UNIVERSITY OF CAPE COAST

FACTORS THAT INFLUENCE SECOND CYCLE STUDENTS' CHOICE OF A CAREER PROGRAMME

BY

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DECLARATION

Candidate's Declaration

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

Candidate's Signature.. ..... Date....4/09/08..

Name.. AYIAH - MENSAH FRANCIS .....

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast

Supervisor's Signature ..... Date.. 05/09/08 ...

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DEDICATION

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CHAPTER ONE

INTRODUCTION

BACKGROUND

Second cycle education is the level where students opt for various programmes or courses of study to pursue towards a particular career. When students are about to reach this level of their educational ladder, they face the reality of making a good choice among the various alternatives that will lead them into a career of their choice.

According to Ostpow (1999), career decision making has been conceptualised as occurring continuously during the life span and not necessarily limited to early adulthood. Individuals may not make only one career decision, but when faced with different life events, may revise their career decisions over time. Career decision can occur during these transitions. For individuals who pursue career in medicine, there are many transitional points at which indecision can occur. First, the individual has to decide to choose medicine as a career, but not long after they begin their education at medical school, questions begin to arise about which medical specialty to enter. The decision about specialty choice is revisited as medical students progress through the curriculum and are exposed to different areas of

medicine. For some students, additional transitional points for medical specialty choice include whether to enter a subspecialty of medicine, and if so, which one.

Although models for career decision making exist, aspects of identity development related to indecision have not been addressed (Kelly and Lee, 2002).

In the olden days, Ghanaian children were encouraged to help their parents in their career, as a result the children grew up to become experts in the same career as that of their parents. For instance, a Fisherman's son grew up to become a Fisherman, a Farmer's daughter ended up as a Farmer and a Blacksmith's son grew up as a professional Blacksmith.

Vocational psychology provides background information helpful to exploring interests and the vocational identity of physicians. Historically, vocational counsellors have relied on interest inventories to determine an individual's vocational interest (Kitson, 1942). These interests are then matched to occupations. Kitson purported that this approach is inadequate because interests are not detectable if interests are not there, and he recommended a shift from detecting interests to creating interests. Based on this idea, an investigation has been conducted on a relational approach regarding the making of vocational interests as opposed to the traditional method of uncovering or finding interest, as applied to medical students.

The report submitted in October 2002 by the twenty-nine member committee who were appointed by the government of Ghana to undertake a review of all aspects of education in the country informed the government to

take some policies. Among them were that, hitherto, Government's Educational Policy and financial allocation are to be concentrated on the secondary school, which offers several education and to a much lesser extent on classroom based technical and vocational instruction.

The Government of Ghana has decided that by the combination of compulsory Junior High Schooling and a comprehensive Senior High School system, it is intended that as from the time when the reform at second cycle level are completed in 2020, all young persons coming into the labour market will have been exposed to second cycle education and be able to meet the challenges of the 21st century. The former Minister of Education, Science and Sports, (Owusu-Ankomah 2007), made a statement that the government's vision for greater human development in Ghana included all the standard strategic imperatives which experts had advocated. He made mention of innovative curriculum, better schools and smaller class sizes, hence the unveiling of the strategic reformation of basic and secondary education by his ministry.

In 2007, Amposah-Bediako, who is the Government spokesperson on social services, affirmed the government's commitment to honor citizens who excel in their various fields of endeavour. He again said that the national honors conferred on the seventy-eight people would encourage them and the youth to achieve greater heights in their various fields of endeavour. Since an individual can receive a national award irrespective of the programme he or she studies in school, it is worth investigating into the factors which influence second cycle students' choice of programme leading to their future career.

Macmillan English Dictionary for Advance Learners (2006), defines factor as one of the things that influence whether an event happens or the way that it happens. The same dictionary explains Influence as the effect that a person or thing has on someone's decisions, opinions, or behaviour or on the way something happens.

OBJECTIVES OF THE STUDY

The main objective of the study was to identify the factors that influence the choice of a career programme by second cycle students.

The research also addressed the following specific objectives:

1. Establish the difference on interest between male and female students in the various career programmes with respect to interest in father's career and the interest in mother's career.
2. Determine whether encouragement from parents, siblings and teachers is the same for both male and female students offering the various career programmes.
3. Establish the gender difference on prospect for good salary in the various career programmes.

RESEARCH QUESTIONS

The objectives of this study can be supported by formulating the following research questions:

1. What is the nature of the correlation among the variables in general

2 What are the major factors that influence second cycle students' choice of a career programme?

3 Is there a relationship between the interest in father's career and interest in mother's career?

4 Could the encouragement from the parents, siblings and teachers be classified as a single factor?

LITERATURE REVIEW

Research demonstrates that parents' comments, beliefs and interactions with their children may have a profound influence on their child's vocational development. Many of these past studies focused on demographics or interactions from the young adult perspective. Some of the previous researchers did not ask parents themselves about their perceptions of their role in this developmental process.

Reddy et al. (2007) did a research work on factors influencing candidate choice of categorical internal medicine programme. This study was conducted as a community based university affiliated internal medicine residency programme. Each candidate was asked to complete a survey in which he/she would score, using 7-point likert scale, the importance of each of 36 factors in affecting their decision making. The survey also asked that each participant then return to their pre-specified list and circle those three factors most important in their choice of residency.

The factors identified as most important to candidates interviewed at a community-based internal medicine training programme involve their clinical

learning experience, the perception of resident satisfaction of the programme and the perceived potential for fellowship placement after residency. Factors unrelated to the educational aspects of the programme were identified as having the least relevance in their choices.

According to Esters and Bowen (2005), research question on which individuals influence the career choice of students who graduated from an urban agricultural education programme revealed that, the former students' mother or female guardian ($M = 3.05$), a friend, ($M = 2.82$) and father or male guardian ($M = 2.69$) had a "low influence" on their career choice. These findings were similar for both male and female respondent although females ($M = 2.69$) indicated more than males ($M = 2.40$) that their father or male guardian was more influential on their career choice.

Furthermore, friends had more influence on former student's career choice than other selected individuals including the father. A spearman's rho coefficient of 0.86 revealed that males and females were in agreement with their ranking of individuals who influence their decision to pursue a career in agriculture.

Esters and Bowen (2005), also asked the research question on what events or experience influenced students who graduated from an urban agricultural education programme to choose or not to choose a career in agriculture. The former students were asked to list a specific event or experience that influenced their choice of a career in agriculture. An agriculture career was defined using listings in the Occupational Outlook for Agriculture handbook (2002). Four former students indicated a career

opportunity was the event or experience influencing their decision to choose a career in agriculture while another four students indicated high school educational experiences. An additional three students indicated high school work experiences as the event or experience influencing their decision to choose a career in agriculture.

Of the former students who did not choose a career in agriculture, 19 indicated they had other career interest while another 13 students provided responses that were classified as "others". These included events and experiences such as few minorities represented in agriculture, tired of school and work, no event or experience, and poor grade in school. Of the 88 former students who responded, 16 students chose a career in agriculture.

According to Borges (2007) regarding medical career development, a t-test was performed using the Medical Career Development Inventory (MCDI) to assess whether there was a change in medical students' vocational development. Significant differences were noted between pre and post test scores on the MCDI for career crystallisation, $t = 6.31$, $p = 0.000$, and career implementation, $t = 3.10$, $p = 0.003$, at 10% significance level. Once multiple comparisons were made, the significance level was adjusted to $p = 0.06$ using the Bonferroni procedure to control the family-wise error.

Regarding career crystallisation as measured by the MCDI scale, the mean scores before participating in a new course called the Ambulatory Care Experience (ACE) were higher than the mean scores after the course. Pretest, $M = 19.13$, $SD = 3.34$; post test, $M = 16.71$, $SD = 3.47$, indicating that at the end of the course, first year medical students were less likely to have

formulated a general preference for a career in medicine and had not yet begun to form a vocational identity. Regarding career implementation as measured by the MCDI scale, mean scores were also lower after taking the ACE course. Pretest: $M = 18.03$, $SD = 3.40$; post test, $M = 16.77$, $SD = 3.63$. This suggests that the medical students were less likely to have implemented their preferences and to have demonstrated a commitment to medicine after completing the ACE course.

Borges (2007) research work also revealed the results of the t-test for the specialty indecision scale, which assessed students' thoughts about a medical career or a medical specialty. It revealed that the study participants' pretest responses were significantly different from the post test responses for 14 of the 18 items. Students indicated less comfort about knowing how to implement their choice of a medical career and also indicated that they felt more undecided on a medical career after participating in ACE ($t(89) = 4.76$, $p = 0.000$). The mean scores before participating in ACE were higher than the mean scores after the course: pretest $M = 3.23$, $SD = 0.74$; posttest, $M = 2.83$, $SD = 0.89$. Because multiple comparisons were made, the significance level was adjusted to $\alpha = 0.002$ using the Bonferroni procedure to control the Type I error rate.

Careers Paths in Materials Science and Engineering conducted a survey on factors influencing people to enter a field. One main objective of the survey was to obtain information on reasons for people to enter a field. The survey group clearly indicated that among the types of influencing sources, people are the prime factors. Over 35% of the survey group was

influenced by some personal interaction. It again revealed that there has been a very little change in the influencing factors for the recent graduates as compared with the entire group. However, courses both in high school and college were cited more by recent graduates than the entire group while printed materials were less of a factor for the recent graduates.

The source for these influencing factors is another area of interest. In their research the survey group found information about the field. Over 50% of the survey group found information about the field in college with high school sources a distant second at around 20%. Also, family members as a source continue to be a significant source as does employment. Further, there appears to be no significant change in source areas over the years.

The Northwestern University Career Service report on factors affecting students' major choice identified both External and Internal Factors. The External Factors were lack of information, too much information, majors and careers don't seem to relate.

It was said under lack of information that because there is little career education prior to college, it is not unusual for students to have too little information to make a comfortable major decision. Students' first step might be to make sure they have the resources needed. However, under too much information, the report indicated that the World Wide Web offers more information than we can manage on any topic we can imagine. It was said that many students find themselves quickly overwhelmed. An important skill everyone needs to have is knowing how to skim the web and quickly find good and accurate information on the web.

Majors and careers don't seem to relate was another external factor. The report revealed that an assumption that majors and careers are related is not necessarily so. It was said that majors are institutional construction. That is, part of the requirements for a degree but careers are types of work an individual might choose to do, and are largely skill based. It explained further that while an individual can find work that relates to a specific major, a person is not limited to work related to his or her major. The majority of entry-level positions require degree first, skills second and sometimes, but not always, a preferred major third.

The Internal Factors identified in the report were lack of self-confidence, fear or anxiety, conflicting values, conflict with significant others and multipotentiality.

Lack of self-confidence was explained that if choosing one's major seemed an especially critical choice for him or her, the individual may experience a lack of information that can be related to this factor and often obtaining additional information can help.

The report explained that a little fear or anxiety can help you to stay on your toes, but too much anxiety will wear you down, leaving you more susceptible to error and illness. Anxiety can come from the fear that you will make "bad" decisions can paralyse an individual. Often by considering alternate ways to view the situation, fear and anxiety can be relieved.

The conflicting values factor: sometimes one's personal values are not compatible for the type of work he or she considers. A desired salary is not always possible in organisations that help people. Job security in the

performing industry is difficult to find. Being clear about one's personal and work values and knowing what values different work industries share are important pieces of information in choosing a major or career.

Conflict with significant others is another internal factor. There are people in an individual's life who have more influence on him or her than others. Parents and significant others may have definite ideas about a person's career choice. The desire to please or a person's need for financial support may put undue pressure on him or her to choose a path he or she does not really want. Despite this pressure, some students will opt not to decide.

Multipotentiality is an internal factor resulted from the fact that most Southwestern students have many interests and even more abilities. This made them find it difficult to choose a major or career because they find themselves attracted to many options that all seem appealing to them.

DATA COLLECTION

The data for this study were collected from selected final year students in some selected Senior High Schools (SHS) in the Western Region. Questionnaires were administered during the [illegible] period. Data was taken. The students were asked to complete the questionnaires in the presence of the researcher. This was [illegible] and also to ensure a high response rate.

The target population for the study was [illegible] Senior High School Students in the Western Region. However, the accessible population comprises six schools namely Sekondi College, Archbishop Porter Girls

Secondary School, Ghana Secondary Technical school, Bompeh Secondary Technical School, Methodist Secondary School and Fijai Secondary School.

A non-probability sampling technique of judgmental or purposive sampling was used to determine a sample of size 600. Hundred students were selected from each of the six schools. Students offering programmes such as Science, Business, Home Economics, Visual Arts, General Arts and Technical were sampled. The diversity in the choice of programme was necessary to ensure that the study covers students who have the intention of making different career choices.

The details of the frequency and the percentage responses on the data are shown in the preliminary analysis and the Appendix B. The responses Very high, High, Average, Low and Very low were coded as [illegible] and [illegible] respectively. The same coding were also used for the response Strongly agree, Agree, Neutral, Disagree and Strongly disagree. GA, VA, Sci, Bus, HE and Tech have been used to represent the programmes General Arts, Visual Arts, Science, Business, Home Economics and Technical respectively. The variables for the study are defined as follows:

X_1 Interest in father's career

X_2 Interest in mother's career

X_3 School's proposal

X_4 School noted for a programme

X_5 Sibling encouragement

X_6 Interest in a programme

- Parent's encouragement
- Teacher's programme
- Teacher's encouragement
- Friend's suggestion
- Prestige attached
- Prospect for good salary
- Degree of gender association
- Influence choice to go abroad
- Getting job
- Cost of programme
- Available material

The factors were selected since they are used to indicate the motivation for choice of career programme.

OUTLINE OF DISSERTATION

This project is divided into five chapters. Chapter one is the introduction of a career programme by a selected secondary school students in the Ashanti region of Ghana.

The report is organised into five chapters. In chapter two is the discussion of the Background of the study, the Objectives of the study, Research Questions, Literature Review and Data collection. Chapter three looks at the methodology that is used to analyse the data. Chapter three looks at the Preliminary Analysis of the data which includes summary statistics and

graphical representations of the variables. Chapter four deals with further views of the data and chapter five consists of Summary, Discussion, Conclusion and Recommendations.

CHAPTER TWO

REVIEW OF METHODS

This chapter discusses the established method needed to convert the raw data into the kinds of information decision makers need. Factor Analysis which is a multivariate technique for summarising and analysing data is presented in this chapter.

FACTOR ANALYSIS

Sharma (1996) said that, factor analysis was originally developed to explain student performance in the various courses and to understand the link between grades and intelligence. Spearman (1904) hypothesized that student performance in the various courses are intercorrelated and their intercorrelation could be explained by student's general intelligence levels. However the technique is generally used in recent times in business situations which require a scale or an instrument to measure the various constructs such as attitudes, image, patriotism, sales aptitude and resistance to innovation. If data is collected on a large number (n) of variables most of which are correlated it may be desirable to reduce the number of variables involved. This requires an examination of the interrelationship between the variables.

and then represented by a few (m) new underlying factors. The new fewer variables also referred to as latent factors are then used to approximate the correlations between the original variables.

Mathematically, factor analysis is somewhat similar to multiple regression analysis in that each variable is expressed as a linear combination of underlying factors. The two basic approaches to factor analysis are principal component analysis and common factor analysis. In principal component analysis, the total variance in the data is considered. Principal component analysis is recommended when the researcher's primary concern is to determine the minimum number of factors that will account for maximum variance in the data for use in subsequent multivariate analysis. In common factor analysis, the factors are estimated based only on the common variance. This method is appropriate when the primary concern is to identify the underlying dimensions and when the common variance is of interest. This method is also known as principal axis factoring. The amount of variance the variable shares with all other variables is called communality.

The covariation among the variables is described in terms of a small number of common factors plus a unique factor for each variable. These factors are not overtly observed. If the variables are standardized, the factor model may be represented by

$$X_i = A_{i1}F_1 + A_{i2}F_2 + A_{i3}F_3 + \cdots + A_{im}F_m + V_i U_i$$

Where

X_i is i^{th} standardized variable

A_{ij} is standardized multiple regression coefficient of variable i on common

factor i

F_i = common factor i

V_i = is standardized regression coefficient of variable i on unique factor i

U_i = is the unique factor for variable i

m = is number of common factors

The unique factors are uncorrelated with each other and with the common factors. The common factors themselves can be expressed as linear combinations of the observed variables.

$$F_i = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + \dots + W_{ik}X_k \qquad 2.2$$

Where

F_i = is estimate of ith factor

W_i = is weight or factor score coefficient

k = is number of variables

It is possible to select weights or factor score coefficients so that the first factor explains the largest proportion of the total variance. Then a second set of weights can be selected, so that the second factor accounts for most of the residual variance, subject to being uncorrelated with the first factor.

This same principle could be applied to selecting additional weights for the additional factors. Thus, the factors can be estimated so that their factor scores, unlike the values of the original variables, [illegible]. Furthermore, the first factor accounts for the largest [illegible], the second factor the second largest and so on.

PRINCIPAL COMPONENT FACTOR ANALYSIS

Principal Component is one of the procedures for carrying out Factor analysis. To identify the latent factors underlying the correlations between p indicator variables $X_1, X_2, \ldots, X_p$, the correlation matrix of the variables are examined by means of Principal Component Analysis. This is done by forming p new variables Y_j, $j = 1, 2, \ldots, p$, where

$$Y_1 = a_{11}X_1 + a_{12}X_2 + \cdots + a_{1p}X_p$$
$$Y_2 = a_{21}X_1 + a_{22}X_2 + \cdots + a_{2p}X_p \qquad (2.1)$$
$$\vdots$$
$$Y_p = a_{p1}X_1 + a_{p2}X_2 + \cdots + a_{pp}X_p$$

That is, the Y_j's are linear combinations of the original variables. The new variables are referred to as the Principal Components. The coefficients $a_{j1}, a_{j2}, \ldots, a_{jp}$ of the j^{th} variable Y_j, $j = 1, 2, \ldots, p$, are called the principal component coefficients. The coefficients are determined such that

$$a_{j1}^2 + a_{j2}^2 + \cdots + a_{jp}^2 = 1, \quad j = 1, 2, \ldots, p \qquad (2.2)$$

$$a_{j1}a_{k1} + a_{j2}a_{k2} + \cdots + a_{jp}a_{kp} = 0, \quad j \neq k, \; j, k = 1, 2, \ldots, p \qquad (2.3)$$

These conditions ensure that the components are uncorrelated, i.e., orthogonal, and each other.

Suppose λ_j is the variance of the j^{th} principal component, $j = 1, 2, \ldots, p$, and $\lambda_1, \lambda_2, \ldots, \lambda_p$ are the eigenvalues and N the variance of the j^{th} principal component coefficient defined by $\frac{\lambda_j}{N}$.

is the loading of the *ith* variable on the *uth* component. This value then is a measure of the correlation between the *ith* variable on the *uth* component. In this case, $Cov(x_i, z_u)$ may then be generally written as

$$x_i = \sum_{u} l_{iu} z_u \qquad 2.6$$

Equation 2.6 may be written in matrix form as

$$\mathbf{x} = \mathbf{L}\mathbf{z} \qquad 2.7$$

where $\mathbf{z}$ is a $p \times 1$ vector of standardized components

$\mathbf{L}$ is a $p \times p$ orthonormal matrix of loadings.

$\mathbf{x}$ is a $p \times 1$ vector of indicator variables

Thus $\mathbf{L}\mathbf{L}' = \mathbf{I}$ is $p \times p$ identity matrix. From Equation 2.7, $\mathbf{z}$ is obtained as

$$\mathbf{z} = \mathbf{L}'\mathbf{x} \qquad 2.8$$

That is, the original variables $x_i (i = 1, 2, \ldots, p)$ now expressed in terms of the components as

$$\begin{aligned} z_1 &= l_{11}x_1 + l_{21}x_2 + \cdots + l_{p1}x_p \\ z_2 &= l_{12}x_1 + l_{22}x_2 + \cdots + l_{p2}x_p \\ &\vdots \\ z_p &= l_{1p}x_1 + l_{2p}x_2 + \cdots + l_{pp}x_p \end{aligned} \qquad 2.9$$

Or z_u is generally expressed as

$$z_u = \sum_{i} l_{iu} x_i \qquad 2.10$$

Since orthogonality conditions are met, the z_u accounts for the *uth* largest variation in the data and z_1 here is referred to as the *first* factor. Using the rules of factor extraction proposed by (Zwick and Velicer, 1986) the factor is interpreted by considering those high loadings (> 0.4) indicates the factor's importance in explaining the variability in that variable.

The scree plot proposed by Cattell (1966) is another popular rule for factor extraction. In this rule a plot of the eigenvalues against the number of components is examined for an "elbow". The number of principal components that need to be retained is given by the elbow. One or more combinations of the extraction rules are used to obtain the first few m factors ($m < p$). The remaining ($p - m$) factors are used to derive the specific variances of the original variables accounting for these unique variances. Equation 2.10 may then be written as

$$x = \sum_{j=1}^{m} l_{ij} F_j + e_i \qquad 2.11$$

Where e_i is the unique variance of the i^{th} variable x_i. The matrix form of Equation (2.11) is given by

$$X = BF + P \qquad 2.12$$

In Equation (2.12) B is a $p \times m$ reduced matrix of X and the matrix BB' is of dimensions $P \times P$ and represents the reproduced matrix of the correlation matrix. F is a $m \times 1$ vector of reduced factors and P is a $p \times 1$ vector of unique variances. The elements of P are $e_i^{1/2}$ for the unique variance of x_i. In Equation (2.12) each variable is represented as the sum of two component parts. The first is a linear combination of the m extracted factors called the common factors. The second part is the remaining ($p - m$) components which represents the unique variance. The loading $\sum_{ij}$ where l_{ij} are the coefficients in Equation (2.11) is the covariance of x_i and can also be obtained as the (i,j) diagonal element of the

reproduced matrix BB'. The corresponding specific variance is then obtained by

$$\psi = I - \sum l \qquad 2.13$$

The assumption governing the principal component factor analysis is that the initial estimate of the communalities of the variables is equal to 1. This means that initially the variables do not have any specific variances. If the values of ψ and for that matter the elements of the vector Ψ are small, it implies that the m extracted factors explain very well the correlations between the variables. The matrix BB' is then approximately equal to the original correlation matrix Σ. The closeness of this approximation ultimately determines the goodness-of-fit of the factor model.

SOME CONDITIONS FOR CONDUCTING FACTOR ANALYSIS

In determining whether a particular data set is suitable for factor analysis, the sample size and the strength of the relationship among the variables are some of the main issues to consider. There is little agreement among authors concerning how large a sample should be. The recommendation generally is that, the larger, the better. In small samples the correlation coefficients among the variables are less reliable, tending to vary from sample to sample. Tabachnik and Fidell (2001) review this issue and suggested that it is comforting to have at least 300 cases for factor analysis.

The second issue to be addressed concerns the strength of the inter-correlations among the items. Tabachnick and Fidell recommend an

inspection of the correlation matrix for evidence of coefficients greater than 0.3. Two statistical measures operated by SPSS to help assess the suitability of the data are Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy.

The Bartlett's test of sphericity should be significant ($p < 0.05$) for the factor analysis to be considered appropriate. The KMO index ranges from 0 to 1, with 0.6 suggested as the minimum value for a good factor analysis. The value of the KMO is a measure of well defined subgroups among the entire group of indicator variables. Kaiser and Rice (1974) describe this value as "Middling" if it is between 0.7 to 0.8 and unacceptable if it is less than 0.5. In the latter case, a decision to use factor analysis technique needs to be carefully informed.

It has been speculated by some factor analysts (Zwick and Velicer, 1986) that the precision of the recommendation of the KMO measure is dependent on the number of indicators underlying a particular factor. If the number of indicators per factor is large, precision increases. By the derivation of the KMO measure, the value is high if each variable has an individual KMO. In other words, the value can be increased by deleting those variables under study whose individual KMO are small.

Sometimes analysis of the data may not be possible as a result of scanty information on some variables that does not allow for the computation of pairwise correlations between the variables. Since the technique utilizes the correlation matrix, the variable involved in such a case might be dropped and the correlation matrix obtained for the remaining variables for the study.

Another condition on the number of variables that can be used in the study is known as the Federmann bound. Federmann (1937) has derived a bound for the number (m) of factors that can be extracted from p original variables. The bound is given by

$$m \leq \frac{1}{2}\left[(2p+1) - \sqrt{(8p+1)}\right] \qquad (14$$

that is, the number of common factors cannot exceed the largest integer satisfying the inequality. By Sneath's definition, $m \geq 3$. It can be deduced from the form of this equation that the number p of variables is less than 8 if the condition on m is violated. On the other hand, the source of this bound given by the quadratic inequality $(p - m)^2 \geq p + m$ (9) naturally rules out the possibility of the value of m being equal to p. The factor analyst is recommended to use dimensionality reduction techniques if the number of variables under study is quite large, and to note that Sneath's criterion is also true if the number of common factors extracted is greater than the initial number of variables considered.

DETERMINATION OF THE NUMBER OF FACTORS

In order to summarise the information contained in the original variable a smaller number of factors should be sought. Several methods have been proposed for determining the number of factors to be retained. A priori determination approaches are based on the percentage of variance accounted for, split-half reliability, and empirical

Sometimes because of prior knowledge the researcher knows how many factors to expect and thus can specify the number of factors to be extracted beforehand. The extraction of factors ceases when the desired number of factors have been extracted. Most computer programs allow the user to specify the number of factors, allowing for an easy implementation of this approach.

We can also determine the number of factors based on eigenvalues of extracted factors. In this approach only factors with eigenvalues greater than 1.0 are retained and the other factors excluded in the model. An eigenvalue represents the amount of variance associated with the factor. Hence only factors with [illegible] greater than 1.0 are included. Factors with variance less than 1.0 are not better than a single variable, [illegible] standardization, each variable has a variance of 1.0. If the number of variables is less than 20, this approach will result in a conservative number of factors.

The scree [illegible] plot [illegible] eigenvalues [illegible] the number of factors in order of extraction. The [illegible] the plot is used to determine the number of factors. Typically [illegible] distinct break between the steep slope of factors [illegible] gradual trailing [illegible] associated with the rest of the factors [illegible] which the scree begins denote the true number [illegible] number of factors determined by a scree plot [illegible] that determined by the eigenvalue criterion.

The number of extracted factors can also be determined based on percentage of variance. In this approach the number of factors extracted is determined so that the cumulative percentage of variance extracted by the factors reaches a satisfactory level. What level of variance is satisfactory depends upon the problem. However it is recommended that the factors extracted should account for at least 60 percent of the variance.

A split-half reliability is another approach where the sample is split in half and factor analysis is performed on each half. Only factors with high correspondence of factor loading across the two sub samples are retained.

It is possible to determine the statistical significance of the separate eigenvalue and retain only those factors that are statistically significant. A draw back is that with a large sample (size greater than 200) many factors are likely to be statistically significant, although from a practical view point many of these accounts for only a small proportion of the total variance.

THE ORTHOGONAL FACTOR MODEL

According to Johnson and Wichern (1992) the observable random vector X with p components has mean μ and covariance matrix Σ. The factor model postulates that X is linearly dependent upon a few unobservable random variables $F_1, F_2, \ldots, F_m$ called common factors and p additional sources of variation $\varepsilon_1, \varepsilon_2, \ldots, \varepsilon_p$ called errors or sometimes specific factors. In particular, the factor analysis model is

$$
\begin{aligned}
X_1 - \mu_1 &= l_{11}F_1 + l_{12}F_2 + \cdots + l_{1m}F_m + \varepsilon_1 \\
X_2 - \mu_2 &= l_{21}F_1 + l_{22}F_2 + \cdots + l_{2m}F_m + \varepsilon_2 \\
&\vdots \\
X_p - \mu_p &= l_{p1}F_1 + l_{p2}F_2 + \cdots + l_{pm}F_m + \varepsilon_p
\end{aligned}
\qquad 2.15
$$

the equivalent matrix notation is

$$X - \mu = LF + \varepsilon$$

where

l_{ij} is the loading of the i^{th} variable on the j^{th} factor

L is the matrix of factor loadings

ε_i is associated only with the i^{th} response X_i

The p deviations $X_1 - \mu_1, X_2 - \mu_2, \ldots, X_p - \mu_p$ are expressed in terms of $(p + m)$ random variables $F_1, F_2, \ldots, F_m, \varepsilon_1, \varepsilon_2, \ldots, \varepsilon_p$ which are unobservable. This distinguishes the matrix notation factor model from the multivariate regression model in which the independent variables whose positions are occupied by F in the matrix notation can be observed.

ROTATION

Sharma (1996) stated that the objective of rotation is to achieve a simpler factor structure that can be meaningfully interpreted by the researcher. He mentioned an orthogonal rotation which is most popular the rotated factors are orthogonal to each other whereas in oblique rotation the rotated factors are not orthogonal to each other. The interpretation of the factor structure resulting from an oblique rotation is more complex than that

resulting from orthogonal rotation. Varimax and Quartimax are the most popular types of orthogonal rotations.

In the varimax rotation the major objective is to have a factor structure in which each variable loads highly on one and only one factor. That is a given variable should have a high loading on one factor and near zero loadings on the other factors. Such a factor structure will result in each factor representing a distinct construct.

The squared multiple correlation of each equation represents the amount of variance that is common between all the variables and their respective factor and is used to determine the ability of the variables to measure or represent the respective factor. In other words, squared multiple correlations simply represents the extent to which the variables or indicators are good measures of a given construct. Obviously the squared multiple should be high. Many researchers have considered values greater than 0.60 as high however once again how high the high is subject to debate.

It has been noted in Equation(2.12) that the matrix B with dimension $p \times m$ is a reduced matrix of the loading matrix A and that the matrix BB' is of dimensions $p \times p$ and represents the reproduced matrix of the observed correlation matrix R. The covariance matrix Σ can be factorised as

$$\Sigma = \Psi + BB' \qquad 2.16$$

Where Ψ is a diagonal matrix whose elements are the specific variances given in Equation (2.13). If T is an $m \times m$ orthogonal matrix, the product BT is a rotated loading matrix of the original matrix B under the transformation T. Substituting BT for B the covariance matrix Σ can be generated by a loading

matrix BT whose elements are different from the original matrix B. There are infinite number of such orthogonal transformations and as such the covariance matrix can be generated by an infinity of loading matrices. With a convenient angle of rotation, all the possible rotations are aimed at obtaining a simple structure [illegible] gives a more interpretable factor solution. This may be achieved in two ways by removing or reducing the number of negative loadings which confuse the interpretation of factors or by making the sizes of negative loadings negligible.

The major objective of this rotation technique is to obtain a pattern of loadings such that all the variables have a fairly high loading on one factor and near zero loadings on the remaining factors. Obviously, such a factor structure will represent one factor that might be considered as an overall factor and the other factors that might be specific constructs. Thus, quartimax rotation will be most appropriate when the researchers suspect the presence of general factor. Varimax rotation destroys or suppresses the general factor and is not appropriate to be used when the presence of the general factor is suspected.

CHAPTER THREE

PRELIMINARY ANALYSIS

The data collected from the students have been explored in this chapter to identify the nature of the variables. This is in readiness for conducting specific statistical analysis to address the research questions and to achieve the objectives of the study. The SPSS software was used to explore the frequencies of the data, correlation analysis, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's test, Eigenanalysis and Bar graph.

FREQUENCIES OF THE DATA

The Table 1 shows the frequency of the responses for each of the items on the variables. It is significant to note that [illegible] students [illegible] valid percentage have a very high (VH) interest in father's career while [illegible] students have a very high (VH) interest in mother's career [illegible] valid percentage. 21 students with a valid percentage of 3.5 were the [illegible] group to indicate that they have a low interest in their father's career [illegible] interest in father's career. The largest group of 1[illegible] students said they have a [illegible] high interest in their mother's career. However, 39 students with a valid

percentage of 6.5 indicated that they have a very low interest in their mother's career.

The response on X5 (School's proposal) shows that a larger proportion of the students were of the view either to disagree or strongly disagree with the statement that a student should accept any programme given to him or her just because he or she wants to attend a particular school. These two responses have a valid percentage of 71.5. However they were of the view that their schools are X4 (School noted for a programme) that is a school well noted for the programmes they are offering. This perhaps influenced their decision to opt for the school and their choice of a career programme. Only 39 students with a valid percentage of 6.5 indicated that they strongly disagree with the statement.

Most of the students said they don't have a sibling who offered their programme in school as shown in the Appendix B. But 48.1 valid percentage of the students response indicates a lot of X3 (Sibling encouragement) to opt for their pursing programme. Majority of the students have a very high X1 (Interest in a programme) of study with a valid percentage of 64.9. The X2 (Parent's encouragement) is also very high with a valid percentage of 48.8. See Table 1.

A larger proportion of the students strongly disagree or disagree with the statement that a student should offer the X6 (Teacher's programme) that his or her best JSS teacher teaches. However they indicated a lot of X7 (Teacher's encouragement) from their teachers in their opted programmes.

There was no singular popular students' opinion on X_{11} (Friend's suggestion) to offer a programme. However, larger proportions strongly disagree or disagree that a student should offer the same programme just because his or her friend has decided to opt for it. A larger proportion of the students strongly disagree also that a student should choose a programme that will automatically lead him or her to the X_{12} (Parent career).

The X_{13} (Prospect for good salary) may be an influential factor which most of the students might consider in opting for a programme. The valid percentage for this opinion is 56.0. Majority of the students were of the opinion on X_{14} (Degree of gender association) that their programme is not associated with any particular gender with a very high degree. This accounted for 39.9 of the valid percentage.

Considering the response on items X_{15} (Enhance chances to go to abroad) and X_{16} (Getting job) as indicated in the Table 1, all the students responded to these items probably due to the high interest they attached to them. A larger proportion of the students indicated that the X_{17} (Cost of programme) of their career programme is either high or very high. Since a lot of the students were of the opinion that the cost of their career programme is on the higher side, cost may not be an influential factor for the choice of a career programme. The students' response on X_{18} (Available material) shows that materials such as text books or tools motivated them to choose their career programme. It can be seen on the Table 1 that 170 students which is the

highest frequency on the item, indicated that the influence on the available material is just average

Table 1: Frequency and valid percentage responses

Variable	Responses	1	2	3	4	5	
X_1	Frequency	269	162	122	21	23	597
	Valid percentage	45 1	27 1	20 4	3 5	3 9	100
X_2	Frequency	157	179	175	49	39	599
	Valid percentage	26 2	29 9	29 2	8 2	6 5	100
X_3	Frequency	50	67	53	194	234	598
	Valid percentage	8 4	11 2	8.9	32 4	39.1	100
X_4	Frequency	234	185	86	53	39	597
	Valid percentage	39 2	31.0	14.4	8 9	6 5	100
X_5	Frequency	288	156	92	24	39	599
	Valid percentage	48 1	26 0	15 4	4 0	6 5	100
X_6	Frequency	389	146	53	6	5	599
	Valid percentage	64 9	24 4	8 8	1 0	0 8	100
X_7	Frequency	291	164	76	39	30	600
	Valid percentage	48.5	27 3	12 7	6 5	5 0	100
X_8	Frequency	46	67	52	208	246	599
	Valid percentage	7 7	7 8	8 7	34 7	41 1	100
X_9	Frequency	234	170	147	32	16	599
	Valid percentage	39 1	28 4	24 5	5 3	2 7	100
X_{10}	Frequency	107	152	152	91	98	600
	Valid percentage	17 8	25 3	25 3	15 2	16 3	100
X_{11}	Frequency	30	34	57	188	289	598
	Valid percentage	5.0	5 7	9 5	31 4	48 3	100
X_{12}	Frequency	336	144	47	41	32	600
	Valid percentage	56 0	24 0	7 8	6 8	5 3	100
X_{13}	Frequency	237	207	113	25	17	599
	Valid percentage	39 6	34 6	18 9	4 8	2 8	100
X_{14}	Frequency	309	143	104	22	22	600
	Valid percentage	51 5	23 8	17 3	3 7	3 7	100
X_{15}	Frequency	362	154	59	15	10	600
	Valid percentage	60 3	25 7	9 8	2 5	1 7	100
X_{16}	Frequency	305	176	100	6	11	598
	Valid percentage	51 0	29 4	16 7	1 0	1 8	100
X_{17}	Frequency	128	144	170	97	60	599
	Valid percentage	21 4	24.0	28.4	16.2	10.0	100

The table in Appendix B shows the frequency of the responses of the subject items on the questionnaire. It can be seen that all the 600 students indicated their gender, but the males were more than the female students. Age had a multiple mode of 16 years and 17 years.

All the students indicated their religion with the majority being Christians. This accounted for 95.0 valid percent as it can be seen in Appendix B. Sample size of hundred students was selected from each of the six schools and the six programmes. A larger proportion of the future career responses indicated by the second cycle students is related to science programme. The equivalent percentage is 33.7 of the valid responses as seen in Appendix B.

Out of the 598 students who indicated their native of a region in Ghana, 196 of them come from the Western Region. This represent 32.8 valid percentage as indicated in the Appendix B. A larger proportion of the students indicated that their father's career does not require any particular programme but their mother's career is Business related. This accounted for 60 valid percentage. The rest of the questions sought student's opinion on the help they get in learning their career programmes, the difficulty nature of each programme and what motivated them to choose their career programmes.

CORRELATION ANALYSIS

The Table 2 which shows the correlation matrix of the study variables satisfy the assumption of the correlation matrix in the factor analysis. The assumption which states that for a data to be considered suitable for factor analysis, the correlation matrix should show at least some correlation of $r = 0.3$ or greater. The correlation matrix constructed from the data obtained as shown indicates a relatively high correlation among some of the variables. For instance, there is a highest correlation of 0.437 between the variables X1(Interest in mother's career) and X2(Interest in father's career). Also, the variables X11(Parent's encouragement) and X12(Sibling encouragement) recorded a correlation value of 0.358.

The least correlation is 0.001 which occurred between the variables X3(Getting job) and X7(Friend's suggestion). The variables X5(School's proposal) and X2(Interest in father's career) showed another very low correlation of 0.003. It can be said that there is a generally low correlation among most of the variables, indicating that they have very little in common. Although most of the variables correlated both positively and negatively, the variables X_6(School noted for a programme) and X7(Friend's suggestion) correlated positively with all the other variables.

Table 2: Correlation Matrix

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}
X_2	.437															
X_3	.003	-.009														
X_4	.106	.092	.028													
X_5	.082	154	.084	261												
X_6	127	.124	- 007	186	221											
X_7	.073	146	095	.078	358	198										
X_8	- 064	- 041	264	080	-.006	- 056	046									
X_9	- 008	063	.073	103	229	181	213	020								
X_{10}	091	149	144	130	200	074	.193	.158	171							
X_{11}	028	.017	106	.153	046	- 046	- 029	199	- 056	.018						
X_{12}	054	038	.100	075	- 028	058	053	.028	042	117	063					
X_{13}	075	153	045	158	.139	117	.067	- 013	.142	.042	- 015	040				
X_{14}	085	122	017	139	204	187	.146	- 005	084	075	- 043	065	189			
X_{15}	132	134	030	130	190	.207	164	-.104	141	001	-.073	066	187	288		
X_{16}	029	-.050	- 048	010	044	078	042	- 069	087	010	-.120	027	.068	031	157	
X_1	117	146	110	203	216	163	.144	086	131	157	054	076	196	.253	150	.048

Table 3: KMO and Bartlett's Test

TEST		VALUE
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.723
Bartlett's Test of Sphericity	Approx. Chi Square	931.587
	Degree of freedom	136
	Significance	0.000

The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) value is 0.723 as shown in Table 3 Moreover, the Bartlett's Test of Sphericity is significant ($p = 0.000$). These figures also satisfy the assumption of the suitability of the data for factor analysis to support the result on the correlation matrix Here the Kaiser-Meyer-Olkin value was expected to be 0.6 or above while the Bartlett's Test of Sphericity should be significant with $p < 0.05$. Thus, the data meets the requirement for the use of Factor Analysis

EIGENANALYSIS

The eigenvalues and the percentage of variation of the data on factors that influence second cycle students' choice of a career programme have been shown in the Table 4. Five out of the seventeen components recorded eigenvalues greater than one A plot of the eigenvalues against the corresponding component is given on the scree plot in Figure 1 It can be seen that the "elbow" of the diagram occurs at the fifth component

The Table 4 gives a summary of eigenvalues extracted from the total variance explained output The Initial Eigenvalues give the eigenvalues The eigenvalues for the factors are as expected in decreasing order of magnitude as we go from variable 1 to variable 17

The eigenvalue for a factor indicates the total variance attributed to that factor. We are interested only in a component that has an eigenvalue of one or more. To determine how many components meet this criterion, we scan down the values provided in the first set of column labelled Total In the Table 4, the five components recorded eigenvalues above one as follows; 2.759, 1.613, 1.341, 1 153 and 1 076 The values of the five components explained a total of 46 712 per cent of the variance as shown in the cumulative % column of the Table 4

Table 4: Eigenvalues and percentage of variance explained

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.759	16 228	16 228
2	1.613	9 487	25.715
3	1 341	7.885	33.600
4	1.153	6.780	40.380
5	1.076	6 332	46 712
6	.978	5.754	52.466
7	.934	5.492	57 958
8	895	5.262	63 220
9	.862	5 071	68.291
10	805	4.733	73 024
11	.753	4.427	77.451
12	739	4 346	81.797
13	.726	4.269	86.066
14	666	3 919	89.985
15	627	3.686	93 671
16	554	3.256	96 927
17	.522	3.073	100.000

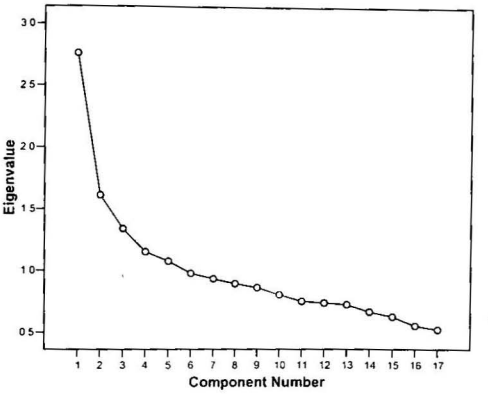

Figure 1: Scree plot of adding Eigenvalue against Component Number

It is important to also look at the scree plot as shown in the Figure 1. What is needed in the scree plot is to look for a change or elbow in the shape of the plot. The scree plot shown reveals a quite break between the fourth and the sixth components. Hence the first five components are to be retained because they capture a reasonable proportion of the total variance. This support the use of the initial eigenvalues.

PRELIMINARY ANALYSIS OF RESPONSES

Bar graphs have been used to give a quick summary of the distribution of scores on selected items on the questionnaire. The use of the bar graphs gives a pictorial presentation of the gender responses of a programme on a particular variable. The vertical scale on the bar graphs shows whether the difference between any two bars is only a few scale point or not.

The selected items are Interest in father's career, Interest in mother's career, Sibling encouragement, Parent's encouragement, Teacher's encouragement and Prospect for good salary. The selection of these items was in accordance with the objectives and the research questions of the study.

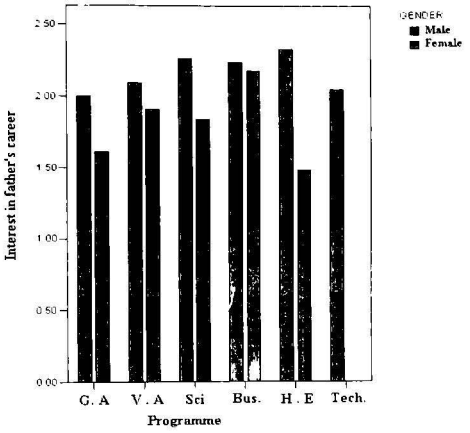

Figure2: Distribution of Interest in father's career

The Figure 2 shows that male students Interest in father's career in all the programmes exceeded that of the female students. The difference in Home Economics (H.E) is the highest while that of the Business (Bus) is the lowest. But the difference in a career related to General Arts (G.A), and Science (Sci) is almost the same.

In the sample selected, there were no female students offering Technical (Tech) programme in all the schools selected. As it can be seen from the bar graph, only males indicated future career interest in Technical programme.

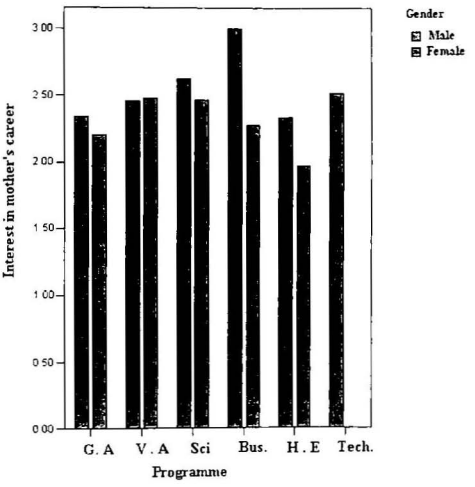

Figure 3: Distribution of Interest in mother's career

Generally, male students showed more interest than females in their mother's career in almost all the programmes except Visual Arts (V A) as shown on the Figure 3. Averagely, the difference in interest in Business (Bus) was very high while the difference in interest in the Visual Arts (V A) was very low but in favour of female students

The student's response as it can be seen from the bar graph also indicates that perhaps males have the desire to pursue their mother's career than females.

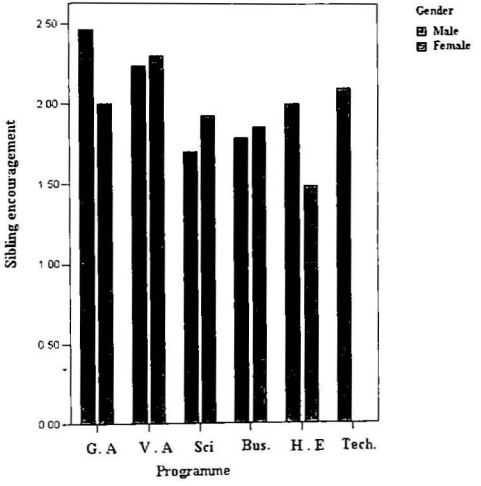

Figure 4: Distribution of Sibling encouragement

It can be seen on the Figure 4 that males receive more encouragement from their siblings to offer General Arts (G.A) and Home Economics (H.E) than females. However, females get a lot of encouragement to offer Visual Arts (V.A), Science (Sci) and Business (Bus.) than males. The difference in sibling encouragement for General Arts (G.A) and Home Economics (H.E) are almost equal and in favour of male students. It is interesting to note also that the difference in Visual Arts (V.A) and Business (Bus.) are almost the same but in favour of females.

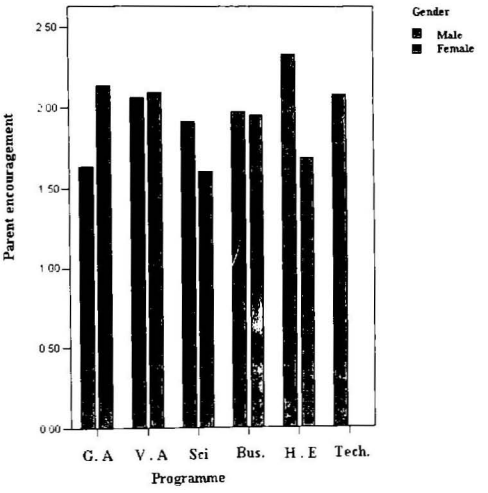

Figure 5: Distribution of Parent encouragement

As compared to the females, male students offering Science (Sci) and Home Economics (H.E) indicated a lot of encouragement from their parents. Nevertheless, it appears females receive a lot of parent encouragement to offer General Arts (G.A) and Visual Arts (V.A). The parental encouragement for Business (Bus.) programmes for males and females are almost equal

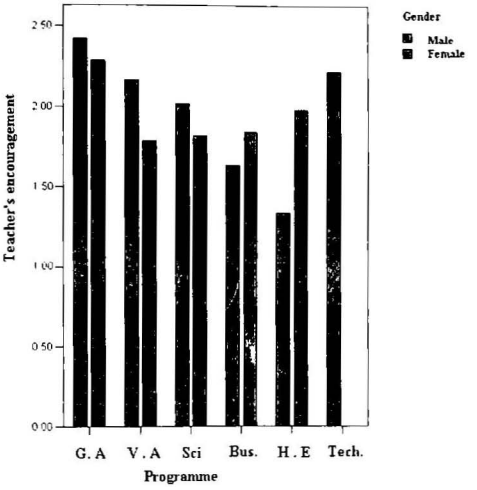

Figure 6: Distribution of Teacher's encouragement

The Figure 6 shows that male students offering career programmes in General Arts (G.A), Visual Arts (V.A) and Science (Sci) receive a lot of encouragement from their Teachers as compared to their female counterpart. On the other hand female students receive a lot of encouragement than males from their Teachers in the Business (Bus.) and Home Economics (H.E.) programmes.

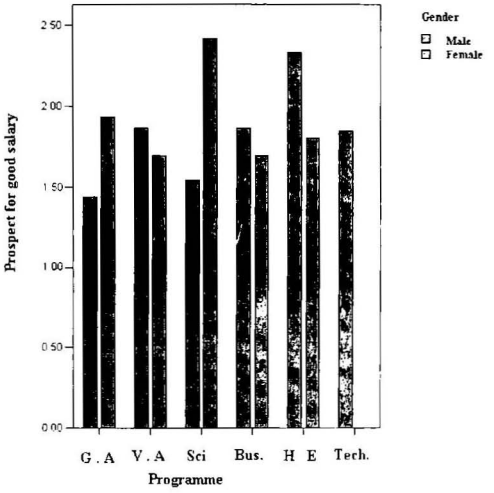

Figure 7: Distribution of Prospect for good salary

It can be observed on the Figure 7 that females offering Science (Sci) indicated a very high interest in Prospect for good salary than students offering any other programme. Male students offering both Visual Arts (V. A) and Business (Bus) showed a high interest in good salary than their female counterparts. But the difference is almost the same in the two programmes.

CHAPTER FOUR

FURTHER ANALYSIS

This chapter concerns with the further analysis of the data collected from the second cycle students. The main technique used here is the factor analysis method which takes a large set of variables and looks for a way that the data may be reduced or summarised using a smaller set of factors.

It was realised in the chapter three that most of the variables correlated both positively and negatively. The preliminary analysis generally revealed the suitability of the data for factor analysis. There is therefore the need to do further investigation to identify the groupings among the variables to identify factors that influence the second cycle students' choice of a programme leading to a career.

EXTRACTION OF FACTORS AND FACTOR INTERPRETATION

It was observed in the preliminary analysis that both the rule of eigenvalue greater than one and the "elbow point" of the scree plot resulted in the extraction of five components to approximate the correlations among the original variables. This is in an agreement with Cattell's recommendation to retain all the factors above the elbow or the break in the plot as these

factors contribute the most to the explanation of the variance in the data set Hence, it is reasonable to say that five factors could give meaningful explanation of the variation in the data A cut-off value of 0 5 would be used in the interpretation of the factors This means that only loadings of 0 5 and above are to be considered to make the output easier to interpret

Table 5: Component Matrix of responses

Variable	Component				
	1	2	3	4	5
X_1	366	-	692	-	-
X_2	441	-	640	-	-
X_3	-	552	-	330	319
X_4	453	-	-	-	- 330
X_5	606	-	-	-	- 385
X_6	494	-	-	-	-
X_7	510	-	-	- 436	-
X_8	-	696	-	-	-
X_9	424	-	- 392	-	-
X_{10}	387	362	-	- 396	-
X_{11}	-	527	-	-	-
X_{12}	-	-	-	-	631
X_{13}	416	-	-	369	-
X_{14}	497	-	-	337	-
X_{15}	489	- 342	-	-	-
X_{16}	-	- 320	- 314	-	371
X_{17}	527	-	-	-	-

Table 5 shown gives the unrotated component matrix This shows the loadings of each of the items on the five components The first component loads on the items X_1 (Sibling encouragement) X_2 (Parent encouragement) and X_{13} (Available material) These variables had low correlation values however they were all positive in the preliminary analysis on Table 2 The

variables which loads on the second component are X_3 (School's proposal), X_8 (Teacher's programme) and X_{11} (Parent career) These were also positively correlated on the same table X_1 (Interest in father's career) and X_2 (Interest in mother's career) are the items which loads on the third component It is interesting to note that these items had the highest positive correlation value of 0.437. It can also be seen on the Table 5 that these items recorded quite a high loadings Since the cut-off loading value is 0 5, the fourth component does not have any item which loads on it Only X_{12} (Prospect for good salary) loads on the fifth component Although this item correlated both positively and negatively on other variables as shown on the Table 2

FACTOR ROTATION

Having determined the number of factors, there is the need to rotate the factors. This process will enhance the interpretation of the factors. It is important to note that the factor rotation does not change the underlying solution, rather it presents the pattern of loadings that is easier to interpret The two main tables that are considered under the Varimax Rotation are the total variance explained and the rotated components matrix.

Table 6: Total Variance Explained

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	1 951	11.474	11 474
2	1 767	10 396	21 870
3	1 486	8 742	30 612
4	1.412	8 308	38.920
5	1.325	7 792	46 712

The Table 6 reveals that there are five components with a cumulative percentage value of 46.712. The values under the column labelled "% of variance" for each of the component have changed. The previous values for the components 1,2,3,4 and 5 on Table 4 were 16.228, 9.487, 7.885, 6.780, and 6.332 respectively.

It can also be seen from the table that the distribution of the variance explained have also been adjusted after rotation. The first component now explains 11.474 percent of the variance and the second component explains 10.396, the third component explains 8.742 while the fourth and the fifth component now explains 8.308 and 7.792 respectively.

Table 7: Rotated Component Matrix

Variable	Component				
	1	2	3	4	5
X_1	-	-	.818	-	-
X_2	-	-	.805	-	-
X_3	-	-	-	.651	-
X_4	.500	-	-	-	.427
X_5	-	.671	-	-	-
X_6	.389	.352	-	-	-
X_7	-	.697	-	-	-
X_8	-	-	-	.566	.382
X_9	-	.567	-	-	-
X_{10}	-	.468	-	.445	-
X_{11}	-	-	-	-	.662
X_{12}	-	-	-	.576	-
X_{13}	.566	-	-	-	-
X_{14}	.611	-	-	-	-
X_{15}	.585	-	-	-	-
X_{16}	-	-	-	-	-.542
X_{17}	.518	-	-	-	-

The Table 7 gives the loadings of each of the variables on the five factors that have been selected. The nature of the underlying latent variable represented by each component can be identified by looking for the highest loading variables and those that meet the cut-off criterion of 0.5 on the five components. The table shows the factor loadings of each of the variables. It can be seen that the highest loaded item recorded 0.818 on the third component while the least is 0.500 in the first component.

The first four components recorded positive loadings however the fifth component recorded the only negative loading. The Table 7 reveals that the main loadings on the first component recorded 0.500, 0.518, 0.566, 0.585 and 0.611. These are the items V_3 (School noted for a programme) V_5 (Available material), V_7 (Degree of gender association), V_8 (Getting job) and V_{12} (Enhance chances to go abroad). The main items on the second component are the variables V_4 (Sibling encouragement), V_6 (Parent encouragement) and V_9 (Teacher's encouragement). Their loadings are 0.671, 0.697 and 0.567 respectively.

A look at the third component indicates that V_1 (Interest in father's career) recorded 0.818 while the V_2 (Interest in mother's career) resulted in 0.805. The fourth component loads with the variables V_{13} (Teacher's programme), V_{14} (Prospect for good salary) and V_{15} (School's proposal). The loadings for these variables are 0.566, 0.576 and 0.651 respectively. V_{10} (Cost of programme) and V_{11} (Parent's career) are the items which loads on the fifth component. The loadings for these variables are -0.542 and 0.662.

respectively. It is interesting to note that this is the only component which recorded a negative loading.

FINAL FACTOR SOLUTION

Interpretation of the component is facilitated by identifying the variables that have large loadings on the same factor. The factor solution may be derived by comparing both the unrotated and the rotated solution. A factor can be interpreted in terms of the variables that load high on it.

A cut off loading value of 0.4 in the interpretation of the extracted factors has been used. The guide in this study as it is in all studies is consideration of the absolute values of the sizes of the loadings that would make interpretation of the factors plausible. The use of this value is also partly due to the main objective of the study which requires an easier interpretation of the factor solution.

It can therefore be summarised from the data that five factors basically influence the students' choice. The first factor being the most influential while the fifth is the least influential factor.

CHAPTER FIVE

SUMMARY, DISCUSSION AND CONCLUSIONS

This chapter presents the summary of the study, discusses the findings of the data collected and draws appropriate conclusions from the study.

SUMMARY

The survey analysed factors that influence second cycle students' choice of a career programme. The data was obtained from a sample of six hundred students drawn from selected six Senior High Schools in the Shama Ahanta East Metropolis in the Western Region.

Students offering different career programmes were sampled to ensure a true representation of the Senior High School programmes. The study was conducted to investigate whether students in the Senior High Schools choose a particular career programme based on any underlying influential factor or set of factors.

Inspection of the correlation matrix revealed the presence of a coefficient above 0.3 between some variables. However, the correlations among the variables were generally low. V1(Interest in father's career) and

A.C Interest in mother's career recorded the highest value of 0.437 indicating a high relationship between them. On the other hand the lowest correlation value of 0.000 was recorded between the variables V (Getting job) and V (Friends suggestion). This means that Friends suggestion and Getting job have a very low relationship.

The Bartlett's test of sphericity in the study had a significant value of $p = 0.000$. This test together with the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) value of 0.723 indicated that the choice of factor analysis in the study is strongly informed.

Eigenanalysis which comprises eigen-value-greater-than-one and the scree plot were used to determine the number of factors. With the use of eigenvalue five components had eigenvalues more than one. This finding was supported by the scree plot which revealed that five components needed to be extracted.

The Varimax rotation under the factor rotation was performed on the five components to reveal the main loadings on each of them. This helped in the identification of the nature of the underlying latent variables represented by each component. The result obtained in both the unrotated and the rotated factor solution revealed that V (Interest in father's career) and V (Interest in mother's career) are to be retained on the same component. This may be attributed to the fact that they recorded the highest correlation value.

DISCUSSION

The discussion from the findings of the preliminary and the further analysis are outlined as follows. A total of six hundred second cycle students were sampled. This is made up of three hundred and six males representing 51.0% and two hundred and ninety four females representing 49.0%. A larger proportion of the students were either sixteen or seventeen years old. This forms 64% of the total sample. It is interesting to note that 95% of the students were Christians. This may be due to the fact that the study was conducted in the Western Region of Ghana which is largely dominated by Christians.

A sample of hundred students was taken from programmes namely, General Arts, Visual Arts, Science, Business, Home Economics and Technical. It is important to note that 62 students representing 10.4% had the desire to pursue their future career in General Art's related programmes. 58 students with a percentage of 9.7 had interest in Visual Arts related programmes. Although one hundred Science students were sampled, it was revealed from the study that two hundred and one students representing 33.5% had the desire to pursue their future career in Science related programmes. This may be attributed to the fact that students offering programme in Technical and Home Economics usually take one or two Science subjects as Elective. This enables them to pursue future career in the Science related programme such as Engineering and Nursing respectively.

The study also revealed that 98 students representing 16.3% of the Business students had the desire to pursue their career in the Business programme. With the Home Economics programme, only 30 students having

a percentage of 5.0 would like to pursue their future career related to their programme. A total of 92 students with equivalent percentage of 15.3 offering Technical programme indicated their interest in pursuing technical related programmes. Second cycle students who had the desire to pursue their future career in areas which require a general knowledge, such as Army and Police are 55 students representing 9.2%.

Interpretation of the factor analysis is facilitated by identifying the variables that have large loadings on the same factor. A factor can be interpreted in terms of the variables that load high on it. A cut-off loading value of 0.5 in the interpretation of the extracted factors has been used. The guide in this study as it is in all studies is consideration of the absolute value of the sizes of the loadings that would make interpretation of the factors plausible. The use of this value is also partly due to the main objective of the study which requires an easier interpretation of the factor solution.

The Table 7 on rotated component matrix shown in the chapter four indicated that five factors influence the second cycle students' choice of a career programme. The first factor reveals that the main loadings on the first component are the items X_1(School noted for a programme), X_2(Available materials), X_{10}(Degree of gender association), X_{12}(Getting job) and X_{14}(Enhance chances to go abroad). Therefore may be labelled as Motivation. The main items on the second component are the variables X_3(Sibling encouragement), X_4(Parent encouragement) and X_5(Teachers encouragement). This factor may be labelled as Persuasion. The third

component indicates that V_{13} (Interest in father's career) recorded 0.818 while the V_{14} (Interest in mother's career) resulted in 0.805. The interpretation of this factor was initially identified in the unrotated solution as Interest in parent career. Interestingly the result after the rotation supported the interpretation. The fourth rotated component loads with the variables V_{15} (Teacher's programme), V_{17} (Prospect for good salary) and V_{18} (School's proposal). The interpretation of this component could be labelled as Available information. V_{16} (Cost of programme) and V_{19} (Parent's career) are the items which load on the fifth component. Hence it can be labelled as Awareness. It is interesting to note that this is the only component which recorded a negative loading.

Esters and Bowen (2005) said that friends had more influence on the former students career choice than other selected individuals including the father. However V_{12} (Friends suggestion) recorded values of 0.468 and 0.445 in the second and the fourth components respectively on Table 7. These values are below the cut-off of 0.5. Hence Friends suggestion cannot be seen as a factor. The data on factors that influence the second cycle students' choice of a career programme reveals that five factors basically influence their choice. These are Motivation, Persuasion, Interest in parent career, Available information and Awareness.

CONCLUSIONS AND RECOMMENDATIONS

The main objective of the study is to identify factors that influence the second cycle students' choice of a career programme. The general response on the items in the questionnaire and it's analysis shows that students receive a lot of encouragement from their siblings, parents and teachers.

It was revealed that students have interest in their parents' career. However, they do not opt for a career programme that will automatically lead them into their parents' career because they see ability as a factor in considering their choice. Fosters and Bowen (2005) indicated that Friends had more influence on former students career choice than other selected individuals including the father. However, Friends suggestion cannot be said as a factor that influences the second cycle students' choice of a career programme for the students selected in the study.

The factor analysis technique used revealed some enlightening results. The five main factors that influence the second cycle students' choice of a career programme are Motivation, Persuasion, Interest in parent career, Available information and Awareness. The most important influential factor is Motivation. It can be said that Persuasion is the next important factor which influences the second cycle students. Interest in parents career is a factor but it is considered after motivation and persuasion. This may be due to the fact that students are of the view that interest in parents career must be considered together with ability. The fourth factor that the student in the study indicated is Available information while the least influential factor is Awareness.

It was assumed in the study that the students enrolled had the ability to pursue their career programmes. However it is still remains questionable as to what extent student's ability influences his or her choice of a career programme. It is therefore recommended that future research work should investigate ability as a factor for students to consider in choosing their career programme and whether a particular factor is associated with gender.

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APPENDIX A

UNIVERSITY OF CAPE COAST

DEPARTMENT OF MATHEMATICS AND STATISTICS

The objective of this questionnaire is to determine factors that influence the choice of programme/subject by second cycle students. Any information given on this questionnaire will be held in utmost confidence. Thank you very much.

SECTION A

1 Gender [ ] Male [ ] Female

2 Age during your last birthday [ ] 15 years [ ] 16 years [ ] 17 years [ ] 18 years [ ] 19 years [ ] 20 years and above [ ]

3 Religion [ ] Christian [ ] Traditional [ ] Muslim [ ] None [ ] Other (specify)

4 School attending:

5 Which programme are you offering in school

General Arts [ ] Visual Arts [ ] Science [ ]

Business [ ] Home Economics [ ] Technical [ ]

Other (specify) [ ]

6 What is your future career

7 You are native of which of the regions in Ghana

SECTION B

8 What is your father's or male guardian's career

9 How do you rate the interest you have in that career

Very High [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

10 What is your mother's or female guardian's career?

11 How do you rate the interest you have in that career?

Very High [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

12 A student should accept any programme given to him or her because he or she wants to attend a particular school? Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree [ ]

13 Your school is well noted for the programme you are offering Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree [ ]

14 Did any of your siblings offer your programme? Yes [ ] No [ ]

15 To what extent did your sibling(s) encourage you to offer your programme? Very High [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

16 Indicate the degree of interest you attached to your programme Very high [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

17 To what extent did your Parent encourage you to choose a particular programme Very high [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

18 A student should offer the programme that his or her best JSS Teacher teaches Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree [ ]

19 How will you rate the encouragement given by your teachers to offer your

programme ? Very high [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

20 To what extent did your BSS Friends suggestion led you to choose your programme ? Very High [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

21 A student should offer the same programme that his or her friend has decided on Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree [ ]

22 A student should choose a programme that leads to his / her parent career Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree [ ]

23 A student should choose a programme that will lead him / her to a career with a very good salary Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree [ ]

24 Your programme is associated with which one of the following ?
Male [ ] Female [ ] Both [ ]

25 What is the degree of that association in question 24
Very high [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

26 What is the extent of hope do you have that your programme will send you to abroad ? Very high [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

27 What is the degree of getting a job after studying your programme ?
Very high [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

28 How do you assess the cost of your programme of study ?

Very high [ ] High [ ] Average [ ] Low [ ]

Very Low [ ]

29 In your estimation which SSS programme will you consider to be much costly ?

30 Which of the SSS programmes will you consider to be less costly ?

31 How did the available materials such as text books or tools motivated you to choose your programme ?

Very high [ ] High [ ] Average [ ] Low [ ]

Very Low [ ]

32 To what extent do you get somebody to teach you at home ?

Very high [ ] High [ ] Average [ ] Low [ ]

Very Low [ ]

33 What is the degree of the problem you have in understanding your programme topics taught in class ?

Very high [ ] High [ ] Average [ ] Low [ ]

Very Low [ ]

34 How do you find studying some topics in your programme on your own ?

Very high [ ] High [ ] Average [ ] Low [ ] Very Low [ ]

35 Which ***one*** of the following motivated you most to choose your programme ?

Good income [ ] Prestige [ ] Popularity [ ] Easy to get a job [ ]

Easy to pass exams [ ] Talent [ ] Other specify

APPENDIX B

FREQUENCIES OF THE DATA

GENDER

	Frequency	Percentage	Valid percent
Yes	306	51.0	51.0
No	294	49.0	49.0
Total	600	100.0	100.0

AGE

	Frequency	Percentage	Valid percent
15years and below	33	5.5	5.5
16years	192	32.0	32.1
17years	192	32.0	32.1
18years	129	21.5	21.5
19years and above	53	8.8	8.8
Total	599	99.8	100

SCHOOL ATTENDING

	Frequency	Percentage	Valid percent
Sekco	100	16.7	16.7
APCSS	100	16.7	16.7
Methodist	100	16.7	16.7
BSLS	100	16.7	16.7
Ejita	100	16.7	16.7
GSLS	100	16.7	16.7
Total	600	100	100

RELIGION

	Frequency	Percentage	Valid percent
Christian	570	95.0	95.0
Islam	16	2.7	2.7
Traditional	11	1.8	1.8
Others	3	0.5	0.5
Total	600	100	100

PROGRAMME

	Frequency	Percentage	Valid percent
General Arts	100	16.7	16.7
Visual Arts	100	16.7	16.7
Science	100	16.7	16.7
Business	100	16.7	16.7
Home Economics	100	16.7	16.7
Technical	100	16.7	16.7
Total	600	100	100

FUTURE CAREER

	Frequency	Percentage	Valid percent
General Arts	62	10.3	10.4
Visual Arts	58	9.7	9.7
Science	201	33.5	33.7
Business	98	16.3	16.4
Home Economics	30	5.0	5.0
Technical	92	15.3	15.4
General	55	9.2	9.2
Total	596	99.3	100

FATHER'S CAREER

	Frequency	Percentage	Valid percent
General Arts	20	3.3	3.4
Visual Arts	8	1.3	1.3
Science	89	14.8	15.0
Business	148	24.7	24.9
Home Economics	3	0.5	0.5
Technical	78	13.0	13.1
General	248	41.3	41.8
Total	594	99.0	100

NATIVE OF A REGION

	Frequency	Percentage	Valid percent
Western	197	32.7	32.8
Central	171	28.5	28.6
Greater Accra	46	7.7	7.7
Eastern	38	6.3	6.3
Volta	47	7.8	7.9
Ashanti	65	10.8	10.8
Brong Ahafo	6	1.0	1.0
Northern	11	1.8	1.8
Upper East	4	0.7	0.7
Upper West	6	1.0	1.0
Total	598	99.7	100

MOTHER'S CAREER

	Frequency	Percentage	Valid percent
Oriental Arts	9	1.5	1.5
Visual Arts	5	0.8	0.8
Science	51	8.5	8.5
Business	358	59.7	60.0
Home Economics	39	6.5	6.5
Oriental	138	23.0	23.0
Total	597	99.5	100

SIBLING PROGRAMME

	Frequency	Percentage	Valid percent
Yes	207	34.5	34.6
No	391	65.2	65.4
Total	598	99.7	100

FRIEND'S PROGRAMME

	Frequency	Percentage	Valid percent
Strongly Agree	17	2.8	2.8
Agree	18	3.0	3.0
Neutral	27	4.5	4.5
Disagree	160	26.7	26.7
Strongly Disagree	384	64.0	63.9
Total	600	100	100

GENDER ASSOCIATION

	Frequency	Percentage	Valid percent
Yes	123	20.5	20.5
No	95	15.8	15.8
Both	382	63.7	63.7
Total	600	100	100

PROGRAMME COST MOST

	Frequency	Percentage	Valid percent
General Arts	19	3.2	3.2
Visual Arts	81	13.5	13.5
Science	135	22.5	22.6
Business	14	2.3	2.3
Home Economics	323	53.8	54.0
Technical	26	4.3	4.3
Total	598	99.6	100

PROGRAMME COST LESS

	Frequency	Percentage	Valid percent
General Arts	297	49.5	49.5
Visual Arts	45	7.5	7.5
Science	29	4.8	4.8
Business	198	33.0	33.0
Home Economics	18	3.0	3.0
Technical	13	2.2	2.2
Total	600	99.8	100

AVAILABLE MATERIALS

	Frequency	Percentage	Valid percent
Very high	55	9.2	9.2
High	100	16.7	16.7
Average	185	30.8	30.8
Low	136	22.7	22.7
Very low	124	20.7	20.7
Total	600	100	100

TEACHING HELP

	Frequency	Percentage	Valid percent
Very high	55	9.2	9.2
High	100	16.7	16.7
Average	185	30.8	30.8
Low	136	22.7	22.7
Very low	124	20.7	20.7
Total	600	100	100

EASIER UNDERSTANDING

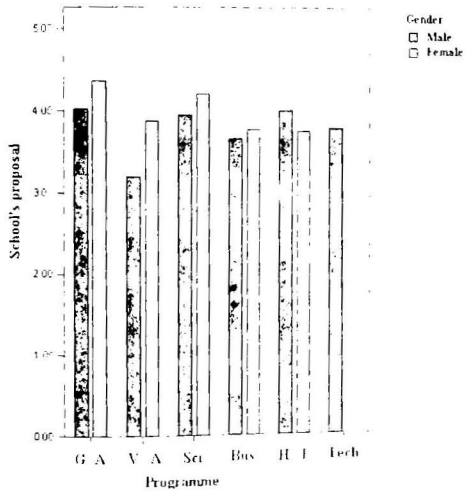
	Frequency	Percentage	Valid percent
Very high	48	8.0	8.0
High	164	27.3	27.3
Average	250	41.7	41.7
Low	91	15.2	15.2
Very low	47	7.8	7.8
Total	600	100	100

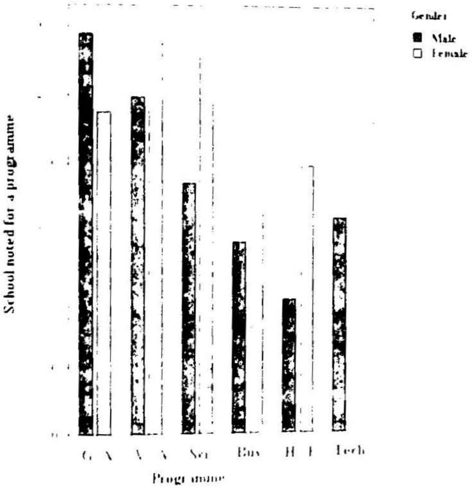
DIFFICULTY IN LEARNING

	Frequency	Percentage	Valid percent
Very high	68	11.3	11.3
High	162	27.0	27.0
Average	290	48.3	48.3
Low	53	8.8	8.8
Very low	27	4.5	4.5
Total	600	100	100

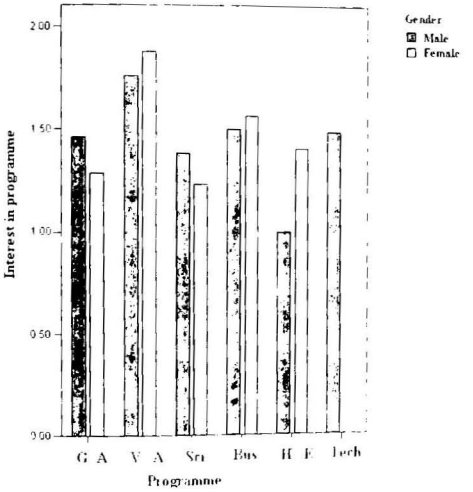
APPENDIX C

BAR GRAPHS ON THE VARIABLES





Gender
Male
Female
School noted for a programme
Bus
Tech
Programme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Female
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1.00
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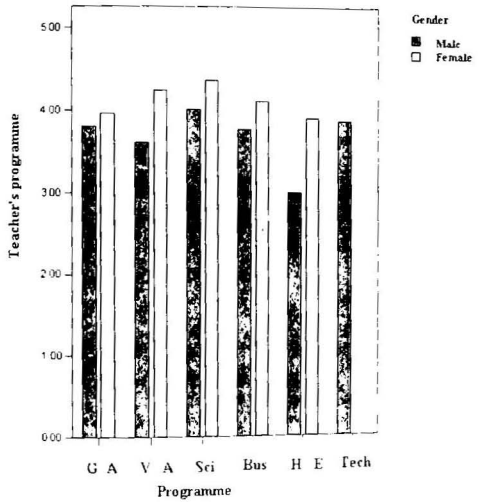
0.00
G A
V A
Sci
Bus
H E
Tech
Programme


Gender
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Female
Teacher's programme
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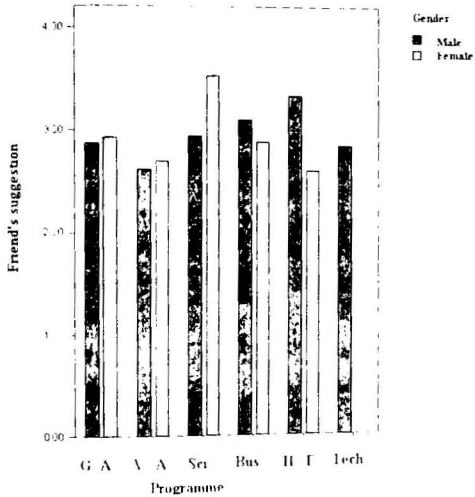
4 00
3 00
2 00
1 00
0 00
G A
V A
Sci
Bus
H E
Tech
Programme


Gender
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Female
Friend's suggestion
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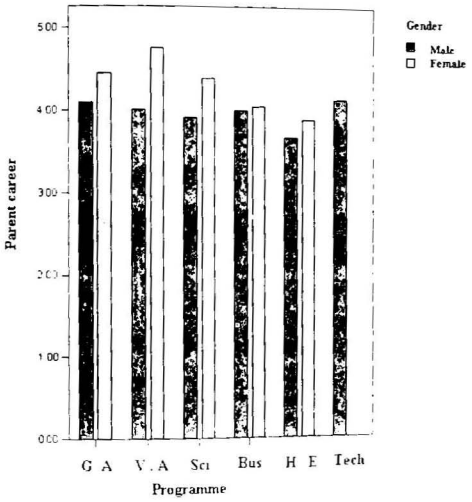
3.00
2.00
1
0.00
G A
V A
Ser
Bus
H T
Tech
Programme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Female
Parent career
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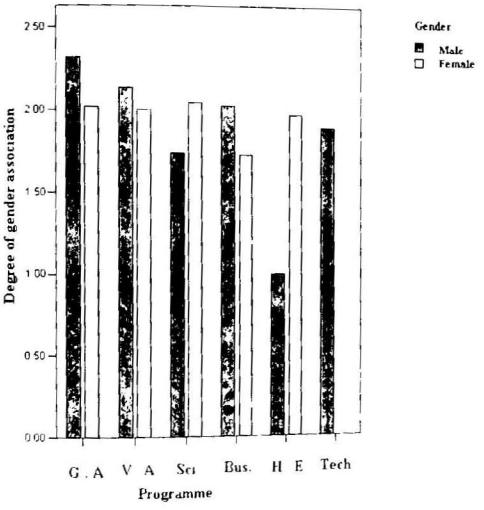
G A
V. A
Sci
Bus
H E
Tech
Programme


Gender
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Female
Degree of gender association
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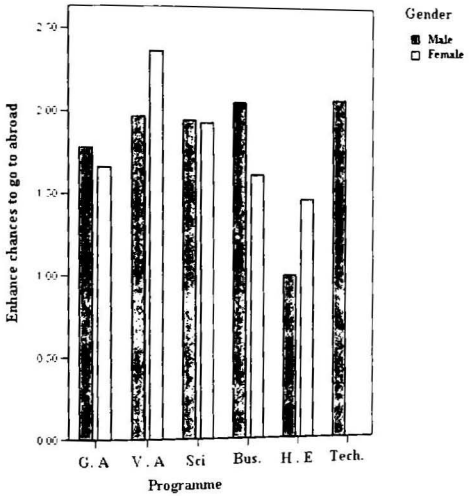
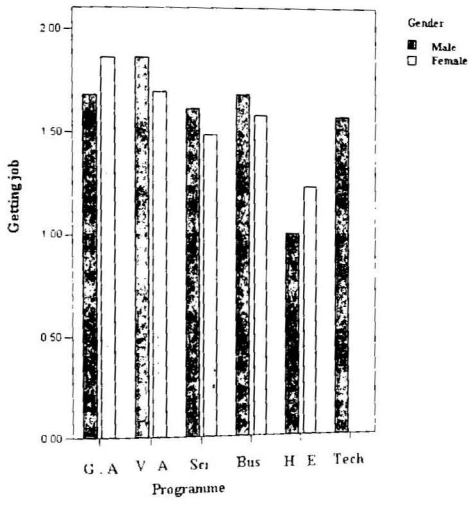
0.50
0.00
G. A
V A
Sci
Bus.
H E
Tech
Programme


Gender
Male
Female
Enhance chances to go to abroad
2.50
2.00
1.50
1.00
0.50
0.00
G. A
V. A
Sci
Bus.
H. E
Tech.
Programme


Gender
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Female
Getting job
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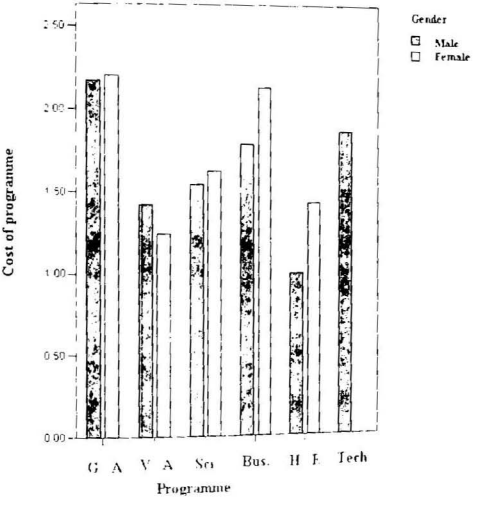
1.00
0.50
0.00
G.A
V A
Sci
Bus
H E
Tech
Programme


Gender
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Female
Cost of programme
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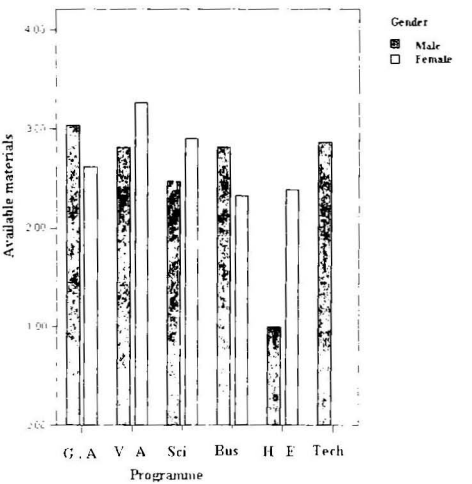
1.50
1.00
0.50
0.00
G A
V A
Sci
Bus.
H E
Tech
Programme


Gender
Male
Female
Available materials
4.00
3.00
2.00
1.00
.00
G . A
V A
Sci
Bus
H E
Tech
Programme