

**THE RELATIONSHIP BETWEEN HOLLAND'S PERSONALITY TYPES, GENDER,
CONGRUENCE AND SATISFACTION WITH DEGREE PROGRAMS AMONG THIRD-
YEAR STUDENTS**

By

GITONGA CIRIAKA MURIITHI

E83/10999/2008

**A DOCTORAL THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR DEGREE OF DOCTOR OF PHILOSOPHY
(EDUCATIONAL PSYCHOLOGY) OF
KENYATTA UNIVERSITY**

2012

DECLARATION

I declare that this dissertation is my original work and has not been presented for a degree in any other University.

Sign----- Date-----

Gitonga Ciriaka Muriithi
E83/10999.2008

This thesis has been submitted for examination review with our approval as university supervisors.

..... Date.....

Dr. Edward M. Kigen
Department of Educational Psychology,
Kenyatta University.

..... Date.....

Dr Tabitha Wangeri
Department of Educational Psychology.
Kenyatta University.

..... Date.....

Dr John Aluko Orodho
Department of Policy and Curriculum Studies
Kenya University.

DEDICATION

This doctoral thesis is dedicated to my sons Mutuma and Mwenda who fill our quiver, and the late Ferdinard Nkanata my father-in-law whose love remained steadfast in his life. I will always remember he would call me “Ntii”.

ACKNOWLEDGEMENTS

This thesis is the result of four years of work that involved people who made significant contribution to its completion. To all I take this opportunity to express my gratitude for the contribution made by each person. I am greatly indebted to my supervisors, Dr. Edward Kigen, Dr. Tabitha Wangeri, and Dr John Orodho for their unfailing guidance, encouragement and support throughout the entire research and dissertation writing process.

I thank Dr David Reile, Dr Barbara Sidharth and Elda Schwartz for introducing me to the use of career inventory test from which I was able to learn how to use the Self Directed Search by Holland. I thank my classmates in the Educational Psychology class for providing a good and motivating environment for constructive research discussions during group meetings. In particular I would like to thank the Lecturers in the Educational Psychology Department for their involvement in developing research skills in us. I remember in a special way the late Prof S. Bali, who worked with us a few moments before her demise. I would like to thank the Deans of Schools who organized with the lecturer time for data collection.

I thank Pastor Steve Laughlin, Armitage Church Chicago for helping me during the process of online purchasing of the instruments, Pastor Simon Oriedo and Barine Kirimi for delivering all the research instruments. May God bless them.

This research would not have been possible without the support and financing from my loving and devoted husband Prof. Gitonga, Mutuma and Mwenda, my sons who kept me working and following up on the progress, I thank you. My parents, who did not know that I was a student, thank you for the excitement that this degree brings to your hearts. Finally, to God the Father, Son and Holy Spirit I now believe "I can do all things through Christ who strengthens me".

ACRONYMS AND ABBREVIATIONS

ACT	American College Testing
ANOVA	Analysis of Variance
CAI	Career Interest Inventory
CHE	Commission for Higher Education
CISS	Campbell Interest and Skills Inventory
COI	Career Direction Inventory
COPS	Career Occupation Preference Systems
C-INDEX	Congruence Index
DHOC	Dictionary of Holland Occupation Codes
HELB	Higher Education Loans Board
JAB	Joint Admissions Board
Odel	Open and Distance E-Learning
OECD	Organization of Economic Corporation Development
RIASEC	Realistic, Investigative, Artistic, Social, Enterprising, Conventional
REA	Realistic, Enterprising, Artistic
SDS	Self Directed Search
SII	Strong's Interest Inventory
SSP	Self Sponsored Program
UNESCO	United Nation Educational, Scientific and Cultural Organization
UNIACT	Unisex American College Testing
VISION 2030	Kenya Government Development Blueprint

ABSTRACT

With the increased number of students enrolling in and graduating from Kenyan public and private universities in the last three decades, it is important to find out if students' personality types are congruent with choice of degree program and demands of the job market. In Kenya, the extent to which the personality types match the choice of degree program has not been examined. This study examined the relationship between students' personality types using the Holland typology, the degree of congruence and the levels of satisfaction with the choice of degree program. The theoretical framework was based on the Holland theory, which postulates that people will spend a considerable amount of time seeking work places/academic environments that match their personality types. The assumptions by Holland's theory that were tested in this study were: the outcome of a match between the personality types and the academic environment is congruent and satisfying and the outcome of mismatch between the personality types and the academic environment is incongruent and dissatisfying. The study design was ex-post facto design because the choice of the degree program had already taken place and the students were in their third year of study implying that they were stable in their choice. The independent variables were the personality types and the choice of the degree programs. The dependent variables were the degree of congruence and levels of satisfaction. The Self Directed Search 4th Edition questionnaire by (Rosen, Holmberg, & Holland, 1994) was the main tool for data collection. A satisfaction scale and an interview schedule were also used to gather information on what the students' felt about the choice of the academic program. This study used measures of relationship and association techniques employing Pearson's coefficient correlation and Chi-square to analyze data. The results indicated that the choice of degree program by majority of the students at Kenyatta University was significantly correlated to personality types, gender and levels of satisfaction. The relationship between personality types and choice of degree show Chi score ($X^2 = 457.816$, $df = 30$, $p = .000$) indicating the significant relationship. There was significant relationship between personality types and the choice of degree program ($r = .34$, $n = 389$, $p = .000$). Congruence had a weak correlation with choice of degree program ($r = .04$, $n = 389$, $p = .433$), but significantly negative correlated with satisfaction with the degree program ($r = -.14$, $n = 389$, $p = .008$). The following conclusions were drawn; Holland typology can be used to classify students' personality types and degree programs, that gender has significant influence in the choice of degree program, that congruence is a predictor of choice of the degree program but not a strong predictor of satisfaction. It is therefore recommended that a detailed study be carried out to investigate reasons why congruence found to be a predictor of choice of degree program is a weak predictor of satisfaction. Secondly, there is need to carry out a detailed study to investigate the cultural validity of Holland's tenets in Kenya and to determine the person-environment fit in the different academic programs.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The process of choosing a career involves a student's ability to build blocks of a career path. For some students, the career path is clear, while others struggle to put the career blocks together. A good career decision is characterised by a match between a student's career aspirations, interest, clarity of the nature of work and type of training required. Understanding the connection between one's interest and the world of work may lead a student to seek enrolment in a college or university to develop skills and competences most preferred. This is based on the student's ability to be specific and realistic about career choices because the training in the college and university prepare one for a lifelong vocation (Holland, 1997).

Holland (1997) argues that every individual has the tendency to like or dislike certain activities associated with different careers. The activities that a person likes constitute career interest and one will naturally spend considerable amount of time seeking and doing the activities preferred while avoiding those disliked. In school, student's will similarly like some subjects and dislikes others. The career choice made in most cases will be a reflection of what a student likes. Globally, the initial career choice is made when a student is at a tender age of 14 to 15 years. Stead and Watson (1998) state that the formation of the developmental tasks associated with personal self-concept occurs at this stage. In the psychosocial theory by Erik Erikson, the adolescent struggles with adolescent crisis, which affects among other areas career decision-making process. The effects of these challenges have been summarised by Super & Bohn (1971) as follows:-

- i. Lack of awareness of the need for a career decision. Often times a student is not cognitively aware of the need to make an occupation choice.
- ii. Lack of knowledge of the decision-making process. In order to make an informed decision one needs to be well informed. There is a general lack of information available to students at this age to support their decision making process.
- iii. Tendency to avoid personal responsibility in the career decision-making process.
- iv. Inadequate, contradictory or insufficient information on career options.
- v. Unwillingness to accept information that contradicts a person's self-concept.
- vi. Difficulties in selecting from multiple career options.
- vii. Personal limitations such as health, finances, ability and education, unrealistic choices; poor career implementation plans among others.

Super and Bohn (1971), state that these challenges need to be resolved by helping a student know how their personality types relate to the world of work as reflected by subjects selected. A student self-understanding is crucial in aiding informed career decisions (Parsons, 1909), because it impacts on a student's life beyond the college. Many scholars have reported a high correlation between the choice of a degree program job satisfaction and stability after graduating.

Proponents of developmental approaches have viewed the process of making an occupational choice as a gradual and unfolding process. It takes place progressively throughout life and the evolution is characterized by a series of career decisions taken at various points in life (Super, 1963). During this time, a student develops the understanding self, and acquires knowledge of on how various personality types relate to the world of work (OECD, 2004). The ability to make a wholesome connection between career aspirations, interest, subject selection and curriculum offered in institution of higher learning influences a career decision (Organisation of Economic

Development, 2004). This is because a good career decision shows a match between the understanding of personal interest and the choice of a training program (Holland, 1997). It determines the kind of interaction the student will have with the faculty, the development of abilities, competences, interest, values and attitudes regarding different work environment (Smart, Feldman & Ethington 2000).

A career guidance program that targets adolescents between ages 14 to 18 will enhance the students' ability to make the relation between the instruction offered in schools and university, their personal aspirations and interests to the work environment (Feldman, Smart & Ethington, 2001). Review on career development by the World Bank has recognized the socio-economic value helping students make congruent career decisions on the individuals and the national economics (Organisation of Economic Development, 2004). The UNESCO emphasised the need to view students as potential assets in the economic development and active participants in poverty alleviation by helping them through structured career guidance transit into a work environment congruent with their personality types (Dakar Conference, 2000). The focal point of classifying training offered in post secondary institutions is to provide a student an opportunity to make a choice (Feldman, Smart & Ethington, 2006). Parsons, (1909) states that the choice process involves applying and enrolling for training based on a student's likes and dislikes.

The academic environment on the other hand is organised in a way that develops different skills. Since the academic environment offer subjects that share similar characteristics with different work environment, the students should be aware of competences, skills, attitudes and abilities developed in selected academic fields (Feldman, Smart & Ethington,2001). They further argue that when a student is continuously exposed to academic discipline that simulates the work

environment, course content and vocational experiences that match their interest, higher level of satisfaction with the degree program is achieved.

There is evidence that a fit between the personality type and the study environment is related to higher levels of educational stability, satisfaction and achievement (Holland, 1997), (Smart, Ethington & Feldman, 2000). The personal benefits of finding and enrolling in an academic environment that matches one's interest and abilities include less stress, course retention, while the institutional benefits include less absenteeism, low dropout and high academic productivity (Holland, 1994).

The Holland's theory has been applied to academic disciplines to help understand the differences between academic disciplines in higher learning. This theory provides a useful method of understanding the relationship between one's vocational interest and educational environment (Smart, Feldman, & Ethington, 2000). Other studies have found a systematic relationship between congruence and the personality types. Walsh & Holland (1992), state that there is overwhelming evidence that students will select courses congruent to their personality types.

Studies also have found that the selection of an academic major is influence by the gender of students. Gender socialisation and stereotypes have been found to significantly influence the choice of an academic program with more males preferring science-related fields and more females preferring social sciences (Holland, 1997).

With an increased number of students enrolling in Kenyan public and private universities in the last three decades, it is important to find out if students' personality types are congruent with choice of degree program. This will be in line with Vision 2030, which recommends the need to

link the skills being developed in the institutions of higher learning with demands of the job market. This study examined the relationship between personality types, gender, congruence and satisfaction with the degree program as postulated in the Holland's theory.

1.2 Statement of the problem

The reforms that have taken place in the education sector in the last three decades coupled with the rapid changes in the labour market have presented challenges and opportunities for relevant career counselling globally (Organisation for Economic Corporation Development, 2004). In Kenya, these reforms have led to increased number of tertiary institutions and the number of students enrolling and graduating from the colleges and universities. Yet, many students graduating from these colleges and universities remain unemployed. Several factors have been found to account for unemployment with the potential employer seeking graduates who are well prepared for the world of work. It is now common practice to find that employers and employment agencies use psychometric tests to help screen for the most fitting candidate for various job openings.

In Kenya, university admission has continued to be guided by the Joint Admissions Board based on the student's academic performance, universities capacity and the degree program choices made by students while at high schools. The government development blue print, Vision 2030, has emphasised the need to match training in institutions of higher learning with skills required in the job market. In addition, studies conducted in Kenya reveal the need to help students acquire in-depth understanding of self in order to choose careers that best suit their personality types and job market demands. Studies on occupational aspirations among students have indicated that there are no assessments done to determine career interest among students. The question that needs to be answered is whether the students are aware of their personality types and how the different types relate to the academic environment and eventually to the world of work. There

has been no study in Kenya that has examined the relationship between personality types, gender, congruence and satisfaction with the degree program as hypothesised by the Holland's theory. In particular, the widely used Self Directed Search (SDS) tool based on the Holland's tenets that has gained popularity in the western world and most recently in South African has not been used among university students in Kenya.

1.3 Purpose of the study

The purpose of this study was to examine the relationship between personality types, gender, congruence and satisfaction with the degree programs among third-year students at Kenyatta University in order to address the mis-match between the training offered in institutions of higher learning and the demands of specific vocational skills in the job market. The purpose was achieved using the Holland's SDS, and a self-made satisfaction scale.

1.4 Objectives of the Study

The objective of this study was to examine the relationship between the personality types, gender, the degree of congruence and levels of satisfaction with degree program among third-year students at Kenyatta University. The specific objectives were:

- i. To examine personality types of students enrolled in various degree programs at Kenyatta University.
- ii. To investigate the degree of congruence between the personality types and choice of the degree program.
- iii. To describe gender distribution in the various degree programs.
- iv. To describe gender distribution in different personality types.
- v. To investigate the relationship between congruence and levels of satisfaction with the degree program.

1.5 Research Questions

- i. What is the nature of the relationship between personality types and choice of degree programs among third-year students at Kenyatta University?
- ii. Are student personality types congruent with the choice of the degree program?
- iii. What is the relationship between gender and choice of degree programs?
- iv. How is the gender distribution among the various personality types?
- v. What is the relationship between congruence and levels of satisfaction?

1.6 Hypothesis

- H₀₁ There is no relationship between personality type and choice of degree program.
- H₀₂ There is no significant relationship between congruence and choice of degree program
- H₀₃ There is no significant relationship between gender and choice of degree program.
- H₀₄ There is no significant relationship between gender and personality types.
- H₀₅ There is no significant relationship between congruence and levels of satisfaction.

1.7 Assumptions of the study

The following are the assumptions of this study:

- i. Students were in the degree programs that they had preferred and consequently they were congruent
- ii. Students were well knowledgeable about different demands of the work environment and that their choice matched their interests.

- iii. The universities have career services that provide career assessment inventories and the students are familiar with them.
- iv. The Self- Directed Search is culture-fair since the work environments are similar globally and the activities associated with work environment that constitute interest is universal.
- v. Third-year students have stabilized in the degree program and are unlikely to drop out.

1.8.1 Limitations of the study

The study was limited to only one public university in an urban setting. For comprehensive results all public, private universities and other institutions of higher should have been included in the study, but financial and other logistical constraints made it impossible to cover all institutions of higher learning in the country. There are no locally developed interest inventories and the researcher used an already developed Self Directed Search SDS by Holland from the Psychological Assessment Resources Inc. Because of copyright issues, the researcher acquired the SDS test in its original form. Consequently, the literature review was drawn from outside Kenya because that is where this test has been extensively used. It was not possible to include institutions involved in student admissions into universities for their opinion due to the limited financial and time resources.

The research design was ex-post facto in nature and therefore it was not possible to manipulate any variables. An Ex-post facto design presents that situation as it is and the effects are measured after they have already occurred. The target population was third-year students and therefore the sample did not include all students in other years at Kenyatta University.

1.8.2 Delimitations of the study

The population under consideration was drawn from one public university, Kenyatta University. The theoretical framework was only drawn from the tenets of Holland and the SDS test only. The definition and classification of personality types were drawn from Holland's classification only.

1.9 Significance of the study

It is envisaged that results generated will be used to inform university admission criteria and career-counselling services in all institutions of learning in Kenya. Using career assessment tests is a quick way of aiding students to refine their career choices. This study forms a basis for a more detailed study to examine the cross-cultural applicability of the Holland's SDS test, which has gained popularity globally. Currently, SDS has been adapted and is used in South Africa, India, China, Japan, Korea, Australia and Croatia.

This study will inform decision on the admission criteria to institutions of higher learner in-order to address the mismatch between the training currently offered and the demands of the job market, which is in line with demands of Vision 2030. Consequently, the increased number of students enrolling in and graduating from Kenyan public and private universities will be trained to meet the demands of the changing job market.

1.10 Theoretical Framework

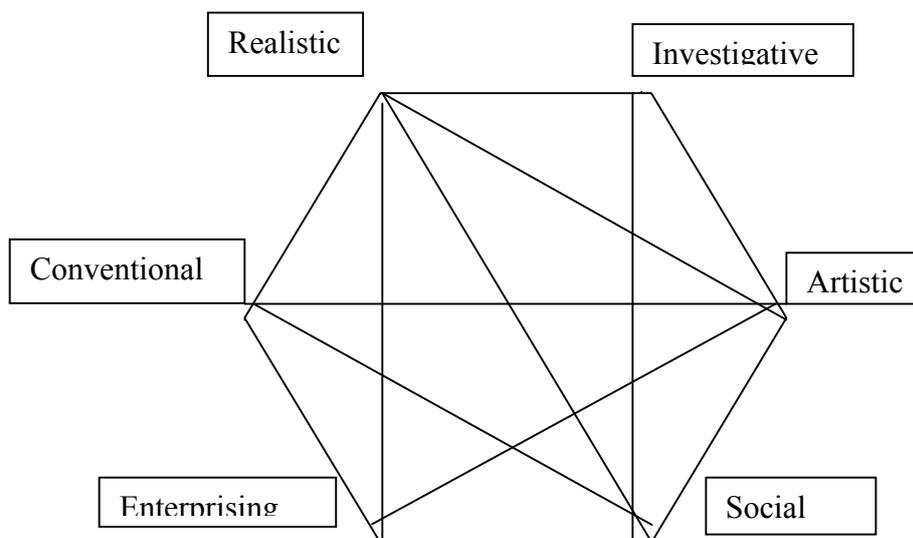
This study was based on Holland's theory of occupational choice. Holland's theory was influenced by the works of Frank Parsons on career development who stated that in building a career, it is quite important to make a wise location, lay foundation properly and work up a well considered scientific plan (Parsons, 1909). Holland, (1985a) proposes a six personality types namely: Realistic, Investigative, Artistic, Social, Enterprising and Conventional (RIASEC) and six corresponding model RIASEC environment. The theory is based on seven assumptions:

- i. People fall under six different vocational personalities (RIASEC), which develop in a person through socialization, biological factors, and cultural influences. As a result of these interactions, the person eventually develops competences and interest in certain career fields. The six scales of the SDS are used to estimate a person's resemblance of each personality types.
- ii. The six personality types can only fit a corresponding work environment that bears the kind of activities that appeal to the different personality types. The work environment gives a person an opportunity to express their interests, skills and talents. The work environment is characterised by activities which attracts a given personality type. Such an environment will tend to have people who tend to share interests, competencies and outlook of the world. Such an environment will reflect their personality types,
- iii. People search for environments that will let them exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles. If the person finds the work environment that match their personality types there will experience congruence. Therefore people will spend a considerable amount of time seeking environments, which will match their personality types.
- iv. The person's behaviour is determined by an interaction between his or her personality and the characteristics of the environment. Based on an individual's personality pattern and the pattern of the environment, certain outcomes can be predicted which includes occupational choice, job satisfaction, stability and persistence.
- v. The degree of congruence between a person and an occupation can be estimated. The hexagon model provides four degrees of person-environment congruence or fit. Adjacent personality types on the hexagon share similar characteristics and they are much related. The alternate personality types share less similar characteristics while the opposite personality types share the least characteristics.

- vi. The degree of consistency within a person or an environment is defined using the hexagon where a consistent personality type will have compatible interests, personal dispositions or job roles. Consistency is associated with more stable work history.
- vii. The degree of differentiation of a person or an environment modifies predictions made from a person's SDS profile. People and work environment are clearly defined and that a person resembles a single type more than the other. A particular type of characteristic most likely dominates well-defined work environment.

The implications of these assumptions in an academic setting can be summarised using one's typology, predicting and understanding occupational behaviour such as academic stability, vocational choices, and academic satisfaction. This theory therefore provides a framework that one can use to test student's interest and determine the degree of match between their specific choices and interest. The basic premise in this theory is that an individual's choice of a vocational or academic major is a way of expressing the personality because the choice made correlates with the personality scale. Figure 1.1 shows the Holland's hexagon model and the relationships that are generated.

FIGURE 1.1 HOLLAND'S HEXAGON MODEL OF PERSONALITY TYPES AND ACADEMIC ENVIRONMENTS



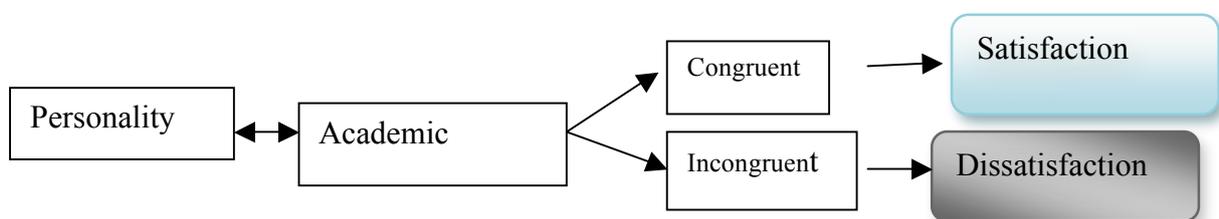
Adapted from Smart, Ethington & Feldman (2000). Holland's theory and the study of college students and faculty.

The Holland hexagon model was useful in examining the personal attributes and the corresponding academic environment among the third-year students at Kenyatta University. Based on Holland's congruence and satisfaction assumptions, the researcher was able to determine the nature of the relationships that existed in samples studied.

1.11 Conceptual Framework

Given the theoretical framework above, key issues emerged on which the conceptual model presented in figure 1.2 below was developed to show the relationships between the independent and dependent variables in this study. The nature of interaction between the personality type and academic environment results into either a congruent or incongruent outcome. Congruence occurs if a student finds an academic environment that matches their personality type, while incongruence occurs if a student's find him/herself in an academic environment, which they have no interest in. As hypothesized by Holland (1997), a congruent experience is expected to result into academic satisfaction, stability, academic excellence and reduced stress. On the other hand, incongruent experience will result into dissatisfaction, instability, academic failure and increased levels of stress.

Figure 1.2 RELATIONSHIP BETWEEN PERSONALITY TYPES AND ACADEMIC ENVIRONMENT



Developed from the ideas of Holland (1997) and Smart, Ethington & Feldman (2000)

1.13 Operational definition of key terms

This section presents operational definition of term that is used in this study.

Artistic people: The people who prefer to work with ideas.

Career choice: This is preferred occupational choice.

Career interest: This implies the student's aspirations to fit in a given occupation

Congruence: This is the degree to which the summary scores and the subject choice match when compared with the occupational listing on the vocational finder.

Conventional people: The people who prefer to work with data and things.

Consistency: The degree to which the personal characteristics of a student agrees with the interest shown by the vocational finder.

Differentiation: The degree to which the summary score is able to clearly differentiate different vocational characteristics of a student as well as the work environment.

Environmental factors: This will include factors such as school and home environment, role of media, socio-cultural factors and peer influence.

Enterprising people: The people who prefer to work with data and people.

Investigative people: The people who prefer to work with ideas and things.

Parental factors: This will include factors such as parental level of education, inherited personality traits, parents' social economic status and parents' occupations.

Personality types: In this study, personality will refer to attributes/characteristics as shown by the RIASEC three letter codes measured by the SDS activities, with the first letter indicating the personality type.

Public Universities: These are universities the owned by the government and are financed be the treasury.

Private Universities: These are the universities that are owned by either religious organizations or individual entrepreneurs. The students pay tuition directly.

Realistic people: The people who people prefer to work with things.

SDS profile: The SDS profile is composed of the generated scoring for each individual test. This profile shows the student's interests, abilities and competences related to the work environment.

Social people: The people who prefer to work with people.

Degree program: This is the specific academic program of study a student is pursuing.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter outlines a detailed description of reviewed literature based on the study objectives.

Literature review is organised in the following sub-sections.

- i. The Holland's classification personality types and academic environment
- ii. Holland's personality types and the choice of degree program
- iii. Congruence between the personality types and choice of the degree program.
- iv. Gender, personality types and choice of degree programs.
- v. Congruence and levels of satisfaction with the degree program.

2.2 Holland's Classification of personality types and academic environment

Holland's typology is greatly influenced by the works of Frank Parson who is considered as the "father of vocational guidance". In his classic book *Choosing a Vocation*, published posthumously in 1909; Parsons stated that a wise choice of a vocation is based on three factors:

- 1). A clear understanding of oneself, one's aptitude, abilities, interests, ambitions, resources, limitations, (knowing self);
- 2). Knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities and prospects in different lines of work (career exploration);
- 3). True reasoning in the relations of the above facts (decision-making).

It is from factors above that Holland developed a theory that has been used to direct guidance and counselling practices. In his earlier writings, Holland stated that the choice of a vocation is an expression of a personality, which reflects the person's motivation, knowledge, personality and

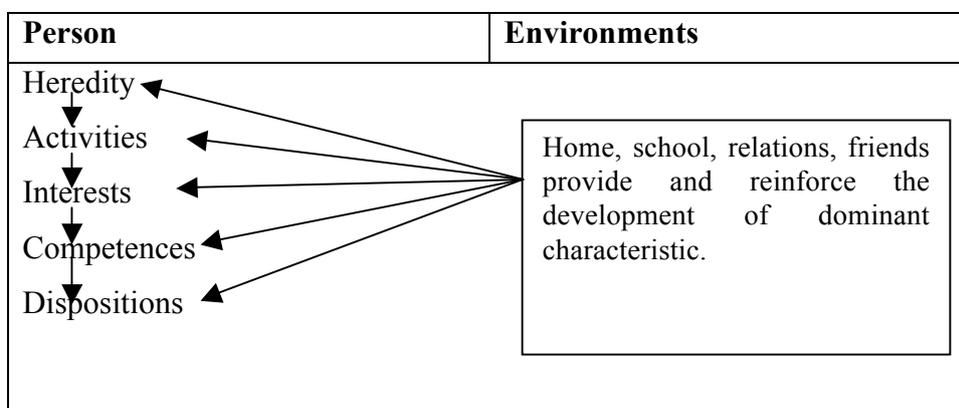
ability (Holland 1973, 1985, 1997). That a person's preferences or choice tend to moderately correlate with personality scale, which vocational behaviour theorists refer to as vocational interests. The underlying basis of Holland's theory is that human behaviour is a function between the individual and their environment (Smart, Feldman & Ethington, 2000). The theory is centred on the assessment of individuals, their environment and the interactions or fit between individuals and their environment. Holland (1997) characterised his theory as a structural-interactive, or typological-interactive in that it attempts to organise people and jobs. He further posits that the interaction results into many careers and social behaviour emerge from people and the environment acting on each other.

In their extensive work on Holland's theory applied to academic environment, Smart, Feldman and Ethington, (2000) state that students choose an academic environment compatible to their personality types. This is because the students expect this environment to reinforce their interest and result into satisfaction. The greater the personality and environment patterns match, the greater the satisfaction. Incongruent interaction may cause the student to be dissatisfied with the degree program. This has been supported by Betz (2008), Spokane and Cruza-Guet (2005) who found that congruence predicts a student's choice. Holland suggests that people's occupation or scores on vocational interests' inventories flow from their life history and constitutes an expression of personality.

The personality types presented by Holland's (RIASEC) model in figure 1.1 represent a measure of the real person which a product of parental and environmental factor. The interaction between cultural and personal forces such as heredity, peers, parents, social class and the physical environment influences the development of a personality type. Holland states that "types produce types" and the role of the parents in development of the personality is crucial because they

provide an environment. A parent is crucial in enhancing type producing type by creating a nurturing environment created at home for the development of occupational interest. For instance, a realistic parent will tend to create a realistic environment for the child and ignore, avoid or reject social activities, situations and people. The environment the parent creates will therefore enhance the development of certain characteristics while inhibiting the development of others. To illustrate how type may develop type, figure 2.1 by Holland shows the different formulations.

Figure 2.1 HOW TO DEVELOP TYPES



Adapted from Holland (1973).

The experience a child has at home environment creates a disposition, which makes him/her exhibit characteristic behaviour. The dominant characteristic leads to the development of self-concept, values, likes or dislikes occupational preferences and other personal traits. As the dominant characteristic is reinforced the child grows preferring certain occupational activities.

The school environment provides the academic and social interaction for the child. As the child interacts with peers and teachers occupational preferences begins to develop. The academic environment established in different schools reinforces and rewards different patterns of student abilities and interests, which leads students to aspire for different occupations (Smart, Feldman & Ethington 2000). Depending on the nature of socialisation in different academic environment,

students will tend to perform preferred activities while avoiding others. In the end the student will develop preferred competences, values and will feel rewarded. Such an environment is said to be congruent with the dominant personality types (Holland, 1997).

The Holland model therefore offers a technique that can be used to determine the relationship between the personality types and the choice of academic environment (degree program) qualitatively because the dominant characteristics can be observed and measure. The Self-Directed Search has a set of activities that have been used to measure personality. Similarly, academic environment can be qualitatively described because the activities carried out are very distinct. To identify the corresponding personality type and academic environment, the Dictionary of Holland Occupational Codes gives the qualitative data as shown by Gotfredson & Holland (1997). The College Majors Finder by Rosen, Holmberg & Holland (1989) contains hundreds of college majors classified according to their resemblance to the distinctive interests, skills and abilities presented by disparate personality types and academic environments.

Half a century after Holland's theory came to existence, it remains clear that it has made significant contribution in career development psychology and the influence in the practice remains outstanding (Nauta, 2010). The constructs in Holland's theory that have been extensively examined to inform the career practice include the relationship between the six personality types and six work/academic environments. Holland offers ways of matching persons to environment and this has been done for the last many decades (Brown, 2005), (Spokane & Cruza-Guet, 2005) (Smart, Ethington & Feldman, 2006). The existence of the RIASEC model has been supported by research in many countries (Fouad, 2002). Holland's work remains the most cited in career counselling (Armstrong & Round, 2008).

Even though Holland's classification has generated a lot interest in research and practice in the western world, not much has been done in Kenya where tertiary training has been expanding in the last decade. To support the role of the universities and to assist other tertiary institutions develop distinct abilities and competences using existing career development theories are necessary, particularly using theory based interest tool. To fill this gap, this study examined the Holland's theory in classifying students according to their personality types and the different characteristics of academic environment

2.3 Holland's personality types and the choice of degree programs

Holland (1997), states that people possess attributes of all the six personality types with one being the dominant. The most dominant types influence one's choice of subjects at high school, degree major and consequently the vocation. He further states that the consistency of a personality pattern is positively related to choice of an educational setting, vocational stability, satisfaction and success and that personality patterns differ from one another and it is possible to differentiate people. The differentiation is considered to be the absolute difference between a people's most preferred choices as compared to the least preferred choice. Spokane (1996), notes that the differentiation is a measure of crystallized interests and gives clarity on a person's vocational profile, which is evident in choice of academic majors.

Holland's premise is that helping a young person to select a degree program that suits their personality types is the most basic foundation of career guidance. He states that person-environment fit begins early in life when a student selects subjects in high school. Feldman, Smart & Ethington (2004) reveal that the extent to which person-environment fit contributes to successful behaviour in an educational setting largely depends on dominant characteristics in a person and corresponding dominant characteristics in an academic environment. This is because the personality types will be enhanced in a congruent academic environment. The interaction

between the personality type and the academic environment in which a student enrolls influences the behaviour pattern (Smart, Ethington and Feldman, 2002).

The degree program a student pursues is created for the people whose personality characteristics are dominant. Students will seek an academic environment that will provide them an opportunity to pursue a degree program that will prepare them for the world of work and in which they find great pleasure. Such an environment within a university setup should prepare students for specific work environment that reflects typical characteristics of its members. Consequently, different work environments/degree programs will be dominated by personality types that are similar since an environment and people are inseparable i.e. social environment will have social personality types (Holland, 1997).

According to Smart, Feldman & Ethington, (2000), a model academic environment provides a socialization process for students and stimulates individual members to perform the preferred activities in the environment. Such an environment fosters respective competences, encourages the members to see themselves in ways consistent with the preferred values and rewards them to display the preferred values.

In this case the academic environment the student enrolls in should develop the skills and competences for the most preferred career choice. The student's personality type and academic environment stimulates interest, fosters the development of work related competences (Smart, Ethington& Feldman, 2000), and encourages students to behave in a given way consistent with professionals in the field. This rewards students' effort in a manner that they display the required behaviour (Holland & Gottfredson, 2002).The relatedness of preferred activities, patterns of attitudes, interests, and competences of each type provides the distinctive profiles for the six

personality types and the six academic environments linked together (Smart, Feldman & Ethington, 2000). The following is a detailed description of distinctive personality types and corresponding academic environment.

Realistic personality types prefer activities that involve the manipulation of machines, tools, and objects, and they have an aversion to educational, interpersonal, and therapeutic activities. They value material rewards for tangible accomplishments and have manual, mechanical, and agricultural competences. They perceive themselves as being practical, conservative, asocial, and persistent. They are seen by others as being normal and frank. The realistic people are robust (full of life), rugged (not particularly very smart) and practical. They are uncomfortable in social settings. They have good motor coordination and love hands-on activities. They are stable, natural and persistent. They like to build or construct things and to work with big powerful machines.

A student who is categorised as a realistic type will seek a degree program to develop competences around working with things. Disciplines commonly associated with realistic environments are electrical engineering, mechanical engineering and military science. These disciplines emphasize concrete, practical activities and use of machines, tools and materials. The activities involved lead to acquisition of mechanical and technical competences. Students in a realistic academic environment utilize mechanical abilities and they are limited in their interpersonal skills. They are encouraged to perceive themselves as having practical, productive, and concrete values. As a result, the realistic academic environment rewards students for displaying conforming behaviour and practical accomplishments.

The **investigative personality types** prefer activities that entail the exploration, understanding, and prediction or control of natural or social phenomena and avoid those involving persuasion and sales. They value the development and acquisition of scholarly and scientific knowledge. They have scientific and mathematical competences and perceive themselves as being critical, intelligent, and sceptical while lacking interpersonal skills, and they are seen by others as being asocial and intellectual. The investigative people have a scientific orientation. They are task-oriented (all wrapped up in their work), introspective (inward thinking). They have a strong need to understand the world and prefer to work independently. A student will seek an academic environment that will develop competences around working with ideas and things.

An investigative degree program emphasises the acquisition of knowledge through investigation and problem solving. Some of the disciplines that are considered investigative are biology, mathematics, sociology, economics and civil engineering. In these disciplines, a student engages in analytical or intellectual activities aimed at the creation and use of knowledge. Such an environment pays no attention to persuasive, social and repetitive activities. Students in an investigative environment perceive themselves as cautious, critical, complex, curious, independent, precise, rational, and scholarly. Students in an investigative environment feel rewarded for scepticism and persistence in problem solving, documentation of new knowledge and understanding solutions of common problems. Students are exposed to investigate complex aspects of life in an abstract way. It demands students who have a scientific ability and generally low on managerial skills. The disciplines that are associated investigative environments are biology, mathematics, sociology, economics, and physics.

Artistic personality types prefer literary, musical, and artistic activities. They avoid activities associated with conformity to established rules. They value aesthetic qualities such as creative

expression of ideas, emotions, and sentiments. They have art, music, drama, and writing competences. Artistic types perceive themselves as innovative, open to new experiences, emotional, sensitive, and often lacking in clerical and office skills. They are seen by others as unconventional, disorderly and creative. The artistic people like art, music, drama, and other creative interests. They prefer free unstructured situations. They are impulsive, non-conforming, independent and adverse to rules. They value beauty and aesthetic qualities. A student will seek an academic environment to develop competences around working with ideas.

An **Artistic degree program** encourages the acquisition of innovative and creative competences. The artistic disciplines include English Literature, Architecture, Speech, Music, and Theatre. The emphasis is on ambiguous, free, and non-systematic activities that involve emotionally expressive interactions with people. Little attention is given to explicit, systematic, or ordered activities.

Social personality types prefer activities associated with helping other individuals through personal interaction. They often avoid mechanical and technical tasks. They value social services and fostering the welfare of others and have interpersonal and educational competences. Social types perceive themselves as cooperative, empathetic, helpful, understanding, and lacking in mechanical ability. They are regarded by others as agreeable, nurturing and extraverted. The social people are sociable, responsible, humanistic, and religious. They have good verbal and interpersonal skills. They enjoy curing, training, developing, or enlightening others. They are understanding, helpful, idealistic, cooperative, friendly, and generous. A student will seek an academic environment to develop competences around working with people. **Social disciplines** focus on the acquisition of interpersonal competences. Disciplines that are commonly associated

with social environments are Education, Political Science, Nursing, Special Education, Philosophy and History.

Social degree programs focus on activities that involve mentoring, treating, healing or teaching. Little attention is paid to explicit, ordered, systematic activities involving tools, or machines. Students in a social academic environment will perceive themselves as cooperative, empathetic, generous, helpful, idealistic, responsible, tactful, understanding and having concern for others welfare. The social people feel rewarded for displaying empathy, humanitarianism, sociability and friendliness.

Enterprising personality types prefer activities that entail persuading, manipulating, and directing others to attain organisational goals or economic gain. They avoid engagement with scientific, intellectual, and abstruse topics. They value political and economic achievements and social status. An enterprising type seeks to develop public speaking and leadership competences. They lack scientific abilities and are seen by others as energetic and gregarious. The enterprising personality types have good verbal skills and are persuasive. They are concerned with power, status, and leadership. They have high energy levels. They value money and material possessions. They dislike science and systematic thinking. A student will seek an academic environment to develop competences around working with data and people.

Enterprising degree program will be oriented toward personal or organisational goal attainment through leadership or manipulation. The emphasis is on leadership development. Enterprising disciplines include Business, Journalism, Communication, and Computer science. The academic environment, focus on activities that involve manipulation of people to attain organisational and economic goals. This environment pays limited attention to observational,

symbolic, or systematic activities. Students need to exhibit leadership, interpersonal, speaking and persuasive skill. The students in this area are deficient of scientific competences. They perceive themselves as aggressive, ambitious, domineering, energetic, extroverted, optimistic, popular, self-confident, sociable, and talkative. They feel rewarded for displaying the initiative in pursuit of financial or material gains, dominance and self-confidence.

Conventional types prefer activities associated with establishing and maintaining orderly routines and the application of standards to attain organisational or economic goals, and they have aversion to ambiguous or unstructured activities. Their engagement in these activities leads to the development of clerical and numerical competences and to a deficiency in artistic abilities. They value material or financial accomplishments and power in social, business, or political arenas. They perceive themselves as conforming, orderly, methodical, and practical. Others see conventional personality types as being careful and conforming. They prefer well-ordered environments. They are conscientious or thorough, efficient, and practical. They identify with power. They are orderly, persistent, calm, stable, well controlled and dependable. They like systematic, verbal, and numerical activities. They avoid ambiguous situations and problems. A student will seek an academic environment to develop competences around working with data and things.

Conventional degree program focuses on the competences associated with the use of numbers or machines. They are characterised by activities with numbers, things and machines. They seek to develop clerical skills. Academic disciplines include Accounting and Data Processing. The academic environment emphasises activities that involve explicit, ordered, systematic manipulation of data to meet predictable organisational demands or specific standards. Students in conventional degree programs perceive themselves as having conventional outlook and

concern for orderliness and routines. The environment is more traditional and formal in outlook with high degree of orderliness and routines. They feel rewarded for displaying dependability, conformity and organisational skills.

Several studies have been found personality types to be predictive of students' choice of a degree program as presented by Holland's typology (Porter & Umbach, 2006), (Astin, 1995). Porter & Umbach (2006) found that the choice of an academic major is influenced by a student's pattern of interests. They concluded that assisting student's make informed career decisions on the selection of degree program promotes greater student satisfaction and success in their undergraduate experience. Tracey & Robbins (2005) found that interest, choice of college major and college success were related to high rates of retention. Feldman, Smart & Ethington, (2004) found that the likelihood of students increasing their initially prominent characteristics over a four-year period of study is largely a function of whether or not they choose an academic environment that is consistent with their dominant personality type at the time they entered college. They also concluded that an academic environment prevailing has an influence on the personality types.

Examining how students select subjects in high schools that eventually lead to the degree program and other post secondary education is important in understanding the relationship between a student's interest and its relationship to the choice of the academic environment. Several studies in Kenya have focused on factors that lead to career choice with no documented studies showing the relationship between personality types and choice of degree program. This study examined the relationship between the salient personality types and academic environment in Kenya using the Holland classification.

2.4 Congruence between personality types and choice of degree program

Congruence according to Holland, (1963) is a measure of fit between a person and the environment, the degree of compatibility or agreement. Congruence means a good fit or correspondence. Tinsley (2000) relates congruence to the relation between desires and supplies. Congruence assumption has been investigated by numerous studies with most of them finding a high correlation between personality types and work environment. In Holland's theory a person is most likely to flourish in the environment with the same dominant characteristics since such an environment provides opportunities, activities, tasks and roles that match the competences and interests that parallel personality type. Holland further suggests that all things being equal, congruence of person and environment leads to higher levels of stability, satisfaction and achievement of the person. In same breath, incongruence of person and environment leads to instability, dissatisfaction and low performance.

The arrangement of the Holland's personality and environment codes on the hexagon show the relatedness of the dominant characteristics. The codes on the hexagon are arranged in manner that the distance between one code and another is the same. The closer the codes are on the hexagon, the more similar the dominant characteristic. The farther the codes are on hexagon, the more dissimilar the dominant characteristics. This shows how they overlap and share characteristics. The codes R-I-A-S-E-C order gives four levels of measuring degree of congruence. The highest level of congruence occurs when a given personality type matches environment e.g. artistic personality in an artistic academic environment. This is followed by adjacent category on the hexagon i.e. artistic personality is in an investigative environment. The third level of congruence is alternate category on the hexagon e.g. artistic personality type is an enterprising environment. The lowest level of congruence occurs when a personality type falls in an opposite environment e.g. artistic personality type in conventional environment.

The personal and situational characteristics associated with person-environment congruence become more explicit by viewing the formulations that illustrate both personality types and the environment involved. In an academic setting, a student classified as a social type in a social academic environment is a clear case of perfect fit. Such a student is provided with the opportunities to engage in social activities, use their social skills/competences, to perform services he/she values, to see him/her as understanding and helpful and to exhibit personality traits of generosity, friendliness and sociability. In turn, the social environment reinforces the self-image the social person brings to the environment and rewards him for social values and social personality traits such as generosity, friendliness, and sociability. On the other side of the coin, social students in a social academic environment are able to avoid the activities they dislike and demands for competences they lack.

The context and structure of incongruent interactions can be explained in the same way (Holland, 1963, 85, 97). For instance a conventional type in an artistic environment will find oppositions or incongruities. A conventional person likes structured activities while an artistic environment provides an unstructured environment. The competences possessed are concerned with numbers, things or machines, while the artistic environment looks at the world unconventionally. A conventional person prefers order while the artistic environment is disorderly and impulsive. Put together the negative interactions will result in gross dissatisfaction, ineffective coping behaviour and probably leaving the environment.

There are several studies that show strong evidence that congruence predict individual choices (Betz, 2008), (Spokane & Cruza-Guet 2005). A study by Smart, Feldman & Ethington, (2000) examined the application of Holland's theory in an educational setting to determine the outcome

of congruence. They found that the academic environment that is compatible with students' personality type rewards different patterns of students' abilities and interests. They argue that a student will select an educational setting that will provide activities, roles, competences and interest that match their personality type and avoid that environment which is incongruent. They further state that in different schools/faculties, students will select academic lines that match their career interest and that students will enrol for courses in which they demonstrate strong abilities and interest for their majors (Smart & Feldman, 1998).

Students have been found to flourish in academic environments that are congruent with their personality types (Smart, Feldman & Ethington, 2000), (Hackett & Lent 1992), (Holland, 1997) and (Walsh & Holland, 1992). The argument is that students will select academic programs in the hope that they will fit and excel because they expect to develop their abilities and competences to fit in the world of work. In an academic environment, Feldman, Smart & Ethington, (2006) state that the extent to which a person-environment fit contributes to successful vocational behaviour in an educational setting largely depends on prominent characteristics of a person and the corresponding prominent characteristics of the academic environment.

Olitsky, Robbin & Neymann (2007) found that congruence of interest and planned college major has a positive relationship with post-collegiate earnings and the students seek academic environments that enhance college success. Among the Chinese high school students in Hong Kong, Leoug & Zhi-jin, (2001) found that the degree of congruence's between SDS interest codes for boys and girls, and choice of academic track was higher in realistic and investigative scores for science track and high for arts track for students in Artistic, Social and Enterprising personalities. In the same study, gender differences in the SDS scores were evident as well as the degree of choice congruence.

The Joint Admissions Board bases admission in the Kenyan public universities on the predetermined criteria. The students' selection to join the university is based on the subject cluster points, academic performance and the university capacity for specific course. Even though students are required to make a choice of a degree program they intend to pursue in the universities at high school there is no documented study to show whether the students are admitted to the course they prefer most or the Joint Admissions Board allocates them the course they study. While the self-sponsored students have an opportunity to select and enrol in the courses they prefer, it is not clear if the regular or government sponsored students enrol in the course they choose as the first choice. Examining the degree of congruence as an outcome of person-environment fit in an academic setting will show if the students are pursuing courses they most prefer. Since there is no documented study on congruence and choice of degree program, this study examined this construct using the SDS test as a measure of degree of fit.

2.5 Gender, personality types and choice of degree programs

Gender differences in selection of career choice emerge early in a person's life with many studies attributing it to cultural beliefs and socialization factors (Eccles, 1999). Female roles are still more associated with caring for people than engaging in fields such as Engineering that are perceived as "dirty", "heavy" and requiring more physical energy which are left for males. It is also common to associate mathematical competences with masculinity as required in realistic and investigative environment and social competences with femininity. Most female students shy away from subjects perceived to be more masculine while male will avoid subjects that are feminine in nature (Hersh, 2000). This is evident in most school curriculum designs globally. Female students will gravitate towards social sciences and males towards pure and applied sciences.

Many studies have reported gender differences in career choice with most suggesting that socialisation barriers are the main cause. Sociologists argue that the effects of gender differences in career choice are felt at different levels i.e. primary, secondary and post secondary (Hyde, Fennema, Frost & Hopp, 1990). The socialization barriers that emanate from belief systems and behaviour patterns lead women to avoid certain career fields which are related to perceived gender roles, gender identity and cultural beliefs (Eccles, 1999).

International data in EUROSTAT, (2004) shows that in Europe and other industrialized countries, women in engineering and other science fields have been increasing steadily in the last few years but still fall far below the males. Gender disparities in realistic and investigative fields associated with males and social fields associated with females is still evident (Ranson, 2003), (Ismail, 2003), (Hersh, 2000) (Schwartz, 1992). According to Bix, women are still nowhere close to approaching proportional representation in the professions in realistic and investigative fields let alone achieving inclusive work practices in the same fields (2004). This finding is further supported by Francis, (2001) who argues that students career choices continue to reflect a gendered dichotomy where boys choose technical and scientific fields and girls choose jobs with creative and caring elements.

Studies reveal that boys will tend to choose career fields that are traditionally known to be male-oriented while girls will choose career fields that are seen to be more feminine (Holland, 1997, Holland & Gottfredson, 1991, Smart, Feldman & Ethington, 2000). Gender socialization (Pike, 2006), and gender stereotypes detrimentally affect the development of girls and women leading females to believe that they should prioritize homemaking and childrearing roles and de-

emphasis their own educational achievements and consequently leading to decreased aspirations of girls.

Studies show that boys and girls start out with equally high aspiration, but girls reduce theirs over time. The boys are said to continue persisting in their aspiration, but the youthful women's aspiration fades as they approach marriageable age. Stereotypes have significant effects because certain occupations are either classified as masculine or feminine. Gender roles that are stereotypically expressed in vocational interest have been extensively studied (Betz & Hackett, 1981), with males showing preference to realistic and investigative occupations while female students lean more to social options.

Studies also show that career-related women perceive themselves as weak in mathematics and science related fields (Betz, 2008). Betz argues further that the lack of mathematics or fear of mathematics constitutes a major barrier to women's career development and female students' self-perception in science fields is usually lower than that of males (Betz & Hackett, 1997). A woman's self-perception is very important in occupational choice. Most females feel and believe that males perform better in realistic and investigative fields. What a girl internalizes about the abilities in science-related fields affects career choice with opting for social fields (Ismail, 2003).

This biased self-assessment on career related decisions is based on females' underestimation of self and males' overestimation of self. This is self-efficacy. According to Bandura (1997), the self-efficacy affects/influences a person's beliefs of what one can successfully do and complete to reach a desired goal. An individual might perceive himself/herself as able or unable to solve algebraic equation, fix a flat tire or care for an infant. In self-efficacy, Bandura states that people will manifest three behavioural consequences: approach verse avoidance behaviour, increased or

decreased quality of performance or behaviour in the target domain and persistence in the face of obstacles or disconfirming experiences. The consequences of low self-efficacy would be avoidance, poor performance and increased tendency to give up when faced with discouragement or failure. In career development, self-efficacy influences the type of courses selected by a student (Betz, 2008). This has been found evident in the life of women.

In an African setting, cultural beliefs make up the components of the gender stereotypes that define expectations for each person. Eccles, (1999) argues that cultural beliefs result into what we think about most people and aid in categorising people as “men” or “women” as far as duties are concerned. Parents are critical in conveying the cultural beliefs and consequently influence the career choice of their children. Teachers too, whether male or female, have lower expectations from female students in science-related fields.

Multiple gender roles have been found to correlate with women’s choice of career. Fitzgerald, Fussinger & Betz (1995) noted that the history of women’s traditional roles such as homemakers and mothers continue to influence every aspect of their career. They state that many women plan their career mindful of how they will integrate these roles (Betz, 2005). Farmer (1997) found that as women mature, they downscale their career aspirations as demands of the family life increase.

Gender discrimination in the work place has continued to affect women both overtly and subtly. Fitzgerald & Harmon, (2001) suggest that women in some organisations experience a glass ceiling of how far they can advance. He further states that demeaning comments, sexual harassment continue to affect women’s career advancement. In an academic set up, it is no wonder one will find few women in male dominated fields. Hostile work environment makes women fail to persist in given career fields. Women need tenacity and persistence, flexibility,

creativity and ability to overcome challenges in-order to succeed in their career pursuits (Gomez, Fassinger, Prosser, Mejia & Luna, 2001).

Gender therefore remains fundamentally correlated significantly on Holland's vocational classification (Smart, Feldman & Ethington, 2000), (Holland & Gottfredson, 1991), (Holland, 1997), and (Pike, 2006). In these studies, gender in the Realistic, Investigative and Social types have been significantly correlated with a high representation of males in realistic and investigative fields while females in social field. In all the studies, student gender showed a weak correlation in Artistic, Enterprising and Conventional types with a somewhat similar distribution in the all the fields.

Studies using the SDS 4th edition by Rosen, Holmberg & Holland, (1994) reported that gender was strongly associated with the choice of realistic and social fields and weakly associated with investigative, artistic, enterprising and conventional fields. Women are more likely to have low scores on realistic scale and high scores on social scales, while men are likely to have high scores on realistic fields and low scores on social fields.

Gender difference has also been noted when assessing student's satisfaction (Rienzi, Allen, Sarmiento & McMillin, 1993), (Smart, Feldman & Ethington, 2000) (Holland, 1997). Women reported lower satisfaction with college majors compared to men. Gender difference has been noted as a significant factor when examining satisfaction in college. Women have been found to register low satisfaction than men (Umbach & Porter, 2002), (Adelman, 1991) and (Fricko & Beehr, 1992).

Almiskry, Bakar, & Mohamed, (2009) in a study conducted to determine the career interests of university students in Malaysia using two hundred and thirty-eight undergraduates, found a significant difference of realistic career interest pattern between male and female students. Behrend, Thompson, Maede, Grayson & Newton (2007) in a study examined whether a career influences survey assessing the value medical students place on providing comprehensive patient care exhibited measurement invariance across males and females. Their findings supported measurement invariance and indicated that women valued opportunities to provide comprehensive care when choosing a career specialty more than men.

Kusku, Ozbilgin & LerzanOzkale, (2007) found that although a balance has been achieved in the overall numbers of female and male students in higher education in the industrialized countries, vertical sex segregation has remained high as male academics and students continued to outnumber their female counterparts internationally. Gender representation is only one façade of gendered disadvantage in engineering, as complex forms of gendered disadvantage occur in social, cultural, psychological and economic layers of life, where women engineering students find themselves swimming against the tide of prejudice. Their findings suggest that linear formulations of gender prejudice and disadvantage in engineering study is insufficient to account for the complexity of influences on career choice and their concomitant gendered outcomes. Most studies suggest gender disparities in choice of science-based fields. In Kenya, the gender differences in choice of degree programs have been related to differences between females and males. There has been no study examining gender differences in personality types and the choice of the degree programs.

2.5 Congruence as a predictor of satisfaction with degree program

Satisfaction with the degree program has been cited as an outcome in the congruence between personality types and choice of an academic environment. Studies done in the 1980s by Smart (1987), (Smart, Elton & McLaughlin, 1986). This revealed that in an organisation the most prevalent personality types showed the highest level of congruence and scored high on satisfaction than those who were incongruent. Investigating dropout rates from the nursing occupation using interest inventories to assess similarities between nurses' specialization and vocational interest revealed that there were high levels of satisfaction where subjects were congruent with the career interest (Hener & Meir, 1981)

In the 1990s, studies by Gottfredson & Holland (1990) showed a correlation between congruence and satisfaction. According to Tranberg, Slane and Ekeberg (1993), there is evidence to link congruence and satisfaction. The personality types that were congruent with the college majors were most satisfied with their choices (Mitchell, 1997). Recent meta-analysis studies have confirmed that greater person-environment congruent RIASEC types are associated with favourable outcomes such as job satisfaction (Spokane, Meir & Catalano, 2000), (Tsabari, Tzinar & Meir 2005). Increased levels of stability, satisfaction and achievement when personality types and educational setting are congruent have been reported (Holland & Gottfredson, 2004).

Smart, Elton & McLaughlin (1985) however argue that congruence did not automatically predict satisfaction. Holland (1996a) acknowledges the need to understand more about the modest explanatory power of congruence construct in measuring other outcomes. Holland (1997) and Gore & Brown (2006) note the limitations congruence studies in determining the levels of satisfaction. Even though some studies have shown that congruence appears to be a sufficient

though not a necessary condition for job satisfaction, several studies have reported a correlation of .25 range. In a meta-analysis of 27 studies by Tranberg, Slane & Ekeberg (1993), congruence –satisfaction correlation was found to be $r = .21$.

De Fruyt (2002) and Camp & Chatrand (1992) found that congruence-satisfaction relationship differ depending on the index used to calculate the C-Index. Other variables were found to influence the strength of relationship between congruence and satisfaction with some studies stating that factors such as age, teaching resources, faculty interaction, job market opportunities and vocational identity being crucial (Tracey & Robbins, 2006)(Young, Tokar & Subich 1998).

Congruence as a predictor of satisfaction has generated mixed results in the studies reviewed. The relationship between a match personality type and academic environment as hypothesised by Holland is that satisfaction with the choice is the expected outcome. Given the difference, noted in various studies and the lack to research in this area, the study examined the relationship between congruence and satisfaction in Kenya.

2.6 Summary of reviewed literature

The reviewed literature focused on the Holland's personality types, gender, congruence and satisfaction with choice of degree program students. The literature reviewed shows that there is a significant relationship between personality types and the choice of degree program with most studies concluding that students will spend considerable amount of time selecting subjects that they enjoy while avoiding those that they dislike. The classification of personality types according to Holland typology reveals strong association between personality types and work environment. When applied to the academic environment literature supports the self-selection process where an individual shows preferences for one vocation and avoids the other. The reviewed literature also indicated that gender disparities exists in various academic disciplines with most showing that science related fields are dominated by males and social sciences dominated by females. Literature also supports congruence as strong predictor of academic choice but weak in predicting satisfaction. This study sought to investigate these variables using a sample drawn from Kenyatta University.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the research methodology used in this study. It commences with a description of the research design and locale. This is followed by a discussion of the major variables that were derived from the objectives of the study. The chapter then discusses the target population and sampling strategies used to get the subjects that participated in the study. The types and justification of the research instruments is discussed in line with the strategies used in data collection and analysis. The chapter ends with a discussion of the combination of quantitative and qualitative methods that were used to analyze the facts and issues generated by the study.

3.1 Research design

This study adopted an ex-post facto research design. Kerlinger (1973) defines ex-post facto research as a systematic, empirical inquiry in which the scientist does not have direct control of the independent variables because their manifestation has already occurred or because they are inherently not manipulable as they occur in a natural setting (Orodho, 2009:51), (Fraenkel & Wallen, 2008, Borg& Gall, 2003). In other words, the researcher does not manipulate any of the independent variables. In ex-post facto design the researcher attempts to determine the relationship and effects that have occurred between and among the variables and allows one to express in a mathematical terms the degree of relationships in any two or more variables (Orodho, 2012).

The use of ex-post facto design in psychological research allows one to test hypotheses about cause and effect. Ex-post facto design has been supported in educational research, which does

not lead to experimental work (Fraenkel & Wallen, 2008), (Mugenda, 2008). Ex-post facto design was considered appropriate because the independent variables under investigation, especially the gender of respondent, personality types, and degree programs had already occurred and could not be manipulated.

3.2 Study variables and their measures

The researcher examined the relationship between Holland's personality type, gender, congruence and satisfaction with the degree program. The independent variables in this study were personality types, gender and degree program. The dependent variables were congruence and satisfaction with the degree program. Gender was measured as male and female respondent, personality types were classified as realistic, investigative, artistic, social, enterprising, and conventional measured using the Self Directed Search (SDS) based on Holland's theory.

The researcher scored the SDS test by counting the "L" (LIKES) and the totals recorded in the boxes shown on the test. Similarly in the competences and occupation section of the test a count of "Y" (YES) was recorded. The three highest scores generated the three letter codes e.g. "R" 36; "I" 10; "A" 20; "S" 19; "E" 24 and "C" 1. In this case, the highest scores **R (36), E (24), A(20)** indicated the summary code for the participant. In this case the Holland summary code is (REA). The researcher used the 1st letter to determine the personality type of the participants. In this case the person will be regarded as a **realistic personality type** since **R** had the highest score.

Degree programs were classified using the Dictionary Holland of Occupational Classification, which reflects the different academic environment within Kenyatta University (Holland & Gottfredson, 1996). The dependent variables were degree of congruence and satisfaction with the degree program. Congruence was measured using the C index proposed by Brown & Gore, (1994). C index is easy to calculate and it is sensitive to both the order of the Holland codes as

well as to the distance between codes. The formula for C is $C = [3(x) + 2(x) + 1(x)]$, where x is a score of 3, 2, 1, or 0 assigned to each comparison according to the hexagonal distance between the letter (3 = identical person and environment letters, 2 = adjacent hexagonal letters, 1 = alternate hexagonal letters, and 0 = opposite hexagonal letters). The highest score for congruence is 18 and the lowest score is 0. In this study, scores between 0-8 were regarded as incongruent and scores between 9 and 18 were considered congruent.

Satisfaction was measured using a dichotomous dummy score of (1) satisfied and (2) dissatisfied, which was generated from the likert scale with scores ranging from 1-5. The likert scale had statements to assess the student feelings regarding the degree program, which were scored at five levels: 5 (Strongly Agree); 4 (Agree); 3 (Undecided) 2 (Disagree); 1 (Strongly Disagree). For each score 1 was interpreted as least satisfied while 5 indicated most satisfied. All scores between (1-2) on the likert scale were considered as dissatisfaction, while scores between 3-5 were considered satisfaction with the degree program. The degree program satisfaction scale was used to assess if the university students are satisfied with the degree program.

3.3 The study locale

This study was conducted at Kenyatta University. It is a full-fledged university, which is located in Nairobi. It is the second largest university in Kenya with a population of over 40,000 students enrolled in different programs. Currently the university has the following campuses and constituent colleges; Kahawa Main Campus, Ruiru, Parklands, Kitui, Mombasa, Igoji, and Pwani College. In addition, Kenyatta University has eight regional centres administered by the Institute of Distance, Open and e- Learning (ODEL). The centres are located in Mombasa, Nairobi, Embu, Nyeri, Garissa, Nakuru, Kisumu, and Kakamega.

The university is therefore strategically within the metropolitan. Kenyatta University was selected for this study because it is composed of a diverse student population from within and outside the country. Kenyatta University enrolls students into 5 different programs as outlined below:-

- i. The Continuous Education program targets teachers who are in schools and colleges are willing to pursue a postgraduate diploma in Education, a Bachelors of Education, Masters of Education programs or Doctorate Degrees.
- ii. The Enhanced Program targets professionals interested in developing a job specific skill. Under this there is the Executive Masters in Business Administration.
- iii. The Joint Admissions Board (JAB) program admits students who are commonly referred to as regular students sponsored substantially by the government.
- iv. The Open and E-Learning (ODEL) program is specially designed for students who are not able to attend university on full time basis and therefore pursue the degree programs using well prepared modules.
- v. The Self Sponsored Program (SSP) admits the students who qualified for university education, but did not meet the JAB admission requirement or they sat for international curriculum examinations. These students are enrolled on full time basis. They pay tuition fees from their family support or private sponsors.

In addition Kenyatta University has a long history of offering unique courses like Fine art and Music, which according to Holland fall distinctly under the artistic field. These courses are not offered in any other public universities. For this reason the researcher felt that Kenyatta University degree program classification fitted well within the Holland's model. The student population at Kenyatta University is similar to all other public universities in that majority of

them are admitted through the joint admissions board and self sponsored programs and the data generated represents the population in other public universities.

3.4 Target population

The target population in this study was all third-year students at the Kenyatta University main campus during the 2010/2011 academic year admitted through the Joint Admissions Board and Self Sponsored Program (SSP). There were 4570 third-year students during the 2010/2011 academic year. These students were selected because they had completed two years of study implying that they were persistence and stable in their selection. They were highly likely to complete the study program. Kenyatta University academic environments at the time of this study were organised into thirteen schools (Kenyatta University, 2010). All the Schools were classified using the Holland's Dictionary of Occupational (DHOC) into six Holland strata i.e. Realistic, Investigative, Artistic, Social, Enterprising and Conventional. Some schools had overlapping RIASEC classification and they were eliminated from the study. Only the schools that had dominant RIASEC characteristics under the Holland classification were selected. These were Schools of Engineering, Health Sciences, Pure and Applied Sciences, Visual and Performing Arts, Education, Business and Economics. The researcher grouped the Schools of Health and Pure and Applied Sciences together into one stratum named School of Sciences since they fell under investigative category. The following schools were eliminated from the study because in Holland's classification they shared two dominant characteristics. School of Agriculture and Enterprise Development was classified as Realistic/Enterprising, School of Environment Studies as Investigative/Enterprising, School of Hospitality as Artistic/Social, Humanities and Social Sciences as Investigative/Social/Enterprising, and School of Law as Investigative/Social. The schools selected for the study are shown in table 3.1.

Table 3.1. Holland's classification of Academic Environment

Schools	Holland's Classification	Female	Male	Total
Engineering	Realistic	51	271	322
Sciences	Investigative	259	637	896
Visual/Performing Arts	Artistic	31	61	92
Education	Social	788	890	1678
Business	Enterprising	338	554	892
Economics	Conventional	183	507	690
Total		1650	2920	4570

The accessible population for the study from the six schools was 4570 students. The females were 36% of the total population and males were 64%. In the School of Engineering females were 15% and males 85%, School of Sciences females were 29% and males 71%, School of Visual and Creative Arts females were 34% and males 66%, School of Education females were 47% and males 53%, School of Business females were 38% and males 62% and School of Economics females were 27% and males 73%. This result indicates that male students are more among the third year students at Kenyatta University in all the schools.

3.5 Sampling Techniques

Probability and non-probability sampling techniques was used to select the sample. The probability technique that was used simple random, while the non-probability technique that was used was purposive sampling technique (Orodho, 2012). The simple random technique allows individuals in the target population to have an equal and independent chance of being selected as a member of the sample. Purposive sampling was used select schools which were had the dominant RIASEC characteristics. After the schools were selected, the departments within each school were put into a pool and simple random sampling was used to select the two departments from each stratum. However, a proportionate sample of three Departments was selected from the

School of Education, which had the highest enrolment and two Departments from the School of Visual and Performing Art, which had the least number of students.

3.5.1 Sample Size

The researcher used proportionate sampling technique to get the required sample size. Most schools had over 300 students and they were categorised as large. The School of Visual and Performing Arts had less than 100 students and it was categorised as a small school. The Schools of Science, Education, Business and Economics were categorised as large schools and a sample size of 10% was drawn. The Schools of Engineering had a total population of 322 students with females being 51(15%), which is a proportionately smaller number. To increase the probability of getting females represented in the sample, a proportionate sample size of 15% was drawn from this school, while from the Visual and Performing Arts categorised as a small school, 43% was drawn. The total sample size was 514 students from all the schools as shown in table 3.2.

Table 3.2 Sample Size

Holland Classification	School	Total	Sample size
Realistic	Engineering	322	50
Investigative	Sciences	896	89
Artistic	Visual and Performing Arts	92	40
Social	Education	1678	167
Enterprising	Business	892	89
Conventional	Economics	790	79
	Total	4570	514

3.6 Research Instruments

The Self-directed Search (SDS), Occupation Finder by Holland, Powell & Fritzsche (1994) and the Directory of Holland Occupational Classification by Gottfredson & Holland (1996) were used as the main data collecting instruments. The SDS instrument was used because it has generated a lot of research interest and it has been cited in numerous studies in the western world

and South Africa. The SDS instrument is based on Holland's theory and it can be tested using an established criteria. This instrument has not been used in Kenya before in its original form and therefore the researcher felt it was necessary to use it in order to provide basis for further studies. This test has been used in South Africa and the results generated show that the precepts in Holland's theory can be applied in career counselling in an African setting.

Even though the test was developed for a predominantly white population, the work/academic environment characteristics are global and the test is appropriate for use in an African setting. However, the test may require certain modifications to make culture fair and this was not within the scope of this study. The degree program satisfaction scale was used to gather data on student's satisfaction with the degree program being pursued.

3.7 Pilot Study

The pilot study was carried out among third-year students from Jomo Kenyatta University of Science and Technology. The university is within the Nairobi Metropolitan and it therefore has a diverse population composition like other public universities in Kenya. A total of 30 students were selected from the School of Engineering. Jomo Kenyatta University of Agriculture and Technology was selected because the student population is comparable with the sample in the study. The students are comparable to the sample selected in many ways because majority were enrolled to the different campuses having attained the minimum requirement set by JAB. This university also offers a wide range of courses and several campuses across the country except for Education.

The SDS questionnaire was piloted to determine the duration the Self Directed Search (SDS) 4th Edition. The satisfaction scale developed by the researcher was also piloted to determine if the

questions asked were well framed based on the research objectives. Very few alterations were made on this instrument.

3.7.1 Validity

The validity is the ability of a test to measure what it purports to measure. The SDS instrument concurrent validity for 1994 version was found to be same with tests that had been done in the previous years as reported by Holland, Fritzsche & Powell (1994) when administered to college students. College students globally share similar characteristics in terms of age and pre-college training which is usually 13 years of education before enrolling for different courses in colleges and universities. The instrument tested based on the research objectives were found to be valid (Holland, Fritzsche & Powell, 1994).

The validity of the satisfaction scale was determined using content related evidence, which examines the content and format of the instrument. Since the researcher was interested in investigating the satisfaction as expressed by the feelings the students have with regard to the degree program being pursued, each item was examined to determine its content validity. A panel of experts comprising of the thesis supervisors determined the final assessment of the validity of the instruments. The results of the pilot study showed that the instruments could be used to answer the research questions in this study.

3.7.2 Reliability

Reliability refers to the consistency of the scores obtained. It is the degree to which a research instrument would yield the same results if repeated. A coefficient of 0.80 or more implies that there is a high degree of reliability of data (Mugenda, 2008, Orodho, 2009). This reliability coefficient is used to express the relationship between the scores of the same individual on the

same instrument. The SDS 1994 version was found to have a reliability coefficient that ranged between 0.59- 0.92(Holland, Fritzsche & Powell, 1994).

In this study, test-retest method was used to determine the reliability coefficient that was administered within three months. The reliability coefficient using the Pearson Product-Moment correlation between pre-test and post-test was calculated. A reliability coefficient of 0.76 was attained which was within the range of 0.92 as found by (Holland, Fritzsche & Powell, 1994) and 0.8 by (Orodho, 2009).

3.8 Data Collection

Research permit was obtained from the National Council of Science and Technology Ministry of Science and Technology and also supported by Kenyatta University. Data collection was carried out in two phases as detailed below.

3.8.1 Data collection: Phase 1

The researcher visited Deans of various schools to obtain permission. The researcher got introduced to various lecturers in-charge of various course units. The researcher contacted the lecturers and made appointments to administer the questionnaires during a lecture session. The questionnaires were administered at the specified time that the lecture was scheduled and all students present completed the questionnaires. The researcher briefed the subjects the purpose of the study and requested them to complete the consent form. Confidentiality of the information shared was emphasised to the subject by reassuring that the data gathered was for the purpose of this study only. Subjects who were not willing to complete the questionnaire were not compelled to do so. The researcher requested the subjects to indicate their email addresses or telephone numbers if they wished to be contacted for further information later on. A total of 460 questionnaires were presented to the subjects who attended the lectures, which means that out of

514-sampled population 54 did not attend the lectures. On average the session took between 25-35 minutes to complete the questionnaires.

3.8.2 Data Collection Phase 2

The results gathered showed that the choice of the degree program was highly correlated to the personality types; that gender is highly correlated to the choice of degree program; and that congruence was correlated to levels of satisfaction but weakly. Considering that SDS search instrument has not been used in research in Kenya, the researcher wanted to find out through an interview if the results generated reflected the true feeling of the subjects. An interview schedule was developed and a sample of 12 students was drawn from the six schools using simple random. The subjects who had indicated their phone numbers during initial data collection were contacted. A self-made interview schedule with three structured open-ended questions was developed. These types of questions were preferred because they allow the participant to explain their answers without limitation and to clarify what they felt was important. The interviews were conducted at different times and the responses were recorded. During this session the researcher was able to clarify questions and the respondent had an opportunity to expand on answers that were particularly important and revealing (Fraenkel & Wallen, 2008).

3.9 Data Analysis

The quantitative data generated using the Holland's (the Holland's what?) and satisfaction was coded and entered into a Statistical Package for Social Sciences (SPSS) computer program version 17.0. The data was analysed according to the hypothesis posted for the study. The following null hypotheses were tested using the described statistical tool at a confidence level of $\alpha = 0.05$.

H_{01} There is no relationship between personality type and choice of degree program.

- H₀₂ There is no significant relationship between congruence and choice of degree program.
- H₀₃ There is no relationship between gender and choice of degree program.
- H₀₄ There is no significant relationship between gender and personality types.
- H₀₅ There is no significant relationship between congruence and satisfaction.

To test hypothesis Chi Square and Pearson coefficient correlation were used to determine the nature of the relationship between the variables under investigation. As a non-parametric test, chi-square is used to determine if the categorical data in the hypothesis shows dependency or the two classifications are independent (Fraenkel & Wallen, 2008). Pearson's coefficient of correlation (or simple correlation) was used to measure the degree of relationship between two variables. The qualitative data from the interview guide was analysed thematically according to the major aspects followed in phase 2 of this study. The two analytical techniques reinforced each other and enabled the researcher to explain findings obtained from the SDS test and satisfaction scale. The descriptive data was reported using averages (mean and median), spreads (range and standard deviation), bar graphs and pie charts.

3.10 Logistical and Ethical considerations.

3.10.1 Logistical Considerations

The researcher obtained the required licences to carry out the study from Kenyatta University and the Ministry of Higher Education, Science and Technology. Plans to gather contacting the Deans of various schools who assisted the researcher to contact individual lecturers to allow time for data collection made data within schools. The lecturers were contacted to allow the researcher to gather data during their lecture sessions.

3.10.2 Ethical Considerations

To ensure confidentiality was maintained, the researcher assured the participants that the purpose for data collected was purely for this study and the data will not be used for any other purpose. Each participant was requested to fill in a consent form to accept to be involved in the study and the students were free to withdraw from the study if they so wished.

CHAPTER FOUR

RESULTS, INTERPRETATION AND DISCUSSION

4.1 Introduction

The chapter begins with descriptive statistics computed for the predictor variables. Results are presented in graphs and frequency distributions. This is followed by statistical analyses of the hypothesis under consideration with an interpretation of each finding stated. All the findings are presented and discussed in line with the literature reviewed and according to the objectives of the study, namely:

- i. To examine personality types of students enrolled in various degree programs at Kenyatta University.
- ii. To describe gender distribution in the various degree programs.
- iii. To describe gender distribution in different personality types.
- iv. To investigate the degree of congruence between the personality types and choice of the degree program.
- v. To investigate the relationship between congruence and levels of satisfaction with the degree program.

4.2 Demographic data

A total of 460 SDS questionnaire and satisfaction scale were completed during a regular lecture session. It was notable that out of the expected sample of 514 students, 460 students attended the lecture session meaning 54 (10%) were absent. Out of the 460 who completed the questionnaire, 76 had missing information and they were eliminated from the data analysis, leaving 389 questionnaires. The return rate was 85% of all questionnaires presented.

4.2.1 Gender Distribution Schools and Departments

Gender distribution in schools and departments was investigated and the results are displayed in table 4.1. Examining the data in table 4.1 shows that among the third-year students at Kenyatta University, male students were 53.2% and female students were 46.8%. With a 6% gender difference, the results imply that the gender gap has been reduced considerably and more female students are accessing university education at Kenyatta University. However, the results from different schools reveal the gender disparities characterised by the nature of subjects offered with more male students dominating the physical science disciplines. The results indicate science-related fields more than two-thirds of the students enrolled in Engineering and Sciences were males (85.5%) and (63%) respectively compared to the females in Engineering (14.5%) and Sciences (37%). In the social sciences there were more females in Education (67%) compared to males (33%). The findings in this study show that the enrolment patterns to science and social disciplines are influenced by gender. It is notable that other academic disciplines like music, business and economics the gender differences is not very significant.

Table 4.1 Gender distribution in schools

	Male		Female		Total	
	N	%	N	%	N	%
Engineering	49	85.5	7	14.5	56	100
Sciences	29	63	17	37	46	100
Education	46	33.1	93	66.9	139	100
Creative & Performing Arts	13	50	13	50	26	100
Business	26	56.6	20	42.4	46	100
Economics	44	57.9	32	42.1	76	100
Total	207	53.2	182	46.8	389	100

In various department data in table 4.2 reveals clearly that more males were enrolled in the physical sciences. In the Energy Engineering male were (82.1%), Mechanical Engineering (89.7%), Plant & Microbial Sciences and Public Health were an average (64%) accounting for

over 50% of the students enrolled in science disciplines. In the social sciences, the results reveal that females were over 50% of student's enrolment in Educational Psychology (72.2%), Special Education (68.8%) and Early Childhood Studies females (61.1%). On the overall females had over 50% enrolment in social sciences.

Table 4.2: Gender Distribution in Departments

Departments	Male		Female		Total	
	N	%	N	%	N	%
Energy Engineering	23	82.1	5	17.9	28	100
Business Administration	26	56.5	20	43.5	46	100
Educational Psychology	10	27.8	26	72.2	36	100
Special Education	15	33.3	33	68.8	48	100
Early Childhood Education	21	38.9	33	61.1	54	100
Music	6	60	4	40	10	100
Fine art	7	43.8	9	56.3	16	100
Econometrics and Statistics	26	78.8	7	21.1	33	100
Applied Economics	18	41.9	25	58.1	43	100
Plant and Microbial Sciences	19	61.3	12	38.7	31	100
Public Health	10	66.7	5	33.3	15	100
Mechanical and Manufacturing	26	89.7	3	10.3	29	100
Total	207	53.2	182	46.8	389	100

The results are supported by the findings of Holland & Gottfredson (1991) and Smart, Feldman & Ethington (2000) who reported more males in science fields and more females in social sciences. These results imply that gender continues to play a key role in the choice of subjects with majority of females avoiding science related fields. Studies have consistently shown that boys tend to choose career fields that traditionally seem masculine while girls those that seem feminine (Holland, 1997) (Holland & Gottfredson, 1991) (Smart, Feldman & Ethington, 2000). Gender socialization has been cited as one of the reasons for differences in career choices (Pike, 2004) (Hyde, Fennema, Frost & Hopp, 1990) (Eccles, 1999) and (Betz, 2005).

Several studies suggest that cultural belief and the compounding effects of gender stereotypes (Eccles, 1999) are contributing factors. Stereotypes aid in categorising people as “men” or “women” in as far as duties are concerned. Females’ roles remain associated with caring for people than engaging in fields such as engineering, which is perceived as “dirty” “heavy” and requiring more physical energy and therefore left for males is demonstrated by the results. In this study, the interviewed female students stated that they shied away from subjects perceived as masculine as reported by Hersh (2000). The general feeling presented was that women perceive themselves and are treated as being weak in mathematics and sciences (Betz, 2005) (Betz & Hackett, 1997) (Ismail, 2003).

Even though the number of female students in investigative field was slightly higher than the realistic field, the results were consistent with International data in EUROSTAT, (2004) which shows that in Europe and other industrialized countries, the number of women in engineering and other science fields has been increasing steadily but still falls far below the males (Ranson, 2003) (Ismail, 2003) (Hersh, 2000) (Schwartz, 1992) (Bix, 2004) (Betz & Hackett, 1981) (Fitzgerald, Fussinger & Betz, 1995). Gender therefore remains fundamentally correlated to vocational choice, Almiskry, Bakar, & Mohamed 2009) and Pike, 2006).

4.2.2 Personality type distribution within schools

The other task of the study was to examine the distribution of personality types in different schools at Kenyatta University. The data in table 4.3 reveal the distribution of personality types in schools. This indicates that in four schools over 50% of the students’ personality types were found in a corresponding academic environment. They include School of Sciences dominated by investigative types (63%), School of Creative and Performing Arts dominated by Artistic types (57%), School of Education dominated by Social Types (61.9%) and the School of Economics

dominated by Conventional types (48.7%). These results imply that the student's choice of the academic environment was influenced by the need to find an environment that provides them an opportunity to do the activities they prefer most. However, the School of Engineering was dominated by enterprising type (33.9%) instead of the realistic types and school of Business was dominated by Artistic (34.8%) as postulated by Holland.

Table 4.3 PERSONALITY TYPES DISTRIBUTION IN SCHOOLS

Schools	Personality type													
	R		I		A		S		E		C		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Engineering	18	32.1	8	14.3	1	1.8	3	5.4	19	33.9	7	12.5	56	100
Education	1	.7	11	7.9	15	10.8	86	61.9	20	14.4	6	4.3	139	100
Sciences	4	8.7	29	63	2	4.3	4	8.7	6	13	1	2.2	46	100
Crea & Performing	2	7.7	2	7.7	15	57.7	3	11.5	2	7.7	2	7.7	26	100
Business	0	0	5	10.9	16	34.8	5	10.9	8	17.4	12	26.1	46	100
Economics	1	1.3	2	2.6	3	3.9	11	14.5	22	28.9	37	48.7	76	100
Total	26	6.7	57	14.7	52	13.4	112	28.8	77	19.8	65	16.7	389	100

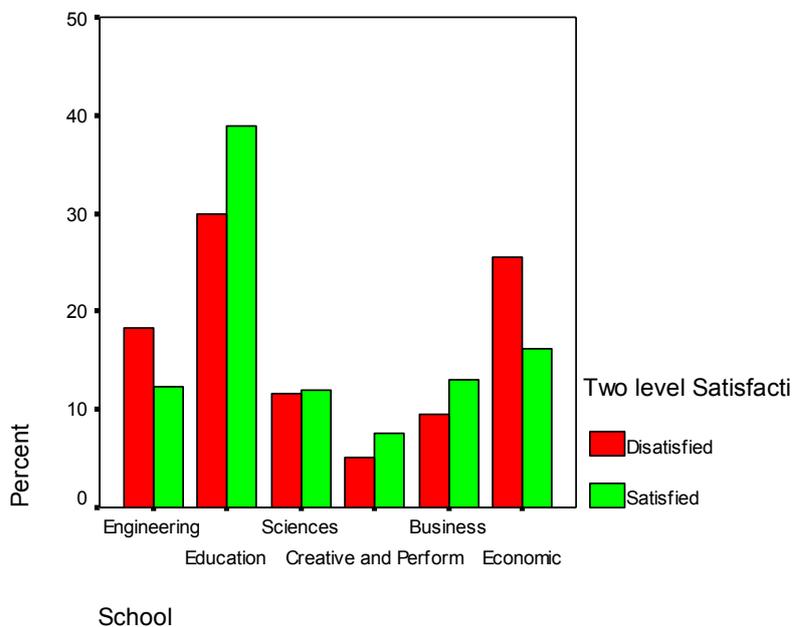
The relatedness of preferred activities, patterns of attitudes, interests and competences of each type were expressed in the results generated. The personality types have been reported by several studies to be a predictor of choice of degree program (Porter & Umbach, 2006) (Porter & Umbach, 2001) (Astin, 1997). Student will seek an academic environment, which provides an opportunity to develop and apply skills and abilities as they engage in activities that interest him/her most (Holland, 1997). Students in different academic environments are of dominant personality types seeking to develop similar skills and attitudes associated with a corresponding work environment (Holland, 1997). Smart, Feldman & Ethington, (2000), state that an academic environment provides an individual student the opportunity to perform the preferred activities, fosters respective competences, encourages the members to see themselves in ways consistent

with the preferred values of the environment and rewards the members to display the preferred values of the environment.

4.2.3 Satisfaction distribution within Schools and Departments

The distribution of the levels of satisfaction was examined in schools and departments. Satisfaction in this study was examined as a feeling expressed by individuals regarding the choice of academic program. The results of the distribution of satisfaction in schools are shown on figure 4.1. An examination of the data in figure 4.1 shows that the School of Education, School of Creative and Performing Arts and School of Business registered the highest number of satisfied cases while the School of Economics and Engineering the highest cases of dissatisfaction. On the overall majority of students were satisfied with the degree programs at Kenyatta University.

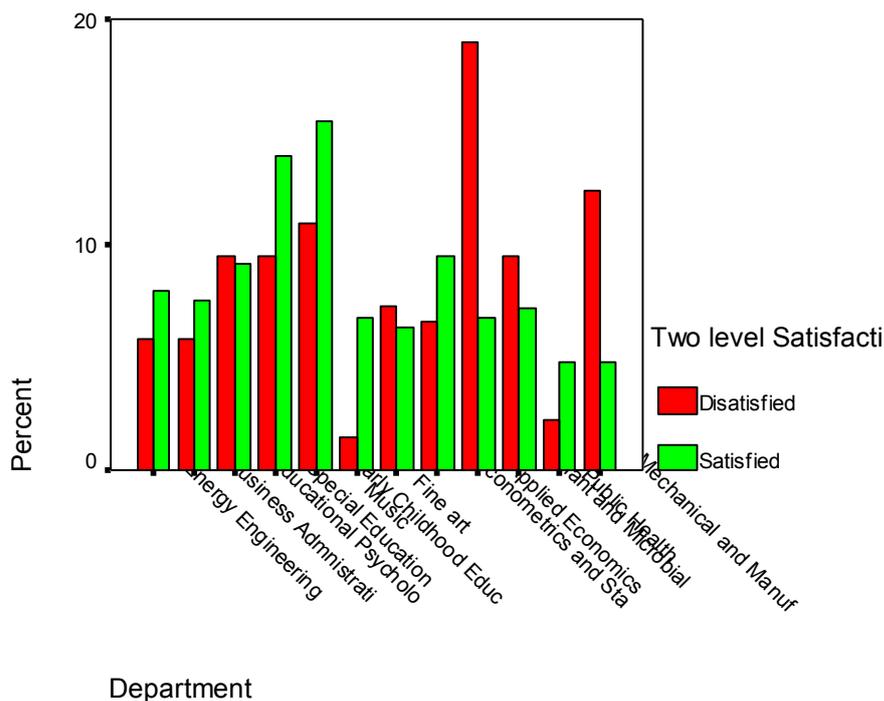
Figure 4.1 DISTRIBUTION OF SATISFACTION IN SCHOOLS



The data in figure 4.2 display satisfaction levels within the departments. The results show that more students in the Departments of Mechanical Engineering were dissatisfied compared to

those in the Department of Energy Engineering in the School of Engineering. Students from the Departments of Special Education and Early Childhood were the most satisfied compared to those from the Department of Educational Psychology who had more dissatisfied cases in the School of Education. Students from the Departments Music were most satisfied compared to those in Department of Fine Art who had more dissatisfied cases in the School of Creative and Performing Arts. Students in the Department of Applied Economics were most dissatisfied compared to those in the Department of Econometrics in the School of Economics. While the Department of Plant and Microbial Science had more dissatisfied cases compared to the Department of Public Health in the School of Sciences.

Figure 4.2 DISTRIBUTION OF SATISFACTION IN DEPARTMENTS



4.2.4 Satisfaction distribution within personality types

The study examined the distribution of satisfaction by personality types within schools at Kenyatta University. The data in table 4.4 display the distribution of personality types and their levels of satisfaction. The result suggests that personality types as an expression of interest were

satisfied with their choice. The results show that the personality types that were most satisfied (64.2%) were social, Investigative, Artistic, Social, Enterprising, and Conventional.

Table 4.4 Personality types and satisfaction levels

Personality Type	Satisfaction Levels					
	Dissatisfied		Satisfied		Total	
	N	%	N	%	N	%
REALISTIC	12	46.2	14	53.8	26	100
INVESTIGATIVE	19	33.3	38	66.7	57	100
ARTISTIC	12	23.1	40	76.9	52	100
SOCIAL	41	36.6	71	63.4	112	100
ENTERPRISING	27	35.1	50	64.9	77	100
CONVENTIONAL	26	40.0	39	60.0	65	100
Total	137	35.2	252	64.2	389	100

4.2.5 Satisfaction distribution within gender

Gender and satisfaction distribution within schools and departments at Kenyatta University was investigated and the results are displayed in table 4.5. The data reveal that both males and females were fairly satisfied with their choice of degree program with nearly two-thirds of students (64.8%) comprising of 33.7% males and 31.1% female indicating satisfaction. On the overall, the male students appear to more satisfaction than the female students on the choice of degree program.

Table 4.5 Satisfaction distribution by gender

Gender	Satisfaction Level					
	Dissatisfied		Satisfied		Total	
	N	%	N	%	N	%
Male	76	19.5	131	33.7	207	53.2
Female	61	15.7	121	31.1	182	46.8
Total	137	35.2	252	64.8	389	100

In an academic environment satisfaction with the degree program can be demonstrated by student's ability to achieve good grades, retention in the academic program and general stability. Satisfaction in this study was examined as an outcome of congruence which many studies have

reported a strong positive correlation (Smart, 1987), (Smart, Elton & McLaughlin) (Marcic, Aiuppa & Waston, 1989), (Hener & Meir, 1981), (Gottfredson & Holland, 1990).

4.2.6 Congruence distribution within Schools and Departments

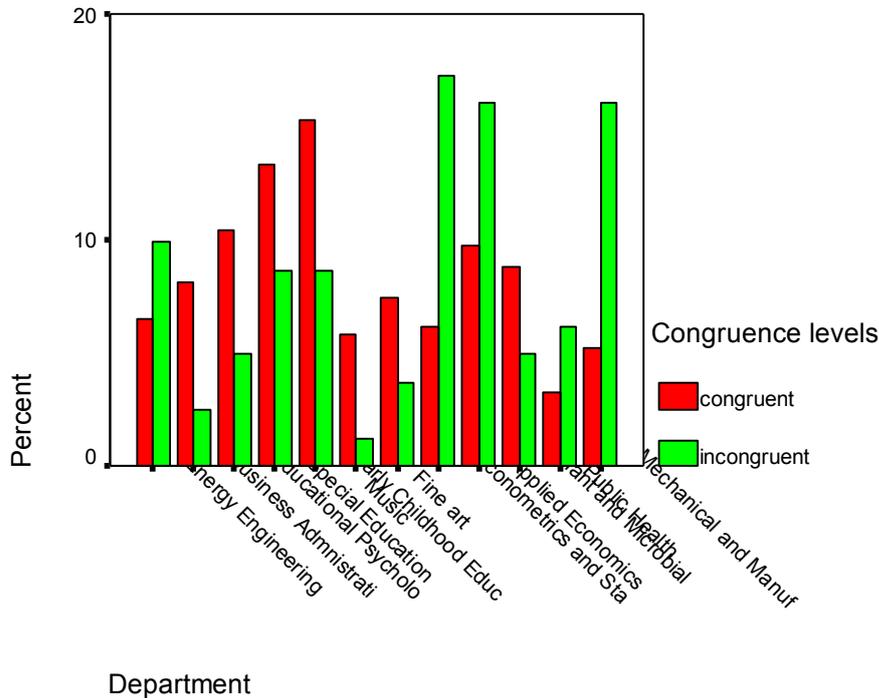
The distribution of congruent and incongruent cases choices within schools and department was examined. The results of the distribution of congruent and incongruent are displayed in table 4.6. The data in table 4.6 reveals that more than two-thirds of the third-year students at Kenyatta University were congruent (79.2%), while incongruent (20.8%) in their choice of the degree program implying that students' personality types matched that the academic environment they were enrolled in. The schools such as Education (86.3%), Business (93.5%) and Creative & Performing Arts (88.5%) had the highest cases of congruent cases while the Schools of Engineering and Economics highest cases of incongruent (35.7%) and (35.5%) respectively.

Table 4.6 Congruence distribution in Schools

School	Congruence				Total	
	Congruent	Incongruent	Congruent	Incongruent	Total	Total
Engineering	36	64.3	20	35.7	56	100
Education	120	86.3	19	13.7	139	100
Sciences	37	80.4	9	19.6	46	100
Creative & Performing Art	23	88.5	3	11.5	26	100
Business	43	93.5	3	6.5	46	100
Economic	49	64.5	27	35.5	76	100
Total	308	79.2	81	20.8	389	100

The results in figure 4.4 further show that the departments of Business Administration, Educational Psychology, Early Childhood, Music, Fine Art, Plant and Microbial Sciences had more congruent students while the departments of Energy, Econometrics, Applied Economics, Public Health and Mechanical and Manufacturing Engineering had many incongruent.

Figure 4.3 Distribution of congruent and incongruent cases in various departments



4.2.7 Congruence and satisfaction

This study investigated congruence and satisfaction distribution among the students at Kenyatta University. The results of congruent and satisfaction distribution are displayed in table 4.7. The result shows more than over two-thirds of the students who were satisfied were congruent (82.1%) with a small percentage of incongruent (17.9%). This implies that congruence is a predictor of satisfaction, however the same data shows a significant number of dissatisfied students were congruent (73.7%) while 26.3% being incongruent. This also implies that congruence between a personality types and choice of degree does not influence satisfaction with the degree program at among third-year students at Kenyatta University. Congruence in this study appears to be a necessary, but not a sufficient condition for satisfaction.

Table 4.7 Congruence and satisfaction distribution

Satisfaction levels	Congruence levels					
	Congruent		Incongruent		Total	
	N	%	N	%	N	%
Dissatisfied	101	73.7	36	26.3	137	100
Satisfied	207	82.1	45	17.9	252	100
Total	308	79.2	81	20.8	389	100

4.3 Statistical analysis of the Null Hypotheses

4.3.1 H₀₁: There is no significant relationship between personality types and choice of degree program

The researcher investigated the relationship between personality types and the choice of degree program. The Chi-square results in table 4.8 display ($X = 389.753$, $df = 25$, $p = .000$), which indicates a significant relationship between personality types and choice of degree program. The results imply that the personality types influenced the choice of degree programs at Kenyatta University. The researcher therefore rejected the null hypothesis of no difference and accepted the alternative hypothesis of statistically significant relationship.

Table 4.8 Chi-square results relationship between personality types and choice of degree program

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	389.753(a)	25	.000

Several studies have supported this finding revealing that students will seek academic environments that match their personality type and avoid environment which is which does match their interest (Smart, Feldman & Ethington, 2000, Astin, 1997, Porter & Umbach, 2006, Havillal, 1998, Wheeler , 1992 and Spokane2000). Most studies carried out in the western world found have high correlation between personality type and academic achievement (Walsh &

Holland, 1992), as well as increased levels of stability, satisfaction and achievement (Meir & Yaari, 1988).

4.3.2 H₀: There is no significant relationship between congruence and choice of degree program.

The researcher also examined the relationship between congruence as a measure of fit and the choice of degree program. Pearson's coefficient correlation results in table 4.9 ($r=.04$, $n=389$, $p=.433$), indicate a weak correlation between congruence and choice of degree program. These results imply that the choice of degree program at Kenyatta University is not strongly influenced by the need to attain congruence. The researcher rejected the null hypothesis of no difference and accepted the alternative hypothesis of a relationship. Feldman, Smart & Ethington (2006) found similar results, but also argued that a student who was not congruent can through socialization learn from the interactions with the faculty and develop skills, attitudes and values that would in turn help them fit in the academic environment.

Table 4.9 Correlation between congruence and choice of schools

		School	Congruence
School	Pearson Correlation	1	.040
	Sig. (2-tailed)		.433
	N		389

In Kenya, students' admission to public universities is based on academic performance and course prerequisites. In most cases students who fail to attain the required points during the first selection are required to make a second selection based on courses available. The second selection process is used to allocate degree programs available. This means that a student may be allocated a degree program they did not intend to pursue in the initial stage of selection. The results above led the researcher to find out through an interview if the students' subjects and their personality types match the choice of the degree program they were pursuing.

The respondents from the School of Engineering felt that the academic environment offered them the opportunity to discover things through scientific exposure, a passion they had even before enrolling into the program. Most of the respondents in the School of Education considered themselves as extroverts and social and they were comfortable working with people. The respondents in School of Science felt the course they were pursuing fitted well their interest and that they had an opportunity to explore scientific concepts. The respondents in the School of Creative and Performing Arts felt that they had an opportunity to develop skills that matched their interest.

In general all the respondents interviewed felt that they were in an academic environment that provided adequate opportunity to develop the skills and abilities they were interested in most. The researcher concluded that the need to be in an academic environment that meets the personal preferences among the sample selected was critical. The career path the students wanted to pursue was clear in their minds and the need to develop the competences in those areas of occupational interest was critical.

4.3.3 H₀: There is no relationship between gender and choice of degree program

This study also investigated the relationship between gender and personality. The researcher predicted a gender difference in the distribution of various degree programs the third-year students at Kenyatta. The Chi-square results in table 4.10 ($X=34.962$, $df 5$, $p = 0.000$) indicate a significant relationship between gender and degree programs.

Table 4.10 Chi-Square results of relationship between gender and choice of degree program.

	<i>Value</i>	<i>df</i>	<i>Asymp. Sig. (2-sided)</i>
Pearson Chi-Square	51.807 (a)	5	.000

The researcher rejected the null hypothesis and accepted the alternate hypothesis. This implies that the gender is a significant factor in the choice of the degree programs of student's third-year at Kenyatta University. This finding is supported by (Holland & Gottfredson, 1997, Smart, Feldman & Ethington, 2000, Ranson, 2003, Hersh, 2000), and Hyder, 1990) who found that scientific fields attract more males than females. These results imply that gender continues to play a key role in the choice of mathematics and science based subjects with majority of females avoiding these fields.

Gender socialisation is reported to significantly influence subject selection (Hersh, 2000) (Betz, 2005) (Betz & Hackett, 1997), (Ismail, 2003), (Ranson, 2003), (Ismail, 2003), (Hersh, 2000), (Schwartz, 1992), (Bix, 2004), (Betz & Hackett, 1981), (Fitzgerald, Fussinger & Betz, 1995). Gender differences in selection of career activities has been reported to emerge early in life. Cultural beliefs are considered to be a contributing factor with females preferring feminine responsibilities and males assuming roles perceived masculine. Dossey, (1988), Eccles, (1999), EUROSTAT, (2004), Ismail (2003), Hersh, (2000) and Schwartz, (1992) all state that gender disparities in realistic and investigative fields associated with males and social fields associated with females is still evident. Research further suggests that even though there has been an increase in the number of females in the realistic and investigative fields, the numbers are still small (EUROSTAT, 2004). The disparities in enrolment of females in science related fields continue to be supported by Schwartz (1992), Frances, (1996), and Eccles (1999) who state that

the choice of careers and academic fields continue to reflect the gender dichotomy between boys and girls. The above results were further investigated in an interview to determine what the students felt about gender distribution.

The interview results reveal that respondents from the School of Education confirmed that there were more females than males in this school. Some of the reasons attributing to this occurrence were the socialization factors where the females were encouraged to take courses that appear more feminine. A course like Early Childhood Studies was considered a feminine course because it deals with children who are best taken care of by women. The female responses regarding men in the School of Education and in particular those pursuing English, Swahili, CRE, and Early Childhood termed men as “weak and shy” and that “they should be doing science subjects which are more masculine.”

The results revealed that in the School of Engineering there were only six ladies. Some of the female responses were: “I sometimes feel a minority”, “I often get discouraged from this course especially by my parents”, “Sometimes I feel more masculine than feminine”, “But I wanted to be an engineer from when I was in class six”. The emotions generated by this quotes makes one realize the effects of the vocational socialization in a typical African setting. On the other hand, a male student’s response to the same question was more revealing about the women in engineering. “There are very few ladies in my class. It is now that I realize the difference is quite significant. We have a ratio of 6:1. Sometimes I think, ‘Who will marry these ladies? They look very hard.’ But when we interact with them, we realize they are just ladies.” Yet another male response affirmed the social roles and stigma women in sciences might face. “They are look like men, not ladies. Ladies fear Engineering because it requires a lot of fieldwork, the clothes worn are not fashionable, traditional mentality that ladies should be at home doing light jobs and it is

awkward to have a lady drilling or fabricating metals. I fear ladies in engineering because they look like men.” Gender differences in Business related fields were not significant. The general feeling of the respondents was that women are more empowered to pursue business related fields due to aggressive campaigns on gender equality. Again the business courses do not assume any gender bias.

4.3.4 There is no significant relationship between gender and personality types

The researcher also examined the relationship between gender and personality type. Table 4.11 displays chi-square results ($X = 34.962$, $df = 5$, $p = .000$), which suggest a significant relationship between gender and personality types.

Table 4.11 Chi-square results for relationship between gender and personality types

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.962(a)	5	.000

Gender has been reported to correlated significantly on Holland’s personality classification (Smart, Feldman & Ethington, 2000), (Holland & Gottfredson, 1991), (Holland, 1997), and (Pike, 2006). These studies reported that there were more males in realistic and investigative personality types and more females in social types. However, a weak correlation between gender and personality types has been reported in artistic, enterprising and conventional types using the SDS 4th edition by Rosen, Holmberg & Holland, (1994). Women have been reported to score low on realistic scale and high scores on social scales, while men are likely to have high scores on realistic fields and low scores on social fields.

4.3.5 H₀: There is a significant relationship between congruence and satisfaction.

The researcher also investigated the relationship between congruence and satisfaction with the degree program. Pearson's coefficient correlation results in table 4.12 ($r = -.135$, $n = 389$, $p = .008$), suggests a weak negative correlation between congruence and satisfaction. This implies that congruence is not a predictor of satisfaction with the degree program among third-year students at Kenyatta University. The researcher rejected the null hypothesis of no difference and accepted the alternative hypothesis of a relationship.

Table 4.12 Correlation between congruence and satisfaction

		Congruence	Satisfaction
Congruence	Pearson Correlation	1	-.135
	Sig. (2-tailed)		.008
	N		389

Congruence as an outcome of person–environment has been found to positively correlate with satisfaction outcome, (Holland, 1997), (Smart, Elton & Mclaughlin, 1985), (Marcic, Aiuppa & Waston, 1989), (Hener & Meir, 1988). Others studies have concluded that there is overwhelming evidence linking congruence and satisfaction (Spokane, 1985), (Assouline & Meir, 1987), (Tranberg, Slane & Ekeberg, 1993), (Mitchell, 1976) and (Frantz & Walsh, 1972). Several studies have found increased levels of stability, satisfaction and achievement when personality types and educational setting are congruent (Holland & Gotfredson, 2004), (Meir & Yaari, 1988). Students have been found to flourish in academic environments that are congruent with their personality types.

A study by Marcic, Aiuppa & Waston, (1989) revealed that in an organisation, the most prevalent personality types showed the highest level of congruence and scored high on satisfaction than those who were incongruent. In their study investigating dropout rates from the nursing occupation using interest inventories to assess similarities between nurses' specialization and vocational interest, Hener & Meir (1981) revealed that there were high levels of satisfaction where subjects were congruent with the career interest. Other studies by Mitchell, (1976) and Frantz & Walsh, (1972) examined satisfaction among graduate students and found out that the personality types that were congruent with the college majors were most satisfied with their choices. The results in this study suggest weak correlation between the two variables, which lead the researcher to interview selected respondents.

The results from the interviews reveal that the respondents in the School of Education felt very satisfied with the choice of degree program. Those in Early Childhood Studies felt satisfied because they were among the first to pursue Early Childhood Studies and therefore felt there would be more openings in the job market upon graduation. Others felt that course content was well prepared and there they would be competent to handle children issues in the field.

The respondents from the School of Engineering had mixed responses on satisfaction. The students from the Department of Manufacturing felt satisfied with the course because the resources provided were adequate. One respondent stated, "In Engineering, we are taught unlike other courses where they are lectured." Such a fact produced a sense of satisfaction. However, students from the Department of Energy felt quite dissatisfied because the Engineering Regulatory Board (ERB) failed to recognize their training. This quote explains the student's source of dissatisfaction "I am not satisfied, I do not like the course I was told to do it by parents and society in general put pressure because I had passed. More than half of my classmates are not

satisfied and I am personally doing other diploma courses. You know our course is not registered by the Engineering Regulatory Board and the general public does not view energy engineering as a prestigious course. We are all JAB students. I had no prior knowledge of this course even though my grades qualified me for it. I did not know which other course to pursue but later I learnt I could do Computer Sciences but I was not allowed to change. I just want to finish and get a certificate and move on with it.”

The respondents from the School of Business were quite satisfied with the course with most them feeling they were well prepared for the job market. Some of the responses captured were: “I am satisfied with my choice because this is what I wanted to do”, “I am a self-sponsored student and so I am doing my preferred course.”. In the School of Creative and Performing Arts, the responses were: “I am satisfied but not 100% but I like it. I enjoy most of my classes. Music is the best. In English class there’s not much interaction with the faculty. I feel I will be a better teacher in Music than English. Being a JAB student I am very satisfied with what I’m doing so far.” However one respondent felt dissatisfied. “I am not satisfied. We do not cover enough to make you an expert in this area. I expected to learn modern courses in music; it is too traditional here. We do mostly music and traditional dance. Most of the current courses like music technology are not offered.”

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In the previous chapter, data collected was analyzed, results presented and discussed. This chapter will focus on the summary of the findings, followed by conclusions and recommendations for further study.

5.2 Summary of the findings

The increased number of students enrolling and graduating from Kenyan public and private universities, coupled with high numbers of unemployment in the last three decades has raised concerns as to whether the training offered meets the demands of the job market. It has been suggested that to address rising cases of unemployment it is important to offer training that meets the demands of the job market as well as matching personal interest to stimulate entrepreneurship.

This study therefore examined the extent to which the personality types, gender, congruence and satisfaction influence the choice of degree program among the third-year students at Kenyatta University using Holland's theory. This study sought to fill the gap arising from several studies that have been carried out in Kenya which have recommended the need to determine the relationship between students' personal interests and choice of the academic environment. The study specifically examined the relationship between students' personality types, gender, congruence and satisfaction with choice degree program among selected third-year students from

Kenya University. The purpose was met by determining a student's personality type, gender influences, nature of fit between individual personality types and the academic environment selected using the Self Directed Search that is based on the Holland theory (1997). The key findings of this study include:

- i. The personality types of students influenced the choice of degree program at Kenya University. The results revealed that over 50% of the students in this study were enrolled in the degree program that shared similar characteristics. This result implies that students will seek an academic environment that will provide them an opportunity to do the activities they prefer most.
- ii. The study revealed that congruence is an important factor in the choice of degree program among the third-year students at Kenya University. More than two-thirds of the students were in congruent academic environment. The cases of incongruent were associated with the JAB degree.
- iii. This study revealed that gender played a significant role in choice of degree program at Kenya University. In the an overall the ratio of male to female admitted at Kenya University was close to 1:1, implying that more females are accessing university education. However, the study revealed gender disparities were evident in the choice of academic disciplines with males dominating the physical sciences and females the social sciences. Similarly, in classification of personality types there were more males in realistic and investigative types while the females were more in the social fields.
- iv. Congruence in this study was found to somewhat influence satisfaction with the degree program. However the relationship was weak implying that congruence alone is not sufficient to result into satisfaction with the degree program.

5.3 Conclusion

First, this study concluded that personality types is a predictor of choice of degree program ($X^2 = 389.753$, $df=25$, $p= 0.000$) at Kenyatta University. This means that student have a need to be an academic environment of choice. They seek to be enrolled in a degree program where their interests will be fulfilled as they develop competencies. It is therefore important to consider the different personality types when enrolling students in an academic program.

Secondly, the study findings led to the conclusion more than two-thirds of the third-year students at Kenyatta University were enrolled in a congruent academic environment. This is because the congruence and choice of degree program correlated at ($r = .04$, $n= 389$, $p = .433$). However the weak correlation suggests that there are other factors that influence choice of degree program not just the need to be congruent.

Thirdly the study concluded that gender gap between male and female student at Kenyatta University is significantly reduced implying that more female students are accessing university education. Gender however remains an important factor in the choice of different academic disciplines ($X = 51.807$, $df= 5$, $p= .000$). These finding show male students continue to dominate the science fields while female students dominate social sciences study. It also was concluded that gender is strongly correlated to different personality types ($X = 34.962$, $df= 5$, $p= .000$) with more males classified as realistic and investigative and more female's social types.

Fourth, this study concluded that congruence is a weak predictor of satisfaction ($r = -.135$, $n = 389$, $p = .008$) with degree program even though more than two thirds of the students showed that they were satisfied with the choice of the degree program. This implies there are other factors that influence satisfaction with the degree program at Kenyatta University.

5.4 Implications of the Study

Based on the findings of this study, the results generally support the assumptions of the Holland's theory in varying degrees. The results imply that students at Kenyatta University can be classified into six different (RIASEC) personality types and the academic environments can be grouped six (RIASEC) environments. The results also indicate that majority of the students are enrolled in corresponding academic environment congruent with their personality types. It is also evident that the nature of interaction between the personality types and the academic result satisfaction or dissatisfaction as outcome. Based on these implications, the researcher suggested certain research and policy implications of Holland theory in studying students' career choices and the role of university administration in offering quality career guidance programs in Kenya. Since Holland's theory has gained global attention in the practice of career guidance and counselling among many countries, it is beneficial to examine Holland theory and its implication on career counselling using a large population to inform career guidance practice. This will be in support of the numerous attempts made by Ministry of Education seeking to institutionalise the provision of career guidance in high schools, colleges and universities as shown by several educational commissions (Ominde Report, 1964, Gacathi Report 1978, 1979-1985 and Kamunge Report(1988). This study has shown that it is possible to identify students' personality types and enhance ability by making the connection between the training and the job market demands. The systematic way of classifying students according to their personality types using the Holland classification offers an easy to way to measure and understand interest.

5.5 Recommendations and Suggestion for Further Research

The above implications led to one general recommendation and specific recommendations to universities, policy makers and researchers.

5.5.1 General Recommendation

Students seek academic environments in colleges/universities to develop skills in career fields that they possess liking or passion for and that student has a specific career aspiration. It is therefore important for the institutions of higher learning to ensure that students are placed in corresponding academic discipline where their interests will be nurtured as they develop the competences needed in the job market. When this happens a student will experience satisfaction as an immediate outcome of the match between their personal characteristics and enjoy the training that will lead to a corresponding job market.

5.5.2 Recommendation to universities

Universities should have well-structured career support services that provide the use of inventories managed by qualified career counsellors. The role of career counsellor is crucial in aiding career decision-making. Globally, the use of online career assessment programs and in particular career inventories has been found to help students develop a general understanding of their personal characteristics that play an important role in career choice.

University must ensure that the academic environment is similar in all aspects to the work environment that the students intend to join on completion of their course of study. The facilities within each school should have the facilities and tools required for training and performance of duty. When the faculty and the facilities are appropriate then students will be able to develop the competences required to fit in the appropriate job market.

The faculty within schools in university should be members of a professional body that governs the professional ethics of the practitioners in the specific field. By so doing current practices will be incorporated in the instruction program to make sure the programs offered are current and meet the demands of the job market. The universities should ensure the quality of the faculty in

each school. The faculty should uphold professional ethics and get involved in research in their different schools. A faculty that is professional and sensitive to innovative skills will impact on the students' outcome such as satisfaction, stability and academic performance.

5.5.3 Recommendations for the Policy-makers

The role of career guidance counsellors is critical in all stages of school life. It is important to develop programs that target the career counsellors in schools to empower them to productively engage students in developing skills needed in career decision-making. Research and reports from the Ministry of Education have repeatedly indicated the need to train career counsellors who will be used in institutionalizing the programs in schools. The current practise is that career counsellors are arbitrary appointed to run the departments. They have full teaching load and have other responsibilities in school. There is no time allocated to career guidance programs in schools. In most cases career guidance program is not included in school budget.

5.6 Further for Research

It would be useful to carry an extensive study using more universities to investigate the applicability of Holland's theory with the objective of developing a Kenyan version of the Self Directed Search. Further research is required to be sure that the validity and reliability of the SDS tool among Kenya population is ascertained. Further researcher is needed to examine student satisfaction with the degree program. Satisfaction indicators vary as shown in numerous studies. This study assessed satisfaction based on the feelings of the students regarding the choice of the degree program. An extensive study can be carried out to examine satisfaction with the facilities provided, quality of instruction and the general learning environment.

The need to increase women enrolment in science related fields as been echoed by many studies. It would be of interest to investigate the background of women in science and find out how they

made the decisions to pursue science fields and the challenges experiences. The findings can be used to make strategies to help children at an early age pursue science related fields.

There is need to carry out a study to determine if the training offered in various schools within a university meets the demands of the job market. The way work is done today requires one to have developed professional competences as well as soft skills. The faculty needs to be aware of the soft skills needed in each student in order to prepare them to compete effectively in job search. The academic environment should in all ways simulate a work environment.

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APPENDICES**Appendix A:**

The Self Directed Search (SDS) Questionnaire

Personal Information

SCHOOL

Department

REG NO

Gender: Female Male

Instructions

This booklet will be used to assess the career interests, career competences and preferred career options that you are pursuing. In particular the test will be used to find out if your career interest matches the course that you are pursuing.

This booklet contains three sections:

Career Activities

Career Competences

Occupations

The research assistance will guide you on how to complete each section. Each section must be completed before moving to the next.

List below the occupations you like to join after graduating. Put your most preferred choice on line 1

Occupation

Code

Activities

Shade under **L** for those activities you would like to do. Shade under **D** for those things you would dislike doing or would be indifferent to.

R	L	D
Fix electrical things	<input type="checkbox"/>	<input type="checkbox"/>
Repair cars	<input type="checkbox"/>	<input type="checkbox"/>
Fix Mechanical things	<input type="checkbox"/>	<input type="checkbox"/>
Build things with wood	<input type="checkbox"/>	<input type="checkbox"/>
Take a Technology Education (e.g. Industrial Arts, shop) course	<input type="checkbox"/>	<input type="checkbox"/>
Take a Mechanical Drawing course	<input type="checkbox"/>	<input type="checkbox"/>
Take a Woodworking Course	<input type="checkbox"/>	<input type="checkbox"/>
Take an Auto Mechanics Course	<input type="checkbox"/>	<input type="checkbox"/>
Work with an outstanding mechanic or technician	<input type="checkbox"/>	<input type="checkbox"/>
Work outdoors	<input type="checkbox"/>	<input type="checkbox"/>
Operate motorized equipment	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	

I	L	D
Read scientific books and magazines	<input type="checkbox"/>	<input type="checkbox"/>
Work in a research office or laboratory	<input type="checkbox"/>	<input type="checkbox"/>
Work on a scientific project	<input type="checkbox"/>	<input type="checkbox"/>
Study a scientific theory	<input type="checkbox"/>	<input type="checkbox"/>
Work with chemicals	<input type="checkbox"/>	<input type="checkbox"/>
Apply mathematics to practical problems	<input type="checkbox"/>	<input type="checkbox"/>
Take a physics course	<input type="checkbox"/>	<input type="checkbox"/>
Take a chemistry course	<input type="checkbox"/>	<input type="checkbox"/>
Take a mathematical course	<input type="checkbox"/>	<input type="checkbox"/>
Take a biology course	<input type="checkbox"/>	<input type="checkbox"/>
Study Scholarly or technical problems	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	

- | A | L | D |
|---|--------------------------|--------------------------|
| Sketch, draw or paint | <input type="checkbox"/> | <input type="checkbox"/> |
| Design furniture, clothing or posters | <input type="checkbox"/> | <input type="checkbox"/> |
| Play in a band, group or orchestra | <input type="checkbox"/> | <input type="checkbox"/> |
| Practice a musical instrument | <input type="checkbox"/> | <input type="checkbox"/> |
| Create portraits or photographs | <input type="checkbox"/> | <input type="checkbox"/> |
| Write novels or plays | <input type="checkbox"/> | <input type="checkbox"/> |
| Take an Art Course | <input type="checkbox"/> | <input type="checkbox"/> |
| Arrange or compose music of any kind | <input type="checkbox"/> | <input type="checkbox"/> |
| Work with a gifted artist, writer or sculptor | <input type="checkbox"/> | <input type="checkbox"/> |
| Perform for others (dance, sing, act etc) | <input type="checkbox"/> | <input type="checkbox"/> |
| Read artistic, literary or musical articles | <input type="checkbox"/> | <input type="checkbox"/> |

- | S | L | D |
|--|--------------------------|--------------------------|
| Meeting important educators or therapists | <input type="checkbox"/> | <input type="checkbox"/> |
| Read sociology articles or books | <input type="checkbox"/> | <input type="checkbox"/> |
| Work for a charity | <input type="checkbox"/> | <input type="checkbox"/> |
| Help others with their personal problems | <input type="checkbox"/> | <input type="checkbox"/> |
| Study juvenile delinquency | <input type="checkbox"/> | <input type="checkbox"/> |
| Read psychology articles or books | <input type="checkbox"/> | <input type="checkbox"/> |
| Take a human relations Course | <input type="checkbox"/> | <input type="checkbox"/> |
| Teach in a high school | <input type="checkbox"/> | <input type="checkbox"/> |
| Supervise activities for mentally ill patients | <input type="checkbox"/> | <input type="checkbox"/> |
| Teach adults | <input type="checkbox"/> | <input type="checkbox"/> |
| Works as a volunteer | <input type="checkbox"/> | <input type="checkbox"/> |

- | E | L | D |
|---|--------------------------|--------------------------|
| Learn strategies for business success | <input type="checkbox"/> | <input type="checkbox"/> |
| Operate my own service or business | <input type="checkbox"/> | <input type="checkbox"/> |
| Attend sales conferences | <input type="checkbox"/> | <input type="checkbox"/> |
| Take a short course on administration or leadership | <input type="checkbox"/> | <input type="checkbox"/> |
| Serve as an officer of any group | <input type="checkbox"/> | <input type="checkbox"/> |
| Supervise the work of others | <input type="checkbox"/> | <input type="checkbox"/> |
| Meet important executives and leaders | <input type="checkbox"/> | <input type="checkbox"/> |
| Lead a group in accomplishing some goal | <input type="checkbox"/> | <input type="checkbox"/> |
| Participate in a political campaign | <input type="checkbox"/> | <input type="checkbox"/> |
| Act as an organizational or business consultant | <input type="checkbox"/> | <input type="checkbox"/> |
| Read business magazines or articles | <input type="checkbox"/> | <input type="checkbox"/> |
| Operate motorized equipment | <input type="checkbox"/> | <input type="checkbox"/> |

- | | | |
|---------------------------|--------------------------|--------------------------|
| Setup records of expenses | <input type="checkbox"/> | <input type="checkbox"/> |
| Take an accounting course | <input type="checkbox"/> | <input type="checkbox"/> |

- | | | |
|---|--------------------------|--------------------------|
| Take a Commercial Math Course | <input type="checkbox"/> | <input type="checkbox"/> |
| Take an inventory of supplies or products | <input type="checkbox"/> | <input type="checkbox"/> |
| Check paperwork or products for errors or flaws | <input type="checkbox"/> | <input type="checkbox"/> |
| Update records | <input type="checkbox"/> | <input type="checkbox"/> |

- | C | L | D |
|--|--------------------------|--------------------------|
| Fill out income tax forms | <input type="checkbox"/> | <input type="checkbox"/> |
| Add, subtract, multiply, and divide numbers in business or bookkeeping | <input type="checkbox"/> | <input type="checkbox"/> |
| Operate office machines | <input type="checkbox"/> | <input type="checkbox"/> |
| Keep detailed records of expenses in an office | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | |

Competences

Put a tick under Y for “Yes” for those activities you can do well or competently. Put a tick under N for “No” those activities you have never performed or perform poorly.

R	Y	N
I have used wood shop tools such as power saw, lathe or sander	<input type="checkbox"/>	<input type="checkbox"/>
I can make a scale drawing	<input type="checkbox"/>	<input type="checkbox"/>
I can change a car’s oil or tire	<input type="checkbox"/>	<input type="checkbox"/>
I have operated power tools such as drill press or sewing machine	<input type="checkbox"/>	<input type="checkbox"/>
I can refinish furniture or woodwork	<input type="checkbox"/>	<input type="checkbox"/>
I can make simple electric repairs	<input type="checkbox"/>	<input type="checkbox"/>
I can repair furniture	<input type="checkbox"/>	<input type="checkbox"/>
I can use many capentry tools	<input type="checkbox"/>	<input type="checkbox"/>
I can make simple plumbing repairs	<input type="checkbox"/>	<input type="checkbox"/>
I can build simple articles of wood	<input type="checkbox"/>	<input type="checkbox"/>
I can paint rooms of a house or an apartment	<input type="checkbox"/>	<input type="checkbox"/>

I	Y	N
I can use algebra to solve mathematical problems	<input type="checkbox"/>	<input type="checkbox"/>
I can perform a scientific experiment or survey	<input type="checkbox"/>	<input type="checkbox"/>
I understand the “half-life” radioactive element	<input type="checkbox"/>	<input type="checkbox"/>
I can use logarithmic tables	<input type="checkbox"/>	<input type="checkbox"/>
I can use a computer to study a scientific problem	<input type="checkbox"/>	<input type="checkbox"/>
I can describe the function of white blood cells	<input type="checkbox"/>	<input type="checkbox"/>
I can interperet simple chemical formulae	<input type="checkbox"/>	<input type="checkbox"/>
I understand why man-made satellites do not fall to earth	<input type="checkbox"/>	<input type="checkbox"/>
I can write a scientific report	<input type="checkbox"/>	<input type="checkbox"/>
I understand the “Big Bang” theory of the universe	<input type="checkbox"/>	<input type="checkbox"/>
I understand the role of DNA in genetics	<input type="checkbox"/>	<input type="checkbox"/>

A	Y	N
I can play a musical instrument	<input type="checkbox"/>	<input type="checkbox"/>
I can participate in two-or four-part choral singing	<input type="checkbox"/>	<input type="checkbox"/>
I can perform as a musical soloist	<input type="checkbox"/>	<input type="checkbox"/>
I can act in a play	<input type="checkbox"/>	<input type="checkbox"/>
I can do interpretive reading	<input type="checkbox"/>	<input type="checkbox"/>
I can do a painting, watercolour or sculpture	<input type="checkbox"/>	<input type="checkbox"/>
I can arrange or compose music	<input type="checkbox"/>	<input type="checkbox"/>
I can design clothing, posters or furniture	<input type="checkbox"/>	<input type="checkbox"/>
I write stories or poetry well	<input type="checkbox"/>	<input type="checkbox"/>
I can write a speech	<input type="checkbox"/>	<input type="checkbox"/>
I can take attractive pictures	<input type="checkbox"/>	<input type="checkbox"/>

S

	Y	N
I find it easy to talk with all kinds of people	<input type="checkbox"/>	<input type="checkbox"/>
I am good at explaining things to others	<input type="checkbox"/>	<input type="checkbox"/>
I could work as a neighbourhood organizer	<input type="checkbox"/>	<input type="checkbox"/>
People seek me out to tell me their troubles	<input type="checkbox"/>	<input type="checkbox"/>
I can teach children easily	<input type="checkbox"/>	<input type="checkbox"/>
I can teach adults easily	<input type="checkbox"/>	<input type="checkbox"/>
I am good at helping people who are upset or troubled	<input type="checkbox"/>	<input type="checkbox"/>
I have an understanding of social relationships	<input type="checkbox"/>	<input type="checkbox"/>
I am good at teaching others	<input type="checkbox"/>	<input type="checkbox"/>
I am good at making people feel at ease	<input type="checkbox"/>	<input type="checkbox"/>
I am much better at working with people than with things or ideas	<input type="checkbox"/>	<input type="checkbox"/>

E

	Y	N
I know how to become a successful leader	<input type="checkbox"/>	<input type="checkbox"/>
I am a good public speaker	<input type="checkbox"/>	<input type="checkbox"/>
I can manage a sales campaign	<input type="checkbox"/>	<input type="checkbox"/>
I can supervise the work of others	<input type="checkbox"/>	<input type="checkbox"/>
I am an ambitious and assertive person	<input type="checkbox"/>	<input type="checkbox"/>
I am good at getting people to do things my way	<input type="checkbox"/>	<input type="checkbox"/>
I am a good salesperson	<input type="checkbox"/>	<input type="checkbox"/>
I am a good debater	<input type="checkbox"/>	<input type="checkbox"/>
I can be very persuasive	<input type="checkbox"/>	<input type="checkbox"/>
I have good planning skills	<input type="checkbox"/>	<input type="checkbox"/>
I have some leadership skills	<input type="checkbox"/>	<input type="checkbox"/>

C

I can file correspondence and other papers

Y

N

I have held an office job

I can use an automated posting machine

I can do a lot of paperwork in a short time

I can use simple data processing equipment

I can post credits and debits

I can keep accurate records of payment or sales

I can enter information at a computer terminal

I can write business letters

I can perform some routine office activities

I am a carefull and orderly person

Occupations

This is an inventory of your feelings and attitudes about many kinds of work. Show the occupations that *interest* or *appeal* to you by ticking under Y for “Yes”. Show the occupations that you *dislike* or find *uninteresting* by ticking under N for “No”.

	Y	N		Y	N
Airplane Mechanic	<input type="checkbox"/>	<input type="checkbox"/>	Career Counsellor	<input type="checkbox"/>	<input type="checkbox"/>
Auto mechanic	<input type="checkbox"/>	<input type="checkbox"/>	Sociologist	<input type="checkbox"/>	<input type="checkbox"/>
Carpenter	<input type="checkbox"/>	<input type="checkbox"/>	High School Teacher	<input type="checkbox"/>	<input type="checkbox"/>
Truck Driver	<input type="checkbox"/>	<input type="checkbox"/>	Substance Abuse Counsellor	<input type="checkbox"/>	<input type="checkbox"/>
Surveyor	<input type="checkbox"/>	<input type="checkbox"/>	Juvenile Delinquency Expert	<input type="checkbox"/>	<input type="checkbox"/>
Construction Inspector	<input type="checkbox"/>	<input type="checkbox"/>	Speech Therapy	<input type="checkbox"/>	<input type="checkbox"/>
Radio Mechanic	<input type="checkbox"/>	<input type="checkbox"/>	Marriage Counsellor	<input type="checkbox"/>	<input type="checkbox"/>
Locomotive Engineer	<input type="checkbox"/>	<input type="checkbox"/>	Clinical Psychologist	<input type="checkbox"/>	<input type="checkbox"/>
Mechanist	<input type="checkbox"/>	<input type="checkbox"/>	Social Science Teacher	<input type="checkbox"/>	<input type="checkbox"/>
Electrician	<input type="checkbox"/>	<input type="checkbox"/>	Personal Counsellor	<input type="checkbox"/>	<input type="checkbox"/>
Farmer	<input type="checkbox"/>	<input type="checkbox"/>	Youth Camp Director	<input type="checkbox"/>	<input type="checkbox"/>
Helicopter Pilot	<input type="checkbox"/>	<input type="checkbox"/>	Social Worker	<input type="checkbox"/>	<input type="checkbox"/>
Electronic Technician	<input type="checkbox"/>	<input type="checkbox"/>	Rehabilitation Counsellor	<input type="checkbox"/>	<input type="checkbox"/>
Welder	<input type="checkbox"/>	<input type="checkbox"/>	Playground Director	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>			<input type="checkbox"/>	

	Y	N		Y	N
Meteorologist	<input type="checkbox"/>	<input type="checkbox"/>	Buyer	<input type="checkbox"/>	<input type="checkbox"/>
Biologist	<input type="checkbox"/>	<input type="checkbox"/>	Advertising Executive	<input type="checkbox"/>	<input type="checkbox"/>
Astronomer	<input type="checkbox"/>	<input type="checkbox"/>	Manufacturers Representative	<input type="checkbox"/>	<input type="checkbox"/>
Medical Laboratory Technicians	<input type="checkbox"/>	<input type="checkbox"/>	Business Executive	<input type="checkbox"/>	<input type="checkbox"/>
Anthropologist	<input type="checkbox"/>	<input type="checkbox"/>	Master of Ceremonies	<input type="checkbox"/>	<input type="checkbox"/>
Chemist	<input type="checkbox"/>	<input type="checkbox"/>	Salesperson	<input type="checkbox"/>	<input type="checkbox"/>
Independent Research Scientist	<input type="checkbox"/>	<input type="checkbox"/>	Real Estate Salesperson	<input type="checkbox"/>	<input type="checkbox"/>
Writer of Science Article	<input type="checkbox"/>	<input type="checkbox"/>	Department Stores Manger	<input type="checkbox"/>	<input type="checkbox"/>
Geologist	<input type="checkbox"/>	<input type="checkbox"/>	Sales Manager	<input type="checkbox"/>	<input type="checkbox"/>
Botanist	<input type="checkbox"/>	<input type="checkbox"/>	Public Relations Executive	<input type="checkbox"/>	<input type="checkbox"/>
Scientific Researcher	<input type="checkbox"/>	<input type="checkbox"/>	TV Station Manager	<input type="checkbox"/>	<input type="checkbox"/>
Physicist	<input type="checkbox"/>	<input type="checkbox"/>	Small Business Owner	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Analyst	<input type="checkbox"/>	<input type="checkbox"/>	Legislator	<input type="checkbox"/>	<input type="checkbox"/>
Social Science Researcher	<input type="checkbox"/>	<input type="checkbox"/>	Airport Manager	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>			<input type="checkbox"/>	

	Y	N
Poet	<input type="checkbox"/>	<input type="checkbox"/>
Musician	<input type="checkbox"/>	<input type="checkbox"/>
Novelist	<input type="checkbox"/>	<input type="checkbox"/>
Actor/Actress	<input type="checkbox"/>	<input type="checkbox"/>
Free-Lance Writer	<input type="checkbox"/>	<input type="checkbox"/>
Musical Arranger	<input type="checkbox"/>	<input type="checkbox"/>
Journalist	<input type="checkbox"/>	<input type="checkbox"/>
Artist	<input type="checkbox"/>	<input type="checkbox"/>
Singer	<input type="checkbox"/>	<input type="checkbox"/>
Composer	<input type="checkbox"/>	<input type="checkbox"/>
Sculptor/Sculptress	<input type="checkbox"/>	<input type="checkbox"/>
Playwright	<input type="checkbox"/>	<input type="checkbox"/>
Cartoonist	<input type="checkbox"/>	<input type="checkbox"/>
Entertainer	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	

	Y	N
Bookkeeper	<input type="checkbox"/>	<input type="checkbox"/>
Budget Reviewer	<input type="checkbox"/>	<input type="checkbox"/>
Certified Public Accountant	<input type="checkbox"/>	<input type="checkbox"/>
Credit Investigator	<input type="checkbox"/>	<input type="checkbox"/>
Bank Teller	<input type="checkbox"/>	<input type="checkbox"/>
Tax Expert	<input type="checkbox"/>	<input type="checkbox"/>
Inventory Controller	<input type="checkbox"/>	<input type="checkbox"/>
Computer Operator	<input type="checkbox"/>	<input type="checkbox"/>
Financial Analyst	<input type="checkbox"/>	<input type="checkbox"/>
Cost Estimator	<input type="checkbox"/>	<input type="checkbox"/>
Payroll Clerk	<input type="checkbox"/>	<input type="checkbox"/>
Ban Examiner	<input type="checkbox"/>	<input type="checkbox"/>
Accounting Clerk	<input type="checkbox"/>	<input type="checkbox"/>
Audit Clerk	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	

Appendix B

Degree program satisfaction scale

The statements below describe feelings you may have in regard to the degree program you are pursuing. Indicate from the scale if you **5 (Strongly Agree)**, **4 (Agree)**, **3 (Undecided)**, **2 (Disagree)**, or **1 (Strongly Disagree)**

Item	SA	A	U	D	SD
The degree program am pursuing is my preferred choice					
I often wish I could choose another course					
I wish I was happier doing this degree program					
I am strongly considering changing to another degree program					
I am satisfied with the degree program I am pursuing					
I would like to talk to someone about changing my degree program					
If the university was offering a major or minor programs I would be happier					
The degree program I am pursuing will readily lead me to a job of my choice					
I am studying a professional course to make me more competitive					

Appendix C

I will ask you the following questions regarding the degree program you are pursuing.

1. Does your personality type match the degree program you are pursuing?
2. Are there gender differences in the degree program you are enrolled in?
3. Are you satisfied with the degree program you are pursuing?
4. What factors influenced the choice of the degree program?

Appendix D

Consent form

Study Objectives

You have been randomly selected to participate in a study that aims to establish the relationship between students personality types, career interest, career choice and levels of satisfaction of degree program. This study will involve completing a set of questionnaires.

Confidentiality

Your views in this study will be held strictly confidential and will not be divulged to anybody. The questionnaires will be completed during a regular lecture time. Only the researcher will have access to the information.

Risk and Benefits.

No risks are anticipated as results of taking part in this study. The questionnaire includes items on your university admission status, age, career interest and choice and satisfaction scale .Should have any questions at any time you will be encouraged to ask.

Participation

Your participation in this exercise will be voluntary and you may refuse to any questionnaire. You can withdraw from taking part at any time. If you agree to participate in this project please sign the consent below

I have read and understood the above information and I am ready to participate in this exercise. By signing this consent am agreeing to participate in this study voluntarily.

Name, Signature of the participant and Date

Appendix E

Work Plan

2008/2009

Completed Coursework

January-April 2010

Develop Proposal

Presentation of the proposal

Registration with the Graduate school

First Seminar paper

April- August 2010

Fieldwork (pilot and data Collection)

Progress report

September- December2010

Data analysis

Second Seminar paper

Progress report

Give notice on intention to submit

January- May 2011

Writing starts and second seminar

June/September 2011 Submit thesis

September/November 2011

Defence

Make corrections

Submit final copy

Postgraduate Seminar

Graduate

Appendix F

Proposed Budget

Items	Quantity	Cost per Item	Total Cost
Printing paper	20 rims	350/=	7000/=
Photocopying	10,000 copies	5/=	30,000/=
Other Stationary	Assorted writing	10,000/=	10,000/=
Lap top	1	50,000/=	50,000/=
Transport	6 Schools 6days	3000/=	18,000/=
	University	1000/=	1,000/=
Data SPSS		15,000/=	15,000/=
Self Directed Search	1 Comprehensive package	26,000/=	26,000/=
Research Assistances	2	10,000 per month 2 months	40,000/=
Taught course fees			650,000
Total Cost			850,000