,(genetically pre-programmed), that promote boys' effectiveness in mathematics and linguistics than girls and which consequently precipitate the subject specialisms (Harding, 1986).

**Reconciling family and workplace responsibilities**

Reconciling family and work is a concern for women artisans and technicians. Busquin ((2003) had this to say:

"Women in industry find difficulties combining family life and working life, while many women scientists and engineers cite the integration of family life and work as a primary concern; it seems that they often encounter difficulties in combining both activities because both are demanding in terms of time and personal investment". Busquin ((2003:6).

Furthermore, he pointed out that the reconciliation problem is particularly harsh in scientific work compared to other fields, because women scientists are often married to men who pursue careers very similar to their own. This results in both partners being affected, particularly, by the demanding features of a technical career.

Research has identified the significance of women's career paths and domestic responsibilities as having an impact on their level of activity in the world of work. Cass (1983) for example, noted that women appear to have faced the possibility of the 'forced' choice of domesticity and parenthood in

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ways that men do not. She continued "For men, their families constituted a domestic support system that facilitated an achievement-oriented, competitive and geographically mobile career-system" (p.9). Cass argued further that career has been built into it a set of assumptions and processes concerned with continuity, competition and productivity, and set to a time-scale in which reputations should be made and secured early. She added that job discontinuity or winding career paths, due to domestic reasons, is inappropriate in the world of the 'clockwork' career. She concludes that there is some evidence, however, of "increased reciprocity in the domestic relations of male and female that might suggest the possibility of change in the future" (Cass 1983).

According to Cass (1983) Castleman cited the study by Grimes which suggests that employers of higher education graduates regard women as particularly suited to part-time and temporary employment, regardless of their actual or intended domestic arrangements. This suggests that many women, in their bid to prove their worth in engineering and technology, may forgo the experience of motherhood in order to succeed in their chosen career, a point also authenticated by Cass. This shows the extent to which career choice affects women and family. Some jobs are such that women are discouraged from participating; because of the stress imposed by employers and society at large.

However, on a cautionary note, Bozzoli (1991) postulated that there was some compatibility of women's household roles and their work in the informal sector, and highlighted the possibility that women sometimes chose to work in the informal sector, because the sector provides forms of employment that could be combined easily with childcare and housework. On

the other hand, he believes that domestic and factory work could not adequately provide for these household roles. The informal sector he further stated "therefore, appears to have operated as a defensive mechanism both against full proletarianisation, and as a means of protecting the less traditional household". By avoiding work that involved long absences from the home means that the sector enables women to partake in the management of their own households.

Bozzoli concluded that the feminist view exposes the easy entry of women in the informal sector and their incomplete proletarianisation, which links their wage work with household work. This, he noted, explains the structural position of women in the labour market.

The next impediment pointed out by Etzkowitz, Kemelgor and Neuschatz (1991) in their study of women in academic science research was that when a married woman is about to attain a higher position, it is then that the problems come into play, typically deflecting women's careers from their highest potential. They contended that marriage and children are generally viewed by male faculty members as impediments to a scientific career for women. The study noted that even those most supportive of women in science had some disappointments with very good women who settled for jobs that were less equivalent to what men would do.

The writers further stated that these people who claim to support women often make derogatory remarks such as "You have some extremely good people you think are going to go out and make a mark and then somehow or other they marry somebody and spend their time in a bad career" (p.46). The report added that for a man to decide not to take his career

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seriously is like admitting he takes drugs. But, for a woman to say she puts her family ahead of her career is considered a virtue. This, the writers added stems from the pressures of society. For example, Etzkowitz et al went on to say that the women are told, "Isn't this wonderful. You are giving up your career to sacrifice for your husband". The pressures, the writers concluded, come from society, relatives, to some extent the men involved and the parents of the husband.

### Interest and experience

Oost (1988) reported a Project Technika-10, which was started in the Netherlands in 1985 to stimulate girls' interest and knowledge in technology before the age of adolescence. Research conducted established that young girls aged between 10 and 12 have the same affinity and interest in technical features as boys, but girls on the other hand, have less experience and knowledge. Their limited experience stems from the fact that girls are provided with games and items which do not stimulate technological insights.

Kellly (1975) agreed by commenting that "toys and games teach children a great deal about 'appropriate' and 'inappropriate' gender roles". She went on to explain that even the packaging plays a part. For example, she noted that boxes showing girls playing with dolls and tea sets and boys playing with erector sets, or doctor kits; and showing a boy as the doctor and a girl either as a nurse or patient, send information to children on who is supposed to assume a particular role. Also, the fact that children select same-sex playmate begins to reinforce gender roles for both boys and girls.

Kelly (1975) observed that some abilities are more necessary for science and technology than others; however, what is not so obvious according to her is that some personalities can make better scientist or technologist than others. Drawing more to the point, Rossi (1975) noted that studies of scientists do show a remarkably consistent personality type. Scientists and technologists are typically independent, self confident, somehow unsociable and uninterested in people, with a non-verbal intelligence bias. If technology presents the above character, then it is no wonder women are under-represented in this field.

### Impediments to female participation in science and engineering programmes at school level

Blackstone and Weinreich-Haste (1980) reviewed studies on "Female participation in science and engineering". They found that girls tend to set their sights lower, take easier courses in further education, take fewer A-levels for higher education; and thus are less likely to go on to higher education. They also found that girls attribute their success to luck and external factors and attribute their failure to lack of ability. Boys on the other hand, tend to be opposite, and attribute successes to themselves.

Newton (1986) reported that girls were found considerably behind boys in having experience in physics, crafts and technical subjects. The reasons found for girls' under-participation in physics, wood work, metal work and technical drawing included (i) their being prevented from taking the courses, (ii) lack of or shortage of facilities and staff, (iii) social pressure, and (iv) absence of traditional career guidance. Newton also found that girls reported

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that they were not exposed to engineering careers until it was too late for them to choose the appropriate subjects necessary for engineering studies.

Stan (as cited in Badekale, 1996) noted that, in the United States, research indicated that girls have poor attitude towards science, thereby enrolling less often in it and demonstrating lower achievement levels in the subject. Skolnick according to Badekale (1996), also argued that since poor attitudes relate directly to lower achievement levels and to lower enrolment in science courses, negative attitudes must be ameliorated in girls and women in science and technology.

Keino (1985), was of the view that differentiation in course choice based on gender is not biological, but is rooted in sex stereotyping the world over. In the school system, female trainees may be presumed unprepared to cope with science and technical subjects or lack confidence in pursuing masculine courses. Also, the school structure and attitudes in co-education institutions may not be supportive of females taking high-tech subjects.

Another factor identified by Keino is lack of female teachers to act as role models in the fields of high-tech training such as mechanical engineering, electrical engineering, building construction, wood and metal technology, motor mechanics and plumbing. This may discourage the few who have the interest and aptitude to venture into any of them. To this end, those who wish to venture into the male-dominated courses may become discouraged when they find they are the only one or two female(s) in the course. Nevertheless, Keino reported that attempts have been made to integrate Kenyan women into the development process, but a great deal still remains to be done "if the disparity between the 'de jure' and the 'de facto' positions is to be closed".

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Auvinen (1970) argued for the necessity to have females in the science and technological arena. She stated:

In the automated and programmed society of the future, special talents and abilities will be essential to carry out highly skilled jobs requiring an advanced level of education in mathematics, science and technology. Where women are denied this, they will lose in the labour market (Auvinen 1970:73).

Auvinen's argument on women to stand to be counted in their efforts to venture into fields previously male-dominated is geared towards the acquisition of appropriate skills that will improve the employment prospects of women to be at par with their male counterparts who dominate the 'high-tech fields' in training. She concludes that without an understanding of what makes people behave the way they do, little can be done to change the way women behave. On the other hand, if it will be possible to discover what causes certain behaviours, for example, the factors that influence female participation and course choice in vocational and technical training, there will be at least some hope of attacking the root cause of the problem rather than dealing with the symptoms.

In the view of Emmanuel (1982), market forces also contribute to low female participation in science and technology education. He argued that:

Nobody signs on at a technical school or university in order to help the country import a certain technology. One chooses one's speciality and one's school as a function of a sliding scale of remuneration already in force in the labour market. If young women tend to flock toward social sciences rather than in

chemistry or electronics, it is not because they have a congenital preference for rhetoric, but rather because there is an administrative apparatus which absorbs those skills, whereas there is no outlet for them either in chemistry or electronics (Emmanuel 1982:52).

The argument is that no indirect encouragement can induce someone to set out to learn a given trade or to specialise in a particular form of know-how, if the corresponding outlets for it do not exist. It is the jobs offered by enterprises that are seen to be working and whose potential can be assessed that brings forward candidates, women trainees included, to take up the appropriate form of training.

Teese, Davies, Charlton and Polesel (1995) pointed out that girls, more than boys, rely on completing school as preparation for employment because (i) their vocational alternatives are very limited and (ii) their main employment opportunities lie in the services sector of the economy, with limited openings in manufacturing and construction. They are thus required to make more use of schooling than boys. Given the direction of industry growth, higher school completion rates should work in favour of girls. However, the ability of individuals to exploit emerging career opportunities depends not on length of schooling as such, but on content of learning and quality of performance.

The research carried out by Teese's (1995) on schooling of girls tends to suggest that greater use of and reliance on school by girls is not benefiting them; partly because they are over-represented in subjects which lack effective vocational linkages. Boys on the other hand, have been able to make less use

of school because they have available and organised alternative system of accredited vocational education and training in the workplace. This research strongly supports the point that subject choice within the curriculum hierarchy is crucial.

Furthermore, staying on at school does not imply that girls have available to them structured alternatives inside school which compensate for lack of craft training outside. He further noted that the kinds of subjects which girls choose do not cohere in the way to those of boys and the girls' subject selection do not reflect the same vocational emphasis as those of boys. The weakness of curriculum structure, as experienced by girls in school aggravates the lack of structured training alternatives outside school (Teese 1995).

Teese added that girls are less confident than boys, either about jobs at the end of school or careers after further training, despite the fact that girls complete school more often and have a somewhat higher rate of transition to university. He is of the view that there is a very possible link between this comparative lack of confidence in the vocational outcomes of school and the view of girls about school life and the role of the school. The researcher pointed out that "girls are more likely than boys to endorse developmental, ethical and enrichment goals, while boys concentrate on the "main game" of academic results and mapping out a career. More to the point, Poole and Langan-Fox (1997) added that these differences are mirrored in the different orientations of men and women to the concept of "career" and to the notion of a life path.

George and Kaplan (1998) used the data of Unites States National Educational Longitudinal Study (NELS 88) to focus more narrowly on

parental involvement and its relationship to students' attitudes to science. Again, key background variables were factored out. The researchers concluded that, 'One of the important effects in the study is the influence of parental involvement on science attitudes.' The more the parents showed a positive attitude to science, the better the pupils' achievement in science. The parental effect works through discussion of school experiences and through arranging or supporting activities in science clubs, libraries and museums.

Contributing to the debate, Kelly (1975) and Ormenerd and Duckworth (1975) added that science, as portrayed by many in books, television, 'sciencey' gadgets at home, in school and so on carry masculine image. They noted that the most striking thing about choices made in the areas of science is that girls choose biology while a great number of boys choose physics. The researchers argued further that girls are more interested in nurture and people rather than things and machines. In this wise, finding the reasons that have accounted for the low representation of females in science and technology is justified.

### Socio-cultural dichotomy of masculinity and femininity

### Dominance of men in engineering

A cursory glance at the different engineering fields all over the world and, in particular Ghana, reveals that men dominate the fields and the profession is regarded as a male domain. Walton cited by Badekale, (Badekale 1996), reported that societies do not expect women to become scientists and those that do are seen to step "out of line". Also, according to Kelly (1975), Wyne-Jones stated that for a girl, social science is respectable, biological

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science is just permissible; physical science is beyond the 'pale' and engineering science absolutely prohibited. As a result of these restrictions, women are under-represented in the engineering fields and are over-represented in what can be termed the service-sector. The jobs in this service-sector include teaching, nursing, sales and advertising. However, the explanations given for this dominance by men in the fields of engineering and sciences have been mostly speculative. According to Badekale (1996), Breakwell argued that there are undoubtedly overt institutional and organisational barriers which function to restrain access or involvement of women in those fields.

Gutek (1987) identified a model for four different reasons why so few women have attained positions of significant in formal authority. The reasons are (i) individual deficit, (ii) structural factors, (iii) sex-roles and (iv) inter-group phenomena. She also pointed out that of the four reasons, interventions aimed at remediation of individual deficits are the most feasible and attainable. Structural interventions are considerably more complex, while changes in sex-roles and inter-group phenomena are societal in nature and imply a major reconstruction of society. Her model explains why much previous work in the area of career development for women has concentrated on overcoming women's alleged work-related problems. She further asserted that this structural-institutional model highlighted the positive impact of role models and company policies as having influence on careers of women.

The dominance of male in engineering and technology occupations is still a phenomenon. Blackmore (cited by Cass 1998) drew attention to the importance of measuring the progress of women in institutions of higher

education through more complex measures than simply their proportional representation in positions of power and prestige. The formal focus conceptualises the 'problem' as a consequence of the choices women make or of what they lack. On the other hand, Cass (1998) considered mere representation of women in positions and power as their 'neediness'. A number of world conferences on women empowerment, has sought to shift the equal opportunity agenda for women away from the framework of women participation in technology and its related occupations and rather to focus on the structural barriers to women's full participation. But Cass and others argued that this move to reshape the equal opportunity agenda has not been entirely successful.

Newton (1986) described the traditional image of engineering as being heavy, dirty and masculine and so a woman who would succeed in the field had to be tough, aggressive and masculine. If she does not possess these characteristics, then she must work in menial jobs requiring manual dexterity and "nimble fingers".

The masculinity surrounding the image of engineering over the years remained very powerful and in turn reinforced the belief that the field is unsuitable for none other than men. Thus, women until recently formed a small percentage of total enrolments in university engineering departments all over the world. Linden et al (1985) and Sheridan (1984) affirmed that in the United States, the number of women who matriculated into and graduated from engineering faculties had increased over the past decade. They reported that women now form about 20 percent of beginning engineering students. They also opined that there had been changes in attitudes towards the roles of

women and the probable changes in women's own perception of their capabilities.

Several developments have brought about this shift in the traditional view of science and engineering as perceived by men and women. For example, Newton (1986) observed that less emphasis is now placed on the "older heavy type of engineering", while talk is more and more about computers, printed circuit boards and electronics. Furthermore, the roles of women and men have been changing, as a result of (i) women's liberation and empowerment movements, and (ii) changes in economic conditions which are altering the division of labour and raising questions, otherwise left unasked in the past. Particularly, concern has been intense about increases in the number of women in technology and how their access to the fields will be made easier. Finally, it must be observed that though there are increases of women in engineering enrolment, much is still needed to improve the lot of women.

**Masculine nature of the traditional classroom**

Badekale (1996) reported that Whyte and others paid several visits to eight schools and found, among other things, that "the sexes constantly divide and are divided at school; boys dominate classroom discussion, boys insist on more of the teachers' attention; boys and teachers 'masculinize' the lesson content in science and crafts; boys 'hog' resources; girls 'fetch and carry for the boys'... ".

Alting and Udo (cited by Badekale, 1996 ), in their study of girls and women in science and technology in Nigeria, affirmed that on the first day of "Science, Technology and Engineering (STE) School", some girls were

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extremely nervous, shivered, felt very tense, were anxious or had headaches. The girls studied attributed these reactions to their conspicuous position as "the only girl in a boys' group". They, however, found that the presence of other girls and reassurance from boys they had previously known, and who also were attending the STE, reduced the anxiety of the girls.

Alting and Udo also found that some of the teachers in the male-dominated classes do not know how to react towards girls in their classes. They found teachers' reaction to be inconsistent towards both boys and girls. While some teachers were found to be antagonistic and biased towards girls and their work, others were indifferent to them. Some teachers also thought that the presence of girls has positive effects on the behaviour of boys, while some thought intimate relations between boys and girls could negatively affect the school atmosphere. Girls in the study also reported that teachers had authoritarian style, which they did not like.

A study by Parker, Rennie and Hutchinson (1985) emphasized that teachers' attitudes and behaviours have a critical influence on the attitude of their pupils. After an in-service programme conducted for ten teachers (five males and five females) the pre and post treatment questionnaires, revealed that the experimental teachers became more conscious of their attempt to "be fair to both sexes" in time and attention given. The study thus revealed the necessity for teachers to change their attitudes and behaviour towards females in their classes.

Badekale (1996) reported a study by Staberg in which she observed science lessons in grades 3, 7, and 9, Staberg found that girls in general participated in fewer interactions than boys. Girls, who made up about one

half of the class, got only one third of the attention. She also observed that girls neither seemed content with this as they made very little effort to participate nor adopted attention-seeking strategies. On the other hand, boys dominated the pupil-initiated interactions; they talked more and also dominated physically by being more active than girls.

Interviews in the same study revealed that girls complained about unpleasant behaviour of teachers. However, some of the girls thought that, in most cases, teachers' behaviour was unintentional, but was due to male teachers' limited knowledge on how to handle girls.

The New South Wales (NSW) Department of School Education in Australia conducted an extensive evaluation of the outcomes of girls' schooling in 1994 and stated the following conclusions: (1) while girls' academic outcomes at school level have improved, their post school destinations remain limited and (2) while a greater proportion of girls are entering tertiary study, boys continue to outnumber girls in science based faculties.

The evaluation also identified some of the factors which contribute to unequal academic outcomes for girls:

(i)     girls' greater family and domestic responsibilities;

(ii)    few teachers have a strong understanding of gender equity; and

(iii)   gender issues are not widely addressed in classroom practice.

It also came out from the evaluation that although girls reported a wide range of incidents of sex-based harassment, the majority of school executives believe that sex-based harassment does not exist in their schools.

McGaw (1997) believed that because they are a small select group, the girls who do take male-dominated subjects achieve well. However, their levels of participation continue to be far lower than those of boys. For example, McGaw found that Girls' participation in higher level Mathematics and Physics has actually declined from 1991 to 1995, their participation in technology-related subjects remains at about five percent of that of boys; and they are virtually absent from classes in Electronics, Industrial Technology and Engineering Science

Probert, Ewer & Whiting (1998) reported of a research by Daniel conducted in a number of professions and occupations and revealed that women had not made advances towards equality in the public sphere at all, and may have gone backwards in some fields. They cited an example in the research that in higher education, the proportion of women above Senior Lecturers remained static at 13% from 1988 to 1996

As far as the roadblocks to women's entry into the technology and related fields are concerned, Suriya (1998) in her contribution to women participation in IT argued that women's preference for non-scientific and non-technical subjects is cited as one of the major reasons. She further stated that many of the women who have made in-roads into high-tech industries studied computers, mathematics, engineering, or other science and technology disciplines at the undergraduate level. She went on to support her argument with an example that in 1996, men were three times more likely to choose computer science as a field of study than women.

Moreover, Suriya was of the view that women's participation in other technology-related disciplines is parallel to IT. She stated that "overall,

women earn about one of every six bachelor level degrees awarded in engineering which provide the gateway to many technical careers in the United States economy". Again, she highlighted the Information Technology Work Force Convocation (ITWC) report on some of the barriers that blocked women participation in technology. These include: (i) less encouragement to enter technical education and careers due to a lack of role models in the technical professions in school, at home, in post-secondary education, in the work force, and among high-tech business owners and executives; (ii) image of the IT profession; (iii) learning styles; (iv) lack of networks among peer groups; (v) glass ceiling and (vi) employers bias in hiring policies.

Carens, (1998) from a study conducted by the Carnegie Mellon University in the United States also indicates that early exposure to science and technology could change women's perceptions.

**Women and the labour market**

In the job arena roles are traditionally assigned along gender lines. This is ingrained in the traditional Akan sayings like, "a female sells garden eggs, but not gun powder". The diversity of occupations dominated by men tends to suggest that men possess a wide range of skills, talents and intelligence. On the other hand, the dominance of women in service professions, such as nursing, waitressing, sales girls, day-care workers and petty trading seems to have the implication that female's abilities, potentialities and intelligence are limited. Again such female dominated occupations tend to pay less, confer less autonomy and power than those, which are male dominated.

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In Ghana, females tend to choose sex-stereotype occupations like hairdressing, dressmaking, cooking and homemaking related professions. Manuh (1984) reiterated that in Ghana, the predominance of women in the informal sector is largely a reflection of a lot of factors. Among them are work segregation; women's relative lack of education and skills compared to men; and the sexual division which assigns all household duties and tasks to women. These factors are easy to combine with economic or productive activities in the informal sector.

With regards to domestic duties, Australian government research showed that unpaid work continued to fall disproportionately on women regardless of wage rates, education or husband's income. Also in employment fields with a strong masculine culture, the percentage of women remained extremely low. For example, the number of women in Engineering was found to be very low (Bittman, Wolcott and Glezer, 1995 and Poole and Langan-Fox, 1997).

Labour market discrimination acts as a further barrier. According to a UNESCO study in Pakistan, women were hired less, often received lower pay for equal work, and were in lower grades of post, despite equal or better qualifications. The exception to this, the study found, was in scientific and medical fields, where women were more highly paid. However, while in teaching women receive equal payment as their male counterparts, they were paid significantly less in engineering and technology (Hussain, Sanyal, Abbasi &. Shahrukh, 1987).

Badekale (1996) reported Kanter's research on female workers which showed that women did not seek or find career success for several factors. One

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important factor was that women learnt that high achievement meant a loss of their traditional femininity, which was preferred and was thus preserved, while achievement was sacrificed. The study however, revealed that there were no serious sex-related individual differences between women and men's behaviour at work. Conversely, lack of opportunity to succeed, and not a personality style that spurns success, is what separates the women from men.

Opare (2003) deduces from Kane's research of observation on women and work, that women perceive the market place to be heaven where they can go to make money if all else fails. This, he noted, shows clearly that girls lack to perceive how to achieve success in their occupational aspirations and do not have concrete and realistic ideas about occupations they are likely to get and how to excel. These personal perceptions limit their aspiration in vocational and technical choice.

Prugl and Tinker (1997) have this to say about home-based work and women:

> Women in home-based work are inserted differently into the labour force than men because of socially constructed roles, which tie them to the home. Thus homework exposes the contradictions in women's work, such as the passing of homework as household work and the subordination of women to the home (largely as dependent on the male breadwinner), even though they have independent contracts with formal enterprise. As a result, Home based work, more than any other type of female employment, challenges the gender bias in constructions of workers as legal and

economic subordinate. On the other hand, they reveal that a dualistic understanding of workers as either employed or self-employed fails to capture the complexity of women's insertion in the labour market. (Prugl and Tinker, 1997:476).

Rübsamen-Waigmann, et al. (2003) concluded that industry is also a sector where the exit rate of women is higher than that of men, and which might suggest that women perceive the climate in industry as inhospitable. This they explained could be due to the fact that most science and technology fields are male-dominated, which means that women are subject to values and criteria that men have established for men, not for women. The consequences for women include discrimination, sexual harassment, isolation and exclusion from informal networks, problems linked to the different modes of communication between men and women, and lack of opportunities for career development. The researchers affirmed that there are also informal barriers whereby women are singled out, overlooked, ignored or discounted.

Contributing to the debate, Ramsay (cited by Cass 1998) articulated that present-day feminists analyse the position of women in major organisations and workplaces and are quick to criticise studies which focus purely on the characteristics of women and the factors that might be preventing them from full participation in those male dominated occupations. It is argued that instead of focusing on 'the problem of women', far more attention is paid to 'the politics of privilege' in which male characteristics and life patterns are made the norm, thereby marginalising the activities, experiences and characteristics of women.

Regarding job satisfaction among women scientists and engineers, the important issues for women working in the industrial sector include career development (promotion, salary increase, and recognition), training, level of responsibility and trust, level of job interest, hospitable work environment, flexible working arrangements, job security and the existence of mentoring. Thus, top managers can use these motivations to attract more women to their firms. Indeed, having more women in technology is essential since a broadening of the recruitment base will facilitate a better match with the market and with clients. Moreover, women have different qualities than men and, therefore, more women in technology-based occupations increases diversity, changes modes of communication and bring something new to the innovation process and thus improve the sector's competitiveness. But, McGregor & Harding (2001) observed that achieving equal presence and equal working conditions for men and women in science and technology involves both significant opportunities and significant constraints

Commenting on women's upward mobility in the job arena, Mr. Asafo-Adjei, in his opening statement at the National Women's Conference of the Construction and Building Materials Workers Union of the Trade Union Congress, advised all workers and females in particular, to develop their professional and academic status to facilitate their progression to the top. (The Daily Graphic, Thursday, November 18, 2004, number 149284).


**Socio-cultural barriers**

Cultural and common patterns in the role and status of women tend to emerge across countries, despite widely different circumstances. They reflect

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the cultural and cross cultural social norms and traditions by which the subservient status of women is maintained. In some societies, these create "almost challenging obstacles to women's participation in education" (Evans and King 1991). Evans (1995) stated that the analyses of participation rates in different social and cultural contexts (as indicated by Kember, King and Hill) showed that they reflect closely the relative status of women and the power of tradition.

However, socio-cultural barriers in Africa have given rise to misconceptions about the role of women in development. Traditional societies placed the human worth of female children below that of male children. For example, Ngau (1991) cited the cultural practice among the Kikuyu of Central Kenya where the birth of a girl is greeted with four "ululations" while that of a boy receives five. Similarly, among the Luo of Western Kenya, the drums boom three times to announce the birth of a girl and four to announce the birth of a boy.

Evans (1995) observed that perceived attitudinal differences in male and female roles and capabilities are inculcated through socialisation in the home and family and reinforced through schooling, vocational and career guidance services and experiences in the workplace. He also added that peer pressure and absence of female role models are other attitudinal barriers. Lack of confidence and self esteem, he noted, is itself a major barrier, and it is the one which every successful initiative in this field has found it essential to address directly and specifically. It implies that enormous motivation and self-confidence is needed to break through these barriers.

Society through the socialisation process, has established specific roles for males and females. Formal education and training is the modern strategy for preparing the youth for their future roles in society. In a survey of female students in institutes of technology Ngau (1991) observed that the youth are expected to take courses that will prepare them for appropriate occupations. She found in the study that many parents, some teachers and a number of female and male students did not think a female student should be allowed, let alone be encouraged to enrol in courses that have been the preserve of males.

Sometimes traditional beliefs and taboos are invoked whenever necessary to discourage girls from taking certain courses. A typical example is found in a survey conducted by Ngau (1991) in a number of technology institutions in Kenya. She found that among the Gusii and Moi Institutes, girls were discouraged from training in Masonry and Electrical Installation courses, because among the traditional believe of the Luo, women were not supposed to climb on tops of houses, trees or poles. Ngau noted that to break such taboos is prevented with some kind of divine punishment and where such beliefs are strong punishment could be severe. For example, she said a house built by a woman must be burnt down to serve as a deterrent to other women.

Traditions die hard and the ones mentioned above are no exception. While things are changing slowly, there are still some people who take such beliefs seriously. According to Ngau (1991), some of the principals of the institutes where female students were taking the traditionally masculine courses of Mechanical Engineering, Masonry, Carpentry & Joinery and Electrical Installation had problems placing them for industrial attachment. One of such student (the only one in Gusii Institute who was doing Masonry)

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alleged that she had been attached to the Ministry of Public Works, where she was given very few opportunities to have hands-on experience. She was about to complete her course, but she had never had a chance to roof a house.

She continued that other female students in these fields who had been on attachments, revealed that men in the industries did not take them seriously and, therefore, gave them less challenging work than that given to their male counterparts. They commented further that these men sympathised with them and assigned them the less risky jobs while other foremen treated them like pets for display in the workshops. Although the girls complained bitterly about such negative attitudes and asked for more challenging assignments that would expose them to the realities of their future careers, they were not listened to. In another development, Ngau (1993) reported the case which appeared in the Daily Nation, August 1, 1993, about two highly qualified female Motor Vehicle Mechanical Engineers. They were denied appropriate positions in their area of specialisation and were assigned to work at the reception desk of Marshals Company in Nairobi.

In the same study, the researcher reported that the few girls who were found taking courses in Motor Vehicle Mechanics (MVM), Masonry, Mechanical Engineering, Carpentry & Joinery, Plumbing and Metal Fabrication also complained that they were often viewed as abnormal, particularly by fellow trainees and sometimes by their teachers. Male students in the study argued that females in these courses were wasting their time since no company would want to employ them because they (females) were weak. Fellow female students in other areas of study thought these courses were dirty and since they involved the use of muscle power, they were not appropriate for

ladies. Some of the interviewees in the study wondered whether their colleagues in the male-suited courses were hoping to attract decent men for marriage. One female trainee at Moi Institute wondered aloud about her colleague who was enrolled in MVM: "What if she develops biceps like a man because she is constantly lifting heavy car parts? Does she think any man would be interested in a woman like that? Her hands are very rough and greasy these days." This is the common attitude about women; they must maintain certain feminine features because they have to be attractive to men, for marriage must be their ultimate goal in life.

Language, as it is used in the media, plays an important role in gender socialisation. For instance, the use of the generic pronoun "he" and the term "man" to refer to both sexes invokes an image of a male, thereby excluding women from their consciousness as important members of humanity (Frank & Anshen, 1983; Miller & Swift, 1991).

Zunker (1994) calls attention to Harmon's suggestion of gender bias as prevalent in most current interest inventories, primarily because they are constructed with the assumption that work is dichotomized into man's work and woman's work. This position restricts women from exploring certain career options that are presented as reserved for men only. For example, inventories containing items (statements, questions or names of occupations) such as "he likes auto mechanics" encourage role stereotyping. As a result, women may be discouraged from responding positively to occupations for which they have an interest just because the phrasing implies that the occupation is "off limits" to women.

Television and films offer very limited roles to women; they perpetuate female stereotypes and caricatures (Levy, 1987). Television reinforces the view of women as objects. The portrayal of women in movies, where sex and violence are often casually fused, offers teenagers a sadomasochistic perspective of women as victims (Maio, 1991). Research shows that children as young as toddlers imitate behaviours they see on the television; and that this copying intensifies through adolescence (Comstock & Paik, 1991). Thus, the media are powerful negative gender socializes.

These arguments are important. Hence, it is not sufficient to investigate whether certain characteristics of women as might prevent their full participation in the technical activities and mission of an organisation or an industry. Such an analysis needs to be undertaken with an awareness of the importance of other issues. Questions need to be asked. For example, investigators may ask about what accounts for the low representation of women in certain jobs; how the social institution organises and values different aspects of social work; how certain norms operate about appropriate approaches to certain jobs; and careers which appear more applicable to the life patterns and ways of operating in the world of men. As the Women in Science, Engineering and Technology Advisory Group (1995) noted, more attention needs to be given to correcting institutional and structural impediments to women's participation in engineering, as well as changing attitudes and behaviours of men, boys, women and girls.

At the same time, however, arguments about making certain norms as being a male rather than a female need to be treated with caution. These arguments can become normative, claiming that particular characteristics,

ways of operating in the world, and so on, are necessarily female (or male). There may be common patterns of life among women (or men) and certain distinctive ways in which women are constituted as women (female identities) by institutions, but these do not necessarily become how all women operate or understand themselves. These factors are intertwined. Eade et al. (cited by Cass 1998) have reported correlations between women's performance and factors such as teaching load and type and level of appointment.

According to Cass (1998), arguments developed by Burton and others about the politics of merit have played an important role in the affirmative action programmes which universities in Australia have set out to scrutinize the assumptions about appropriate career paths to address some of the concerns raised by Cass. No clear evidence exists today of the extent to which domestic responsibilities impact on women's participation in the academic labour market, and in particular, on their involvement in research. Castleman et al. (cited by Cass 1983) suggested in their survey of research on this issue that problems might still occur with attitudinal or systemic discrimination against employees with family responsibilities.

Collins (1992) proposed that instead of focusing on why women are under-represented as academics, research needs to look at how various practices, policies and beliefs in universities shape the kinds of opportunities and positions women can occupy in this setting. Such an approach, she insists, is a more dynamic one that looks at the changes occurring in gendered identities and relationships as well as the possibilities for change.

Cass identified a number of factors that exclude women from science and also carry over and affect other careers of women. These include: (a) the

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differential socialisation of men and women, (b) impaired self-confidence, and (c) expectations regarding the impact of children on women's careers progression. The roots of this problem she noted lie in the different gender experiences of boys and girls. As young girls and women, the researcher believes that females are socialised to seek help and be help givers rather than to be self-reliant or to function autonomously or competitively, as boys. Girls are encouraged to be good students in-so-far as they expect to be given a task, complete it well, and then receive a reward from an authority figure. In graduate school, the report revealed that females are expected to be independent, strategic and void of interpersonal support. These expectations, as indicated in the research, are antithetical to traditional female socialisation. In addition, Cass highlighted the needs of women, based on socialisation, which encourages supportive interaction with teachers and said this is frowned upon by many male and some female faculty as indicative of inability. She gave an example of a bitter experience of a female graduate student in science class that "the men have the attitude of 'Why should people need their hands held?'" Lack of a supportive environment exacerbates problems of an often already low level of self-confidence of women in science.

## Summary

From the literature reviewed, women are oriented towards becoming better service providers and this practice tends to side line them in their economic and socio-cultural effort for modern technological development. Through socialisation and education process men and women are channeled

towards sex-specific occupations, a situation where a line is drawn between the roles of men and women. For example, majority of women lack adequate knowledge in science and technology as compared with men and these limit their occupational horizon; hence their career choices are narrowed.

However, from the literature, there are no clear distinguishing characteristics between females and males in their capacities, abilities and potentials in the study of science and technology. Rather evidence suggests that both sexes are equally capable when given the chance and motivation. Barriers that exist are artificially created by the school, society, culture and to some extent the media. Another factor for occupational difference between males and females is the negative attitude and aspirations of most females about themselves.

Despite the fact that women are occasionally encouraged to take advantage of science and technology, for which there is growing demand and a means of empowering them economically, the sexual divide of labour continues to operate to the disadvantage of women. This is because men seem to have established and gained control of such occupations.

The review showed that little has been done in Ghana on research work on women in non-traditional female or male dominated occupations. This gives support to and justification for this study which seeks to find out the factors that influence women to go into occupations dominated by males.

# CHAPTER THREE

## METHODOLOGY

The focus of the study was on the factors militating against the participation of women artisans and technicians in male dominated occupations. The study was carried out in three metropolitan cities of Ghana: Accra, Kumasi and Sekondi-Takoradi. This chapter deals with the research design, population and sample, sampling procedure, the design of the instruments and the pre-testing of the instruments. The procedures followed to administer the instruments are outlined and the methods used for data collection and data analysis are also described.

### The research design

This research aims at exploring the factors militating against the participation of women artisans and technicians in male dominated occupations. In line with the purpose, exploratory research was employed. According to Cooper and Schindler (2001), the objectives of exploration may be accomplished with different methods.

Quantitative technique was used in the study because it helped to describe and explain the factors accounting for the low representation of women in the male dominated occupations. Moreover, quantitative technique

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provided data for statistical comparison and better understanding of the variables.

## The study area and population

The study was conducted in three metropolis of Ghana: Accra, Kumasi and Sekondi-Takoradi. These cities were selected because they are the main cities and the most industrialised metropolitan areas which have attracted substantial internal migration. Again, most of the private garages and workshops for technological occupations are located in these cities.

The target population for the study is female artisans and technicians working in or training for non-traditional female (or male dominated) occupations in the three metropolitan areas. Three categories of female artisans and technicians were considered: employees, self-employed and trainees (students and apprentices). The study considered the trainees who have been in their training Programmes for six months or more either in formal institutions or informal establishments. The employees considered were those who had been in employment for, at least, a year and are practicing as technicians or artisans in their chosen fields of occupation. For the self-employed, the study focused on those who have established themselves in their chosen trades and have operated as such for a year or more. They included those working alone as well as those who have employees and apprentices. The trainees were purposively selected from the three public technical institutes and the three polytechnics in the metropolitan cities and twenty four apprenticeship garages and workshops were identified. The population for the employees and the self-employed was not finite since such

records were not available. Hence, trades associations were relied upon to identify the accessible population through snowballing and, subsequently, the sample of these two categories for the study.

## Sampling procedure and sample size

### Sampling rationale

Eighteen technical trade areas (Table 1) were selected as the focus of the study. However, the women could not be found in all the trades, moreover, where they were, their numbers were very few. For the purpose of meaningful analysis and comparison in the study, the eighteen trade areas were categorised into four main groups of occupations, namely Auto Industry, Construction Industry, Engineering Industry and Others, as shown in Table 1.

Table 1

**The grouping of the trades for sampling**

| GROUPS | TRADES |
| --- | --- |
| Group I:<br>Automobile Industry<br>(5 Trades) | Auto mechanics (automotive), auto body repairs (straightening), auto electrical, vehicle spraying and vehicle upholstery. |
| Group II:<br>Construction Industry<br>(5 Trades) | Building draughtmanship, carpentry and joinery, furniture making, masonry (blocklaying & concreting), and plumbing, |
| Group III:<br>Engineering Industry<br>(5 Trades) | Electrical / electronic engineering, industrial engineering, mechanical engineering (metallurgy, plant & production), metal fabrication, and welding, |
| Group IV:<br>Others   (3 Trades) | Painting and decoration, refrigeration & air-conditioning, and television repairs, |

**Sampling procedure and technique**

The women artisans and technicians in the male-dominated occupations are not many (both in training and employment) and are widely scattered, especially those in employment. Therefore, the selection of subjects for the study was based on a non-probability purposive sampling technique in order to identify and include as many women as possible in such occupations. Cooper and Schindler (2001) described non-probability sampling technique as

arbitrary (non random) and subjective method. Each member does not have a known nonzero chance of being included. The interviewer conducts interview as he / she wishes.

According to Creswell (1998), the purposive selection of participants represents a key decision point in a qualitative study. Huysamen (1994) described purposive sampling as the most important kind of non-probability sampling; whereby researchers rely on their experience, ingenuity or previous research experience to deliberately obtain participants in such a manner that the sample obtained may be regarded as representative of the relevant population.

Based on this, two categories of respondents in employment were purposively selected from practising women technicians and artisans in the 18 selected trades from 28 private and 16 public organisations within the cities. They included women who are employees and those in self-employment. The third category of respondents was trainees in the 18 selected trades; comprising students from three polytechnics, three technical institutes and apprentices in the 24 identified local private workshops and garages within the three cities.

For a selected trade area included in the group, there was at least one female participant in the trade. Similarly, for inclusion of a company or organisation in the study, there was at least a female employed or engaged in one or more of the 18 selected technical trades. Since the number of the self-employed was not known, their selection was based on snowball technique (a non-probability sampling technique) which according to Huysamen (1994) and Fink (1995), relied on a few members of the population to identify other

members of the population. Fink (1995) further admonished that the technique is used when a population listing is unavailable and cannot be compiled. Thus, in this study, this technique was used to identify the self-employed because they were widely scattered and listing was not available. Tables 2 and 3 present the trades (Programmes or courses) of the sample from the polytechnics and the technical institutes respectively. Table 4 gives the trade areas of the working women and apprentice from private workshops and garages.

### Sample size (same as the catchment population)

The total sample for the study was 186 consisting of 124 trainees and 62 in employment. The sample of trainees comprised 44 students enrolled in the engineering departments in the three polytechnics. In the case of technical institutes 40 full time students were accessible out of 84 enrolled in the 2004 / 2005 academic year, and 40 selected apprentices from 24 identified private workshops and garages. The sample for those in employment comprised 32 accessible employees identified from public and private organisations and companies and 30 self-employed identified by snowball from private workshops and garages.

Table 2

**Distribution of female population (same as sample) in the three**

**polytechnics for the 2004/2005 academic year**

| TRADE AREAS (PROGRAMMES) | ACCRA | KUMASI | TAKORADI | TOTAL |
|---|---|---|---|---|
| CONSTRUCTION INDUSTRY | | | | |
| Civil Engineering | 2 | 7 | 8 | 17 |
| Furniture Design & Production | | | | |
| ENGINEERING INDUSTRY | | | | |
| Mechanical Engineering | | | | |
| Electrical / Electronic Engineering | 9 | 9 | 9 | 27 |
| Total sample | 11 | 16 | 17 | 44 |

Table 3

**Distribution of the 40 female samples in the three technical institutions by trade areas or programmes / course (2004/2005)**

| TRADE AREAS (PROGRAMME/COURSE) | ACCRA ATTC | KUMASI (KTI) | TAKORADI (TTI) | TOTAL |
|---|---|---|---|---|
| CONSTRUCTION INDUSTRY Plumbing, Carpentry & Joinery Block laying & Concreting and Building Draughtsmanship | 2 | 4 | 4 | 10 |
| AUTO INDUSTRY Automotive, Auto body repairs Upholstery and Auto electrical | 2 | 4 | 9 | 15 |
| ENGINEERING INDUSTRY Mechanical, Welding and Industrial maintenance | 1 | 1 | 2 | 4 |
| OTHER INDUSTRY Refrigeration and Air Conditioning, Television repairs and Painting and Decoration | 4 | 1 | 6 | 11 |
| Total sample | 9 | 10 | 21 | 40 |

Note: ATTC – Accra Technical Institute, KTI – Kumasi Technical Institute and TTI – Takoradi Technical Institute

Table 4

**Distribution of the 62 women artisans and technicians in public and private employment and 40 identified apprentice as sample from private workshops and garages**

| TRADE AREAS | PUBLIC | PRIVATE | APPRENTICE | TOTAL |
|---|---|---|---|---|
| AUTO INDUSTRY | | | | |
| Automotive, Auto body & Upholstery and Auto electrical | 3 | 22 | 28 | 53 |
| CONSTRUCTION INDUSTRY | | | | |
| Plumbing, Ca rpentry & Joinery Block laying & Concreting and Building Draughtsmanship | 12 | 3 | 6 | 21 |
| ENGINEERING INDUSTRY | | | | |
| Mechanical and Welding | 4 | 10 | 2 | 16 |
| OTHER INDUSTRY | | | | |
| Electrical Installation, Refrigeration and Air Conditioning, Television repairs and Painting and Decoration | 4 | 4 | 4 | 12 |
| Total sample | 23 | 39 | 40 | 102 |

**Instruments**

Two types of instruments were used to obtain information from the respondents. These were interview schedules and questionnaires. In addition,

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data from personal records of trainees and apprentices in the formal and the informal sectors were consulted. The three different approaches (questionnaire, interview schedule and observation) were used to provide for triangulation in the data collection and also to cater for the inadequacies of the individual instruments. Triangulation is the use of multiple and different sources, methods, investigations and theories in qualitative research to provide corroborating evidence (Creswell, 1998). The interview schedules and the questionnaires were adopted and modified versions of the instruments used in a similar study (project RAF/88/MII/NOR) conducted in 1990 by the Commonwealth Association of Polytechnics in Africa (CAPA). The study investigated into the factors impeding the participation of women in technical fields.

The interview schedules were semi-structured to cover issues relating to the purpose of the study and the research questions. Interviews have the advantage of obtaining information from people who cannot read and also from non-natives speakers who may have difficulties with the English Language in the questionnaires. On the other hand, interviews are useful for obtaining information that requires sequencing. The interviewer can clarify the questions and ensures that the respondent understands them. However, since interviews are self-reporting technique, like questionnaires, respondents may sometimes not be truthful about certain issues (Henerson, Morris and Fitz-Gibbons, 1987).

According to Fraenkel & Wallen (1991), questionnaires have the advantage of reaching a large number of respondents. It can also be mailed to prospective respondents. However, the use of questionnaire is limited by an

opportunity to collect additional information through observation, probing, prompting and clarifying questions while they are being completed.

The items on the interview schedules and the questionnaires consisted of close and open-ended questions. The close-ended items were necessary because, by the nature of the work of artisans and technicians, they had little time to spare; as such it was easier to record their responses while they were working.

On the other hand, the open-ended items allowed the respondents to freely express their opinions on some of the key issues raised. Cohen and Marion (1990) noted that open-ended interview schedules list the specific questions to be asked. However, the sequence of the questions is not predetermined; the interviewer is allowed to exercise discretion in controlling the course of the interview. Additional questions can be asked in order to pursue interesting leads.

Both interview schedules and questionnaires were used to solicit information from the trainee women apprentices and the self-employed. Only questionnaires were used to collect data from the employees and the students from the polytechnics, technical institutes.

Different interview schedules and questionnaires were designed for the three main categories of the women artisans and technicians in the study, namely the trainees (students and apprentices), the employees and the self-employed. However, most items of the different instruments were the same, particularly those items relating to the factors perceived to be discriminatory to women participation in non-traditional female occupations. On the other hand, there were some differences in the wording and structure of the questionnaire

for the self-employed and employees of organisations in areas of on-the-job experiences and job satisfaction.

## Design and development of the Instruments

Before the development of the instruments, the researcher undertook familiarisation visits to Accra, Kumasi and Sekondi-Takoradi to identify self-employed and employee women artisans and technicians in male dominated occupations. Also, the researcher consulted other institutions and establishments concerned with women in these trades and made references to the literature on aspects pertinent to the issues raised.

Other areas considered in the development of the instruments were comments and suggestions from experts from the department of Vocational and Technical Education on the style and the sequence of questions asked. Comments from other graduate students in the University who have knowledge on the topic were also considered.

Both the questionnaires and the interview schedules were divided into four main sections (Sections A, B, C and D). Section A consisted of items, used to seek background information on the respondents. Items such as age, level of education, marital status, number of children, duration of training programme and experience acquired on the job were considered.

In section B, respondents were required to express opinion on issues such as gender-divide, attitude to work, and perceived abilities and potentials for their chosen occupations. The four- point Likert-scale was mostly used.

Section C dealt with the factors which facilitate or impede female participations in the male dominated occupations. The areas considered are:

factors that tend to encourage or discourage women participation in male dominated jobs, such as, family life as impeding women participation, and organisations and societal influences.

Section D was devoted to job satisfaction and career development of the women artisans and technicians.

The initial drafts of the questionnaires and the semi-structured interview guides were given to experts in the Department of Vocational and Technical Education of the University of Cape Coast for their comments on the content and the style. The comments received were incorporated and the final draft instruments were field-tested.

## Pre-testing of instruments

It was necessary to test the instruments. A pre-testing of the instruments was therefore, conducted in six local garages at Siwudu Kokompe in Cape Coast, and three training institutions in the Central Region. These were Cape Coast Technical Institute, Biriwa Rehabilitation Centre and Cape Coast Polytechnic. These establishments were used to try test the instruments for the trainees. To test the instruments for those in employment and apprentices, three self-employed local garages at Siwudu in Cape Coast, and twelve employees of the Ghana Railway Corporation Location near Asikadu were used. Selection of the respondents was done in such a way that it included women artisans in most of the 18 selected trade areas. These establishments were chosen for the pre-testing of the instruments because they had similar characteristics with the population for the study.

The pre-testing was an opportunity for the researcher to examine the validity of the drafted instruments before they were used in the main study. It also helped the researcher to become aware of the realities on the field. In addition to the responses to the items, the comments and suggestions from the women artisans and technician shaped the final instruments.

## Data collection procedure

The researcher personally administered the questionnaire to the respondents and conducted the interviews. The data collection took four weeks. The breakdown was as follows: Accra two weeks, Kumasi and Sekondi-Takoradi one week in each case.

## Data analysis

Creswell (1998) argued that there is no consensus on the analysis of qualitative data, however, most approaches have common steps commencing with a general review of the information, sorting the information and reducing the data by subject or theme. In the study, the information was classified according to the four main research questions. These research questions provided bases for the structure of the presentation of the findings of the study.

The data consisted of responses to the items in the questionnaire and the interview by the employees, the self-employed and the trainees who formed the sample for the study.

Data from the study were analysed using the statistical package for social science (SPSS Version 10.0). Descriptive statistics of frequency distribution and percentages were used to analyse the data on background

information on the respondents. Percentage and frequencies were also used to analyse research questions two and three. In addition to percentages and frequencies an independent t-test was used to analyse research question one .In the case of the research question four weighted frequencies and means were used in the analysis.

# CHAPTER FOUR

## RESULTS AND DISCUSSION

This chapter presents the analysis and discussion of the data of the study on the factors militating against the participation of women artisans in technical occupations dominated by males. The chapter is organised into five sections. Section one describes the profile of the respondents from their biographic data such as age, trade area, marital status, number of children and number of years spent on the job or on the programme of study. It also considers the educational background of the women and their experiences on the job.

Section two deals with the research question one which sought to describe the influence of the type of education on the choice of occupation by the respondents. Section three presents the analysis of the responses to the research question two, which sought answers to the socio-economic factors that facilitate the participation of women artisans and technicians in the male dominated occupations.

Section four deals with research question three which describes the factors considered by the women artisans and technicians to discriminate against their participation in male dominated occupations. Section five is

concerned with the research question four which analyses the level of job satisfaction among the women in their areas of work.

## Section one

## Biographical information on respondents

Descriptive statistics, consisting of frequencies and percentages, were the main statistical techniques used to describe the background information of the respondents. The personal characteristics considered in this section were:

1. Age,

2. Marital status and Number of children,

3. Level of education,

4. Number of years spent on the job or the programme of study, and

5. Work experience

### Age distribution of respondents

The respondents for the study numbered one hundred and eighty six (186). Of this number, thirty two (32) were employees from both public and private organisations and thirty were (30) self-employed in private sector. Forty four (44) were trainees from the polytechnics, forty (40) were trainees from technical institutes; and the remaining forty (40) were apprentices from private garages and workshops. The ages of these women are displayed in two tables. Table 5 shows the age distribution of employees of organisations and the self-employed, while Table 6 presents the age distribution of the trainee respondents.

Table 5

**Age of respondents in employment**

| Age category | Employed by Organisation | | Self Employed | | Total Respondents in Employment | |
|---|---|---|---|---|---|---|
| | Freq | % | Freq | % | Freq | % |
| Below 25 years | 2 | 6 | 1 | 3.3 | 3 | 5 |
| 25 – 34 years | 14 | 44 | 14 | 46.7 | 28 | 45 |
| 35 – 44 years | 7 | 22 | 15 | 50.0 | 22 | 35 |
| 45 – 54 years | 7 | 22 | - | - | 7 | 12 |
| 55 years and above | 2 | 6 | - | - | 2 | 3 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

From table 5, the age profile of the sample for the study indicates youthful women respondents in employment. Fifty percent of the women were below the age of 35 years, and another thirty five percent (35%) fell between the ages of 35 and 44, with only fifteen percent (15%) being above the age of 45 years. It can be discerned from the table that all the self-employed women were in the youthful age below 45 years.

Table 6

**Age distribution of trainee respondents**

| Age category | Polytechnics | | Technical institutes | | Apprentice from workshops | | Total trainees | |
|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Freq | % | Freq | % | Freq | % |
| 16 – 18 | - | - | 11 | 28 | 5 | 13 | 16 | 13 |
| 19 – 21 | 20 | 45 | 15 | 37 | 20 | 50 | 55 | 44 |
| 22 – 24 | 18 | 41 | 12 | 30 | 13 | 32 | 43 | 35 |
| 25 and above | 6 | 14 | 2 | 5 | 2 | 5 | 10 | 8 |
| Total | 44 | 100 | 40 | 100 | 40 | 100 | 124 | 100 |

The age categories of the trainee respondents are presented in Table 6. Majority of the respondents (92%) were below 25 years old. An indication that young women are now taking advantage of the equal access of participation in education under the Free Compulsory Universal Basic Education (FCUBE) to enrol in education at an early age. Subsequently some enrol in technical and vocational education and training (TVET) at the post basic level.

The age categories reported in this study by the women in employment as well as those in training tend to support the views expressed by scholars. Firstly, the findings appear to support Makinde & Alao's (1987) opinion that, the period that forms the heart of most people's work lives spans roughly between the ages of 26-44 years. It is during this time that the individual finds an occupation and begins to engage in activities that earn her a permanent place in the job market. Most often this chosen job is one's life occupation and proceeds to build a career in it. In most cases, this is the period when the

individual engages in testing her abilities, capabilities and ambitions relative to the occupational choice

Secondly, the finding seems to give meaning to William and Savickas research findings, as cited in Bejian & Salomone (1995) study, that young workers were more likely to reorganise their priorities, set new goals and explore changing careers than renew commitment to their career by upgrading skills and developing new competencies.

### Family information of respondents

The marital status of the respondents in employment and information about their children are presented in Tables 7 and 8.

Marital status: Table 7 presents the marital status and the number of children of the responding women in employment. The majority (63%) of the working women in the study were married and some of them have children. The responses received revealed that a number of the working women had more than one child. Thirty four percent of the working women were single. The remaining three percent of the respondents indicated separated or divorced. The percentages of the employees and the self-employed who were married with children were high, 66% and 60% respectively.

Table 7

**Marital status of respondents and number of children**

| Marital Status | Categories of employment | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Employed by organ. | | | | Self employed | | | | Total in employment | | Total No. of chn | |
| | Freq | % | No of chn | % | Freq | % | No of chn | % | Freq | % | Freq | % |
| Single | 9 | 28 | 3 | 13 | 12 | 40 | 5 | 23 | 21 | 34 | 8 | 18 |
| Married | 21 | 66 | 19 | 83 | 18 | 60 | 17 | 77 | 39 | 63 | 36 | 80 |
| Others | 2 | 6 | 1 | 4 | - | - | - | - | 2 | 3 | 1 | 2 |
| Total | 32 | 100 | 23 | 100 | 30 | 100 | 22 | 100 | 62 | 100 | 45 | 100 |

Ages of children: The age categories of the children were considered important to the study, because it provided useful information about the number of children depending on these women, and the effects this dependence had on the working performance of the women to practice as artisans and technicians. From Table 8, the ages of the children of the employees of organisations ranged from infants to over 20 years old. On the other hand, the ages of the children of the self-employed ranged from infants to 14 years old, with 64% of them being below 9 years old. In all thirty nine (or 86%) of the children of the women in employment in this study were below fourteen years old. Only the employees of organisation had children who were 20 years and above. The results imply that most of the women technicians and artisans in the study had dependent children and, therefore, had additional domestic responsibilities.

Table 8

**Age category of children of the respondents**

| Age category of children (in years) | Age category of children of the respondents | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation | | Self employed | | Total number of Children | |
| | Freq | % | Freq | % | Freq | % |
| 0-4 | 4 | 17 | 5 | 23 | 9 | 20 |
| 5-9 | 6 | 27 | 9 | 41 | 15 | 33 |
| 10-14 | 7 | 30 | 8 | 36 | 15 | 33 |
| 15-19 | 2 | 9 | - | - | 2 | 5 |
| 20 and above | 4 | 17 | - | - | 4 | 9 |
| Total | 23 | 100 | 22 | 100 | 45 | 100 |

**Educational background of the women artisans and technicians**

Distribution of the educational qualifications of the responding women in employment is presented in Table 9, while Table 10 presents the educational qualifications of the trainees.

Table 9

**Highest level of education of respondents in employment**

| Highest level of education | Categories of employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisations | | Self employed | | Total respondents in employment | |
| | Freq | % | Freq | % | Freq | % |
| Basic | 7 | 21.9 | 9 | 30.0 | 16 | 26 |
| Post–basic (sec.) | - | - | 10 | 33.3 | 10 | 16 |
| Post-basic (tech.) | 8 | 25.0 | 9 | 30.0 | 17 | 27 |
| Post –secondary (gen.) | 2 | 6.3 | 2 | 6.7 | 4 | 6 |
| Post –secondary (tech) | 1 | 3.0 | - | - | 1 | 2 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

Practising women: Of the sixty-two practicing women artisans and technicians who reported their highest educational qualifications, (Table 9) fourteen of them (23%) had tertiary education, only one or two percent had post secondary technical education, and those with post basic secondary education were 10 or 16% and these women were all self-employed. Seventeen or 27% had post basic technical education. The women artisans and technicians in employment with only basic education were 16 (or 26%). The result shows that majority of the practicing artisans and technicians (46 or 74%) had post basic and higher education and training qualifications.

Trainees: Table 10 presents the educational qualifications of the trainees in the sample. Three (7%) of the apprentices or 2.4% of the total trainees had no

formal school education. Twenty eight (or 70%) of the 40 apprentices and 3 of the technical institute trainees had only basic school educational qualification. From the table, as many as 46 or 39.6% of the total trainees in the study had post basic technical or senior secondary school educational qualification, of which 6 or 7.3% were in apprenticeship training. The only three apprentices with post basic technical education and training were in welding, auto electrical and upholstery and they indicated that they wanted to improve their practical competencies in their trade areas. The table also shows that 44 or 35.5% of the trainee respondents were in tertiary education at the polytechnics.

Table 10

**The highest level of education of trainee respondents**

| Highest level of education of respondents | Types of trainees | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Polytechnics | | Technical Institutes | | Apprentice from Workshops | | Total Trainees | |
| | Freq | % | Freq | % | Freq | % | Freq | % |
| No schooling | - | - | - | - | 3 | 7.0 | 3 | 2.4 |
| Basic level | - | - | 3 | 7.5 | 28 | 70.0 | 31 | 25.0 |
| Post basic (gen) | - | - | 37 | 92.5 | 6 | 16.0 | 43 | 34.7 |
| Post basic (tech) | - | - | - | - | 3 | 7.0 | 3 | 2.4 |
| Tertiary (poly) | 44 | 100 | - | - | - | - | 44 | 35.5 |
| Total | 44 | 100 | 40 | 100 | 40 | 100 | 124 | 100.0 |

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## Work experience of respondents in employment

The entire employees and the self-employed women in the study indicated that they worked full-time. From Table 11, sixteen (50%) out of 32 of the employees of organisations had worked up to four years. The remaining fifty percent (50%) had working experiences ranging from five years to over twenty years. In comparison with the self-employed, most of them (60%) had work experience from five to fourteen years. Only one self-employed woman had been in employment for more than 14 years.

Table 11

**Work experience of the working women**

| Number of years spent on the job | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation | | Self employed | | Total respondents working | |
| | Freq | % | Freq | % | Freq | % |
| 0-4 | 16 | 50 | 11 | 37 | 27 | 44 |
| 5-9 | 3 | 9 | 15 | 50 | 18 | 29 |
| 10-14 | 3 | 9 | 3 | 10 | 6 | 10 |
| 15-19 | 3 | 9 | 1 | 3 | 4 | 6 |
| 20 and above | 7 | 23 | - | - | 7 | 11 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

Career breaks by respondents: On the question of whether they had worked continuously since their first appointment, Table 4.8 shows the responses of the women employees. From Table 12, twenty six (42%) of the 62 working women had uninterrupted work history. Of the remainder, 22 or 36 percent

have had less than one year break. Another 6 or 19% have had breaks between two to four years. Only two (3%) of the practicing women reported the longest career break of five years.

Table 12

**Frequency table of career breaks for the working women**

| Item statement | Frequency | Percentage (%) |
|---|---|---|
| Work continuously | 26 | 42 |
| Break for less than a year | 22 | 36 |
| Break for 2-4 years | 12 | 19 |
| Break for 5 years and above | 2 | 3 |
| Total | 62 | 100 |

From fig.1, a mean of 1.8 years with a standard deviation of 0.85 were recorded for the period of career breaks experienced by the women in the sample.

The result implies that most of the working women in the study (78%) interrupted their work for a period of less than one year. Furthermore, the average period of work break for the working women in the study was below two years. It could be speculated that the interruptions were for the reason of going on maternity leave, to take care of pregnancy and new born babies.

Figure 1:
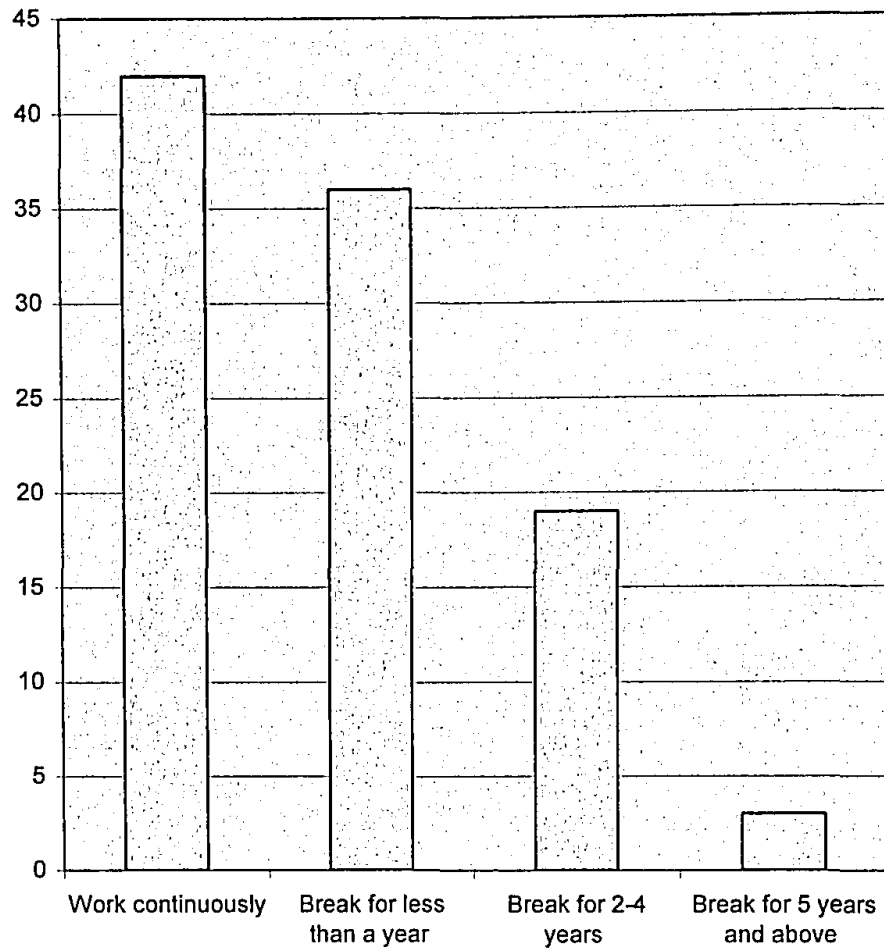


**Periods of career break of working women artisans and technicians**

Mean period of work breaks=1.8 years, Standard Deviation 0.85.

<u>Competency of women in employment</u>: The results of the educational qualification and the work experience tend to suggest that majority of the women are qualified and participate in the male dominated technical or artisan jobs, because forty two percent of the respondents reported of not breaking their service of employment. This probably could also be explained that there is the fear by women technicians employed by organisations of being declared

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redundant if they were to break service. This is a common problem often encountered by lower level or less skilled employees.

Issues regarding maternity leave and time granted for childcare for instance, may pose problems for most employers, and hence become a threat to the women employees. Also if at first, men especially the old and conservatives in engineering fields, did not want women in the workplace, now that women can stay on at work with little interruptions, the situation must change to draw more women into technical and artisan jobs.

The finding of this study challenges the negative attitudes reported by Grimes (cited by Cass 1983) that employers of graduates of higher education regard women as particularly suited to part-time and temporary employment, regardless of their actual or intended domestic arrangements. This further suggests that many women, in their bid to prove their worth in the fields of engineering and technology, may have to forgo the experience of motherhood in order to succeed in their chosen career. This shows the extent to which career choice affects women and family. Some jobs are such that women are discouraged from participating; because of the stress imposed by employers and society at large.

**Trainees' duration of training on programmes**

The data in Table 13 show that apprentices spent more years in training than their counterparts in technical institutes and polytechnics. For example, 13 respondents, representing 32.5% of the apprentices, have spent over four years on a programme. It is also observed that while the prescribed programme duration in the technical institutes and the polytechnics is 3 years,

five students (or 12.5%) of the students in the technical institutes had been on their training programmes for four years or more. While no reasons were stated on the prolonged stay on the programme, it is speculated that the training might have been interrupted by ill-health.

Table 13

**Number of years spent on the programme by trainees**

| Number of years spent on Programme | Types of trainees | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Polytechnics | | Technical Institutes | | Apprentice from workshops | | Total trainees | |
| | Freq | % | Freq | % | Freq | % | Freq | % |
| | 14 | 31.8 | 7 | 17.5 | 6 | 15.0 | 27 | 21.8 |
| Up to 1 year | 20 | 45.5 | 12 | 30.0 | 11 | 27.5 | 43 | 34.7 |
| 2 years | 10 | 27.7 | 16 | 40.0 | 10 | 25.0 | 36 | 29.0 |
| 3 years | - | - | 5 | 12.5 | 13 | 32.5 | 18 | 14.5 |
| Total | 44 | 100 | 40 | 100 | 40 | 100 | 124 | 100 |

## Section two

### Education and occupational choice

This section analyses the data to seek answers to the Research Question 1: **How does the type and level of education of women influence their choice as artisans and technicians in the male dominated occupation?**

This research question was used to establish the type and level of formal education that has influenced the women to choose careers in technical occupations dominated by men. In order to answer the research question the following four areas were examined:

1. Type and the highest level of education of the women;

2. Fields of specialisation of the respondents;

3. The reason for the choice of occupation; and

4. Long term aspiration of the trainee respondents.

**Educational level**

The data presented earlier in Table 9 (in the previous section) show that 16 (or 26%) out of the 62 working women respondents in the study had only up to basic school level education. Another 27 representing 43% had post basic education and training, of the remaining nineteen respondents, five (8%) had post secondary education and training with 14 (23%) of them having tertiary education and training. The respondents with the highest level of education (tertiary level) were all employed by organisations hence, none of the self-employed had tertiary education. It was also found that 30% of the self-employed had formal education only up to basic education level and another 40% had formal post-basic general or academic qualifications. Indeed, only 30% of the self-employed women had formal post basic technical training. The finding seems to suggest that most of the self-employed might have used apprenticeship training to acquire their skills.

Further examination of Table 10 (in the previous section) indicates that majority (77%) of the apprentices had low educational background. There is

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an indication that the higher a person's level of education the more she would seek wage employment. Almost all the women in employment used for the study had in one way or other received some technical training. This seems to clarify Pecku's prediction (reported by Akosah 2000) that the negative attitude which most students have towards vocational and technical education will change with time when most students with these skills are happily employed.

An observation made by some women during the study was that women usually do not want to choose careers or jobs which would offer them the opportunity to increase their horizon and technical know how, because the educational system in Ghana tends to discriminate against technical education students as those who are not exceptionally good academically. This attitude happens to dampen or discourage people, particularly the slow learning women, to develop interest for further study in technical education. This situation may possibly explain why no self-employed woman in the study had tertiary education.

It is known that the higher one climbs along the technical education ladder, the more scientific and mathematical the programme becomes. The demand for science and mathematics poses difficult to many female learners; and in a way tends to become a barrier to prospective learners in their bid to elevate themselves in engineering, technology and related occupations and programmes. Acquisition of such scientific and mathematical knowledge and skills, therefore, becomes a difficult task which invariably serves as a disincentive to many to study further.

It seems Ghanaian women do not take education seriously because, according to Opare (2003), "Kane believed that Ghanaian women have the

notion that the market is a good place for them to make money if all else fail".
It is, therefore, not surprising that more women prefer to take to trading other
than explore other sectors in the work arena.

Furthermore, it appears that there is little expressed interest in
technological activities among Ghanaian women, even though they are
believed to be the largest consumers of technological products. This reason
has reflected in the dislike by many women to climb higher the educational
ladder of technology education, and subsequently do not take up a job that is
technically related. Hence, the study showed the low level of education among
the women in employment.

**Specialisation of respondents in employment**

In answering the research question relating to areas of specialisation of
the women, it is important to determine also the types of engineering or
technology related careers that attract women. The areas of specialisation are
examined in terms of fields of training and the trade areas.

Fields of training: Table 14 presents the fields of training of the respondents in
employment. Fifty percent of the respondents had specialties in technology;
29% in engineering, six percent in arts and culture, five percent in science
specialisation and the remaining 10 percent in commerce. The finding
reinforces the data presented by Oost (1986) on the distribution of women in
engineering fields in European countries. She reported that women
engineering students do not participate equally in the different fields of
engineering. Everts and Oost (cited by Badekale 1996) also argued that

technology cannot be treated as one homogenous field. Finally, the result agrees with what various writers on developing economies have found. They observed that there are different and striking participation rates among women in different technical fields.

Table 14

**Fields of training of respondents in employment**

| Areas of professional specilisation | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation | | Self employed | | Total Employees | |
| | Freq | % | Freq | % | Freq | % |
| Applied Science | 3 | 9 | - | - | 3 | 5 |
| Technology | 13 | 41 | 18 | 60 | 31 | 50 |
| Engineering | 16 | 50 | 2 | 7 | 18 | 29 |
| Arts & Culture | - | - | 4 | 13 | 4 | 6 |
| Commence / Business | - | - | 6 | 20 | 6 | 10 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

The analysis revealed that two fields, technology and engineering, attracted the highest percentage of women 50% and 29% respectively. Others like applied science, arts and culture were not attractive to the women. The finding of this study seems to corroborate the findings reported by Everts and Oost (cited by Badekale 1996) on the trend of women in sciences in Netherlands. Based on a statistical study on higher education in Europe (1970 – 1995), they noted that the Dutch percentage of women in sciences was rated as the second lowest of all European and North American percentages.

Trade areas: Table 15 shows the trade areas of the employed respondents. The data revealed that auto industry had the highest number of females (25 out of 62 or 40%) among the four identified trade groups. Construction and engineering had 15 women or 24% and 14 women or 23% respectively. Only 8 women or 13% were in the other industry. A closer look at the table also shows that employees in organisations preferred to be in the construction industry, while the opposite was the case for the self employed, who on the other hand, dominated the auto industry.

Table 15

**Trade areas of the respondents in employment**

| Trade areas | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation | | Self employed | | Total employees | |
| | Freq | % | Freq | % | Freq | % |
| Auto Industry | 5 | 16 | 20 | 67 | 25 | 40 |
| Construction industry | 14 | 43 | 1 | 2 | 15 | 24 |
| Engineering industry | 8 | 25 | 6 | 20 | 14 | 23 |
| Other industry | 5 | 16 | 3 | 10 | 8 | 13 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

There is an indication from the findings that construction and engineering industries (including auto) are somehow attractive to Ghanaian women. From a study conducted by Everts and Oost (according to Badekale 1996) in the Netherlands, on engineering students in technology institutions, they found that chemical engineering, along with applied mathematics, and

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architecture attracted the highest percentage of women. Other fields like electronic engineering, mechanical engineering and civil engineering were not attractive to women in the Netherlands, as only 1 or 2 percent of the students enrolled were females.

In conclusion the findings from this study does not seem to corroborate that of Everts and Oost, however, it does not contradict it because architecture and construction are related and also, the economic environment of the Netherlands and Ghana are not the same.


### Specialisation of trainee respondents

The distribution of trainee respondents among the areas of specialisation reveals dominance of apprentices in the auto industry. Table 16 shows that 63% of the women apprentices in the study were found in this industry. Comparing this with the other trainees, the table also indicates that the polytechnic trainees were more interested in the engineering industry such as electrical engineering and mechanical engineering (23 women or 52%). In the case of the technical institute respondents, 14 or 35 percent were found in the construction industry, basically in the plumbing and furniture design.

Table 16

**Specialisation of trainee respondents**

| Specialisation of trainees | Types of trainees | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Polytechnics | | Technical Institutes | | Apprentice from Workshops | | Total Trainees | |
| | Freq | % | Freq | % | Freq | % | Freq | % |
| Auto industry | - | - | 12 | 30 | 25 | 63 | 37 | 30 |
| Construction industry | 11 | 25 | 14 | 35 | 1 | 2 | 26 | 21 |
| Engineering industry | 23 | 52 | 6 | 15 | 6 | 15 | 30 | 24 |
| Other industry | 10 | 23 | 8 | 20 | 8 | 20 | 31 | 25 |
| Total | 44 | 100 | 40 | 100 | 40 | 100 | 124 | 100 |

It can be discerned from the table that engineering programme attracted the lowest enrolment of female trainees in the technical institutes and apprenticeship with only 6 women or 15% in each case. Thus, the study agrees with the one conducted by Everts and Oost (from Badekale 1996) in the Netherlands, in which they found it difficult to give explanation to the low representation of women in technical jobs. However, they suggested that the reason could be related to a general perception of unfavoured fields as a male domain. In particular, mechanical engineering has to do with instruments, machines and tools; while on the other hand, the society portrays the woman as soft, gentle and fragile. Thus, the incompatibility between the purported comforts of women as against the ruggedness attributed to men is obvious. Evert and Oost further suggested that other arguments can be found in the interest of women. Women relatively are more interested in fields that have

combination of knowledge. Such fields include aesthetic and other technological areas.

In the study, majority of the women artisans found in the auto industry were self-employed and apprentices from private garages and workshops. On the other hand, the other male dominated occupations like masonry, blacksmithing and carpentry seem to be forsaken by these women. It could be concluded that such occurrence could be due to the fact that the women artisans want to identify themselves with the progress and advancement of the auto industry which is growing rapidly nowadays.

By nature, women want to be surrounded by love and people and such feelings tend to translate to the occupations and activities undertaken by them. On the other hand, they tend to shun away from jobs that offer little interaction with people and more with machines. It is, therefore, not surprising that few women in this study chose occupations in the group IV category (painting and decoration, refrigeration & air-conditioning, and television repairs) that have little contact with other people. Similarly this could possibly be the reasons why more women were found in the auto industry where interaction with the people is very high in Ghana.

**Choice of occupation by female artisans and technicians**

Table 17 shows the responding working women's reasons for their choice of careers in the male dominated occupations in rank order. Interest in the occupation ranked first (207) followed by family influence on the choice of occupation (176). The third ranked item statement was the influence of

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female role model (174), need to earn a living (173) and the least ranked item on the list was family background (146).

These respondents made comments like they were "fascinated by other women at work in the male preserved areas such as building, engineering and electrical and also through interacting with other workers". Another main reason stated was that actual contact with those in the workplace had a positive effect in encouraging entry to the technical occupations dominated by men.

Table 17

Working Respondents Reasons for Choice of Occupation

| Item statement for reason | Frequencies of responses by those in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation (N=32) 4, 3, 2, 1 | Total Score | Self-employed (N=30) 4, 3, 2, 1 | Total score | Overall Total score (N=62) | Rank |
| 1.Interest | (19, 8, 4, 1) 76, 24, 8, 1 | (32) 109 | (15, 8, 7, -) 60, 24, 14, - | (30) 98 | 207 | 1 |
| 2 Family background | (1, 20, 9, 2) 4, 60, 18, 2 | (32) 84 | (6, 20, 4, -) 24, 60, 8, - | (30) 92 | 176 | 2 |
| 3 .Female role model's influence | (2, 18, 4, 8) 8, 54, 8, 8 | (32) 86 | (4, 20, 6, -) 16, 60, 12, - | (30) 88 | 174 | 3 |
| 4. family influence | (8, 14, -, 10) 32, 42, -, 10 | (32) 84 | (3, 25, -, 2) 12, 75, -, 2 | (30) 89 | 173 | 4 |
| 5. Need to earn a living work | (4, 18, 4, -) 16, 54, 8 - | (32) 78 | (2, 4, 24, -) 8, 12, 48, - | (30) 68 | 146 | 5 |

Key: Very important =4,     Important =3,   Not important =2,

Not at all important = 1

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**Reasons for choice of programmes by trainee respondents.**

Table 18 presents the reasons given by the trainee respondents for the choice of training programme in order of rank. The result illustrated that there was a broad range of reasons why women chose a career in technical fields. These reasons were ranked in order of priority. The highest ranked reason was interest in the programme (481score) followed by influence of female role models (367 score) and family background (355 score). The least ranked reason was friend's influence (164 score).

The trainee respondents were asked to rank the reasons why they decided on their choice of programme in the male domain. Nearly all the respondents (481 out of 496 frequencies) indicated that the choice of programme was based on their interest in the programme which ranked first. On the other hand, need to work ranked as low as 7th and the least reason was influence of friends. Further analysis of the background of the respondents revealed that some of the female trainees had one of their parents (mostly the father) in a technical job and this was ranked as the 3rd reason for choice. This finding supports the findings reported by Granstam, (1985) that female technology students were more often daughters of engineers or those with technical background.

It is clear from the analysis that interest in the programme is the major reason for the choice of occupations. It can also be said that the introduction of Science Mathematics and Technology Education (SMTE) clinics for girls had contributed to generate women's interest in science and technology. Thus, if Ghana's vision of women empowerment is to make any meaningful impact, more of such programmes should be encouraged and sustained.

Table 18

**Reasons for choice of programmes in rank order**

| Item statement for reason | Frequency of choice by type of trainees | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Polytechnics n=44 | | Technical Inst. n=40 | | Apprentices from wkshop n=40 | | total respondents | |
| | 4, 3, 2, 1 | tof | 4, 3, 2, 1 | tof | 4, 3, 2, 1 | tof | | rank |
| 1.Interest in the subject area | ( 42, 2, -,  -) 168, 6,-, - | (44) 174 | (37,  3, -, -) 148 9,-, - | (40) 157 | (30,10, -,-) 120,30,-,- | (40) 150 | 481 | 1 |
| 2.Female role model's influence | (20, 22, 2, -) 80, 66, 4, - | (44) 130 | (11,18,8, 3) 44 54,16,3 | (40) 117 | (5,31,3, 1) 20,93,6,1 | (40) 120 | 367 | 2 |
| 3.Family background | (6, 26, 9, 5) 24, 78, 18,5 | (44) 125 | (8, 18, 9, 5) 32,54,18,5 | (40) 109 | (16,9,15,-) 64,27,15,- | (40) 121 | 355 | 3 |
| 4.Need for further training | (19,10, -,15) 76, 30, - 15 | (44) 121 | (15,4,4,12) 60,12,8,12 | (35) 92 | (1,15,- 24) 4,45,-,24 | (40) 73 | 301 | 4 |
| 5.Based on previous programme | (1, 8, 30,  5) 4, 24, 60, 5 | (44) 93 | (-, 2 ,31 ,4) -, 6, 62, 4 | (37) 72 | (2,9,22, 7) 8,27,44,7 | (40) 86 | 254 | 5 |
| 6.Teacher's influence | (8, 16, 7,13) 32 48,14,13 | (44) 107 | (9, 4, 2, 25) 36,12,8,25 | (40) 81 | (1,2,19,18) 4,6,38,18 | (40) 66 | 252 | 6 |
| 7.Need to work | (-, 1, 37, 6) -, 3, 74, 6 | (44) 83 | (1, 2,25, 12) 4, 6, 50,12 | (40) 72 | (-, -, 14, 26) -,-, 28, 26 | (40) 53 | 209 | 7 |
| 8.Friend's Influence | (-, 2, 4, 38) -, 6, 8, 38 | (44) 52 | (1, 3, 8, 28) 4, 9, 16,28 | (40) 57 | (-, 5, 5, 30) -,15,10,30 | (40) 55 | 164 | 8 |
| Total | 44 | | 40 | | 40 | | 124 | |

Key: Very important = 4, Important= 3, Not important =2 and Not at all
important = 1

Again, the results indicated that role models had not appreciably influenced majority of the working women. Nevertheless, role modeling was the third highest reason, eventhough most of the women did not see it as an important reason for their choice of occupations. Some even stated that they did not know any female role models, but this did not deter them from entering the occupational fields. The lack of role models and women mentors has been identified in the literature as barriers to entry of women to male dominated professions (Keino, 1985; CWSE 1994; Suriya, 1998; CAWMSETD, 2000 and Rubsamen-waigmann and Folgurea, 2003). With regard to the trainee respondents, the reason they ranked second highest is the presence of role models as influencing their choice. It was clear from this finding that the presence of women technicians and artisans as role models had some form of influence in attracting young women entrants to the male dominated artisan technical occupations and programmes. This indicates that role models exert some element of influence on career decisions.

A t-test was carried out for the two categories of respondents (practising women and trainees) on four common items (interest, family background, need to earn a living and the influence of female role model) to find out if there was significant difference in the reasons of choice between the respondents. At 0.05 confidence level, the respondents indicated similarities in interest in the choice of occupation or programme of study between practising women and trainees. Again, there was a confirmed similarity between the practising women and trainees on the influence of role model and family background, indicating that there is no significant difference in the choice of occupations and programmes between the practising women and the trainees.

Table 19

**Comparison of the reasons of choice between practising women and**

**trainees**

| | | | t-test for equality of means | | | 95% confidence interval | |
|---|---|---|---|---|---|---|---|
| | T | dt | Sig. (2-tailed) | Mean diff | Std error diff. | Lower | Upper |
| Interest | -6.213 | 184 | .000 | -.53 | 8.57E | -70 | -.36 |
| Family background | 2.754 | 184 | .006 | .36 | - | .11 | .65 |
| Need to earn a living | 14.194 | 184 | .000 | 1.39 | 9.77E | 1.19 | 1.18 |
| Female role model | -3.256 | 184 | .001 | -.36 | .11 | -58 | -14 |

P < 0.05          Note t 180= 1.96

Super (1957) opined in the discussion of the dynamics of vocational development that various factors interplay in the choice of occupations which include among other things, aptitudes, interests, personality, the family, peer group, school and uncontrollable factors in vocational development. Thus the interaction of all these factors results in synthesis or compromise or reality testing. This supports the findings in this study that interest is crucial in vocational choice.

**Aspirations of trainee respondents**

The trainee respondents were asked to indicate their long term aspirations on completion of their programmes. The results are presented in Table 20. The item statement of aspiration chosen by majority of the

respondents from technical institutes (26 out of 40) and the polytechnic (29 out of 44) was to find wage employment in public or private organiation. Mostly the trainees in the polytechnics and the technical institutes wanted to be in wage employment and only a few of them opted to be in self-employment as against the majority (95%) of the apprentices who expressed the desire to go into self-employment.

Table 20

**Aspiration of trainee respondents**

| Item statement | Responses by types of trainees | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Polytechnics | | Technical Institutes | | Apprentice from Workshops | | Total Trainees | |
| | Freq | % | Freq | % | Freq | % | Freq | % |
| 1. To obtain artisan work in the private / public sector | 29 | 65.9 | 26 | 65.0 | 2 | 2.5 | 57 | 45.9 |
| 2. To set-up my own workshop | 7 | 15.9 | 5 | 12.5 | 38 | 95.0 | 50 | 40.0 |
| 3. To teach technical subjects at the JSS & SSS. | 3 | 6.8 | 5 | 12.5 | - | - | 8 | 6.4 |
| 4. To teach technical subject at the technical inst. | 4 | 9.0 | 2 | 5.0 | - | - | 6 | 4.8 |
| 5.To obtain job in the non-technical field | 1 | 2.2 | 2 | 5.0 | - | - | 3 | 2.4 |
| Total | 44 | 100 | 40 | 100 | 40 | 100 | 124 | 100 |

Almost all the respondents did not want to obtain work in the non-technical fields for which they had not had training. The responses from the technical institute and polytechnic students do not agree with assertion by Cromie as cited by Akosah (2000), Cromie asserts that women are attracted to self-employment because it enables them to avoid their subordinate position in society and it helps them to fulfill the dual role of mother and careerist.

It is evident from the study that those who expressed interest in self-employment, mostly the apprentices had low level education. Thus, the type of training and the choice of occupation do correspond. There is also no doubt that most of the trainee respondents in the study who are in formal education and training programmes wanted wage-employment. In Ghana, school training system stresses more on knowledge acquisition and less of skill training. This in a way seems to discourage participants from becoming self-reliant and independent, unlike apprenticeship training where much emphasis is placed on skill training which predisposes trainees to the hazards associated to their fields of specialisation or career.

Again, trainees from the formal training institutions tend to be protected, with removal of certain aspects of the training that may pose danger to them. This in a way creates some fear and uncertainty when they later face reality and so directs trainees' attention to wage employment. Though there is no adequate information or research into the extent to which knowledge learned on a programme of study is used in a job, Teichler (1998) believed that available evidence, though, much of it sketchy, is that apart from some professional practice areas, little of the knowledge is applied in job settings. Thus, employers are more concerned about a variety of personal and

interpersonal skills and abilities than they are about job-related knowledge. Even in professional areas, such as engineering and medicine, it is not so much the knowledge from the technical content that is important to most employers but whether the worker has grasped the underlying principles.

The findings tend to corroborate the research conducted by ILO in 1981 on 'paper qualification syndrome' which found that higher level education favoured employment in the modern sector. Also, it tended to agree with Grierson's argument, according to Akosah (2000), that economic barriers prevent people from going into self-employment

Notwithstanding, the problem of graduates from training institutions not wishing to go into self-employment the study by Grudgin et al. (1979) indicated that firms established by graduates performed significantly better than those established by non-graduates. The importance attached to the level of education is reflected not only in the type and level of education one obtained, but lay in the fact that education continues to play a major role in helping to cope with problems and inadequacies confronted in the employment sector. Perhaps these trainees who opted to be in wage employment want to raise capital during the period of wage employment that would enable them to accumulate sufficient capital, contacts and experience before they can enter into self employment. Mead and Kunjoku (1993) concurred that the most successful self employment artisans are those with significant wage employment experience.

It is in the light of these findings that the researcher shares the views of Goodale (1999) that values transmitted in the school serve to orient the

attention of students to formal sector, white-collar employments and undermine the value of other "traditional occupations".

## Section three

## Socio-economic background of women trainees in male dominated occupations or programmes

The section addresses Research Question 2: **Which socio-economic factors facilitate the participation of women in the male dominated occupations or training programmes?**

Certain socio-economic factors positively or negatively influence the participation of women in their choice of occupations in the male domain. The research question was to determine the socio-economic factors that facilitate the participation or enrolment of women artisans and technicians in programmes in the technical fields. Three items on the questionnaire were used to determine the socio-economic factors of the respondents. The items considered the social standing of the parents, other family members and husbands of respondents with regards to their educational level, occupations and modes of sponsorship. The social standing of the parents of the respondents was classified into three categories. Category 1 was the low income earners, category 2 the middle income earners and category 3 the high income earners.

The Low income earners were defined as parents with primary or no formal educational and who engage in lowly paid jobs. Examples of parents in this category were labourers, petty traders and subsistence farmers and fishermen.

The middle income earners were those parents who have post basic and post secondary qualifications in general and technical education. Examples in this category were teachers, civil servants, technicians and nurses. High income earners consisted of those parents with tertiary educational background and who were mostly in managerial and equivalent positions.

**Socio-economic standing of parents of trainee respondents**

Fathers' Socio-Economic Standing: Table 21 shows the socio-economic standing of the parents of the trainee respondents based on the levels of education and income earning. Using father's educational level and occupations as a measured of socio-economic status of trainee respondents, the table indicates that the sample for the study consisted predominately of children of middle income earners (50.0%), followed by low income earners (34.7%), and only 14.5% had higher income earning fathers. This finding may appear to be contrary to the findings reported by Addae-Mensah and Agbenyega in their study on the influence of family background and educational opportunities in Ghana (cited by Dramanu 2002). In their study, 43 percent of the sample for the study came from high income families, while 14.4 percent came from farmers, fishermen and labourers with 14 percent of the parents having no occupations listed. But their study was on junior secondary school students. A closer observation of Table 21 indicates that the apprentices have majority of their fathers in the low and middle income social groups (21 and 18 or 15% and 17% respectively) with only one (0.8%) in the high income group. Of the trainees in the formal institutions, the polytechnic

respondents have more of their fathers (13 or 11%) in the high income category as against only four (3%) in this category for the technical institutes. Therefore, the finding appears to be consistent with the study by Addae-Mensah and Agbenyega.

Table 21

**The socio-economic standing of the parents of trainees**

| Type of trainee | Fathers' socio- economic standing | | | | | | Mothers' socio- economic standing | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Higher income Earner | | Middle income Earners | | Low income Earners | | Higher income Earners | | Middle income Earners | | Low income Earners | |
| | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| Polytechnic | 13 | 10.5 | 24 | 19.4 | 7 | 5.7 | 4 | 3.2 | 12 | 9.7 | 28 | 22.6 |
| Technical Inst | 4 | 3.2 | 21 | 16.9 | 15 | 12.1 | 1 | 0.8 | 9 | 7.3 | 30 | 24.2 |
| Apprentices | 1 | 0.8 | 18 | 14.5 | 21 | 16.9 | - | - | 5 | 4.0 | 35 | 28.2 |
| Total | 18 | 14.5 | 63 | 50.8 | 43 | 34.7 | 5 | 4.0 | 26 | 21.0 | 93 | 75.0 |

NOTE: Socio-Economic Standing is based on Combination of Level of Education and Earnings

Mothers' Socio-Economic Standing: The picture presented in Table 21 for the socio-economic standing of the mothers of the trainees suggest that generally the mothers were of lower socio-economic standing as compared to that of fathers. Here 75% of mothers of the responding trainees come from low

income level category. Like the fathers' background, the apprentices have more mothers (28.2%) in the low income group. However, with the mothers, the differences in the socio-economic status among the different institutions are not great as compared with the difference in the status of the fathers.

The study conducted by Shavit and Pierce, according to Dramanu (2002), found that the effects of parents education for Ashkenazi Jews were positive and significant. This was because their educational level became a challenge to both parents and children. Children strive harder to achieve what their parents had, and even higher than their parents. Parents on the other hand, know the value of education and therefore devote money, time and other resources to educating their children and see to their educational attainment.

Thus, if most of the parents were from the middle income class then they can conveniently support the training of their wards. The finding of this study reinforces the opinion expressed by Opare, (cited by Dramanu 2002) that besides the social support that middle class parents offer their children and wards such parents also move for the progress of their wards in school and make their children feel a sense of mattering. Such sense of mattering invariably tends to serve as a motivator to pupils to learn hard. Also the finding harmonizes with the findings of Majorbanks (1980) in a longitudinal study that the aspirations of parents of middle class families had differential linear and curvilinear associations with educational and occupational outcomes of young adults. A high percentage of polytechnic and technical institute respondents were of the view that their participation in the male domain and choice of such occupation were influenced by their educational level (Intelligence) and socio economic factors.

### Modes of sponsorship

The success or failure of any training programme or an activity is largely dependent on the available sponsorship for the training. The issue of sponsorship was therefore considered a factor influencing participation of the women trainees. In this connection, lack of certain basic items, like payment of fees, provision of clothing, money for lunch, training materials and other expenses incurred on the programme may negatively influence participation and performance of these trainees. The various modes of sponsorship of the respondents are reported in Table 22

Table 22

**Modes of sponsorship for programmes of trainees**

| Modes of sponsorship of respondents | Types of trainees | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Polytechnics | | Technical Institutes | | Apprentice from Workshops | | Total Trainees | |
| | Freq | % | Freq | % | Freq | % | Freq | % |
| By self | 1 | 2 | 1 | 2 | 4 | 10 | 6 | 4.8 |
| By parents | 34 | 77 | 31 | 78 | 20 | 50 | 85 | 68.6 |
| By husband | - | - | 2 | 5 | 1 | 2 | 3 | 2.4 |
| By other family members | 8 | 18 | 5 | 13 | 15 | 38 | 28 | 22.6 |
| Scholarship | 1 | 2 | 1 | 2 | - | - | 2 | 1.6 |
| Total | 44 | 100 | 40 | 100 | 40 | 100 | 124 | 100 |

Over 68 percent of the respondents reported that they were sponsored by their parents. Only two trainees or 1.6 percent in formal training had government scholarship. Other family members also contributed in sponsoring some trainees. Close to 23% of the total 124 trainees attested to this support. Because of the few married women trainees, only three, representing 2.4% of the total respondents were sponsored by their husbands. From the findings, there are indications that parent and guardians were supportive of the programmes of their wards. This is manifested in the payment of school fees and expenses for training materials.

In as much as parents were a major source of financial support for the continued participation of trainees in education and training programmes, a great deal more is often needed from other sources as supplement. For instance, the longer a person stays in training, to a large extent, depends on the socio-economic standing of parents. The data in Table 22 show that other family members play important role in the sponsorship provided to trainees.

The interest in this research question is the presumed influence of socio-economic factor on the participation of female trainees in technology and its related occupations. It is assumed that there is a link between social class and trainees' achievement and adjustment in their programmes. In this process, parental involvement is assumed to be influenced by financial and material support and parental aspiration. The poorer a person's circumstances, the more difficult it is assumed to support a child's training development or needs. Parental aspiration is in turn influenced by the child's evident achievement. The more the child achieves, the greater is the parental expectation. Thus, it is assumed here that social class has its influence through

three intervening variables (sponsorship, material deprivation and parental aspiration). Again, it is assumed that social class influences achievement and successful completion of programmes.

Parental social standing has been measured by Cotton and Wikelund (1989) as one of the influencing factors of the participation and performance of females in male dominated programmes and occupations. The data in this study suggests that parents from high social class are more likely to be involved in the training of their children to tertiary level of education which tends to lead to more parental involvement. If the parents are not financially sound, then the training of their wards would be hampered. According to Hannon (1999) Rothstein, was of the view that the socio-economic status of parents (educational level and income) is a predictor of potential parental involvement in training than is the type of school attended by the child (private, public, or parochial).

Furthermore, parents who have higher education are likely to have higher academically successful children, as indicated by the Table 22; the polytechnic students have more parents in the high social class followed by those in the technical institutes. This point underpins a suggestion made in a report by the U.S. Department of Education on Strong Families in 1994, that parental involvement is a key to the success of students in training programmes.

The results of this study, coupled with other research reports, such as that of Rothstein, clearly make the case for female participation in education as a social benefit. Hence, the participation of female in male dominated programmes should also be considered as of paramount social importance.

The bottom line is that, encouraging women to access other programmes in different aspects of training, other than in the service sector will provide the nation with both social and economic benefits. While many may view such training and skill acquisition as a means to an end (the end being a higher income than one would receive in areas where there is high female competition), the benefits of the means are not limited to the end alone, but that good employment comes with good income.

In Ghana, wealth and income tend to be accompanied, as has been known in most activities, by increased sponsorship for participation, and parental involvement in training. In addition to the personal economic benefit of a higher income, notwithstanding, the nation as a whole benefits economically from higher incomes of its citizens when those educated individuals receive higher incomes and pay a higher percentage of their income in taxes

Based on the findings of this study and the above argument, it can be concluded that the social standing of parents and the provision of sponsorship facilities enhance female participation rate in male dominated occupations.


**Section four**

**Factors militating against employment of female in male dominated**

**occupations**

Research Question 3: **What factors tend to discriminate against women participation in male dominated occupations?**

The primary objective of this research question was to establish the factors that the respondents considered to discriminate against the

participation of women in certain technical occupations which are male dominated. The questionnaire and the interview identified a number of barriers. Many factors were identified and grouped under the following five headings: organisational, capacity, psychological, relative performance and family demands.

### Organisational factors which militate against female employment in male dominated occupations

The four items or statements used for measuring organisational factors that militate against female participation in male dominated occupations employed a 4-point Likert scale. Each item requested the respondents to indicate the degree to which they agreed or disagreed to the statements. The degree to which they agreed or disagreed to the statements were scored as 4=strongly agree; 3= agree; 2=disagree; 1= strongly disagree

Table 23 provides the rankings for the four organisational factors used to assess the respondents' perceptions of factors that militate against women participation in male dominated occupations. The study considered responses from only the employees in organisations.

Table 23

**Organisational factors militating against the participation of women technicians by rank order**

| Organisational factor and Item statement | Frequency of responses of employees in organisations (N= 32) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SD | % | D | % | A | % | SA | % | Mean | Rank |
| i. Lack of Organisational policy that enables female artisans to take career breaks in order to take care of young children and later re-enter the service | 1 | 1.6 | 15 | 24.2 | 40 | 64.5 | 6 | 9.7 | 2.8 | 1 |
| ii. Organisations prefer to employ female artisans in training and administrative positions | 1 | 1.6 | 17 | 27.4 | 39 | 62.9 | 5 | 8.1 | 2.8 | 2 |
| iii. Most Female artisans prefer to take up office, teaching or research jobs that are less exposed to risk | 1 | 1.6 | 22 | 35.5 | 34 | 54.8 | 5 | 8.1 | 2.7 | 3 |
| iv. Organisations generally prefer hiring male artisans | 3 | 4.8 | 17 | 27.4 | 39 | 62.9 | 3 | 4.8 | 2.7 | 4 |

Scale: 4=Strongly agree (SA); 3=Agree (A); 2=Disagree (D); and 1= Strongly disagree (SD)

From the table, the highest ranked organisational factor identified by the women as militating against their participation in technical occupations was lack of organisational policy that enables female artisans to take career breaks in order to take care of young children and later re-enter the service. The next ranked factor was organisations prefer to employ female artisans in training and administrative positions. The least ranked factor was the preference of organisations in hiring male artisans. The mean differences

among their responses were not that much, indicating that the women considered every item as a possible militating factor.

Comments from the women indicated that women are deliberately discouraged by men from participating in certain jobs where men have established themselves. For example, one woman trained as an engineer, but working as a computer broadsheet and financial analyst, commented that she had lost interest to pursue further training in engineering. Such misplacement in job positions other than the area of specialisation tends to suggest that men feel threaten of job security as such will employ all means to discourage women from full participation in certain jobs which are male dominated. This finding gives credence to a case reported by Ngau (1993), which appeared in the Daily Nation, August 1, 1993, that two highly qualified female Motor Vehicle Mechanical Engineers were denied the appropriate positions in their area of specialisation and were assigned to work at the reception desk of Marshals Company in Nairobi.

### Physical capability of female as militating factor for participating in male dominated occupations

Society perceives that some abilities and capabilities are required more for science, technology and engineering related occupations than other occupations. In the questionnaire and the interview schedule, the respondents were asked to indicate whether or not female technicians and artisans have the physical capacity to carry out the required tasks. The responses are presented in Table 24.

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Table 24

**Employees respondents' perception of physical capability of female as technicians**

| Perception of physical capability of female technician | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation | | Self employed | | Total employees | |
| | Freq | % | Freq | % | Freq | % |
| Capable | 25 | 78 | 15 | 50 | 40 | 65 |
| Not capable | 7 | 22 | 15 | 50 | 22 | 35 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

From Table 24, 25 or 78% of the responding employees of organisations believed that females have the strength to participate in male jobs. For the self-employed, 50% of the respondents believed that women had the strength to participate in male jobs. The result tends to disagree with the general believe that females lack the capacity to perform in certain jobs.

It is also perceived that some types of jobs expose the workers (male and females) of such jobs to life damaging risk or perilous conditions. Examples of such jobs are casting, masonry, blacksmithing and automobile engineering which are usually concerned with the lifting of heavy objects. This requirement could be a reason that deters most female artisans and technicians from doing such jobs for a considerable length of time. This belief strengthens an earlier reported finding of this study, that most of the women technicians and artisans found in the construction industry happened to be plumbers, electricians and furniture designers. As a result, other skilled labour

intensive jobs in the construction industry, like civil engineering and building technology, had few women participation. This finding corroborates the idea that some of the jobs in the male domain demand a lot of strength which women, most of the time, fail to provide, thus, deterring them from full participation in the so called men dominated jobs.

**Demand of programmes as militating factor**

Table 25 presents the responses of the trainees in the study of their perceptions of the demanding nature of their technical programmes.

Table 25

**Trainees' perception of programme demand as a militating factor**

| The respondents opinion of the programmes of study | Types of trainees | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Polytechnics | | Technical Institutes | | Apprentice from Workshops | | Total Trainees | |
| | Freq | % | Freq | % | Freq | % | Freq | % |
| Demanding | 24 | 54 | 7 | 17 | 1 | 3 | 32 | 26 |
| Interesting | 11 | 25 | 13 | 33 | 22 | 55 | 46 | 37 |
| Relevant | 6 | 14 | 5 | 12 | 13 | 32 | 24 | 19 |
| Useful | 3 | 7 | 15 | 38 | 4 | 10 | 22 | 18 |
| Total | 44 | 100 | 40 | 100 | 40 | 100 | 124 | 100 |

The Data in the table indicates that majority of the respondents did not consider the programme demands as a militating factor against women participation in the male dominated occupations. Rather, quite a number (46 or

37%) considered interest as a major factor in the choice of programmes in the male dominated areas. A closer observation of the table indicates that apprentices considered interest as the most important factor in their choice of programme in the male dominated occupations where 22 or 55% of them responded to this fact. Among the respondents from technical institutes usefulness of the programme (15 or 38%) and interest in the job (13 or 33%) were the main factors they considered. Regarding the Polytechnic respondents on the other hand, 11 or 25 percent respondents agreed with their fellow trainees that interest in the programme was a major factor. However, 24 or 54% respondents from this group indicated that the programmes are demanding.

Basing the ensuing argument on Table 25, it may be stated that majority of the respondents from the technical institutes and apprentices from private garages and workshops saw their training programmes to be less demanding, but rather interesting and useful. While their counterparts from the polytechnics saw it to be otherwise. So, it behoves on the researcher to establish the reason why such disparity exists among the polytechnic respondents and the respondents from technical institutes as well as the apprentices. An unquestionable fact is that the training offered to technical institute students and apprentices in the industry does not deal extensively with theoretical aspects of their training but rather the training is focused on practical acquisition. On the other hand, the training at the polytechnic emphasizes more on theoretical aspects of the fields of study, which tend to be more abstract in the engineering fields with little emphasis on practical work. This may explain why the polytechnic students see their training to be more

demanding and less interesting. Also, in most cases, females have poor grounding in mathematics and science subjects and little or no interest in technically-oriented subjects; thus, limiting their performance in these subjects.

It may be speculated that other students offering biological science based programmes in other tertiary institutions may find their programmes of study interesting and less demanding. If so, what is the big deal being claimed by the female polytechnic engineering students. The answer to this may be speculated further by the fact that concepts in biological sciences can be developed or explained using physical objects like the human body, while most of the engineering concepts are mostly based on mathematics and quantum physics as well as economic models.

In this wise the further comments by the polytechnic students that "the heavy workload in engineering which involves a lot of studying and assignments together with practical work to be completed within a specified period of time", go to show the extent of stress the students go through. Adding more to the stress, the students commented of the late arrival of lecturers to classes, coupled with the late start of lectures a few weeks to examinations and ending up failing most of the students. Another discouraging comments made by the students was the constant disruption of the academic calendar leading to closure of the institution.

From the open-ended questions, the trainee respondents further reported a number of unpleasant experiences. Among them were:

- Inability of girls to carry out difficult assignments which their male counter-parts do especially using heavy machines during practical work.

- Lack of respect from fieldworkers during their industrial attachment.

- Always victims of male customers.

- Inability to discuss feminine issue with fellow apprentice.

- Male students pretend to be friendly in order to find a way to date fellow female students.

- Excluding female during class discussions by most lecturers, especially when citing examples in the discussions.

These situations seem possible because of the few numbers of females in the male dominated fields. Others, however, believed that engineering has great challenges to females as it creates awareness of their abilities, capabilities and interest.

**Perception of performance of female technicians relative to male technicians**

Two different sets of items on the questionnaire and interview schedule sought from women respondents in employment on how their performance was perceived relative to their male counterparts. In the case of the trainee respondents, the questionnaire sought answers to how they were perceived by their male counterparts and male trainers. The responses are presented in Tables 26 and 27 respectively.

Table 26

**Perception of performance of female technicians and artisan in employment relative to their male colleagues**

| Performance of female technicians as compared to male counterparts | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation | | Self employed | | Total respondents in employment | |
| | Freq | % | Freq | % | Freq | % |
| i. Perform as well as male staff | 25 | 78 | 28 | 94 | 53 | 86 |
| ii. Perform better than male staff | 6 | 19 | 1 | 3 | 7 | 11 |
| iii. Do not perform as male staff | 1 | 3 | 1 | 3 | 2 | 3 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

Respondents in employment: Almost all the women, 86 percent in Table 26 responded that they performed as well as their male colleagues. Only three percent indicated that their performance was not up to that of males in the trades. While it was acknowledged that the respondents considered their performance to be equal to their male counterparts, seven or 11% of them believed that they performed better than their male colleagues. The implication is that most technical jobs are not necessarily gender specific, but women are pushed towards certain areas of work because men have established themselves in such fields.

According to Leigh-Doyle (1991) the acceptance of female artisans and technicians was perceived to be more of a cultural issue, in that the older 'traditional' clients or conservatives found it harder to accept the word of a female technician. An example is reported by Leigh-Doyle of a client

unwilling to accept the authority of the female, and proceeded to clarify the instruction with a male colleague. Such silent discrimination and stereotyping attitudes continue to exist in many organisations, with the result that even those women who have already established themselves in employment are not always given the opportunity to prove their worth. Such sex-stereotyping encourages the impression that certain jobs are exclusively for men.

### Trainee's perception of male counterparts' attitudes

From the Table 27, 49 percent of trainee respondents perceived that their performance was on equal pedestal as their male counterparts and only 13 percent perceived their training to be inferior. This finding is consistent with studies reported by Houle, (1996) and Jennings and Onwuegbuzie (2001) where they found that males' and females' confidence in their ability to work in the male dominated programmes was equal but found most females' confidence level to be significantly lower than that of males even when females were more successful than the males in class. In this study, thirty one percent reported that their male counterparts were indifferent (did not consider them as equal or inferior) to them. Only seven percent did not know the attitudes of the males. The table further indicates that co-male apprentices showed more indifference (17 or 43%) to their female counterparts. It seems from the table that female apprentices suffer more discrimination from their male trainee counterparts than the trainees in institutions, in that another nine of the apprentice representing 22%, reported that they were considered inferior.

Table 27

**How trainee respondents are perceived by their male counter parts**

| How trainee respondents are perceived by their male counter parts in training | Types of trainees | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Polytechnics | | Technical Inst. | | Apprentice from Wkshops | | Total Trainees | |
| | Freq | % | Freq | % | Freq | % | Freq | % |
| As equal | 29 | 65 | 18 | 45 | 14 | 35 | 61 | 49 |
| As inferior | 3 | 7 | 4 | 10 | 9 | 22 | 16 | 13 |
| Indifferent | 9 | 21 | 12 | 30 | 17 | 43 | 38 | 31 |
| I don't know | 3 | 7 | 6 | 15 | - | - | 9 | 7 |
| Total | 44 | 100 | 40 | 100 | 40 | 100 | 124 | 100 |

This finding is consistent with the finding of a study conducted by Ngau (1991) on female students in technical fields who were on attachments. She reported that men in the industries either did not take them seriously and, therefore, gave them less challenging work than that given to their male counterparts, or they sympathised with them and assigned them the less risky jobs while other foremen treated them like pets for display in the workshops. Although the girls complained bitterly about such negative attitudes and asked for more challenging assignments that would expose them to the realities of their future careers, they were not listened to.

Much of the blame cannot be placed on men's attitude alone; women's own lack of confidence also influences their entry into certain fields and jobs. Gurer and Camp (1998), Selby and Shashaani, (1997) made a point that, often it is not the technology per se, which is the problem, but the economic, social and political structures which keep women in the service sector.

Kekelis, Ancheta, et al. (2004) shared the view that girls with lower confidence are likely to drop out of engineering related programs.

### Respondents' perception of family life as impediment to female artisans and technicians (family work-life balance)

It has earlier been reported in this study (Table7) that the majority (63%) of the respondents in employment were married. It is to be noted also that the age categories of the children reported by most of the women are the period for nursing children. Thus, they were adequately prepared to respond to issues on the stress involved in coping with family life and technical duties. Three items presented in Table 28 sought responses from the women technicians and artisans about the effect of family life on the career performance of female technicians and artisans.

The items were scored as follows; 3= very much effect; 2= moderate effect; 1 =little effect and 0= no effect were summed up ranked from highest to the lowest, the weighted responses (in the brackets).

Table 29 also gives the mean responses of the two categories of the working women on family life serving as impediment to women participation in male-dominated occupations.

Table 28

Perception of how family life impedes the performance of female technicians and artisans.

| Elements of family life | Responses | | | | | | |
|---|---|---|---|---|---|---|---|
| | Employees of organisation | | Self employed | | Total | | |
| | 3, 2, 1 | Total | 3, 2, 1 | Total | 3, 2, 1 | Rank |
| i. Females have difficulty in combining career and family commitment | 5, 9, 13 (15 18,13) | 46 | 4, 9, 15 (12, 18, 15) | 45 | 91 | 1 |
| ii Family life impede females to practice as artisans in technical fields | 4, 9, 12 (12,18, 12) | 42 | 6, 11, 14 (18, 22, 14) | 42 | 84 | 2 |
| iii. Care of young children hold back effective participation of women | 5, 4, 18 (15, 12, 18) | 41 | 9, 18, 15 (36, 36, 15) | 42 | 83 | 3 |
| Total | 14, 22, 43 (42, 48,43) | 129 | 19, 38, 44 (66, 76, 44) | 129 | 258 | |

Scale: Very much effect 3=; Moderate effect 2=; Little effect =1;

and No effect =1

Table 29

**Perception how family life impedes the performance of female technicians and artisans.**

| Elements of family life | Responses | | | | | |
|---|---|---|---|---|---|---|
| | No effect | Little effect | Moderate effect | Very much effect | Total | Mean |
| Employed by an | 4 | 10 | 13 | 5 | 32 | 2.6 |
| organisation | 6.5% | 16.1% | 21.0% | 8.1% | 51.6% | |
| Self employed | 0 | 6 | 22 | 2 | 30 | 2.9 |
| | 0% | 9.7% | 35.5% | 3.2% | 48.4% | |
| Total | 4 | 16 | 35 | 7 | 62 | 2.7 |
| | 6.5% | 25.8% | 56.5% | 11.3% | 100% | |

The highest ranked item by the respondents, according to the table, is females having difficulties in combining career and family commitment. The next item which the women ranked second was family life serving as impediment to females to practice as artisans in technical fields; and taking care of children was ranked third. The effect of the family life was a critical issue in the experience of female artisans and technicians. With a mean of 2.6 and 2.9 respectively the working women found family life to impede their participation. It can be deduced from the responses shown in the tables (28 and 29) that the women experienced difficulty and great stress in coping with work and family issues. As one female employee of an organisation puts it, "It was very uncomfortable carrying my pregnancy while at work. I was prevented from the site once my pregnancy became visible and I have been kept off site work ever since....... Yes, even years after I had my baby".

On the open-ended questions, some of the women expressed concern about the nature of their job which mostly required long working hours away from their homes and children. It must be noted that in the Ghanaian context, it is mostly the duty of the mother to spend more time with the children. They thus had problems as it was impossible to be at both the distant work place and home at the same time. The women further reported that their job was at risk for the following reasons: (i) Leave of absence to join spouse, (ii) maternity leave, (iii) days-off to visit clinics or time off to attend to sick children or nurse other members of the family.

For the unmarried or single technicians and artisans who had not experienced motherhood, other family issues brought about stress in their duties. The need for the single girl or woman to be protected by parents or the family weighed strongly. In the context and beliefs of many Ghanaians, single women had to stay at the home in order to have respect and dignity from prospective suitors. Thus, the need to comply with this made such female technicians and artisans look as if they were unreliable for critical work movements. This in turn affected their suitability for advancement and brought about stagnation and frustration on the job.

A further analysis on the comments from some of the self employed female respondents revealed that they often had to change jobs or find a new job because their husband moved to a different part of the country. The destabilizing effect of this was tremendous as it meant another beginning, and broken professional networks and contacts.

The various family constraints have resulted in non-utilization of the technical training the women had acquired. Women mostly practised other

professions like teaching, trading, entering into contract work and consultancies.

The women added that at the work place, female technicians face a lot of prejudice and mistrust from customers and fellow male artisans. Moreso, some of the women commented that there is a lot of personal interaction between females and male supervisors and superior as well as customers and this affiliation the self employed complained, sometimes made their husbands jealous.

### Psychological preparedness of female for industry

Table 30 presents the perception of the respondents in employment with regard to their psychological preparedness as women for the demand of industry. From the table, majority of the women (66%) believed that they were psychologically prepared to work in the industry, whereas the remaining 34% stated that they were not. It is important to note that both categories of the women in employment (employees and self-employed) affirmed the statement.

Table 30

**Psychological preparation of female technicians for industry**

| Psychological preparation of female technicians | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organization | | Self employed | | Total employees | |
| | Freq | % | Freq | % | Freq | % |
| Prepared | 20 | 63 | 21 | 70 | 41 | 66 |
| Not prepared | 12 | 37 | 9 | 30 | 21 | 34 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

The fact the women are psychologically prepared sends a positive signal. This, however, does not mean that they are not stressful of the demands of the industry, rather, the women feel that they are judged by an entirely different set of standards. As a result, women develop a lack of self-confidence, low expectations or low aspirations, and have to work harder than men to prove their worth. This also contributes to stress and the creation of an unfriendly environment, in which it takes time and energy to ignore or to deal with it

One can now find more women participating in medicine and in a number of biological-related occupations; both in public and private sectors, but the participatory rate of women in technology and related jobs is minimal. Until recently, only few women ever opted to be in engineering or technology and its related occupations. Hence, little is known about the stress and occupational hazards that women in male dominated occupations go through. To the researcher's knowledge, there are still very few female technicians or engineers although women are mostly noted to be the users of the

technological products. Even less is known about the successful participation of women technicians in organisations and what impact this has had on their abilities and capabilities, especially those whose jobs deal directly with automation or machine operation. However, based on the results from the study, the women technicians and artisans in the study are mostly prepared psychologically, irrespective of the stress and hazard the demands of the industry.

## Section five

### Job Satisfaction among Women in Male Dominated Occupations
### Research question 4: what is the level of job satisfaction among women artisans in male dominated occupations?

Primarily the research question 4 was to find out from the practicing women artisan and technicians their level of satisfaction with their chosen vocation. An organisation, whether public or private, expects its employees to render a very high job performance. In the same way, employees also demand from employers some recognition from management, good relationship with fellow colleagues, and involvement in decision making, good working conditions and availability of staff development programmes. These expectations were used as indices to measure job satisfaction in the study.

### Recognition of women technicians and artisans

Recognition by management or customers was one of the important factors used to measure the women's level of satisfaction. The responses of the women technicians and artisans to this question are presented in Table 31.

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Table 31

**The level of recognition of the working women**

| Level of recognition | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Recognition of employees by management | | Recognition of Self-employed by customers | | Total level of recognition | |
| | Freq | % | Freq | % | Freq | % |
| All the time | 6 | 18.8 | 6 | 20 | 12 | 19.4 |
| Most of the time | 8 | 25.0 | 19 | 63 | 27 | 43.5 |
| Occasionally | 18 | 56.2 | 5 | 17 | 23 | 30.1 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

Analysis of the data from the Table shows that many of them (representing about 44%) were satisfied with the level of recognition accorded them by management and customers. A critical look at the table shows that the self-employed women were most of the time recognised more by their customers (19 or 63%) than the employees of organisations who were recognised by management (8 or 25%). Among the two categories of the respondents, employees of organisations were accorded less recognition by management. Recognition, according to McGregor and Harding (2001), has been identified as one of the factors necessary for job satisfaction among women scientists and technologists as it lead to improved performance. This implies that, if the women are dissatisfied with the kind of recognition accorded them by management or customers, then their job performance will also be negatively affected, all things being equal. A similar study conducted in Northern Israel by Bogler and Roint (1999) gives credence to the importance of recognition as a motivator to good performance and positive

attitudes towards work. If on the other hand, workers efforts are not recognized or valued then they would be dissatisfied with their work and performance.

Contrary to the expectation that being few in such male dominated technical occupations, recognition by management of the contributions of women would be very high in their areas of specialisation, the women are not getting such recognition from management. The possible explanation that could be offered is that firstly, because women are few and new entrants in the industrial world, they need to prove their worth by working harder to come to the limelight.

Secondly, industry is also a sector where the exit rate of women is higher than that of men, which might suggest that women perceive the climate in industry as hostile to them. This could be explained by the fact that most technical and engineering fields are male-dominated, which means that women are subject to values and criteria that men have established for themselves, but not for women. So, if there is less recognition by management definitely few women would be attracted, and, therefore, serving as a disincentive to other women, particularly the younger generation.

### Staff development opportunities

Technology keeps changing, leading to the development of new production techniques and new ideas to enhance production. To be in tune with technological changes and to ensure continuous stay in employment, the need for improvement of skills and knowledge from time to time has become necessary. The questionnaire and the interview schedule identified a set of

eight items on creating opportunities for staff development as a measure of job satisfaction. The respondents were requested to rank each factor as high, medium. or low facilitator. In order to ascertain the factors that were rated highest or least facilitators by the respondents, weighted values were assigned on the following basis: high or always was given a value of 3; medium or occasionally was weighted 2; and low was given a value of 1; with never having no value or zero. The results are presented in Tables 32 and 33. Table 32 gives the responses of employee in organisations while Table 33 deals with the responses of the self-employed women artisans.

Table 32

**The extent to which development programmes apply to the working women in organisations**

| Elements of staff development | Extent of application | | | | | | | Rank |
|---|---|---|---|---|---|---|---|---|
| | Always (3) | | Occasionally (2) | | Rarely (1) | | Total | |
| | Freq | Wgt | Freq | Wgt | Freq | Wgt | Wgt | |
| 1 Employees are given opportunity to participate in seminars and workshops organised within the company by experts from outside / consultants | 10 | 30 | 17 | 34 | 4 | 4 | 68 | 1 |
| 2 Employees are given opportunity to participate in seminars and workshops organised by personnel manager / training officer of the company | 6 | 18 | 14 | 28 | 4 | 4 | 50 | 2 |
| 3.Employees are only given time-off to attend seminars and workshops organised by professionals & trade associations. | - | - | 19 | 38 | 10 | 10 | 48 | 3 |
| 4. Employees are sponsored financially to attend seminars and workshops organised by professionals & trade associations. | 2 | 6 | 9 | 18 | 4 | 4 | 28 | 4 |
| 5 Employees are given only time-off to enrol on part-time programmes in training institutions | - | - | 5 | 10 | 8 | 8 | 18 | 5 |
| 6.Employees are sponsored financially to enrol on part-time programmes in training institutions | 1 | 3 | 2 | 6 | 8 | 8 | 17 | 6 |
| 7.Employees are given study leave with pay to enrol on full-time programmes in training institutions | - | - | 5 | 10 | 5 | 5 | 15 | 7 |
| 8.Employees are given study leave without pay to enrol on full-time programmes in training institutions | - | - | 4 | 8 | 6 | 6 | 14 | 8 |

Always = 3, Occasionally = 2, Rarely = 1 and Never = 0.

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From Table 32, the item that the employee respondents rated the highest was the opportunity given to employees to participate in seminars and workshops organised within the company by experts from outside or consultants. The indication of this result is that the women's highest satisfaction was the opportunity given them to experience new skills, knowledge and technologies related to their work. Eventhough these women are believed to be experts in their various fields of specialisation, there is still a greater need to attend training programmes to become abreast with changes in the productive technologies. The employee women's satisfaction on staff development opportunities that ranked second was the opportunity (time-off) given to employees to participate in seminars and workshops organised by personnel manager or training officer in the company. The least ranked items among the employee respondents are study leave opportunities with or without pay to enrol on part-time and full-time programmes in training institutions.

Table 33

The extent to which the self-employed participate in staff development
Programmes

| Elements of staff development | Extent of application | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Always (3) | | Occasionally (2) | | Rarely (1) | | Total | |
| | Freq | Wgt | Freq | Wgt | Freq | Wgt | Wgt | Rank |
| 1. Employees are sponsored financially to attend seminars and workshops organised by professionals & trade associations. | 9 | 27 | 27 | 32 | 2 | 2 | 61 | 1 |
| 2.Employees are only given time-off to attend seminars and workshops organised by professionals & trade associations | 7 | 21 | 17 | 34 | 5 | 5 | 60 | 2 |
| 3. Employees are given opportunity to participate in seminars and workshops organised within the company by experts from outside or consultants. | - | - | 23 | 46 | ·5 | 5 | 51 | 3 |
| 4. Employees are given opportunity to participate in seminars and workshops organised by personnel manager / training officer of the company. | - | - | 23 | 46 | 5 | 5 | 51 | 3 |
| 5. Employees are sponsored financially to enrol on part-time programmes in training institutions | 5 | 15 | 9 | 18 | 14 | 14 | 47 | 5 |
| 6. Employees are given only time-off to enrol on part-time programmes in training institutions | - | - | 2 | 4 | 19 | 19 | 23 | 6 |
| 7. Employees are given study leave without pay to enrol on full-time programmes in training institutions | - | - | 2 | 4 | 8 | 8 | 12 | 7 |
| 8. Employees are given study leave with pay to enrol on full-time programmes in training institutions | - | - | 1 | 2 | 1 | 1 | 3 | 8 |

Always = 3, Occasionally = 2, Rarely = 1 and Never = 0

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With reference to Table 33 the self employed, rated the opportunities to attend seminars and workshops organised by professionals and trade associations as their highest ranked item on the list. These women were quite satisfied with the short term training they have been undergoing. One woman artisan an auto sprayer, remarked that, through a workshop organised by SIKKENS Paint Company Limited, she can now use the computer to mix different shades of colours to the taste of her customers. This, according to her, has improved her confidence in handling customers' needs and taste.

It can be inferred from the responses that there was little emphasis on staff development programmes for this category of women, the self-employed. This situation does not auger well for development and challenges on the job. But challenges, according to Bruce and Blackburn (1992); Locke (1976) and Vroom (1982), tend to be aspects of the job that allow employees to use their abilities and skills in a diversity of tasks, freedom, and performance. So, regular attendance of staff development training would enhance knowledge, skill acquisition and capabilities as well as make the women to be abreast with technological advancement. On the other hand, little or no challenge at the work can lead to boredom, repetition of skills and the use of obsolete machines, tools, equipment and technology. This may make the women self-employed experience frustration and feelings of failure. Therefore, staff development programme is a motivator that promotes interest, efficiency and productivity of the worker.

The problems of inadequate development programmes and lack of training facilities may be identified as disincentive to women participation in technical related occupations. Access to training appears to be limited to both

the self-employed and the women employees of organisations. Maybe men are given the priority for attending such programmes with the belief that they are more likely to use their acquired knowledge and skills for a long time without interruption along their career.

Technical occupations are still seen as a man's job in most parts of the world, like many other professions. Men are also seen to be 'better' in many ways, although according to Soriyan and Aina (1991), statistics from Obafemi Awolowo University in Nigeria show that final year female students perform better than their male counterparts in both the computer hardware and software disciplines. It, therefore, follows that creating avenues for working women to develop themselves from time to time will enhance their successful participation in the male domain. Overall job satisfaction will be positively influenced by employee perceptions of adequate training opportunities

**Job conditions of the women in employment**

The employed women in the study responded to eight items that measured the women satisfaction level toward job conditions. According to Table 34, the total women respondents in employment ranked in order of priority the following as the important job conditions they would like to experience: punctuality, regularity at work, obeying instructions, getting along with others, acceptance of working conditions, increase production, directly making suggestions and level of wages and salary. It is well known that wages in Ghana are low and it applies to all sectors of the economy.

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Table 34

**The perception of job conditions of employees of organisations and self employed**

| Statements | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation | | Self employed | | Total employees | |
| | 4, 3, 2, 1 | Total wgt | 4, 3, 2, 1 | Total wgt | Overall Total wgt. | Rank |
| i. How would you rate your attitude to punctuality | 16, 16, -, - (64, 48, -,-.) | 112 | 12, 18, - - (48, 54,-, -) | 102 | 214 | 1 |
| ii. How would you rate your attitude to being regular at work? | 17, 15, -, -. (68, 45, -, -) | 113 | 5, 25, -, - (20, 75,-, -) | 95 | 208 | 2 |
| iii. Willing to obey instructions | 7, 25, -, -. (28, 75, -, -) | 103 | 4, 25, 1, - (16, 75,2,-) | 93 | 196 | 3 |
| iv. Making constructive suggestions for work improvement. | 4, 23, -, - (16, 69, -, -) | 85 | 1, 28, 1, - (4, 84, 2, -) | 90 | 175 | 7 |
| v. How do you get along with others | 11, 20, 1, - (44, 60, 2, -) | 106 | -, 30, -, - (-, 90, -, -) | 90 | 196 | 3 |
| vi. Increase production | 2, 26, 3, 1 (8, 78, 6, 1) | 93 | -, 29, -, 1 (-, 87, -, -) | 88 | 181 | 6 |
| vii. Acceptance of working conditions | 6, 25, 1, - (24, 75, 2, -) | 101 | 1, 29, -, - (4, 87, -, -) | 91 | 192 | 5 |
| viii. Level of wage / salary | -, 5, 26, 1 (-, 15, 52,1) | 68 | -, 18, 12, - (-, 54, 24,-) | 78 | 146 | 8 |
| Total | 63, 155,31,2 | 781 | 23,202,14,1 | 727 | 1508 | |

Very good = 4,    Good =3,    Fair =2,    Poor =1

The employees in organisation ranked in order of priority they ranked regular at work (113), high sense of punctuality to work (112), getting along with others (106), and willingness to obey instructions (103) as the first four priority work conditions. On the other hand, making constructive suggestion for work improvement (85), and salary level (68) were the lowest ranked statements. With exception to the dissatisfaction expressed by the women in connection with wage and salary levels, there is an indication that there is a positive feeling of satisfaction in the various working places. There seems to be some agreement between the employees in organisation and the self-employed in the ranking of the statements, especially on regularity, punctuality and wage levels.

The findings on wage levels supported comments by Napiers' (1972) that financial prospects and prestige are the most important factors in attracting people into a particular job. It is quite clear that majority of the respondents were dissatisfied with their salary and wage levels. This is consistent with a number of findings from studies on dissatisfaction with salaries among workers. According to Danso-Mensah (2002), studies by Lynch, Carr and Kazanowski (1994) and Ronit and Borler (1999) and, in Ghana, Bame (1992) revealed a lot of dissatisfaction with salary and wage levels among respondents. This may be a reasonable contributing factor to the low representation of women in certain male dominated technical occupations.

**Employees relationship with other staff members**

This section is about the quality of relationship between the working women and their colleagues.Table 35 provides the ranking of the quality of

relationship between the women technicians and artisans and other members

of staff at the work place.

Table 35

**Working women relationship with fellow staff members and artisans**

| Relationship | Frequencies and weighting of responses | | | | | | |
|---|---|---|---|---|---|---|---|
| | Employees of organisation | | Self-employed | | | | |
| | 3, 2, 1 | Total | 3, 2, 1 | Total | Total 3, 2, 1 | Rank |
| Male colleagues | (13, 23, -) | | 6, 24, - | | | |
| | 39, 46, - | 85 | (18, 48, 1) | 66 | 151 | 1 |
| Male subordinates | (5, 26, -) | | 1, 28, - | | | |
| | 15, 52, - | 67 | (3, 56, -) | 59 | 126 | 2 |
| Female colleagues | (8, 23, 1) | | 8, 13, - | | | |
| | 24, 46, 1 | 71 | (24, 26, -) | 50 | 121 | 3 |
| Female subordinates | (7, 18, 2) | | -, 23, - | | | |
| | 21, 36, 2 | 59 | (-, 46, -) | 46 | 105 | 4 |
| Male superior | (7, 23, 2) | | 2, 6, - | | | |
| | 21, 46, 2 | 69 | (6, 12, - ) | 18 | 87 | 5 |
| Female superior | (6, 21, 2) | | -, 2, - | | | |
| | 18, 42, 2 | 62 | (-, 4, - ) | 4 | 66 | 6 |
| Total | (46, 134, 7) | 432 | (17, 96, -) | 243 | 648 | |
| | 117, 278, 7 | | 51, 192, - | | | |

Weighting:  Very good = 3, Good = 2, Fair = 1, Not applicable =0

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From the table, the women ranked, in order of satisfaction, their working relationship as follows: (1) with their male colleagues, (2) with male subordinates, (3) with female colleagues, (4) with female subordinates, (5) with male superior and (6) with female superior. The result suggests that the female technicians and artisans tend to have better working relationship with their male counterparts than they do with female colleagues and female superior. It may be concluded that there appears to be not too good relationship among the female respondents and their female superior, contrary to expectation that the relationship among same sex would be very good. This perhaps could be attributed to the fact that there are few women in senior positions and, therefore, have very little interaction with the female subordinates.

The finding implies that the satisfaction level of the women in the study, which was based on quality of relationship, was good with respect to the kind of relation the women at times enjoyed among their colleagues especially men, and for that matter had positive influence on their performance. This result is similar to a result from a study conducted by Galloway (1982) in New Zealand, where it was discovered that 80% of the teachers used in the study were satisfied with the kind of relationship they had with their colleagues.

Women as well as men like to work in organisational and industrial environment where the emphasis is on building relationships and on seeing different connections between people and technology. As observed by Hopkins (1993), effective and efficient nature of supervision in the workplace is defined by the relationship between the individual employee and the

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immediate supervisor. Other studies have also shown that positive relationships between supervisors and subordinates contribute to higher levels of job satisfaction. For example, Ellickson (2002) reported the study by Ting, where government employees who enjoyed a supportive relationship with their immediate supervisors experienced higher levels of job satisfaction than those who did not.

### The overall job satisfaction among the working women

Overall job satisfaction was measured on a 4-point Likert scale: 4 = very satisfied, 3 = satisfied, 2 = dissatisfied and 1= very dissatisfied. However, for easier interpretation of the results, two scales were used: very satisfied and satisfied were collapsed into satisfied while dissatisfied and very dissatisfied were collapsed into dissatisfied. The responses are reported in Table 36.

Table 36

**Respondents satisfaction with their chosen vocation**

| Satisfaction / dissatisfaction with vocation | Respondents in employment | | | | | |
|---|---|---|---|---|---|---|
| | Employed by organisation | | Self employed | | Total employees | |
| | Freq | % | Freq | % | Freq | % |
| Satisfied | 25 | 78 | 29 | 97 | 54 | 87 |
| Dissatisfied | 7 | 22 | 1 | 3 | 8 | 13 |
| Total | 32 | 100 | 30 | 100 | 62 | 100 |

From Table 36, the women respondents were generally satisfied with their chosen vocation. A total of 54 out of 62 respondents (87%) used in the study affirmed this assertion. Considering each of the two categories of respondents separately, the self-employed women seem more satisfied (97%) than their counterparts employed by organisations (78%). Only one self-employed person representing three percent of the respondents was dissatisfied as compared to seven or 22% of the employees of organisations, who indicated dissatisfaction with their vocation. The respondents perhaps see the work in technical fields as very challenging, and this is the factor found to correlate most highly with overall job satisfaction (Schneider, Gunnarson, & Wheeler, 1992).

A comparison of these results to Maslow's (1951) motivational needs theory provides some insight into employees and the self-employed overall job satisfaction. The number one ranked factor, (Tables 17 and 18) interest in the job and programme of study is a self-actualising motivator which all the women claimed to be the influencing factor for their choice of occupation in the male domain. However, the results proved that wages (Table 24) may be disincentive to their participation. Therefore, if workers want to derive maximum satisfaction in their chosen vocation, then, physiological and esteem factors must be addressed. Contrary to what Maslow's theory suggests, the range of motivational factors is mixed in this study. Maslow's conclusions that lower level motivational factors must be met before ascending to the next level were not confirmed by this study.

# CHAPTER FIVE

# SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

## Introduction

This chapter presents the concluding part of the study. It summarizes the purpose and the findings of the study. Based on the findings recommendations are made for future research work and conclusions are drawn.

## The purpose of the study

Primarily, the study investigated the factors that women artisans and technicians in male dominated technical occupations considered to be militating against their participation in technical and engineering related occupations. It tended to find out: (i) the type and level of education that influences women to choose such occupations; (ii) the socio-economic factors that influence the participation of women in these fields; and (iii) whether women deviate or conform to certain factors.

## Summary of the main findings

Quite a number of the women employees in the study had technology or engineering education backgrounds. However, the study shows that the level of education has less influence on the choice of occupation by women in the male dominated areas. Instead, higher education encourages participation of women in wage-employment or white collar jobs. On the other hand, the type of education gone through by the women, if relevant, only facilitates the choice of occupation in the male dominated technical fields.

One important observation in the study was that, for technological bias occupations interest is crucial for satisfactory performance. Irrespective of the type or level of ones educational background, one can always pursue a career in the field of technology if the interest is there. For example, ten or 16 percent of the self-employed women in the study initially had business and general arts education backgrounds, yet they have become well established auto sprayers after apprenticeship and on-the-job training.

Another important finding from the study was that the older women in engineering and related occupations were employees in organisations. Though, role models did not come out as having much influence in the choice of occupations by the women, their presence was felt, mostly by the trainee respondents.

It also came to light from the study that the social standing of parents or guardians and availability of sponsorship have some influence on the level of education attained by the women and also on their participation in non-traditional female occupations.

Furthermore, a number of factors were identified by the respondents as militating against the participation of women in technical and related occupations. Among them are:

(i) Working women had problems combining family responsibilities and the demands of the industry.

(ii) Too much closer working relations with the opposite sex might be interpreted wrongly and could negatively affects self-employed married women.

(iii) Sex stereotyping still persist in many organisations with regards to definition and distribution of workload.

(iv) Most female technicians and artisans occupy middle and low level positions and so advancement into senior position is difficult.

(v) The women do not always have enough time off their domestic and office work to attend staff development programmes to improve their capabilities.

(vi) Most managers, in both public and private organisations, do not recognise the valuable contributions the women are making in the organisations.

Another important finding from the study was that the self-employed women and the women apprentices were mostly found in the auto industry, whereas employees in organisations and the students in the technical institutions were found mostly in the construction industry.

Finally, the women in the study claimed that they were prepared psychologically for the demands of the industry, except that they were not too sure about their physical capabilities. For example, there was a comment that

they (the women) had difficulties in lifting heavy equipment and articles. That explains why so few of the women were found in mechanical, civil and electrical engineering trades because these trades and professions require physique in their performance.

Generally, the women artisans and technicians reported to be satisfied with their chosen careers, despite the difficulties posed by organisational demands, family commitments and physical challenges. The fact that the few women in the male dominated fields are satisfied sends a positive signal that other young women can equally join the train to break the myth surrounding technology and its related occupations as male domain.

## Recommendations

This study was delimited to three cities of Ghana Accra, Kumasi and Sekondi-Takoradi. From the findings the following recommendations are made:

1. Women affirmative actions need to be stepped up to include the importance of job placement in technical fields so as to increase the number of women in technician, artisan and related fields and also have more mentors and role models.

2. A model all girls' technical education and training institution should be established using one of the existing girls senior high schools in the country to stimulate girls' interest and appreciation of technology and related disciplines.

3. Parents, guardians, feminine groups, philanthropist, government and non governmental organisations must make available to women sponsorship packages for choosing technology and related fields at the secondary and post secondary education levels in order to encourage more women to venture into male dominated programmes and occupations.

4. Regular In-service education and training must be organised periodically by trade associations and organisations, to enable women artisans and technicians develop their competencies and skills.

## Suggestions for future research

The following suggestions are made for future research work.

a) Studies of such nature should be replicated in other metropolitan and municipals areas of Ghana.

b) Tracer study on the performance of female graduates of the polytechnics and technical institutions should be carried out to find the level of job placement for the women

c) The study considered only women artisans and technicians from non-university institutions. Therefore, it is suggested that an expanded study be carried out to include the universities.

d) Finally, the scope of the study was limited to few occupations and vocations. It might be necessary to increase the occupations and vocations in future studies.

## Conclusions

For several centuries and decades, it has been recognised that women in most parts of the world have at one time or the other suffered some form of discrimination in education, job and social placements. The continuation of these suppressive propensities is gradually giving way to open mindedness towards the participation of women in all spheres of endeavours, with particular reference to technology education and the participation in technical related occupations. The contribution toward national development should be of a holistic nature, involving all capable citizenry, irrespective of gender, among other things. The call for affirmative action and equality seems to have been intensified after the well known Beijing and other world conferences on the role of women in society.

Based on the findings of the study, it may be concluded that, to increase the participation rate of women technicians and artisans in technical and related occupations will take the nation, educators and all sundry a long period of time to be achieved. Factors which seem to account for the exclusion of women in technical education and occupations include:

- Social and organisation barriers,
- Lack of staff development programmes in organisations for enhancing talents & skills and
- Family commitment.

It can also be concluded that young women are now penetrating other jobs believed to be the preserve of the opposite sex, however, their participation seems to be restricted to only a small area. Again women may

take advantage of the existence of huge opportunities in other occupational sectors other than in the service sector.

The women derived job satisfaction from their chosen occupations despite difficulties posed by the factors they identified. Another conclusion from the study was that technology and related occupations are suitable for both sexes (men &women) provided there is equal motivation in the form of recognition and development opportunities. Notwithstanding the problems identified by the women. equal opportunities exist for women in the technology and engineering industry and they should make use of them.

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UNIVERSITY OF CAPE COAST

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

QUESTIONNAIRE TO BE COMPLETED BY EMPLOYEES IN

ORGANIZATIONS AND THE SELF-EMPLOYED IN WORKSHOPS AND

GARAGES

Dear respondent,

This questionnaire is aimed at collecting information on the factors

militating against the participation of women artisans in male dominated

occupations. It is to bring out the successes, problems and failures faced by

these women so that appropriate measures could be taken to address them.

It would, therefore, be appreciated if you could complete the

questionnaire or answer some questions as accurately as you can in an

interview with me. Your real name would not be required in completing the

questionnaire so be free in stating your responses sincerely. Information

provided by you will be held in confidence.

SECTION A: <u>BACKGROUND INFORMATION</u>

1.1 Name of company / organisation/ workshop _____

1.2 Status of organization

    (a)  Public    ☐

    (b)  Private   ☐

    (c)  Others (please specify) ————

1.3 Status of employee

    (a) Employed by an organisation ☐

    (b) Self-employed              ☐

1.4 What is your age category?

    (a) Under 25 years      ☐

    (b) 25 – 34 years       ☐

    (c) 35 – 44 years       ☐

    (d) 45 – 54 years       ☐

    (e) 55 years and over   ☐

1.5 State the **highest** level and **type(s)** of your education / qualifications, (by ticking under the appropriate level)

i. Basic Education Level

    (a) Lower Basic or Primary           ☐

    (b) Middle school or Junior secondary school ☐

ii. Post Basic: Secondary Education Level

    (c) Senior secondary school – General    ☐

    (d) Senior secondary technical school    ☐

iii. Post Basic: Technical Training Programmes: Level

    (e) Intermediate            ☐

    (f) Advance              ☐

iv. <u>Post Secondary: Technical Programmes:</u> Level

      (g) Technician I               ☐

      (h) Technician II              ☐

      (i) Technician III              ☐

v. <u>Tertiary – Education Programmes:</u> Level

      (j) Higher National Diploma      ☐

      (k) Bachelor Degree          ☐

      (l) Masters Degree           ☐

      (m) Other (specify) _____

1.6 How was your education and training financed? (Tick as appropriate)

      (a) By self                 ☐

      (b) By parents             ☐

      (c) By husband            ☐

      (d) By other family members    ☐

      (e) By scholarship (specify)    ☐ _____

      (f) By others (specify)     _____

1.7 What is your marital status?

(a) Single           ☐

(b) Married          ☐

(c) Separated        ☐

(d) Other (specify)    _____

1.8 (a) How many children do you have?_____

(b) Indicate the age category of the children and state the number of each

category.

| Age of children | | Number of children |
|---|---|---|
| (a) 0 -4 years | ☐ | _____ |
| (b) 5 – 9 years | ☐ | _____ |
| (c) 10 -14 years | ☐ | _____ |
| (d) 15 – 19 years | ☐ | _____ |
| (e) 20 years and over | ☐ | _____ |

1.9 For how long have you been employed or worked as an artisan in this company / organisation / workshop?

| | |
|---|---|
| (a) 0 – 4 years | ☐ |
| (b) 5 – 9 years | ☐ |
| (c) 10 – 14 years | ☐ |
| (d) 15 – 19 years | ☐ |
| (e) 20 years and above | ☐ |

1.11 What other positions, if any, have you held in this company / organisation within the past five years?

| Position(s) held | Reason(s) for change |
|---|---|
| (a) | |
| (b) | |
| (c) | |
| (d) | |
| (e) | |

1.12 How were you appointed to your present position?

(a)Direct appointment from outside of the organisation through advertisement

b) Promotion within the organisation    ☐

☐

(c) Transfer within the organization

(d) Direct appointment from outside of the organisation through

personal contact ☐

(e) Others (specify) _____

_____

1.13 (i) Do you feel your present position matches your qualifications and experience?

|  | Yes | No |
|---|---|---|
| (a) Qualifications | ☐ | ☐ |
| (b) Experience | ☐ | ☐ |

(ii) **If no,** please explain / comment _____

1.14 In what area is your main technical / professional background?

(a) Applied Science ☐

(b)Technology / Industrial Arts ☐

(c) Engineering ☐

(d) Environmental studies ☐

(e) Agriculture ☐

(f) Arts / Culture ☐

(g) Commerce / Business ☐

(h) Other (specify) _____

1.15 What is your mother's occupation (current / last?)_____

1.16 What is your father's occupation (current / last?) _____

1.17 What is the occupation of your husband? (current / last?) _____

1.18 What is the **highest** level of education of your parents, siblings and husband?

| School Education | Mother | Father | Siblings | Husband |
|---|---|---|---|---|
| (a) Primary | ☐ | ☐ | ☐ | ☐ |
| (b) Middle school | ☐ | ☐ | ☐ | ☐ |
| (c) Secondary school – General | ☐ | ☐ | ☐ | ☐ |
| (d) Secondary Technical school | ☐ | ☐ | ☐ | ☐ |
| **Technical Training:** | | | | |
| (e) Intermediate | ☐ | ☐ | ☐ | ☐ |
| (f) Advance | ☐ | ☐ | ☐ | ☐ |
| (g) Technician I | ☐ | ☐ | ☐ | ☐ |
| (h) Technician II | ☐ | ☐ | ☐ | ☐ |
| (i) Technician III | ☐ | ☐ | ☐ | ☐ |
| **Tertiary Education:** | | | | |
| (j) Higher National Diploma | ☐ | ☐ | ☐ | ☐ |
| (k) Bachelor Degree | ☐ | ☐ | ☐ | ☐ |
| (l) Masters Degree | ☐ | ☐ | ☐ | ☐ |
| (m) Other (specify) | | | | |

_____

## SECTION B

## GENDER ISSUES

2.1 How, in your view, do females in technical jobs perform relative to their male counterparts?

(a) Perform as well as male staff ☐

(b) Perform better than male staff ☐

(c) Do not perform as well as male staff ☐

(d) Comment: _____

_____

2.2 In your view, are female employees physically capable of performing technical jobs in industry?

(a) Capable ☐                    (b) Not capable ☐

(ii) **If no,** why not?

_____

2.3 In your view, are female employees psychologically prepared for technical jobs in industry?

(a) Yes prepared ☐                    (b) Not prepared ☐

**If no.**

(a) Why not? Explain?

_____

(b) What do you think should be done to prepare them psychologically for technical jobs? _____

2.4 How would you rate your attitude to work in your company/organisation in terms of?

| Attitude Towards Work in Your Workshop or | Very good | Good | Fair | Poor |
|---|---|---|---|---|
| Punctuality to work | | | | |
| Being regular at work | | | | |
| Ability to get along with others | | | | |
| Acceptance of working conditions | | | | |
| Levels of wage / salary | | | | |
| Increase production | | | | |
| Willing to obey instructions | | | | |
| Making constructive suggestions or work improvement | | | | |

## SECTION C

## FACTORS PERCEIVED TO IMPEDE THE PARTICIPATION OF

## FEMALES IN TECHNICAL JOBS

3 1 (1) Is there any thing which discriminates against females in undertaking

technical jobs?

    (a) Yes   ☐              (b) No   ☐

(ii) **If yes**, list the problem areas   _____

3.2 What measures would you recommend to ensure increased participation of

females in technical jobs?_____

3.3 To what extent do the family situations described below impede the career

performance of female in technical jobs (tick as applicable?)

| SITUATIONS | Very much effect | Moderate effect | Little effect | No effect |
|---|---|---|---|---|
| (a) Have difficulty in combining | | | | |
| (b) Care of young children hold back effective participation of women | | | | |
| (c) ) Female artisans to practice as engineers | | | | |

3.4 Most trained female artisans do not take jobs in male dominated

occupations because:

| REASONS | Strongly Agreed | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| (a) Organizations generally prefer hiring male artisans. | | | | |
| (b) Lack of policy that enables female artisans to take career breaks and later re-enter the service. | | | | |
| (c) Organizations prefer to employ female artisans in training and administrative position. | | | | |
| (d) Most female artisans prefer to up office, teaching or research jobs that are less exposed to risk. | | | | |

3.5 What part does your husband play in the achievement of your professional objectives?

       (a) Very supportive    ☐

       (b) Supportive    ☐

       (c) Indifferent    ☐

       (d) Does not support    ☐

3.6 As a working woman, what part, if any, does your extended family generally play in supporting your career development?

       (a) All supportive    ☐

(b) Some supportive ☐

(c) All indifferent ☐

(d) Some indifferent ☐

(e) All do not support at all ☐

(f) Some do not support ☐

(g) Not applicable ☐

3.7 Has your career choice been influenced by any one individual?

(a) Yes ☐          (b) No ☐

**If yes**, who was this?

(a) Mother ☐

(b) Father ☐

(c) Husband ☐

(d) Other relative ☐

(e) Teacher ☐

(f) Politician ☐

(g) A female role model ☐

(h) A male role model ☐

(i) Other person (specify)

_____

3.8 List some of the problems that females in this trade face? ⎯⎯⎯⎯⎯⎯⎯

_____

3.9 Are there any other comments you would like to make on:

(i) The working environment of females (as staff members) in technical jobs

in industry or organizations. _____

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# SECTION D

## JOB SATIFACTION OF EMPLOYEES

4.1 What are the main reasons for the choice of this career? (Tick as appropriate)

    (a) Interest in the area                    ☐

    (b) Family background                  ☐

    (C) Family influence                    ☐

    (d) Career guidance in school          ☐

    (e) Conditions of service               ☐

    (f) Work environment                  ☐

    (g) Need to work for earning           ☐

    (h) Other reasons (specify)   —————————————

4.3. How would you describe your relationship with the following staff in your company/organization?

| Relationship with Staff Members | Very good | Good | Fair | Poor |
|---|---|---|---|---|
| (a) Relations with female colleagues | | | | |
| (b) Relations with male colleagues | | | | |
| (c) Relations with female subordinates | | | | |
| (d) Relations with male subordinates | | | | |
| (e) Relations with female superior | | | | |
| (f) Relations with male superior | | | | |

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4.4. Do you feel that you get adequate recognition from top management / customers in relation to your position?

    (a) All of the time ☐

    (b) Most of the time ☐

    (c) Occasionally ☐

    (d) Never ☐

## STAFF DEVELOPMENT EFFORTS AND TRAINING NEEDS

Indicate the extent to which the following staff development programmes and training opportunities are available in your company / workshop for technical employees.

| Programmes & Training Opportunities | Always | Occasionally | Rarely | Never |
|---|---|---|---|---|
| (a) Employees are given study leave with pay (sponsored financially) to enrol on full-time programmes in training institutions | | | | |
| (b) Employees are given study leave without pay to enrol on full-time programmes in training institutions | | | | |
| (c) Employees are sponsored financially to enrol on part-time programmes in training | | | | |

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| | | | | |
|---|---|---|---|---|
| institutions | | | | |
| (d) Employees are given only time-off to enrol on part-time programmes in training institutions | | | | |
| (e) Employees are given opportunity to participate in seminars and workshops organised by personnel manager/ training officer of the company. | | | | |
| (f) Employees are given opportunity to participate in seminars and workshops organised within the company by experts from outside the company / consultants. | | | | |
| (g) Employees are sponsored financially to attend seminars and workshops organised by professional and trade associations | | | | |
| (h) Employees are only given time-off to attend seminars and workshops organised by professional and trade associations | | | | |

4.6 How do you learn about staff training and development opportunities in your organisation?

(a) From training officer ☐

(b) From personnel manager ☐

(c) From head of department / section ☐

(d) Notice from programme / course organizers ☐

(e) Word of mouth within the organization ☐

(f) Word of mouth outside the organization ☐

(g) Others (specify) ☐ _____

4.7 What are the main selection criteria for staff development programmes?

(Rank with 1 being of the greatest importance). Based on

(a) Merit by job performance ☐

(b) Merit by qualification ☐

(c) Training needs expressed by individual ☐

(d) Length of time served in section / department ☐

(e) Seniority in position ☐

(f) Company / organisation need ☐

(g) Personal relationships ☐

(h) Others (specify) _____

4.8. (i) Are you interested in further career mobility?

(a) Yes, within the organisation ☐

(b) Yes, outside the organisation ☐

(h) No, not interested ☐

Reason _____

(ii) **If Yes.**

4.9. What do you feel are your chances of achieving your career aspirations?

(a) Very good ☐     (b) Good ☐     (c) Fair ☐     (d) Poor ☐

4.10. What is likely to prevent you from reaching higher poison? (Tick as appropriate)

(a) Family constraints                                ☐

(b) Social / Cultural constraints            ☐

(c) Technical constraints                        ☐

(d) Organizational constraints              ☐

(e) Absence of opportunity for further training    ☐

(f) Other constraints (please explain) ☐ _____

4.11. If you feel you need further training to achieve your career aspirations then briefly state the type of training below? _____

4.12. To what degree, if any, are you involved in decision making in relation to:

| | Formally | Informally | Not involved |
|---|---|---|---|
| General company / organisation policy | ☐ | ☐ | ☐ |
| Recruitment / selection of staff | ☐ | ☐ | ☐ |

4.13 Do you feel that there are equal career opportunities for female and male staff in the company / organisation?

Yes ☐         No ☐

(ii) **If no,** what barriers, if any, exist for females in attaining senior positions within the organisation/ company? _____

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4.14 Overall, how satisfied are you with your career to date:

    (a) Very satisfied                  ☐

    (b) Satisfied                        ☐

    (c) Neither satisfied nor dissatisfied    ☐

    (d) Dissatisfied                   ☐

    (e) Very dissatisfied              ☐

UNIVERSITY OF CAPE COAST

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

QUESTIONNAIRE TO BE COMPLETED BY TRAINEES IN

INSTITUTIONS AND APPRENTICE

Dear Respondent,

This questionnaire is aimed at collecting information on the factors

militating against the participation of women artisans in male dominated

occupations. It is to bring out the successes, problems and failures faced by

these women so that appropriate measures could be taken to address them.

It would, therefore, be appreciated if you could complete the

questionnaire or answer some questions as accurately as you can in an

interview with me. Your real name would not be required in completing the

questionnaire so be free in stating your responses sincerely. Information

provided by you will be held in confidence.

## SECTION 1

1.1 Age (years) ———————————————————

1.2 Training Institution/Apprenticeship Establishment————————

1.3 Title of programme / field of training ———————————

1.4 If trainee, what is the level of programme being undertaken

Post basic ☐ Post secondary ☐

1.5 If trainee, specific subject area / specialization ————————

1.6 Year and month of enrolment in institution / apprenticeship ————

1.7 Years spent in programme / apprenticeship ——————————

1.8 Expected completion date ( year and month) —————————

1.9 Father's occupation (current or last job)   —————————

1.10   Mother's occupation (current or last job)   —————————

1.11 What is your marital status?

    Single                      ☐

    Married                  ☐

    Separated             ☐

    Other (specify)    —————————

1.12   What type of sponsorship do you have for your programme /

apprenticeship

    By self                  ☐

    By parents             ☐

    By husband            ☐

    By other family members    ☐

    By government        ☐

    By industry          ☐

    By scholarship (specify)   ☐

    By other (specify)    —————————

1.13 What B.E.C.E aggregate did you use to enter the programme?  ____

1.14 What senior secondary school aggregate did you use to enter the

programme?_____

1.15 What was the minimum aggregate required by the institution for the

programme/apprentice? _____

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1.16 Number of students / apprentice in your programme?

| Number of students / apprentice | Male | female | total |
|---|---|---|---|
| Upon entry | | | |
| Currently | | | |

1.17 Are you living in female accommodation provided by the institution?

Yes ☐ No ☐

(b) If no, why

There are no accommodation facilities solely for female students ☐

I could not get into accommodation provided in the institution ☐

I did not wish to be in accommodation of the institution ☐

I live with parents / relatives ☐

Other reason (specify) ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

1.18 What type of basic school did you attend?

Mixed school – girls and boys ☐

All girls' school ☐

1.19 What type of post basic school did you attend?

Mixed senior secondary school – girls and boys ☐

Mixed secondary technical school ☐

Mixed technical institute ☐

All girls' secondary school ☐

Did not attend secondary school? ☐

## SECTION 2

2.1 Do you have career aspirations?

Yes ☐                No ☐

**If yes,** what is your long – term career aspirations?

To set – up my own workshop ☐

To obtain artisan job in the industry ☐

To obtain artisan job in government / public institution ☐

To teach technical subjects in technical Institutions / JSS ☐

To obtain job in non – technical field ☐

Other (specify) _____

2.2 What motivated you most to undertaken this programme? (Rank 1, 2, and 3, with 9 being of the greatest importance)

Interest in the subject area / field ☐

Family influence ☐

Teacher's influence ☐

Friends' influence ☐

Role model's influence ☐

Choice given by the institution based on my aggregate ☐

Based on my previous programme of study ☐

I don't know ☐

Need to work ☐

Other reason (specify) _____

2.3 How were you selected for the programme? (Tick as appropriate)

Based on qualifications and aggregate ☐

Based on my interest ☐

Through written examination ☐

Through interview ☐

Personal relationships ☐

Relative / family influence ☐

Other (specify) _____

2.4 Has the programme met your expectations to date?

Yes ☐

No ☐

**If no,** why not?

Give comment on your reasons

_____

_____

2.5 What is your overall assessment of the programme? (Tick appropriately)

Demanding ☐

Stimulating ☐

Easy ☐

Useful ☐

Others (specify) _____

2.6 What is the likelihood of you completing this programme?

Very high ☐

Moderately high ☐

Low        ☐

Very low       ☐

Unsure       ☐

<u>Please give reasons for your answer</u>

_____

_____

2.7 What is the likelihood of you getting job as an artisan in your area / field

of study?

Very high       ☐

Moderately high       ☐

Low       ☐

Very low       ☐

Unsure       ☐

<u>Please give reasons for your answer</u>

_____

_____

2.8 As part of your programme have you been attached to industry?

Yes       ☐

No       ☐

**If yes,**

(i) In which type of establishment

Technical       ☐

Non – technical       ☐

Other (specify) _____

2.9 How were you perceived by your supervisor in the workplace during the

industrial attachment?  (Tick only one)

Useful ☐

As a burden ☐

Indifferent ☐

I don't know ☐

Other (specify) _____

2.10 How do you think you are perceived by your male counterparts or fellow

male apprentice in the programme / on the job?

As equal ☐

As inferior ☐

As superior ☐

Indifferent ☐

I don't know ☐

2.11 (a) Do you think the programme content discriminates against female

students? ☐

Yes

No ☐

(b) Do you think programme delivery discriminates against females?

Yes ☐

No ☐

**If yes**, in what ways? (i) Content: _____

(ii) Delivery: _____

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2.12 Have you received counselling on career opportunities in your institution?

        Yes        ☐

        No        ☐

2.13 Do you think such counseling is necessary?

        Yes        ☐

        No        ☐

(i)If yes, why is it necessary?

For better awareness of opportunities     ☐

For increased performance at interview     ☐

For better knowledge of working facilities     ☐

For better knowledge of conditions of service     ☐

(ii)If no, why is it not necessary?

Specify reason   _____

2.14 Is there a student's union / apprentice union in the training institution / workshop?

        Yes        ☐

        No        ☐

        I don't know    ☐

(b)If yes, do you participate in the union?

Yes, participate as a voter     ☐

Yes participate as a member of executive     ☐

Yes, participate as a user to address grievance  ☐

Yes, other way (specify)     ☐

No, do not participate     ☐

(c)**If no**, is it because:

Am not interested ☐

Union activities are only for males ☐

Does not meet the needs of females ☐

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