

**DETERMINANTS OF CHOICE OF PROGRAMME OF STUDY BY
STUDENTS IN NATIONAL POLYTECHNICS IN KENYA**

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SCIENCE AND TECHNOLOGY.**

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DECLARATION

This Thesis is my original work prepared with none other than the indicated sources and support; therefore, has not been presented elsewhere for a degree or any other award.

Signed.....

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SUPERVISORS CERTIFICATION

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“Demand-side characteristics and type of programs enrolled in National polytechnics in Kenya.”

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DEDICATION

To my beloved father, Bonface Charles Wafula and my mother Anna Etyang Nabangala. I couldn't have done this piece of work without their genetic material

To my daughters, Sharon Sella, Rouffin Regina and Antoinette Esther who thanked me for tolerating their eccentricity during this period of doing this piece of work.

To my son Yvan Eigen Keith, who whispered to me that probable impossibilities are to be preferred to improbable possibilities.

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ABSTRACT

Young people between 15 and 24 years are at a disadvantage in finding and maintaining quality jobs. Their unemployment rate is three times that of adults. Overall global unemployment is projected to reach 208 million people in 2023 with an unemployment rate of 5.8%. The scenario threatens economic growth and social cohesion. Acquisition of relevant skills that enhance task performance is a noble endeavor to bridge this gap. The dominant explanation for this scenario is increased production of less demanded skills on the job market. Determining which skills are most in-demand is necessary in career choice. Previous research primarily relied on cross-sectional data and thus has been unable to disentangle the changes between the available skills and most in-demand skills. The purpose of this study was to establish the factors that inhibit students from enrolling in various courses in TVETS that offer the in-demand courses in Kenya. Specifically, this study seeks to determine the effect of cost of programs, sex and students socio-economic status on choice of programs one enrolls in National polytechnics. The study was guided by the theory of demand. The study used ex-post-facto design. The study targeted a population of 83157 students from ten national polytechnics and ten principals of these national polytechnics. These students constituted the 2022/2023 cohort who enrolled in various programs in these national polytechnics. Stratified proportional to size, random and purposive techniques were employed to pick a representative sample of 1854 respondents comprising of 1846 students and 8 principals. Data from student respondents was collected using questionnaires and document analysis while principals had an interview guide. My supervisors validated these instruments before being administered. The reliability of the questionnaires was determined using internal consistency using the Cronbach alpha coefficient of 0.8. Frequency distribution tables, percentages, measures of central tendency-mean, median and mode, measures of dispersion-variance and standard deviation, pair wise correlation, chi-square, logistic and multinomial logistic regression analysis was applied on the quantitative data. Qualitative data was however analyzed by objective. The findings were presented descriptively and in tables. The findings of the study showed that cost of programs had statistically significant effect on the type of program of study by students in National Polytechnics in Kenya. The findings further showed that sex was statistically insignificant when it came to choosing programs in National polytechnics in Kenya. Finally, it was revealed that SES had statistically significant effect on the program type by students in National Polytechnics in Kenya. Consequently, the study recommends that the government increases the capitation in National polytechnics depending on the nature of the program. Female students to be lured in STEM subjects.

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LIST OF ABBREVIATIONS AND ACRONYMS.

ITC	Industrial Training Centres
KTIT	Kenya Textile Training Institute.
MoHEST	Ministry Of Higher Education ,Science and Technology.
MoLHRD	Ministry of Labour and Human Resource Development.
SET	Science Engineering and Technology.
STISA	Science Technology and Innovation Strategy for Africa.
TVET	Technical and Vocational Education and Training
VET	Vocational Education and Training.
VTC	Vocational Training Centres.
UNESCO	United Nations Educational, Scientific and Cultural Organisation.

Operational Definition of Terms

For the purpose of conducting this research, the following terms and concepts were conceptualized as follows;

Determinants

Refer to factors which decisively affect the nature/outcome of something. In this study, determinants refer to the cost of program, sex and socio-economic status of a student enrolled in a national polytechnic.

Type of program

Refers to area of speciality that students in National Polytechnics pursue. In this study, it refers to an array of these programs - Pure and applied science, Engineering, Business and Economics and Hospitality & Hotel management.

National polytechnics.

These are National Technical and Vocational Training institutions that students enroll in, for various programs.

TVET

Technical and Vocational Education and Training. In this study, they are institutions that provide technical education and training.

Sex

A student enrolled in a National polytechnic as being a male or female.

Cost of program

Is the total fee charged for a given program/ course in a National polytechnic.

Socio-economic status

Is a student classification of a National polytechnic, either being fully in the low, medium or upper as measured by proxy wealth parameters like Household asset ownership using MCA/PCA Analysis.

KCSE score

Is a student mean score obtained from a KCSE examination?

Sponsorship

Is when a student benefits or not from a financial award.

Age and location of a National Polytechnic

Age refers to the number of years since its establishment.

Location refers to the physical situation of the institution.

CHAPTER ONE

INTRODUCTION

1.1 Overview of the Chapter

This chapter presents the background to the study, statement of the problem, purpose of the study, study objectives, research hypothesis, justification of the study, significance of the study, scope of the study, limitation of the study, assumption of the study, theoretical framework and conceptual framework .

1.2 Background of the Study

Kenya has set an ambitious goal of becoming industrialized by the year 2030. The availability of well-educated and relatively well-trained workforce is regarded as critical to industrialization (Fortunate, 2011). To achieve this goal, Fortunate (2011) alludes that, TVETS are charged with the major responsibility of preparing trainees, with relevant knowledge and skills required in the labor market in order to enhance their productivity.

According to Fortunate (2011), Kenya Institute of Education developed the curriculum for TVETS to equip them with practical skills beyond practical know-how in technical fields. The new curriculum was to be competence based. The idea behind this was to allow students go through training that includes previous absent soft skills. According to Medugu and Bappah,(2013) TVETS is the foundation of sustainable technological development as it helps in human capital development of any nation. It is also regarded as a workforce education that facilitates the adjustment of the skills and knowledge to the changing demands of the society. Simiyu(2009) also argues that TVETS are essential to the world of work and effective means of empowering the society to engage in productive and sustainable livelihoods. Recently, Kenya

revitalised the subsector in order to locate herself strategically in the international scene (Republic of Kenya, 2012) .The paper argues that TVETS are widely recognised as a hallmark to improved productivity, raised income levels and improved access to employment opportunities. They also play a crucial role in social economic development of any nation.

Kenya recognizes the role of education and training in contributing to the Gross Domestic Product (GDP) with particular emphasis on TVETS (Republic of Kenya, 2003). The subsector has been identified as one that will be able to spur economic development and help achieve vision 2030. Since TVETS are widely recognized as a hallmark to improved productivity, raised income levels and improved access to employment opportunities, TVETS play a crucial role in social economic development of any nation. Malgen and Hopkins (1998) emphasis on the proven scientific data indicating the potential economic boost that can be achieved when one increases knowledge and skills. Despite the importance of TVETS, enrolment in TVETS has been found to vary between countries across the globe. In their examination of cross-country data from UNESCO, descriptive statistics and the USA Department of Education data, Rodgers and Boyer (2006) found that different countries give varied emphasis and significance on TVET education around the world. Research showed that European countries recorded higher proportions of enrolment in TVETS. In contrast, they registered minimal enrolment in developing countries.

Findings of UNESCO (2010) and UNESCO (2012) also confirm that there are gender inequalities in TVETS across the globe in favour of males and varies by country status of development. This inequality in gender emanates distinctively from a countrys system of education. UNESCO (2011) also observed that gender imbalances

should be addressed to reduce unavoidable outcomes. Atchoarena and Delluc(2002),while analysing TVETS provision, patterns and policy in sub-sahara Africa, observed that costs in TVETS are much higher than that of secondary education. This poses a more serious challenge to students and parents. The reason for higher costs is largely due to low enrolment and higher cost of equipment and thus higher per capita costs.

Enrolment in TVETS has largely been affected by students socio-economic status. Socio-economic status of parents has been found to be a function of the level of their education attainment and their occupation. As asserted by Jensen (1996) in Akinifesi (1996) socio-economic status today largely is a matter of educational and occupational status. The parental education and occupation play a vital role in the determination of the family income, parental attitudes to children education and the family feeding habit. Brembeck (2000) found that parental education has positive relation with academic performance. Torrence and Strom (1985) strongly agreed that a child whose parent are understanding and give him support and freedom and gives him positive guidance through precepts, has high chance for mental health and consequently high school achievement. These findings were supported by Bowman and Mathew (1998) with their research that found when intelligence and socio economic status were controlled, the only factor that affects achievement is the parent's attitude towards education. Fisbet cited by Ogundule (2005) stressed that children from small sized parents families on average tend to be more attentive at school thus perform better in intelligence tests. Wisemenin Asana (2000) stated that no matter the social group one may belong; parental attitudes towards their children education contribute a great deal in improving their performance at school.

Be that as it may be, there is a major concern internationally, for the increase of low income, low-skilled youth in the job market particularly in developing countries. With increasing emphasis being given to work-and skills-based solutions to economic competition and poverty in the developing world, comes a renewed focus on TVETS as a major means to expand opportunities for marginalized youth. Although countries are aware of the significance of TVETS sector, it still requires monumental tasks to attract the students to become the TVET part. With college tuition rising significantly over the past three decades (Snyder, Dillow and Hoffman 2009), students and parents have become increasingly concerned with college affordability, financial Aid and financial preparations for post –secondary education. Kenya, in particular has its challenges concerning the transition to post-secondary institutions. As of 2019, only 17% of candidates who sat for Kenya certificate of secondary Education (KCSE) qualified to pursue degree courses in post-secondary institutions. Out of the more than 80% who qualified for non-degree courses, only about 20% joined TVETS.

The government of Kenya has put various mechanisms in place to lure in as many students possible. Among these mechanisms are establishing a TVET in every constituency, an annual capitation of 30000/ to every learner that is admitted to a TVET institution and more so students are allowed to apply for loans from Higher Education Loans Board if they are unable to raise the extra fees above the capitation limit. The reduction of fees for students in the TVETS is a calculated financial intervention that is expected to woo more students into these institutions. High poverty rate in Kenya has been identified as among the factors keeping girls out of school. According to Plan International (2012), poverty shaped parental decisions on how to use their scarce resources. Unfortunately, girls were disadvantaged as boys were given first priorities. Among other factors identified that had negative

implication for the girls well-being and educational participation and outcomes include gendered attitudes, high costs of education, early pregnancies, child marriage and long distance from school. Kenyas vision 2030 Blue Print envisages a country that has achieved middle income status supported by the five sectors of the economy.

To be industrialized, Kenya needs people with technical skills. Due to the emphasis put on professional courses and other factors, there is under-enrolment into technical courses resulting into a fewer number of people with technical skills. More recently, it has become clear that many students lack accurate information about post-secondary training (Venezia, Kirst, and Antonio 2003). The rising costs in tuition and related expenses have had a profound impact to students aspiring to join colleges. High college academic requirements particularly from girls also stops them from pursuing good courses. Gift aid in the form of scholarships and grants and work-study as contrasted with loans are associated with high retention and graduates rates. In Kenya, there is a renewed quest for a bigger TVET. This can be seen from the many policies and reforms undertaken by the government. In tandem, it has continued to invest large amounts of its budget in TVET sector (KNBS, 2019). In kenya, just like many African countries, enrolment in TVETS has suffered a slow pace of growth. The low percentages needs to rise to acceptable levels for Kenya to achieve her national development and economic growth.

1.3 Statement of the Problem.

Economic growth, employment, and standards of living of any country depend on recognised skills both nationally and internationally. The Kenya vision 2030 emphasises the need to provide essential skills needed to drive the various sectors of the economy. It places demands on technical and vocational Education and Training

(TVETS) to be the leading engine that the economy relies upon to produce adequate middle –level professionals to drive the economy towards industrialisation. As such, TVETS are therefore targeted to provide and impart technical and vocational skills expected to impact employment, reduce poverty, and promote social cohesion.

The quest to market the TVETS to the critical mass numbers that fail to join universities over the years has been a daunting task. Some courses offered in national polytechnics are very expensive and cant be afforded by many students who have attained minimum requirements in KCSE. On the other hand, girls fear pursuing science- based courses. Additionally, most students come from low socio-economic status which affected their scores in KCSE and therefore cant pursue good courses that provide the required in-demand skills. A recent study reveals that Kenya has a serious skills gap and that there is need to increase the number of artisans exponentially. These gaps can only be filled if we have students joining TVETs and taking up courses that provide in-demand skills. TVETs have the potential to promote participation of women in the labour market, equipping them with necessary skills to undertake the Jobs on the future. These potentials remain largely unfilled for some reasons. Despite the government capitation extended to all students in the TVETs, gender inequality in access and choice of stem courses remains high. Low female representation in STEM related occupation affects the choice of courses in TEVTs. Little evidence exists on the predictors of the demand for in-demand courses in TVETS. Much of the studies on TVETS such as Wairimu (2009), Kingombe(2011) has concentrated on the capacity of TVETS in producing graduates as well their role in curbing unemployment. Its against this backdrop that the study intends to investigate and analyse constraints hindering many students from enrolling in courses that provide in-demand skills. This will eventually contribute to development of the

regulatory framework that would contribute to skills development and reduce unemployment.

1.4 Purpose of the Study

This study sought to determine the effect of students Demand-side characteristics and type of programs enrolled in National Polytechnics in Kenya.

1.5 Objectives of the Study

This study was guided by the following objectives:

1. To determine the effect of cost of program on the type of program one enrolled in National polytechnics in Kenya.
2. To determine the effect of student's sex on the type of program one enrolled in National Polytechnics in Kenya.
3. To determine the effect of students' socio-economic status on the type of program one enrolled in National Polytechnics in Kenya.

1.6 Research Hypothesis

This study was guided by the following hypotheses:

Ho₁The cost of program has no statistically significant effect on type of program one enrolled in National Polytechnics in Kenya.

Ho₂: The students sex has no statistically significant effect on the type of program one enrolled in National polytechnics in Kenya.

Ho₃The Students socio-economic status has no statistically significant effect on the type of program one enrolled in National polytechnics in Kenya.

1.7 Significance of the Study

This study aimed at providing important information to national and county governments, planners, education stake holders, administrators, parents and students with data on the effect of cost, sex and student's socio-economic status and the type of program enrolled in National polytechnics in Kenya. This will form the basis on which policy issues regarding widening participation through which financing of different program in TVETS would be made. In particular, it is hoped that the findings of this study will provide feedback to KUCCPS, NGOs, donors and other partners on how cost, sex, and socio-economic status affects the type of program students choose to pursue in TVETS.

The findings on the effect of mean cost of program and the type of program enrolled in National polytechnics will provide the much needed on the variations in fee payment for various program and their impact. More specifically, students should not be denied to pursue program in National polytechnics on the grounds of the cost of the program. The government should introduce mechanisms to finance these program on the basis of the cost and not equity.

In addition, the findings on the effect of sex and the type of program will provide insights to the government and TVETS on the trends of enrolment in various program in National polytechnics. This will form a basis on which policy recommendations to improve enrolments in courses mainly considered male dominated. Female gender who account who account for over 50% of the Kenyan population are significantly under-represented in TVETS.

The findings on the effect of student's socio-economic status may aid the stake holders concerned to address equity issues arising from students SES. In particular, it is hoped that the findings of this study will provide feedback to KUCCPS, NGOs,

Donors and other partners on the how socio-economic status affects the type of program one enrolled National polytechnics. This may aid the stakeholders concerned to address equity issues arising from SES.

1.8 Limitations of the Study.

The study was limited by the following factors;

1. Data from student SES was sought from students. There was no home visitation to verify the exact socio-economic status of students. This implied that the information may not have been a true reflection since respondents may have been biased and generated inaccurate responses. These socially desirable and inaccurate responses damage the validity of the study. This could have profound effect on research being carried out. However, respondents were assured of their confidentiality so as to provide accurate information.
2. Data was collected from the 2021/2022 cohort. Other cohorts were not involved. These left out cohorts could be that they were having vital information for the study which could have affected the findings of the study. However, it is believed the results were generalized to other cohorts.
3. The study was restricted to Kenya National Polytechnics. Respondents from other TVETS were not involved. However, the findings from these national polytechnics were generalized to other TVETS.
4. It's assumed that all national polytechnics offer same courses. This may not hold for all national polytechnics as some newly upgraded national polytechnic are still grappling with logistic issues like funding, staffing and obsolete training equipment. Its however believed that most of these challenges were being addressed by the government and soon all will have same status quo.

1.9 Scope of the Study

This study was primarily designed to establish the relationship between the student's demand-side characteristics and the type of program enrolled in National polytechnics in Kenya. The student's demand-side characteristics involved cost of programs, sex and students socio economic status. The study was delimited to 2021/2022 students cohort enrolled in National polytechnics and their principals. These national polytechnics are situated in the former eight provinces of Kenya. The aim of this study was to investigate how students demand –side characteristics affected student's choice of programs in national polytechnics. The study employed ex post facto research design. Research tools that were used involved questionnaires and document analysis for students and interview schedule principals.

1.10 Justification of the Study.

The growing problem of youth unemployment in Kenya has been a major concern to the government. The growing complexity of youth transitions, work types and the changes in the labor market are challenges facing the government. However, the government can harness the demographic dividend and shift the balance to the labor market. To realize the opportunity to increase youth employment, youths not in education, employment or training had been a target of several development efforts to increase the access to opportunities and advance their livelihoods. Young people without jobs or hope for a better future live a daily life of frustration. Others embark on the often perilous journey of illegal migrations abroad seeking for jobs. There is also a possibility of these people becoming victims of religious and political manipulation to be used as instruments of politico-religious violence or combatant in armed conflicts. Unemployment possesses a threat to political stability, national security and social cohesion. Conversely, majority of these groups have no skills at all

required by the job market. Kenya needs skilled manpower. In particular, competent artisans and technicians are required to fill the skills gap in various sectors of the community.

Well-functioning TVETS systems are best placed to train the skilled worker which Kenya needs to address. TVET is an education and learning activity which provides knowledge, skills and attitudes for employment and self-employment. They have indisputable impact on national development which is understood and associated with a range of social-economic imperatives that include challenges of poverty and unemployment. Hamza (2011) stresses on the importance of TVET education. Oriah and Aitufe (2010) opined that many developing countries need these TVET education. Ibeneme (2012) emphasizes that the TVET education should be targeted by developing countries for not only self-employment but also make recipient countries creative, innovative and resourceful.

UNESCO (2012) describes TVET as comprehensive term refereeing to those aspect of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitude, understanding and knowledge relating to occupation in various sectors of the economy and social life. Although there is growing consensus that TVET is important for economic growth and social cohesion; collective evidence on the demand driven characteristics and type of programs in National polytechnics shows that there is skewed enrolment in these TVETS. These demand-driven characteristic include the cost of program, students sex and students socio-economic status. This study therefore intends to determine the effect of these demand driven characteristic and the type of program in National polytechnics in Kenya.

1.11 Theoretical Framework.

This study was anchored on the theory of demand. Demand refers to the quantity of a product or service that users are desirous and capable of purchasing at a said prize in a given timeframe. In order to fulfill their desires and wants, people tend to have demand for goods and services. Real demand takes place when the willingness to satiate a need is covered by the paying capacity of the customer. The theory of demand tells the relationship between the price of a good and its quantity demanded. If the price of any good and service increases then its demand decreases and vice-versa, when all other factors are kept constant. These other factors include income of the consumer, consumer preferences, price of other related goods, expectations of future changes in price and income, buyers tastes and preferences, the number of buyers, government policies, climate changes and income distribution. These other factors are also called the determinant of demand. The law of demand states that the higher the price the lower the demand and vice versa. Demand theory is an economic principle relating to the relationship between consumer demand for goods and services and their prices in the market. This theory highlights the role played by demand in price formation. The proponents this theory include among others John Lock (1691, Sir James Stewart (1796), Adam Smith (1776) and later on developed by Alfred Marshall.

The theory is in line with study title and objectives. Indeed the higher the price, the lower the demand of a product or service. This is seen in the first objective where enrolment in programs has inverse relationship with the cost of these programs. The higher the cost of the program, the lower the enrolment and vice versa. From the study objectives, cost is a limiting factor when one plans to enroll in any program in TVET. The price attached on a program reflects the value attached on that program.

Other factors that affect demand include tastes and preferences. This is in line with the second objective sex. Difference in gender has an impact on the type of program pursued. Female students have strong preference for art based subject as compared to their male counterparts. Male students prefer STEM related courses.

Finally, the level of income is another factor influencing demand. Increase ones level of income affects demand for goods and services. People with low income have low purchasing power and may not afford to buy goods and services. Similarly people in low socio economic status may not afford to pay fees for their students.

When studying theory of demand, the law of demand states the relationship between price (cost) of a good and the demand. The relationship is inverse. As the researcher abstracts from this theory of demand, several assumptions underpin this law- the following variables remain constant during that period. It is assumed that his income of the consumers, the price of related goods, tastes and preferences, the quality of similar goods, prices and no substitutes of the commodity in equations remain constant. These assumptions are also in line with the objectives of this study. It is expected that fee charged for the courses will remain constant for the whole duration of the program. It is also assumed that students will retain their courses of choice up to completion and will not make changes.

The theory of demand also faces some exceptions. These exceptions are also in line with the objectives of this study. The first exception of this theory is in the application in the consumption of “Veblen Goods”. These are goods whose prices are naturally high. These goods include diamonds and expensive vehicles. Some of these commodities are not bought for their intrinsic worth but for different reasons. Sometimes they are bought for show to other members of the society to which they

belong. This exception is in line with one of the study objectives. Indeed some high cost courses are chosen by some students not because students qualified, but because their socio-economic status allows them to do so. This being a mere show to those members of the society who cannot afford these courses. Another exception to this theory is in its speculative demand. In this exception of demand, it is assumed that a rise in the price of good creates an impression among the buyers that its price will further rise. So people start buying more of that good when its price rises without considering the inherent utility associated with good. This is also in line with one of the objectives of this study. Some students choose to undertake expensive courses because they fear the mean cost of these courses will still rise. This is done without assessing the employability of these of these courses.

In real life, the demand of a commodity is a function of very many variables. The relationship between demand and these other factors is used to analyze the demand – led factors that affect student's choice of type of courses in public national polytechnics. This function will assume that the type of course one chooses depends largely on students socio economic status, cost of the program and gender of student. Policymakers around the world tend to accept unquestioningly the premise that investment in education and training is a good thing, with most committed to investment in human capital, including Vocational Education and Training (VET), as a means of securing higher economic growth and national prosperity as well as achieving equity goals (see Wößmann, 2008). However, some economists have argued that individuals who are more able and productive also tend to invest in more education (Spence, 1973; Arrow, 1973). In other words, education does not necessarily make you more productive it simply acts as an expensive sorting device, to enable employers to identify more able individuals. Wolf (2002) claims that the

policy emphasis on education and skills as the main driver of economic growth overstates the importance of human capital investments and that a major function of education is as a sorting device and to some extent a social discriminator. Fortunate (2011) notes that, “in making policy about education and training, it is clearly important to understand these potential economic returns to education and training to the individual, firms, and the wider economy. However we must also recognize that separating out the genuine impact of education on productivity and earnings from its role as a sorting device is very difficult”.

Cunha and Heckman (2009) argue that, understanding the economic value of education and training, as measured by gains in wages, is important but not in itself enough to inform policy about the optimal type of education and training system. As recent papers such as Carneiro and Heckman (2003), Cunha and Heckman (2009), and Carneiro (2009) argue, it is also crucial that we understand the technology of skill formation over the life cycle. Carneiro (2009) notes that, “for effective policy formation, we need to know how different types of people can effectively acquire skills at different stages of the life cycle as well as the economic returns to those skills once acquired. This is particularly important in the area of VET, since international evidence suggests that the economic returns to some VET are low”.

Lastly, it is unclear if concentrating solely on income is sufficient, even if one believes that education and training actually increase people's productivity in the job market. First, despite what economic theory suggests, it is not always the case that salaries adequately represent people's levels of production. This is obviously not the situation in the public sector, where salaries for teachers and nurses, for instance, are set by the state (although with some influence from the going rates in the private

sector). Of course, education has many non-financial advantages for the individual and is much more than just an investment.

These benefits may be in the form: “reduced crime, better parenting skills, and/or better health outcomes. Noneconomic benefits from education are not considered in conventional rates of return analyses. However, looking at these potential wider benefits of education and training is also crucial for sound policy development – particularly in the area of TVET”.

1.12 Conceptual Framework

This study was guided by a conceptual framework that presents interplay between the variables under investigation. The demand side characteristics are treated as the independent variable while the type of program enrolled will be considered as the dependent variable.

However, this study acknowledges that the type of program enrolled in by the students in the polytechnics is affected by other variables other than the demand side characteristics. Such factors will be treated as control variables in this study.

Figure 1 shows the model of the effect of independent variable on dependent variable under investigation, with the control variables factored in.

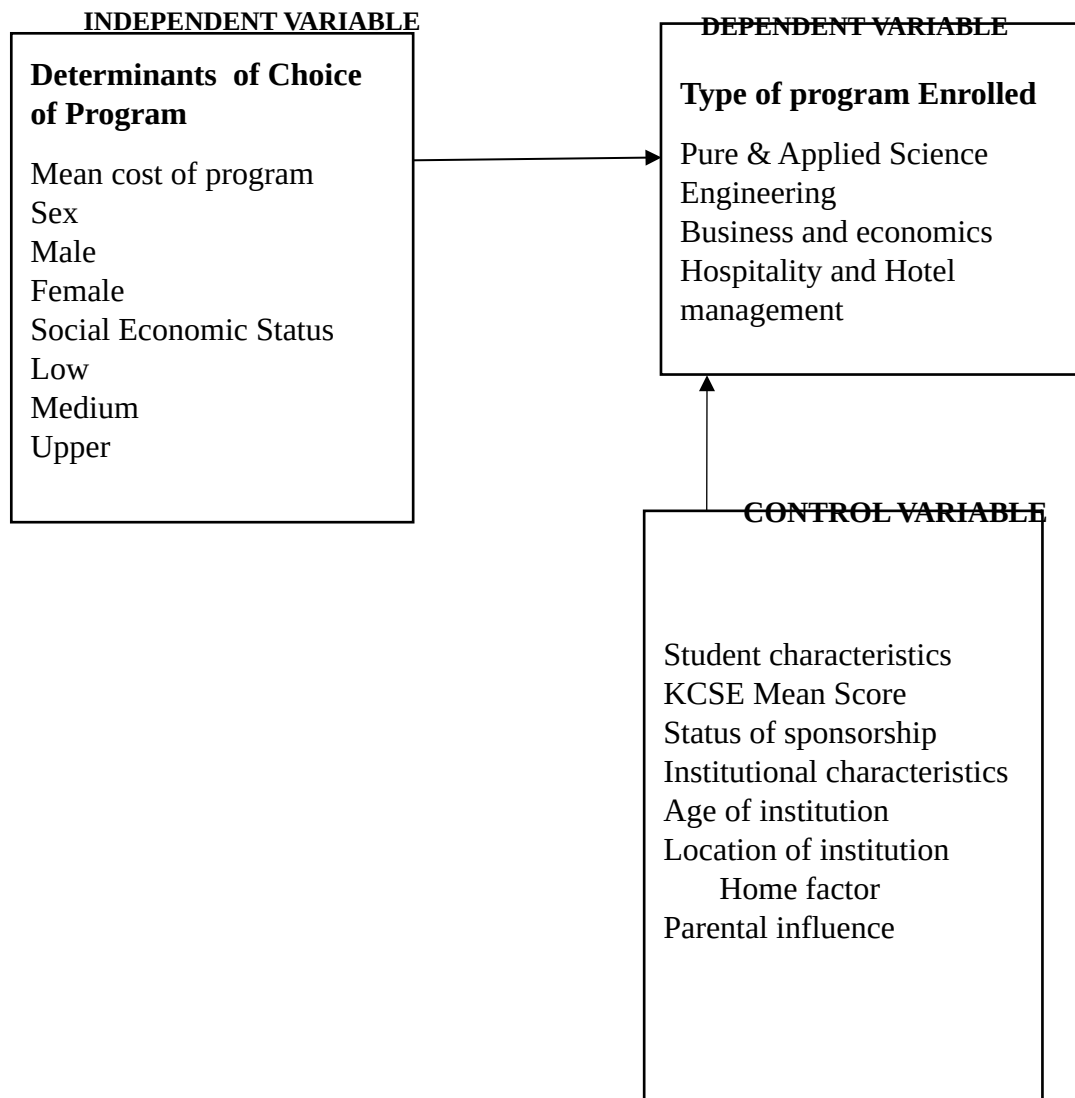


Figure 1 Conceptual Framework

Source: Researcher 2022

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of related literature that is significant to the work that the researcher is going to carry out. For this study, the literature review will be drawn from books, journals, internet articles, periodicals and research thesis. The chapter is divided into four sections. The first section covers literature on the cost of program and the type of program a student enrolls in National polytechnics in Kenya. Student's sex and type of program forms the second section. The third section will focus on students socio-economic factors and the type of program and finally a summary of the reviewed literature is presented in the fourth section.

2.2 Cost of programs and Program of study.

Education is a human right (Constitution of Kenya, 2010). The 21st century is a dynamic world with various advances in technology and development. This kind of technological development comes in with new demands for 21st century workforce. Among the dynamism are competence, accuracy, effectiveness and efficiency to be in the foundations of education. (Iroriteraye-Adjekpovu, 2013). Many countries particularly the west are embracing the new idea of new technology. These countries are enjoying a lot of freedom and flexibility in the educational systems. This is after adopting the advanced technology. This has greatly influenced these countries physical development. It's believed that their immediate communities embrace the skills drawn from their existing educational systems. Those countries that have achieved this kind of development had enhanced and fostered a well-organized and linked TVET system (Edwin and Stella, 2016).

In developed countries, TVET programs have been there for decades. These programs are now recognized and are very well substantiated. In developing countries, the costs in TVETS are much higher than that of secondary education thus posing a more serious challenge to parents. In their analysis, Atchoarena and Delluc (2002) observed that part of the reason for the higher costs of TVETS is that the sizes of their classes are much more smaller than in the usual education and high cost of equipment and thus, higher per capita costs on TVETS education; equivalent to twelve times the primary school average and about four times that of secondary level. Other studies have also found that the lower proportion of students in TVETS was as a result of negative attitudes towards the programs.

Fortunate (2011) alludes that, the cost of education is high both directly and indirectly. Funding of education especially in TVETS is done by both parents and the government. The government is responsible for training the teachers which is done at Kenya Institute of Technical Training. This suggests that the decision of students to enroll in TVETS is primarily based on the parent's capacity to increase the necessary tuition. Young people's education is the cornerstone of any country. A country's future success is determined by the upbringing and education of its youth. In its development plans, Kenya has consistently stated its objective which is producing a properly and effectively trained youth that can in turn make a positive contribution to the development of the nation. TVETS is fundamental to the world of work. TVETS systems are embedded in national economic structures which add to their heterogeneity. Flexibility or rigidity of the labor market has an impact on employee turnover and on employers capacity to protect themselves against free-riding and poaching. In the standard theoretical model of human capital with perfect labor markets, workers capture all the returns to their general human capital and employers

have no incentive to pay for general training. However, when labor market frictions compress wages, firms may invest in the general skills of their employees. According to Acemoglu and Pischke (1998) argue that labor market imperfections restrict mobility of workers. Compared to general or academic education, the costs of TVETS are substantial. In particular, for those occupations that require heavy equipment and sophisticated infrastructure, the costs are high (Beicht et al., 2006)

The role played by TVETS in training programs outside the secondary school system has changed as the needs of the country and available resources have changed. TVETS education has been given renewed attention with a mandate to the ministry of education to renew and revitalize it. TVETS are now found in all constituencies in Kenya. Most of them have expanded to offer a wider range of training courses and supplementary courses which are beneficial to the youths (Hicks et al., 2013) Norwood (2009) in his study in the US found that price was the most influential institutional attribute on college choice. Another study by Bacon (2010), also said that price of education at a college was an indicator of product quality, status and prestige. Hayden (2010), studied factors that influence the college choice process for African students. He found out that financial issues influence the college selection process. Xiaoping (2002) raised a concern regarding the escalating costs in terms of tuition fee charged by most colleges. Parents fear that the rising education costs will deter enrolment in colleges. Yusof et al, (2009) also found out that the cost of tuition is a moderately important factor considered by parents in selecting a particular institution for their children. Wagner and Fard (2009), reiterated on the cost of education, value of education and content and structure or certificates offered are the most important factors that influence the choice of the students.

Another study by Ismael (2009), on the mediating effect of information on college choice indicated that students are satisfied with college choice based on their information on their satisfaction with respect with to financial factors which include financial aids and affordable fees. Economic status is the level of how poor a person is (Ahmed, Andaleb & Arif, 2004) poverty is the inability of a household to meet or afford certain basic needs which include education and training (Muthui & Mugambi, 2010). Most individuals do not consider education as a basic need despite the constitution stating otherwise. Therefore most parents choose to basic needs like food, shelter, and clothing to education and training. Students from poor households are more likely to miss school than students from affluent backgrounds (Keriga & Bujra, 2009). Therefore the level of income of the parents will dictate the enrolment level in TVETS. Becker and Toms in their research in New York on the rise and fall of families noted that poor families were financially constrained hence could not invest in the education of their children (Becker & Tome, 1996).

Kenya's economic survey report noted that poor economic growth in Kenya led to persistent poverty among Kenyan households (The Republic of Kenya, 2013) who lived below the poverty line and were, therefore, unable to access basic services like food, shelter, health, and education. This was why Ngerechi observed that even though tuition fees in TVETS was reasonable, it still remained high for most families that were poor (Ngerechi, 2003). This, he noted hindered access and retention in TVET institutions because most often students are sent home for fees, get de-motivated, disinterested and drop out. Research by Ngumbao (2012), cited among other factors, the economic variables which included high fees charged which ultimately increased the cost of education.

Despite the constitution's declaration to the contrary, the majority of people do not view education as a fundamental necessity. As a result, most parents prioritize education and training over necessities like clothes, food, and housing. Compared to pupils from wealthy families, students from low-income households are more likely to miss school (Keriga & Bujra, 2009). Thus, the parents' income level will determine the TVETS enrollment level.

2.3 Students sex and Program of study.

In many societies, cultural beliefs and gender norms have a significant impact on the educational opportunities available to girls. It is often believed that the girl child's role is in the household, caring for siblings and doing chores, rather than pursuing formal education. Studies have shown that in various African countries, girls are expected to take on domestic responsibilities rather than attend school, leading to lower enrollment rates for girls, especially in rural communities.

The gender divide is also apparent at the vocational training level. While skills like tailoring are considered "female" trades, most other vocational fields like masonry, carpentry, and plumbing are seen as "male" domains. Data from Liberia shows that during the 2006/2007 academic year, only 28% of students enrolled in 5 vocational training colleges were girls, and of those, 62% were in traditional female trades. Vocational and technical education (TVET) aims to equip learners with practical skills needed for productive work. However, many societies, such as France and the UK, have a negative perception of vocational training, seeing it as less valuable than academic education. In contrast, countries like Germany and Switzerland have embraced vocational education, with around 65% of youth obtaining apprenticeships, leading to highly employable youth. The lack of skills for the labor market is a major cause of youth unemployment, which disproportionately

affects young people, including in West and East African countries like Kenya, Cameroon, Nigeria, and Côte d'Ivoire. To address the skills mismatch and high youth unemployment, many countries are complementing their education systems with essential components of technology, including through TVET programs. However, the gender divide in TVET enrollment persists, with a greater percentage of male students compared to female students in Kenya.

Youth training is impacted by inhibitive sociocultural practices. Certain sociocultural practices have instilled preconceived notions in young people, impeding their ability to advance in their careers. Male students enrolling in a feminine subject might be one example of this. Because it is mostly connected with women, men will avoid it even if it may be marketable. Adana,(1986), revealed that education in Africa has not adequately helped to open the youth to himself so that he becomes known to himself, his interests, capacities, values, attitudes and the world around him. Early marriages also fit in this category. In planning, the quality of education and training, Abuel-Ehlers study revealed that teachers are critical to the provision of quality education because they impart literacy and numeracy skills in addition to providing a set of complex, analytical, social and emotional skills (Abuel-Ealer, 2012).

In Kenya, research done by Khatete noted that teacher characteristics after pre-service straining can be improved through in-service programs whose aim should be to enable a practicing teacher to improve on instructional and professional knowledge, interests and skills (Khatete, 2010). Therefore, to him, “improvement in the quality of learning depends on the improvement of teacher competency since they are at the center of teaching and learning process and moreover, the quality of Technical Vocational Education and Training to a great extend depends on the competence of the trainer. Technical and Vocational Education and Training

(TVET) leads to improved quality of life since it help individuals to become economically productive and thus escape poverty and marginalization. When individuals are equipped with skills, they become entrepreneurs, employable and informed citizens thereby contributing to economic development of a nation (Anaele, Isiorhovoja, Dele &Asoluka, 2014). Therefore, human resource development through TVET not only contributes to economic development and reduction in unemployment, but also leads to enhancement of social inclusion. It is estimated that women total to one half of the world's population. Additionally, they represent two thirds of the world workers, but, ironically, earn one tenth of the world's income and own one hundredth of property (Adelakun, Oviawe, &Barfa, 2015. These inequalities can be linked to unequal access to training opportunities". For instance, a study conducted in Nigeria found out female participation in TVET and Science, Engineering and Technology (SET) show that females are still underrepresented and occupy the middle and lower status, in spite of the recent steady progression from this status over time (Udeani, &Ejikeme, 2011). This is confirmed by another study which reported that a large number of women are found mainly in poorly paid jobs and several others go into early marriages, prostitution and child labor (Adelakun, Oviawe, &Barfa, 2015). A study by UNESCO (2010) concurs with this pointing out that male students outnumber the female students in 91 per cent of countries globally, despite increased parity in enrolment in higher education and in Science Technology Engineering and Mathematics disciplines. In the developed world, countries such as United Kingdom experience low rates of female participation in STEM related subjects and occupational choice (National Academies Press, 2007).This gap was attributed to gender bias in the curriculum, classroom pedagogy and failure by the system of education to offer support for development of self-esteem, confidence and

aspiration of female learners at the formative stage (Johnsen& Kendrick, 2005 cited in Watermeyer, and Stevenson, n.d.).

Johnsen & Kendrick (2005) noted that, female underrepresentation in TVET is therefore an issue particularly in developing countries, Kenya included. They contend that despite advancements over the years, a number of disparities, obstacles, and inequities still exist, which makes this article crucial for examining the degree of female TVET engagement in Kenya. People with education and talent drive economic progress and growth. Bennell (1999), alludes that the widely recognized role of TVET was to furnish skills required to improve productivity, raise income levels and improve access to employment opportunities. Moreover, he notes that “developments in the last three decades have made the role of TVET more pronounced in the globalization process, technological change, and increased competition due to trade liberalization. This necessitates the requirements of higher skills and productivity among workers in both modern sector firms and Micro and Small Enterprises (MSE)”. Manda, Mwambu&Kamenyi, (2002) and Nyerere (2009) agree that TVET delivers core entrepreneurial, communication, financial and leadership skills which translate to increased wage and self employment opportunities.

Kenya recognizes the role of education and training in contributing to the Gross Domestic Product (GDP) with particular emphasis on TIVET (Republic of Kenya, 2003). It has been determined that the subsector can support economic growth and contribute to the realization of Vision 2030. The degree of female involvement in TVET in Kenya is the focus of this research. Importantly, TVET is the foundation of any sustainable technological development (Medugu&Bappah, 2013). According to Medugu & Bappah (2013), notes that it helps in human capital development of any nation and is regarded as workforce education that facilitates the adjustment of the

skills and knowledge to the changing demands of the society. Technical and Vocational Education and Training is essential to the world of work and is an effective means of empowering the society to engage in productive and sustainable livelihoods (Simiyu, 2009). Recently, Kenya revitalized the subsector in order to locate herself strategically in the international scene (Republic of Kenya, 2012). Notably, this might not be accomplished as long as women continue to fall behind males in technical professions and courses.

Female enrollment in science, mechanical, and technological courses at TVET colleges is incredibly low, according to Nyerere (2009) and JAB (2011). The issue is why fewer women than males are enrolled in STEM-related programs. Low female enrollment in SET courses and a poor view of TVET among high school students and the Kenyan public are two further issues that female students at TVET schools must deal with.

There is also lack of policies on gender mainstreaming as pointed out during the national workshop organized by the Ministry of Higher Education, Science and Technology in May 2008 (UNESCO-NCST Report, 2010). National Commission for Science and Technology (NCST, 2010) further emphasizes on the need for such policies since they promote empowerment, equal and full participation of women in science, technology and innovation activities. The same paper also points out that women's low performance and engagement in science, math, and technology courses from elementary school onwards might be linked to the underutilization and underdevelopment of their scientific and technological capabilities. Additionally, the UNESCO-NCST Report (2010) notes that males have outpaced women in TVET. Promoting inclusive and high-quality TVET participation is the primary goal of sector policy, particularly for underprivileged groups including students with disabilities,

rural communities, and other marginalized groups. Enhancing gender equity in TVET programs is still fraught with difficulties, though.

Republic of Kenya (2012) emphasized on the enhancement of participation of women in TVET and gender mainstreaming through policies such as affirmative action. Other recommendations made by UNESCONCST (2010) include flexible work arrangements and lobbying for scholarships for female students and staff who wish to pursue studies or training in science and technology. “UNESCO also recommended the establishment of gender focal points and non-discrimination policies in the work place, equality, institutional strengthening and training in science and development of gender indicators. However, despite the proposed recommendations, low female participation still existed by 2021”.

The level of participation of female in TVET having remained lower than that of their male counterparts over time is an issue of concern. Additionally, the Kenya’s Gender Policy in Education (Ministry of Education, 2007) addresses issues relating to gender and education as well as emphasizing implementing of gender responsive initiatives at the training and research levels. The Kenya Vision 2030 promotes the need for strengthening of education initiatives with focus on science and technology without ignoring the need to improve social welfare and democratic governance (Republic of Kenya, 2007). Both men and women are eligible for this social assistance at all levels, including the decision-making ones. High gaps in access to education at all levels continue to be an issue, despite advancements in equality and access, according to this blueprint. The problem is particularly severe in technical industrial, vocational, and entrepreneurship training institutions as well as at the university level. Therefore, the statement emphasizes the need for more financing to support workforce technical capacities as well as improving the quality of science, math, and technology education

in schools, polytechnics, and universities. The growth in number of female enrolments in TVET institutions has been low (Republic of Kenya, 2007). Besides, the gender disparity still persists.

According to the aforementioned, despite all of the efforts made to improve the situation, female participation in TVET institutions is still low. Nonetheless, several regions of the world have succeeded in increasing the number of women enrolled in the TVET subsector of schooling. In order to provide recommendations that may be used to better the situation in Kenya, it is necessary to identify the elements that have contributed to the growth. For both industrialized and developing nations, the same barriers prevent women from enrolling in TVET-related courses. Young women's decisions to pursue STEM disciplines might be influenced by a wide range of social and cultural conventions. One of the main reasons why there are less women in STEM professions is because of these issues (UNESCO-UNEVOC, 2010). Women's access to and involvement in STEM disciplines can consequently be significantly influenced by these social and cultural norms, particularly those that are discriminatory. For example, stereotypes portray STEM courses as male, which leads to the belief that women shouldn't pursue them. Furthermore, the notion of a woman as someone who should care for the house and children is still prevalent in many countries. This implies that women are expected to manage work and home obligations even when they are employed. World Bank, 2012. Social conventions can influence the subjects and professions that women choose to pursue, particularly when it comes to the idea that women should take care of others. For instance, the higher rate of women choosing to pursue professions such as teaching may be due to the perception that such professions allow more flexibility to balance family and work responsibilities (World Bank, 2012). Science subjects which are a prerequisite of

joining engineering field, are given the masculine image of science (Moletsen & Reddy, 2011). This suggests that it has been characterized as a male topic via psychological construction. In the workplace, there is a widespread belief that engineering is better suited for men because it is a technical field. As a result, women are taught that they are incapable of becoming engineers. According to Minton & Schneider in Nguyen (2000), this is also because of the ways that boys and girls are treated differently in our society. Boys are thought to be better at math, mechanics, and other problem-solving activities, while girls are expected to be more proficient in language and social skills. It is imperative that this stereotype be eradicated. Having role models and encouraging more women to pursue these careers can help combat these stereotypes (Moletsen & Reddy, 2011). The same study also shows that low female participation in TVET-related courses is largely caused by sexual harassment, lack of confidence, job stress and burnout, women's PDI status, gender discrimination, and masculine organizational culture. Another element that encourages lesser female involvement in TVET subjects is the workplace. Because female employees were not accepted by their male coworkers and teachers throughout their college training, the workplace might be a difficult place and cause them to lack confidence (Nguyen, 2000). The UNESCO International Centre for Engineering Education is located in a university in Australia, where Nguyen's study was carried out among engineering faculty members. According to the report, women frequently lack the confidence to work in such a male-dominated workplace or do not feel like they belong. According to Nguyen (2000), many women perceive engineering schools to be stressful places where they feel alone and unaccepted by both the male students and the teachers. This supports Moletsen and Reddy's (2011) finding that poor female involvement in TVET in Africa is a result of

gender discrimination, a macho corporate culture influenced by gender-blind workplace regulations, and the casting of women in supporting roles. Despite the fact that the governments of Kenya have policies in place to address gender mainstreaming, this is the situation there. According to a different South African research, the government has not done enough to keep women in the engineering field, which has also led to poor participation (Lourens, 2014). Another factor that may promote or discourage female students from pursuing TVET-related areas is curriculum-based difficulties. The curriculum is created with the requirements of male students in mind, blatantly disregarding those of female students. For example, ladies pursuing engineering programs in India acknowledged that they were somewhat disabled since they lacked the physical strength necessary to operate in some labs and workshops (Nguyen, 2000). Gender parity in engineering has not yet been attained in Kenya. Access, fairness, quality, relevance, and efficiency in the administration of educational resources are the primary issues facing Kenya's education system, according to Sessional Paper No. 14 of 2012. These problems have been resolved as of right now. In order to lessen regional and gender inequalities, there is also limitless potential to accommodate access to TVET and university institutions. Githitu (2011) conducted a survey in Limuru, Kenya, that documented secondary school students' attitudes on the youth polytechnic. It also discovered that a respondent's view regarding youth polytechnics is influenced by their age, gender, socioeconomic status, and academic achievement. Additionally, the study discovered some correlations between secondary school students' academic achievement, socioeconomic background, gender, and attitude toward TVETS. Simiyu (2011) examined the determinants influencing job choices in Bungoma County institutions in yet another study. The purpose of the study was to evaluate

how work prospects, gender, and physical facilities affect career choice. Additionally, the government's policy on youth polytechnics' job choices and the students' backgrounds were evaluated. However, the study discovered that, in comparison to other elements like physical facilities and employment chances, peer pressure, gender, and students' backgrounds had a greater impact on students' decisions. The Ministry of Education should establish bridge courses, workshops, and seminars at postsecondary institutions, according to the study's recommendations for actions to lessen the existing issues brought on by bad career choices. The goal is to assist students in developing career plans that align with the labor market after graduation. When it comes to accessing TVET courses of study, both genders have often faced a number of difficulties. Most of the studies have however associated it to low government's funding, which has a ripple effect on poorly trained teachers, poor of lack of appropriate equipment resulting to inadequately trained graduates to face the industry (Nabwire, 2011; Mbugua, 2012; Kamau, 2013 & Ahmed, Kisilu and Ooko, 2012). These studies recommend that there is need for putting measures in place so that there is link between graduate outputs from these institutions and the industry, besides increased funding to these institutions by the government. A study conducted by Muhonja (2012) on factors influencing low female students enrolment in science based courses in tertiary institutions in Western Province, Kenya, showed that curriculum coverage in tertiary colleges is wanting. According to the study, pupils did not appear to have previously sufficiently studied the course. The majority of them addressed a great deal of the course's theoretical content while covering relatively little of its practical component. This had an impact on the graduates' proficiency at the local tertiary level. Additionally, the primary socioeconomic determinants influencing the female students' enrollment in science-based courses were the fathers'

incomes, the parents' incomes, and the number of siblings. Women typically had a high opinion of science-based courses, and many chose to enroll in them because they felt confident in them.

A list of abstracts presented in the Rift Valley Technical Training Institute (RVTTI) 2nd International conference held on 19-21 June, 2013 (RVTTI, 2014) discloses several studies done in TVET institutions. A study conducted by Makari and Ochierio on youth polytechnics in west Pokot County showed that “lack of modern training equipment, inadequate number of qualified instructors, and low enrolments brought about by lack of funds are the key challenges. However, the study recommended that the government should allocate more funding to TVET and that YPS should be upgraded to offer skills for both the formal and modern sector”. Additionally, according to Akumu et al., (2014) notes that most of the current challenges includes; gender imbalance, poor remuneration, poor treatment by the professional body and lack of proper training facilities in their study on Re-Orienting Engineering Professional Bodies towards Industrialization for Sustainable Development (SD) in Kenya. The major recommendation was that Kenya should train more engineers, technologists, technicians and crafts persons and artisans in order to achieve vision 2030. In the same book of abstracts, “a study done by Serem on the ‘Analysis of Gender Enrolment Trends in Youth Polytechnics: a case of Cheptarit Youth Polytechnic’ showed that enrollment for courses was based on what was seen by the society traditionally to be for either male or female. Despite the fact that most of the girls traditionally enrolled in home economics and dress making, more of the girls are now enrolling in plumbing, motor vehicle and masonry. Notably, boys were more conservative in doing courses perceived to be for females”.

Further, the same list of abstracts themed ‘Greening technical and vocational education and training TVETS for national development’ revealed in a study done by Sheila Kasao on ‘Women and Technical and vocational Education and Training in Kenya that women are faced with many challenges in the process of acquiring right skills and knowledge from technical and/or vocational institution (RVTTI, 2014). Such challenges include negative perceptions of TVET, lack of gender mainstreaming strategies for TVET, socioeconomic challenges to women’s integration into TVET, feeling of physical incapacity, lack of encouragement and prejudices among several others. The study recommended that through reform programs there is need to design non-gender curricula catering for a variety of potentials hence sustaining the interest of women/girls and men/boys. Moreover, there is need to design a policy to stipulate that students must study at least one technical or vocational subject at all levels of education.

A study done by Lauren (2014) revealed that Career patterns are influenced by a variety of forces, among them, gender-role stereotype. The study had purposed to determine factors influencing female students' enrolment in technical courses. Some of the factors included financial, cultural and sociological factors. Although, the study also showed that girls perform equally well on many technical skills and attitudes assessment in the elementary school years, majority of the respondents in the study indicated that technical courses are masculine and are meant to be pursued by boys. Therefore, what they need are role models to encourage them to pursue the technical courses in their tertiary education program.

In conclusion, polytechnics are meant for educating youth on the important technical skills required for development. It is therefore necessary that the public be educated about the usefulness of youth polytechnics as they are not for failures. Curriculum

based, institutional related factors, attitude related issues, government policy and inadequate funding of TVET institutions in Kenya are the key factors affecting these institutions. Subsequently, these factors have an influence on the general enrolments of learners in these institutions. However, female participation levels are wanting due to attitude and other social cultural factors such as stereotyping among other factors as aforementioned in this paper. Conversely, this paper aims at addressing ways of changing this scenario and looking at countries that have improved female participation in TVET institutions.

While the participation of female in TVET has been relatively low in comparison to that of male in many parts of the world, a few countries globally have been successful. These include the Philippines and some parts of Asia such as Malaysia and Mongolia, where a reversed 'gender gap' has been observed as enrolment rates at secondary and higher education, are now higher for girls than boys (UNGEI, 2012 in UNESCO, 2015). For the sake of this study, a few parts of the world are going to be used as examples to show the success stories which may indicate advancements that other countries, Kenya included, may borrow from. Although TVET is a male dominated field of specialization as found out in a study conducted by UNESCO-UNEVOC (2010); there are some distinct practices that could trigger changes in the enhancement of women's competence in TVET. One of the focuses by this study is mainly on reinforcement of equal opportunity by institutional support systems, community life as well as governmental measures, and programs that address social and human equality. These include putting the structures and policy framework in place as was observed in the aforementioned successful countries in improved gender parity. Hence, for any country whose aim is to enhance female participation in TVET, establishing policies and the structures aimed at promoting gender equity in this

subsector is critical. This confirms what was proposed earlier on in this document that there is need to re-design a policy to stipulate that students must study at least one technical or vocational subject at all levels of education (RVTTI 2014) At the outset, raising awareness of gender issues at the institutional level of TVET, can achieve greater social benefits to individual students and trainees thereby increasing their human capital, a component that leads to economic development of a country. This is because knowledge and skills are embedded in human capital and are acquired in the social process of learning, which takes place in families, schools, workplaces, local communities and civil society networks. When an individual is affiliated to these entities, they are typical express of social capital stock. This confirms what UNESCO (2015) points out that gender inequality has been heightened by socio-cultural and labour market preconceptions. Consequently, human and social capital in these cases can be seen as mutually reinforcing and producing beneficial effects on economic growth, as well as other crucial areas such as social control, inclusion, health, governance, institutions and democratic empowerment. Hence, when raising awareness of gender issues is addressed at TVET institutional level, then female participation will be enhanced thereby leading to overall improved economic growth of a country. Arguably, the psychosocial constructions due to gender stereotyping and cultural inhibitions can therefore be controlled hence contributing to economic growth and development, a factor that was noted to influence the low female participation in TVET fields in Kenya.

A case study was conducted in Asia on seven countries. These countries include: - Republic of Korea, Viett Nam, Indonesia, Malaysia, Mongolia, Nepal & Cambodia. The study found out that there is a high level of female participation in countries such as Malaysia, Mongolia and the Republic of Korea (UNESCO, 2015). For instance

Malaysia recorded overall, higher enrolment and graduation rates of female students than those of their male counterparts with female students representing approximately 63 per cent of total student enrolment across all fields of study as of 2012 (MoHE, 2013). In comparison to other countries, female representation in engineering in the three countries remains better than other countries involved in this study (UNESCO, 2015). The study has attributed these improvements to a number of factors which are discussed herein. To start with, having more women in TVET fields has been attributed to the high participation level of women in all TVET fields from training through to work environment. Schechter (2010, in UNESCO, 2015), points out that women make up 50-60 per cent employees in computer industry with a majority of them in management levels. This has been attributed to government's commitment to specific policy initiatives and perceptions rooted in social cultural norms since computer industry constitute indoors "profession". Still in the Republic of Korea, there has been a shift where more women are joining STEM fields especially in line with digital revolution (UNESCO, 2010). Lee (2010 as cited in UNESCO, 2015) points out that this is a shift from the traditional belief that cultural factors influence career choice by female to pursue social sciences instead of natural science streams. Therefore, a government's commitment to specific policy initiatives, having role models in not only training but also in managerial positions can amount to great yields in enhancing female participation in TVET. However, to ensure effective implementation of policies related to education, gender and TVET, coordination between ministries should be strengthened as pointed out by UNESCO (2015).

Additionally, gender responsive teaching strategies have proved important in determining the level of participation of both female and male students in TVET fields (UNESCO, 2015). For instance teacher education should be equipped with

gender responsive strategies with regards to mathematics and science in order to address the learning needs for both male and female students. Hence, teachers should be able to integrate gender equality through their teaching strategies. This is a factor that has been attributed to improved participation of female in TVET. Therefore, through design and implementation of gender responsive interventions, both male and female students may be able to follow their passion in TVET related fields. In addition, these countries have observed that the TVET fields' "curriculum is very costly; hence unless appropriate funding for equipment and resources is allocated to this subsector of education, students will lack interest and will be less motivated to pursue mathematics and science. Moreover, at school level, every year a compulsory specific number of form one classes admits girls to do technical subjects so that they can start appreciating the subjects early and proceed with them at higher levels of education". Finally, allowing students to practically apply their learning in real-life situations as well as creative and hands-on experiments enhances quality of learning and increase student's interest in these subjects (UNESCO, 2015).

Affirmative action policies like the one outlined above regarding the admission of girls to technical courses and sufficient funding for this subsector are therefore necessary. This suggests that encouraging interest in the topic and providing sufficient financing could boost female involvement in TVET. In contrast to the rest of African nations, South Africa has made strides in increasing the number of women enrolled in engineering programs. This was accomplished through successful efforts to draw and keep female students enrolled in engineering programs. Interventions such as cooperating co-curricular components into the engineering curriculum helps improve self- efficacy and retention in the engineering program (Lourens, 2014). This confirms what (Usman&Gatabazi, (n.d.) pointed out in a study conducted in Rwanda

that there is need to not only promote access of women to TVET, but to also address issues relating to how they are received and accommodated into the program once they are enrolled. Affirmative action must be formalized in educational institutions and in leadership roles in the workplace. Furthermore, it is critical to support programs that provide young girls with mentors and female role models (Udeani & Ejikeme 2011). According to the report, educational initiatives that address gender disparity include gender-responsive teaching methods, scholarship programs, and the percentage of female role models teaching at higher education levels. They have also advocated for a more equitable representation of men and women in STEM sectors (UNESCO, 2015).

In conclusion but not least, Kenya has already implemented a number of legislative and policy measures intended to encourage women participation in TVET. Schemes for implementation and monitoring should therefore be strengthened. For example, in order to address different facets of gender inequality, more opportunities should be investigated in the field of networking to enhance and fortify the development of social capital with different sectors and organizations.

2.4 Socio-economic status and Program of study

In most nations, choosing a career has always been a very difficult task for most students making the move from secondary to higher education institutions. Numerous elements are involved, such as self-motivation, peer and parental influence, poverty, unemployment, marriage and pregnancy, and high school test results. The Kenyan government has attempted to increase enrollment in market-driven courses, such as engineering and stem courses, but it has failed to meet demand. According to research findings published in the IRA-International Journal, the primary determinants of vocational course choice were role models (57.67), followed by parental influence

(48), and peer influence (39.87). The results show that high school graduates' profession choices are significantly influenced by the people they connect with.

By the end of their high school year, teenagers should have completed the cultural and developmental job of picking their first professional choice (Super, Savicks, & Super, 1996). Furthermore, Chen (1997) asserts that teenagers' profession choices are impacted by both their personal and social circumstances, in addition to their developmental stage. To help high school graduates make educated decisions, it is crucial to expose them to a supportive and educational atmosphere. The home environment has a significant influence on how children choose their careers. Young people's incapacity to make judgments seemed to be influenced by their families' lack of involvement in the career selection process (Ferry 2005). In order to prevent their children from being deceived by their classmates, parents are expected to be vigilant in their guidance. In order to prevent their children from being deceived by their classmates, parents are expected to be vigilant in their guidance. Perrone et al. (2001) found that college students' profession choices were influenced by the supportiveness of their role models and the quality of their relationships. Although parents, classmates, and role models can have an impact on a person's job selection, it should be remembered that each person has unique skills and abilities, and this should be carefully taken into account when assisting them in making professional decisions.

Despite being one of the most fortunate continents, Africa is nevertheless the world's poorest and least developed region. Many African nations have seen a rise in poverty as a result of numerous difficulties. These nations' national development and educational systems have been based on their degrees of poverty. For the great majority of people in developing nations, education continues to be a barrier to progress. Oriahi and Aittufe (2010), opined that many developing countries lack

essential raw materials, knowledge and skills gained through formal education and TVETS has frequently been described as a form of education whose purpose is to prepare persons for employment in an occupation. Hamza (2011) asserted that it's a form of education, training or retraining which is directed towards developing the learner to become productive either in a paid employment or self employment. It's a type of training which is targeted at developing not only practical skills but also attitudes and habits that make the recipient creative ,innovative and resourceful. (Ibenene,2012). There is a concern for poverty reductions in the developed countries as well as in developing countries with a focus on the poor. The cost of education from the government to the people has put additional economic burden to the already poverty –stricken parents. Oghuvbu(2012) emphasized that a good percentage of children and the youth leave primary, secondary and universities before graduation.

One viable way for young adults to get employable skills is through Technical and Vocational Education and Training (TVET).Even if TVETS rates have decreased due to government subsidies, many people still see the present charge levels to be substantial obstacles. About 15% of yearly per capita spending goes toward the existing charge levels at the least expensive government schools. Reductions in tuition through scholarships or vouchers can greatly boost TVETS enrollment, according to preliminary data from an ongoing randomized TVETS training initiative.

In the context of this study, "females" refers to women and girls. There has been discrimination against women based on gender. In Nigeria, women have fewer educational options and access than men. Compared to boys, fewer girls enroll in and finish their schooling. (Okeke, 2002; Robert, 2005). Both the household and the educational system use gender stereotypes. Because most countries are patriarchal, males are viewed as the most powerful members of society. A male-dominated power

structure permeates both organized society and interpersonal connections in a patriarchal culture, according to Napikoski (2014). According to the United Nations Human Development Report (2008–2009), gender inequality is a significant policy concern. Women typically face discrimination in a number of areas, including access to school, jobs, wages, and land. Numerous factors, such as patriarchy, poor economic position, low education, and sociocultural norms, contribute to gender disparity. Wubon (2013) claims that due to sociocultural views and twisted attitudes, education has not always been a priority for girls. It is thought that the girl-child resides at her husband's home. In most situations, only male children get access to school since male children are viewed as superior to female children in many areas, including education. When the parents are impoverished, they always decide to utilize what little money they have to educate the male in school while letting the girl sell things or do other things.

The number of females not attending school annually in sub-Saharan Africa, including Nigeria, increased from 20 million in 1990 to 24 million in 2002 (Offorma, 2009). There are significant differences across the states and zones, with Nigeria's northeast and northwest exhibiting the worst conditions. Eight Northern Nigerian states have the poorest health and education indices for girls, according to the United Nations Human Development Report (2008–2009), which is also supported by Afri-Dev.Info (2013). Nigeria's worst girl child education, highest female illiteracy, highest adolescent girl marriage, highest under-15 child bearing, and highest risk of maternal death and injury are found in Kebbi, Sokoto, Bauchi, Jigawa, Yobe, Zamfara, Katsina, and Gombe States, according to the most recent scorecard created by a group of non-governmental researchers. The largest percentage of girls between the ages of 15 and 24 who are illiterate is found in Kano State and the same ten states.

For example, the South-east Nigerian state of Ebonyi ranks 12th in terms of the proportion of girls who do not attend secondary school. Similarly, there are a lot of data on teenage girls getting married. Involvement in the decision-making process, sharing in something, or feeling connected to a greater whole are all examples of participation. Being involved offers you a voice. According to Wilcox (2003), participation is the process via which people, organizations, and groups actively engage in a project. According to Reynolds and Healy (1993), Faughnan and Kellagher defined participation as engaging in actions intended to impact events, whether in the domains of policymaking, execution, or assessment. Until policies are developed and appropriately executed, women cannot engage in Technical, Vocational Education and Training (TVET) in an effective manner. The military is the source of the term "strategy," which is frequently used to describe moving forces into position before the enemy is actually attacked; when the enemy has been engaged, the focus switches to tactics. According to Nichols (2012), strategy also refers to the methods used to implement policy. Wenzhong (2014) defines strategy as the process of organizing and leading an operation toward a certain goal, like a war. The pattern of choices and activities a company makes to accomplish its objectives is known as its business strategy. Strategies, according to Newman and Logan in Arnoldo and Nicolas (1986), are forward-looking plans that foresee change and take action to seize possibilities that are included into the company's idea or goal. To increase the number of women enrolled in Technical, Vocational Education and Training (TVET), certain initiatives must be implemented. Although Kenya's primary school enrollment statistics are now impressive, attention has to be paid to regions where girls' education is frequently viewed as an unneeded

luxury as they become older. Girls' education or more specifically, not sending them to school—is no longer merely a cultural quirk, particularly in Africa, as new data indicates that society, both male and female, is paying a hefty price for denying girls the same educational options and opportunities. Today's young girl is more ambitious and competitive by nature. She no longer wants to attend school and will only pursue marginal work options or the subservient role of housekeeper, like her mother most certainly did. Like her male classmates, she aspires to a stable, well-paying work, equal access to financial resources like loans and land, and an equal chance at advancing to management roles. She shares her male colleagues' desire for equal involvement in determining the nation's social and economic policies. But in the current economy, just around one-third of Kenyans in formal work are women, according to the Kenya National Bureau of Statistics. According to estimates, a girl's earnings might improve by up to 25% after completing one year of secondary school, and requiring all girls in sub-Saharan Africa to complete at least secondary school would cut the number of child marriages in half.

Girls who skip school are particularly vulnerable when they are teenagers. One in five teenage girls has either given birth to a kid alive or is expecting her first child, which is concerning. The percentage doubles to two out of ten among the 19-year-olds. According to the Kenya Demographic Health Survey, 18% of females in the nation between the ages of 15 and 19 become pregnant each year. Additionally, there is a concerning trend: 0.5% of females leave school as a result of rape-related incidents. Given that statistics indicate that around half of Kenyan women have only completed basic school, our nation has a lot of work ahead of it. This implies that their ability to engage in socioeconomic processes is limited, and it is highly probable that their families would experience financial hardship in the future. Parents may have fewer

expectations for their girls than for their sons, which leads to their daughters having lesser expectations for themselves. This is one of the harmful aspects of gender inequality that feeds on itself. Unfortunately, many of our households still function according to customs and beliefs that mostly keep women out of the official workforce and girls out of classrooms, even in spite of the seeming complexity of modern life.

2.5 Summary of Literature Review

This study sought to determine the effect of the type of program on the demand-led factors that affect enrolment on public national polytechnic in Kenya. In this study, choice of program in public national polytechnic was measured by the student gender, mean cost of the program and socio-economic status. National economic development is a by-product of personal economic development. Career being an intrinsic factor in economic development, a decision on the choice of a career to suit to one's interest is complex (ALMiskry, Bakar and Mohammed, 2009) Morrison and Glinow,1990) suggested that there is a glass ceiling blocking upward career advancement of women which is still a reality.

Students consider their skills, interests and potential career paths when choosing their major/discipline to explore. While it is important to be passionate about who you want to be one has to realistically evaluate the cost of the course/program one pursues which is in line with objective one. Kenya has embraced various recommendations from education commissions. The Mackay Commission for instance recommended a second university in Kenya that was to be technology based, which was a useful step towards rationalizing vocational education and training. It further recommended a shift to a new education structure which saw 8-4-4 system of education ushered in. Significant findings from scholars such as Amoor and Umar (2015) and Reyes (2018)

regarding women students participation in TVET have it that major factors responsible for women's low participation in TVETs have been a low societal perception of TVETs, last choice of schooling, low smart quotient, low academic performance and job insecurity. Ayub(2017) also echoed these findings. This is in line with objective two. The third objective on the other hand sought to establish the effect of socio-economic status and the type of program one enrolls in TVETs in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was employed in this study under the following subsections. Research design, location of the study, the study population, sampling techniques, research instruments, validity, reliability, procedure for data collection, method of data, data analysis and ethical issues. Research methodology constitutes the plan for studying the research problem.

3.2 Study Design.

This study adopted ex-post facto research design. This is a systematic empirical inquiry in which the researcher does not have direct control of the independent

variable because their manifestations have already occurred or they are inherently not manipulated. In this design inferences about relations among variables are made without direct intervention from a co-commitment variable of independent and dependent variables, Simon and Goes (2013) and Kerlinger and Howard (2000).

Despite studying facts that have already occurred, ex post facto research shares with experimental research design some of its basic logic of inquiry thus this design is a very vital exploratory tool. In this design, the researcher starts by observing the dependent variable/s. The researcher then studies independent variable/s to find out the relationship to, and the possible effects on the dependent variable/s

This design was deemed very convenient for this study since the independent variable (demand side characteristics) has already occurred and the researcher can't manipulate their occurrence. These characteristics had already affected the choice of programs in public national polytechnics. Additionally, the approach is suitable since data on enrolment in each program was available and obtaining permission to study was less involving than involving participants.

As Cohen, Manial and Morrison (2000) assert, it is research that can transform a non-experimental research design into a pseudo experimental study. The design teases out possible antecedents of events that have happened but cannot be manipulated by the investigator. In addition, the study collected its data multi-dimensionally i.e. a mixed method approach involving both scientific and non-scientific methods. This integration provided a better understanding of the research problem. Combining the approaches helped overcome deficiencies in one of the methods only (Stange et al, 2006).

3.3 Location of the study

The study was conducted in 10 national polytechnics in Kenya which are spread in the eight regions of Kenya formerly provinces of Kenya. The justification for the choice national polytechnic is in the fact that these institutions have an array of courses not offered in other TVETs. Most of these courses vary in the mean cost hence parity in choice of courses is also very significant in national polytechnics. The major being the socio-economic status of the students. Socio-economic status of very many students plays a key factor when it comes to students choosing courses in national polytechnics.

Sigalagala National Polytechnic.

This national polytechnic is found in Western region of Kenya, Kakamega County. It is located along this Kisumu -Kakamega highway. It was founded in 1950. In 1967, it became a national polytechnic school offering ordinary level technical competence, and programs

Kabete National Polytechnic

Is situated in Nairobi county, located on Waiyaki way near Uthiru Market in Nairobi county. It was started in 1924. In 1974 it was elevated to national Polytechnic. Currently, it has the highest numbers in terms enrolment.

NEP National Polytechnic

It is situated in North-Eastern region Garissa county. It is located 3km from Garissa Town along Sankuri road off Ngamia Road after the KenGen power station in Garissa town. It was established in 1983 as a community based technical secondary school.

Kisumu National Polytechnic

This national polytechnic is situated in Nyanza region of Kenya in Kisumu County. It is found on the outskirts of Kisumu City within Kisumu county about 3km east of the city centre and about 342km from Nairobi city Kenya's capital city. It was started in 1967 as a technical secondary school.

Kisii National Polytechnic

This institution is situated in Nyanza region, Kisii county. It is located within Kisii Town along the busy Kisii – Keroka drive in Gusii land. It sits directly opposite Kereri Girls high school and next to Jogoo Estate in Kisii town. It was established in 1972 as Gusii institute of

Meru National Polytechnic

This institution is situated in the Eastern Region of Kenya, Meru County along Meru – Nanywa highway about 10km from Meru town and less than 5km from Makutano Centre. It was upgraded from Meru Technical Training Institute in 2016. It was started in 1956 as Gitoru Technical. In 1964, it became Meru Technical School

Kitale National Polytechnic

This institute is situated in Rift Valley Region, Trans Nzoia County. It is located within Kitale Municipality along Elgon Road, about 1km from Kitale town. It started in 1980

Eldoret National Polytechnic

It is situated in Rift Valley Region , Uasin Gishu County, located at Kisumu Road, Eldoret Kenya. It started in 1985.

Coast National Polytechnic

It is situated in the coastal region Mombasa county, it is located in the coastal town of Mombasa. It stands on Kisauni Road. It was started in 19550 formerly known as Mombasa Technical high School. Later it was elevated to a technical college in 1984

Nyeri National Polytechnic

It is situated in central region of Kenya, Nyeri county. It is located on Kenyatta Road nearby to green Hills Hotel. It was started in 1977 as National Technical Secondary School in 1977.

3.4 Study Population.

Kenya comprises of ten National Polytechnics spread in Eight regions, formerly the 8 provinces of Kenya. Two categories of respondents will aid this study .i.e. 2021/2022 cohort and its 8 principal from the selected national polytechnic. This is on the understanding that principal are well versed with information about this cohort. On the other hand students and believed to be honest enough to give correct information. Therefore a target population of this study comprises of 1845 respondents and 8 principals from National polytechnics. Table 3.1 shows the distribution of target population by each National polytechnic.

Table 3.1 shows the distribution of target population per Region

COURSES		PURE AND APPLIED SCIENCE		ENGINEERING		BUSINESS AND ECONOMICS		HOSPITALITY AND HOTEL MANAGEMENT		SUBTOTALS		PRINCIPALS	GRAND TOTAL
Region	Polytechnic	Gender		Gender		Gender		Gender		MALE	FEMALE		
		Male	female	Male	female	Male	female	Male	Female				
Western	Sigalagala	1359	927	2004	513	541	1142	934	1029	4838	3611	1	8449
Nyanza	Kisumu	2041	782	2659	683	963	1806	569	1391	6232	4362	1	10594
	Kisii	1338	549	1542	432	746	1684	501	1231	4127	3896	1	8023
Eastern	Meru	1062	917	2631	531	624	731	486	1167	5103	3346	1	8459
Rift valley	Kitale	728	135	1319	172	639	883	992	942	3678	2132	1	5810
	Eldoret	2542	1304	3478	1887	1546	1767	1261	2346	8827	6604	1	15431
Coast	Mombasa	1634	649	1547	430	843	832	522	1341	4546	3252	1	7798
Central	Nyeri	1149	258	1023	343	681	621	103	847	2958	2069	1	5027
Nairobi	Kabete	2431	584	3062	607	1617	1691	731	1478	7841	4360	1	12205
North Eastern	NEP	208	107	286	51	169	174	126	140	789	572	1	1361
		14492	6212	19551	5649	8369	11331	6225	11912	48939	34204	10	83157

Table 3. 1 shows the distribution of target population per Region

Source: Field 2022

3.5 Sample and Sampling Procedure.

In this study sampling was done at both the respondents and institutional levels. At the institutional level, 8 National polytechnics were sampled to represent each region in Kenya.

So to ensure sample representativeness of the population, all the ten fully fledged national polytechnics were classified into their respective regions of Nairobi, Central, Coast, Eastern, North Eastern, Nyanza, Rift Valley and Western. There after 30% of the polytechnics in each region were picked. Consequently Sigalagala, Kisumu, Meru, Kitale, Mombasa, Nyeri, Kabete and NEP were elected to represent the Eight Regions.

At the respondents level.. The 2021/2022 cohort was sampled and used in the study. A sample size 1845 respondents from the eight sampled national polytechnics across all the courses were sampled and used in the study. The mathematical formulae be used is as shown.

The study used a formulae suggested by (Meler and Brudrey, 1993) for calculating an effective sample size (Chuan 2006, Nachmias -Frankfort and Nachmia, 2008; Weich and Corrier, 1988)

$$n = \frac{(Z \times \sigma)^2}{E}$$

Where:-

n = sample size

Z = Z score associated with the desired confidence level (1.96 for 95%)

σ = Population standard deviation (0.5)

E = Percent6age error that the study will be willing to tolerate ($\pm 2.5\%$)

With a 95 % confidence level for the results and a $\pm 2.5\%$ sampling error. This was better than $\pm 3\%$ widely accepted in Social Sciences Research (Welch and Comer, 1988)

With these formulae a sample size of 1537 was found as follows.

$$n = \left(\frac{1.96 \times 0.5}{0.025} \right)^2$$

$$n = (3.92.)^2$$

$$n = 1537$$

The sample size needed to be adjusted for same reason as observed by Israel (2009). He suggests that 10% to be added to the respondents sample size to compensate for respondents the research was unable to get. In this study 10% of 1537 resulted to 154 respondents who were added for compensation. Israel (2009) and Welch and Comer (1988) also recommended that the sample size adjusted by up to 30% to compensate for non-response. In this case poorly completed questionnaires. A further 10% of the sample size were added, bringing the total sample size to 1854 (1537 + 154 + 154)

For effective sample representativeness of the entire population the 2021/2022 cohort was categorized into four groups of engineering, pure and applied science, business and economics and Hospitality and Hotel Management. Thereafter the respondents from each group was determined using stratified proportionate to size formula. Stratified to random sampling method was applied to select individual student respondent from among the 2021/2022 cohort.

Purposive technique - a non-probability technique was employed when sampling the eight principals from the eight national polytechnics. This technique is deemed appropriate as it helps the research to use cases that have the needed information with

respect to the objectives of the study. The principals of the national polytechnic have information pertaining these respondents by virtue of the functions of their offices. It is believed that this study was undertaken with the aid of 1853 respondents comprising of 1845 students in the four groups of courses and 8 principals. The table below shows the distribution of the sample population in the respective National Polytechnics.

Table 3.2: shows the sample distribution per region

COURSES		PURE AND APPLIED SCIENCE		ENGINEERING		BUSINESS AND ECONOMICS		HOSPITALITY AND HOTEL MANAGEMENT		SUBTOTALS		PRINCIPALS	GRAND TOTAL
Region	Polytechnic	Gender		Gender		Gender		Gender		MALE FEMALE			
		Male	female	Male	female	Male	female	Male	female				
Western	Sigalagala	42	30	63	15	17	35	29	33	151	93	1	264
Nyanza	Kisumu	63	24	83	22	31	53	18	43	195	142	1	337
Eastern	Meru	34	28	82	18	19	23	16	36	151	105	1	256
Rift valley	Kitale	23	4	42	6	20	28	32	30	117	68	1	185
Coast	Mombasa	50	20	43	14	25	20	14	38	132	92	1	224
Central	Nyeri	36	8	32	11	21	20	3	26	92	65	1	157
Nairobi	Kabete	75	19	97	19	51	52	23	46	246	136	1	382
North Eastern	NEP	7	3	9	3	5	6	4	4	26	15	1	40
		330	136	451	107	189	237	139	256	1110	736	8	1854

Table 3. 2 shows the sample distribution per region

Source: Field 2021

3.6 Research Instruments.

In collecting data, questionnaires and interviews as instruments of data collection were administered to respondents. Questionnaires and interviews were effective instruments as all respondents have attained a minimum of KCSE certificate and were deemed literate. Questionnaires are intended to guarantee uniformity of data. The questionnaires were designed in structured form to allow each respondent to the same stimuli. Interviews were administered to administrators. This was to allow the researcher to obtain in-depth data which is not possible with questionnaires. Unstructured questions were used to extract the relevant information while taking notes during the interviews.

3.6.1 Student Questionnaire.

This study used Questionnaire to obtain information on the independent, dependent and control variables from the sampled 2021/2022 cohort of TVET Students. In specific, students were required to respond to numerous questions related to the cost of programs, student sex and student social economic status.

Self-completing questionnaires were administered which enabled data collection over a large sample. Both closed and open ended questions were used in the questionnaire. The justification for the approach is the fact that whereas the open ended permit greater depth of response and respondents gave answers on certain issues in exactly the manner they perceived it. Closed ended questions eased the work of the respondents and the researcher during data collection and analysis respectively (Kahuri and Purls,1993) .

3.6.2 Interview schedule for principal.

Eight interviews were conducted with the eight principals from the eight sampled National polytechnics. An interview schedule were used to solicit in- depth information from the principals on the cost of program, student sex, and student's social economic status and the type of program enrolled in the National polytechnic.

In specific principals were asked to explain the variations in the cost of program in each department . Furthermore they were asked to show enrolment per sex in each program. A clear explanation was required pertaining students who had qualified for high cost program yet their socio economic status could not allow.

3.6.3 Document Analysis Guide

This is a form of qualitative research that uses a systematic procedure to analyze documentary evidence and answer specific research questions. In this study documentary evidence would be retrieved from nominal rolls and fee structures. Evidence of how courses were priced was found in the fee structure. The nominal roll was able to show the total enrollment in the institution.

3.7 Quality Control

3.7.1 Pilot Study

Given that piloting is very important in instruments construction process, piloting of the research was very important and ensured that problems were identified and corrected before administering research in the actual study (Oppeheim, 1996; Bell.1993; Vema and Mallik, 1999,) Bless and Higson –Smith 2000) observed that pilot study is a small study conducted prior to the actual study. This was to determine whether the Methodology, sampling, instrument and Analysis are adequate and appropriate.

Consequently a pilot study was conducted in Kitale National Polytechnic, a national polytechnic situated within the study area. As such the instrument was tested in conditions similar to those of actual research. An interview was conducted with the polytechnic principal while questionnaires were administered to students in respective department. Piloting was a crucial exercise to the researcher as it helped examine and refine items in the questionnaire. It also helped to determine on average the duration one responded to the questionnaires.

3.7.2 Validity of the Instruments

Refers to how well a test measures what it purported to measure; it's the quality of being correct or true. It has a lot of evidence backing it up. In research, the quality of instruments that collect data should be valid (Best and Kahn, 2002). In this research, content validity was adopted to ensure the questionnaires of students in national polytechnics measure what they intent to measure. For this reason the instruments were developed by the researcher under the guidance of the supervisors. Items in the instruments were scrutinized to ensure that they measured what they were intended to. Cohen et al., 2000; Neuman (2000) assert that items in these instruments should be clear and relevant.

3.7.3 Instrument Reliability

Reliability is a measure of degree to which a researcher's instrument gives consistent results after repeated trials (Mugenda and Mugenda 1999). Reliability tells you how consistently a method measures something. Great care was taken when designing items in the questionnaire. This was to ensure that items reflect the same concept. In this research internal consistence was used to test the reliability. The data from questionnaires was then computed and correlated using Cronbachs Alpha using stata. A correlation coefficient (r) = 0.877 was attained for all items implying that the research

instruments were reliable for generating data for this study. The closer the Cronbachs Alpha is to one, the higher the internal consistency of reliability (Sekaran, 2003).

3.8 Procedure for Data Collection

The researcher obtained a research permit from the National Commission for Science Technology and Innovation (NACOSTI) before embarking on data collection in the field. This is after receiving an approval letter from the Directorate of Graduate Studies of Masinde Muliro University of Science and Technology. The researcher sought permission to administer research questions from the Regional and County Directors of Education. The students' questionnaires were administered in person by the researcher with the help of Research assistants in collecting data from the 2021/2022 cohort of students. Data from this study was collected in two phases, the questionnaires for the National Polytechnic Students were administered and analyzed. Thereafter interviews were conducted with the 8 principles of the national Polytechnics. This enabled the researcher to make follow-up and focus the questions in the interviews and probe further in line with the outputs from the student questionnaire. The researcher personally conducted the 8 interviews with the 8 principles of the sampled national polytechnics. The research assistant assisted in collecting data from the 2021/2022 cohort of students form national polytechnics. These research assistants were identified by the respective principals in National Polytechnic. They were later trained on how to administer research instruments and ethical considerations. Thereafter they administered the questionnaires accordingly under the guidance of the researcher. Confidentiality was surely upheld during the whole process.

3.9 Data Analysis Techniques.

Questionnaires administered to respondents were checked to ensure completeness. Qualitative and quantitative data was collected to provide a balanced assessment interpretation. To analyze quantitative data, data was scrutinized for completeness, accuracy and uniformity. Data was then be coded accordingly then keyed in using an appropriate statistical method to analyze data –in this case statistical package for Social Science (SPSS) Computer package. Analyzed data was presented through descriptive statistics using frequency distribution tables, pie charts and percentages.

The study will generate qualitative data hence quantitative methods will be used to analyze data objectively prior to analysis depending on the nature of the variables under study. The variables include students socio-economic status, mean cost of program and sex, Multiple component analysis will be applicable when classifying students in their socio-economic status on the type of program in a public national polytechnic in Kenya. This method allows categorization of sampled students into their respect SES levels.

The first objective of this study was to determine the effect of the mean cost of the program on the type of program one chooses in a public polytechnic. To effectively address this objective, Multinomial logistic regression analysis fitted the data. As a model it is used to predict a continuous independent variable (cost) on the nominal dependent variable (type of program). The justification of logistic regression is in the fact that the dependent variable is nominal and the independent variable binary.

The second objective of this study was to determine the effect of sex on the choice of program in the national polytechnics. Data for this objective was analyzed using the logistic regression model. This was due to the fact that gender or sex is a binary

variable. Logistic regression model fitted the effect of sex on the type of program one chose in a public national polytechnic. This model predicts odds/probabilities of the different outcomes on a four level categorically distributed dependent variables. The justification of this model is in the fact that the dependent variable is nominal and the independent variable binary

The third objective of this study was to determine the effect of SES on the type of program one chose in a public national polytechnic in Kenya. In order to effectively address this study objective, multinomial logistic regression (MLR) analysis was used to fit data. This model was fit for this objective since the dependent variables is nominal and the independent variable SES is categorical. This model can predict the probabilities of the different possible outcomes of a categorically distributed dependent variable. These variables can be real-valued, binary-valued or categorical-valued. This model assumes that the data are cased specific that is, each independent variable has a singular value for each case. It also assumes that the dependent variable cannot be perfectly predicted. In this model, multicollinearity should not exist. Multinomial Logistic Regression is a perfect choice for analyzing this objective since the dependent variable-type of program is group with four nominal groups-Pure & Applied, Engineering, Business& economics and Hospitality & Hotel Management. On the other hand, SES as an independent variable is a categorical-valued.

Table 3.3 Statistical Analysis Summary Table

Objective	Independent variable	Measurement Scale	Statistical tool
Determine the effect of cost of programs on type of programs enrolled.	Mean cost of programs	Interval	Bivariate e.g., ANOVA Chi Square Multinomial Logistic

			Regression
Determine the effect of sex on the type of program enrolled.	Sex	Ordinal	Chi square
			Logistic Regression
Determine the effect of SES on the type of program enrolled.	SES	Nominal	Bivariate e.g., ANOVA
			Chi Square
			Multinomial Logistic Regression

Table 3. 3 Statistical Analysis Summary Table

3.10 Ethical Considerations.

These issues relate to the privacy of possible and actual respondents, voluntary nature of participation, the right to withdraw partially or completely from the process, consent, and possible deception of respondents and maintenance of confidentiality of data collected from individuals or identifiable participants and their anonymity (Saunders 2000). Thus care was taken in this research to avoid harm to all respondents. Consent was obtained first before engagement and their personal identities was held confidential during interviews, questionnaires and observation. Respondents were not pressured or coerced to give information and data was collected at convenient time to all parties.

CHAPTER FOUR

PRESENTATION, INTERPRETATION AND DISCUSSION OF FINDINGS.

4.1 Introduction.

This chapter covers presentation, interpretations and discussions on the research conducted on the effect of Demand-side characteristics on students choice of programs in national polytechnics in Kenya. The chapter is divided into the following six sections: Sample Distribution; description of variables used the study; descriptive statistics of variables used in the study; effect of the cost of program on the type of program one enrolls in national polytechnics; effect of sex on the type of programme one enrolls in national polytechnics and the effect of a student's socio-economic status on the type of program one enrolls in national polytechnics.

4.2 Sample Distribution

Data for this study was collected from eight national polytechnics with the aid of 2021/2022 cohort students questionnaire and principals interview schedule. All the interview schedules with the principals were successful. Out of the 1845 questionnaires that were administered, 1654 were returned. A response rate of 89.647% was archived. As Oso & Onen (2005) opine, this was considered adequate for data analysis. The sample distribution was analyzed descriptively by sex and national polytechnic of study as presented in Table 4.1.

Table 4.1 Distribution of sample by student sex and National Polytechnic

Student Sex	STUDENT NATIONAL POLYTECHNIC								TOTAL
	SGL	KSM	MRU	CTL	MBS	NYI	KBT	NEP	
Female	82	127	94	61	82	58	122	13	660
a	12.42	19.24	14.24	9.24	12.42	8.78	18.48	1.96	100
b	43.00	42.05	41.05	36.75	40.80	41.73	35.67	36.11	39.90
Male	135	175	135	105	119	83	220	23	994
a	13.58	17.61	13.58	10.56	11.97	8.35	22.13	2.31	100
b	57.0	57.95	58.95	63.25	59.20	58.87	64.33	63.89	60.10
Total	237	302	229	166	201	141	342	36	1654
a	12.9	18.43	13.91	9.90	12.20	8.57	20.31	2.14	100
b	100	100	100	100	100	100	100	100	100

Table 4. 1 Distribution of sample by student sex and National Polytechnic

Note: a = Row percentages, b=column percentages, SGL = Sigalala, KSM = Kisumu, MRU = Meru, CTL = Kitale, MBS = Mombasa, NYI = Nyeri, KBT = Kabete, NEP = North Eastern Province. $\chi^2 (7, n = 1654) = P \leq 0.169$,

Cramer's V = 0.0756 : Cramers V weak association = <0.20, "Moderate association = 0.20 – 0.49; Strong association => 0.49;

Source: Field Data, 2023

Table 4.1 Shows that the male student constituted 60% of the total sample size of 2021/2022 cohort of students in 8 national polytechnics.

Female students constituted 40% of the total sample size. The analysis showed that there was no statistically significant relationship ($p = 0.169$) between the sex students and their national polytechnic of study.

Further, the students sample distribution was analyzed by the student sex and the type of programme of study in national polytechnic in Kenya. A summary of the distribution is presented in Table 4.2

Table 4.2 Distribution of the sample by student sex and program of study

Student Sex	STUDENT TYPE OF PROGRAM				TOTAL
	P&AP SCIENCE	ENG	BUS&ECON	H&H.MGT	
Female	121	96	212	229	660
a	18.38	14.55	32.13	34.71	100
b	29.02	19.20	55.50	64.51	39.90
Male	296	404	170	126	994
a	29.78	40.64	17.10	12.62	100
b	70.98	80.80	44.50	35.49	60.10
Total	417	500	382	355	1654
a	24.08	27.60	24.62	23.70	100
b	100	100	100	100	100

Table 4. 2 Distribution of the sample by student sex and program of study

Note: a = Row percentages, b=column percentages, P&AP SCIENCE = Pure and applied sciences; ENG = Engineering; BUS&ECON = Business and Economics; H/H.MGT = Hospitality and Hotel Management. $\chi^2 (3, n = 1654) = P \leq 0.31$, Cramer's V = 0.0756 : Cramer's V weak association = <0.20, Moderate association = 0.20 – 0.49; Strong association => 0.49;

Source: Field Data, 2023

Data in Table 4.2 Shows that there is a statistically significant relationship ($P = 0.31$) between the set of a student and the program of study

4.3 Description of variables used in the study.

All the variables used in this study were coded and entered for analysis on interval,

categorical or dummy scales depending on the nature of the data collected. Table 4.3

provides a summary of the explanations for all the variables used in the analysis

Table 4.3 Description of variables used in the analysis of data.

Variable	Variable level	Scale	Min	Max
a21	Student program of study	Categorical	0	4
Meases 3	Meases 3 = Tertials based on MCA	Categorical	0	3
Meases 31	Low SES	Dummy	0	1
Meases 33	High SES	Dummy	0	1
a31	Course Duration	Categorical	2	3
a32	Tution Fee	Interval	37640	67187
a33	Related Expenses(Exam)	Inerval	8250	11400
a41	Males Student = 1	Dummy	0	1
a43	KCSE Score 6 = c, 12=A	Interval	6	12
a513	Student Uses Paraffin at Home	Dummy	0	1
a514	Student uses electricity at home	Dummy	0	1
a531	Number of cows owned at home	Interval	0	10
a532	Number of sheep owned at home	Interval	0	50
A534	Number of poultry owned at home	Interval	0	200
a61	Students National Polytechnic	Categorical	1	8

Table 4. 3 Description of variables used in the analysis of data.

Note: Min = Minimum; Max = Maximum;

Source Field Data: 2023

As shown in Table 4.3 Tuition fees (a32), Related expense (exam) (a33), KCSE Score (a43), Number of cows, sheep and poultry (a531), (a532) and (a534) respectively were measured and analysed at interval scale. Type of program (a21), Student National Polytechnic (a61) and Social economic status were categorical in nature. All other variables were treated as dummy variables.

4.4 Descriptive statistics of variables used in the study.

All variables in this study were analyzed descriptively using frequency distributions, percentages, means and standard deviation.

The findings were summarized in table 4.4

Table 4.4 Descriptive statistics for the variables used in the analysis of data

Variable	variable level	Mean	Se(mean)	Standard Dev	Min	Max
a31	Course duration	2.473	0.856	1.328	2	3
a32	Tution fee (cost)	51,279	691.81	8846.91	37640	67187
a33	Related Expenses(Exam)	9843.5	69.2	213.7	8250	11400
a43	KCSE Score 6=C, 12=A	8.89	0.07	1.43	6	12
Frequencies and percentages for dummy and categorical variables					0 = otherwise	1=yes
Meases 3.1	1 = Low SES				1103[66.69]	551[33.31]
Meases 33	3 =High SES				1102[66.63]	552[33.37]
a513	Student uses paraffin at home 0=Otherwise				1110[67.1]	544[32.9]
a514	Student uses electricity/solar generator				391[23.76]	1261[76.24]
a531	Number of cows owned at home by student = 1				587[35.3]	1067[64.5]
a532	Number of sheep owned at home by student =1				1331[79.4]	341[20.6]
a534	Number of poultry owned at home by student =1				517[31.3]	1137[68.7]
a21	Student program of study 1=P&P, 2=ENG, 3=B/ECON, 4=H/HN _1=417[25.2]; 2=500[30.2]				3=382[23.0]	4=355[21.6]
a41	Male student=1, Female Student=0				660[39.9]	994[60.1]
a611	SGL 0=otherwise					
a612	MBS 0=Otherwise					
Meases 3	Tertiles based on MCA; 1=Low SES, 2=Middle SES; 3=High SES			1=551[33.31]	2=551[33.31]	3=552[33.32]

Table 4. 4 Descriptive statistics for the variables used in the analysis of data

Note: Min = Minimum; Max = Maximum; se(mean) = Standard error of the mean; std. Dev = Standard Deviation; MBS = Mombasa; SGL = Sigalagala

Data in table 4.4 indicates that students who paid the highest amount of tuition fee paid 67,187 while the lowest tuition fee was 37,640. Other related expenses (Exam fees) was capped at Kshs.11,400 while lowest was KSh.8250. Mean amount fee required by the national polytechnic was Kshs.51, 279 and the mean amount of exam fee demanded was Ksh.9843.5. Government capitation for each diploma student at national polytechnic is Kshs.30,000. The remaining amount can be applied as a loan from the Higher Education Financing Portal.

Capitation awarded by government constitute 58.5% of the total fees paid to the national polytechnics for a diploma course. If the student does not get a loan from the Higher Education Financing Portal, then other modes of financing are sort. Findings point to the fact 41.5% of the remaining cost are sought through other means.

Studies show that the government is perpetually decreasing public funding in tertiary education institutions (OECD 2002). Cost sharing between the taxpayers and the full cost by individuals is in the form of tuition fee. These costs covers tuition fees in provision of non- instructional services and related expenses. Findings from this study show that both direct and indirect cost can be such a hindrance to one pursuing a course in national polytechnic. The direct cost of college is way too high for most students. This is attributes by some of the following reason; growing demand, raising financial aid, lower state funding, exploding cost of administrators, bloated student amenities packages etc. measures have to be put in place to fix this problem.

Escalated cost of college is not a unique problem in Kenya. Studies show that the challenge in many African countries just like in other parts of the world. In developing countries the cost in TVETs are much higher than that of secondary education thus posing a more serious challenge to parents. In their analysis

Atchoarena and Delluc (2002) observed that part of the reason for higher in TVETs is the fact that the sizes of their classes are much more smaller than in the usual education and high cost of equipment, thus higher per capita cost in TVETs education. Norwood (2009) in this study in the US found that price is the most influential institutional attribute on college choice, another study by Bacon (2010) also said that price of education at a college was an indicator of product quality, status and prestige. Haayden (2010) also found out that financial crisis issues influence the college selection process. Xiaoping (2002) raised a concern regarding the escalating cost in terms of tuition fee charged by most colleges. Parents fear that the rising education cost will deter enrollment in colleges. Wagner and Fard (2009) reiterated on the cost of education, value of education and content and structure or certificates offered are the most important factor that influence choice of the student colleges. Additionally, Becker and Tomes in their research in New York on the rise and fall of families noted that, poor families were financially constrained hence could not invest in education of their children (Becker and Tomes 1996)

Effects of income levels on education have been elaborated at different levels of education in countries like USA and Nigeria, It was noted that economic factors had a significant impact on enrollment levels. In this study cost of program was used as an independent variable in the first objective. In a related findings, Table 4.4. shows that upto 32.9% of the students in the national polytechnics sampled indicated that they use paraffin as a source of lighting. These findings point to the fact that student come from poor/humble background and therefore escalating costs of college could easily edge them out of college. These findings are in agreement with those of earlier other studies. In his report Ngerechi (2003) observed that though tuition fee in TVET was reasonable, it still remained high for most families that were poor. Amed and Arif

(2000) state that poverty has led to inability of the household to meet and afford certain basic needs which include education and training. These sentiments were also echoed by Muthui and Mugambi (2010). For many, poverty becomes an unfortunate reality that affects every aspects of college experience. The effect of being financially deprived on college students are far reaching and complex and they can significantly impact their academic performance, mental health and future prospects.

Financial deprivation have a significant impact on education especially on student grades. This leads to lack of access of resources, limited to technology and internet connectivity. This impacts students' ability to complete homework and research assignments. This affects student academic performance through increased stress levels arising from lack of basic needs like food and housing. It is important for policy makers and educators to take this issues into account and work to provide support and resources to students from low income families to ensure that they have access to the tools they need succeed academically. Living in need or on the verge of hardship places students in an impossible situation forcing them to either work multiple jobs to finance college tuition, take on debt in the form student loans or attend college on the part time basis. It is people's collective responsibility to ensure that being financially deprived does not stand in the way of educational opportunism for students from all backgrounds. According to Bishaw and Semega high poverty levels increase numbers of uneducated young people hence perpetuates the growth of poverty across the nation.

4.5 Effect of cost of program on the type of program one enrolls in national polytechnics in Kenya.

In the first Model, the effect of the cost of program on choice of program of study by students in national polytechnics in Kenya was fitted. In order to effectively address

this study multinomial logistic regression analysis was used to fit the mean cost of program against the type of study pursued by students in national polytechnics in Kenya, while controlling for student characteristics and national polytechnics of study.

Prior to modelling, pairwise correlation and Chi-Square with Cramer's V were used to correlate the outcome variable (Type of program of study) with the continuous and categorical variable respectively, with the view of determining which plausible interaction to pursue in the regression models at $\alpha = 0.05$, the null hypothesis was rejected at 5% if the significance level was less than $\alpha = 0.05$. Only variables which had significant relationship with the dependent variable were pursued further in the regression analysis.

The results for pairwise correlation showed that mean tuition fee, related expenses (exam) academic performance and course duration were the only statistically significant continuous explanatory variables. The results of chi square test showed that student sex, SES and program of study were the only significant categorical variables. Consequently three sequential regression models were developed. The first model fitted mean tuition fees (cost) of program (predictor variable) against students program of study (outcome)

In the second model mean cost of program was fitted against student type of program of study (outcome variable) while controlling for student characteristics. In the third model mean cost of program (predictor variable) was fitted against student program of study (outcome variable) while controlling for both student characteristics and national polytechnic characteristics.

The findings from three models are summarized in table 4.5

Multinomial logistic regression for the association between students program of study and the mean cost of program of study.

		Pure/Applied Sciences Vs H/Hotel Management						Engineering Vs Economics/Business					
		Model 1	(a32)	Model 2	(a32)	Model 3	(a32)	Model 1	(a32)	Model 2	(a32)	Model 3	(a32)
Variable	Variable level	RRR	P	RRR	P	RRR	P	RRR	P	RRR	P	RRR	P
		1.00	0.001					1.00	0.048				
a32	Tuition fee			1.00	0.337	1.00	0.378			1.00	0.282	1.00	0.21
a33	Related Expenses (exam)			1.79	0.109	1.85	0.100			1.495	0.242	1.14	0.344
Meases 3.1	1=Low SES			0.43	0.104	0.53	0.248			1.980	0.073	3.12	0.003
Meases 33	3=High SES			1.52	0.197	1.67	0.124			1.984	0.074	1.55	0.103
a41	Male Student = 1			4.15	0.00	4.13	<0.001			1.244	0.044	0.85	0.592
a43	KCSE Score 6=C; 12=A			2.58	0.00	2.68	<0.001			1.344	0.006	1.11	0.383
a611	1 = SGL 0=otherwise			2.72	0.002	2.93	0.002			1.508	0.117	1.38	0.260
a615	1=MBS 0=Otherwise			0.57	0.019	0.07	0.024					0.44	0.076
a651	1=P&P 0=Elsewhere					0.56	0.298					0.57	0.113
Constant		0.04	<0.001	0.00	<0.001	0.00		0.08	0.001	0.01	<0.001	0	0.01
N		1654		1654		1654		1654		1654		1654	
LR chi ² (df); Value		(3) 22	0.006	(60) 73	0.001	(85)91	0.001	(3)22	0.006	(60) 73		(85)	
										0.006		917	
Pseudo R ²		0.0191		0.2303				0.0191		0.2303			
						0.2750						0.2750	

Table 4. 5 Multinomial logistic regression for the association between students program of study and the mean cost of program of study.

Note: LR = likelihood ration; df=degrees of freedom; RRR=Relative Risk Ratio

In the first model while holding all other factors constant, a multinomial regression analysis was run to determine the effect of cost of program on the likelihood of studying pure and applied sciences over hospitality and hotel management. As shown in table 4.5 mean cost of program had some effect on the type of program of study by students in national polytechnics in Kenya. In specific, a one unit increase in the mean amount of fees (cost) reduced the relative risk ratio of studying Pure & Applied sciences by 1.05 times ($P=0.048$) respectively against the risk ratio of studying Hospitality & Hotel Management. Furthermore the constants for model were statistically significant as was the overall model ($P=0.006$) with a pseudo ($R^2=0.0119$). However the model only explained 1.19% of the variability of the response data around the mean. This implied that the model only explained 1.19% of the variations in choice of program of study by the students in national polytechnic in Kenya.

Furthermore, when student characteristics were controlled for in the second model, the mean cost of program became statistically insignificant ($p=0.316$, $p=0.291$) respectively. In both scenarios of Pure & Applied sciences over Hospitality& Hotel Management courses, the constant in both scenarios were significant ($p<0.001$) as the overall model ($p<0.001$) with a pseudo ($R^2=0.2701$). This model implied that 27.01% of variations in choice of program of study in national polytechnics could be explained.

In the second model student characteristics was significant in explaining the choice of program of students by student in national polytechnics in Kenya. These variables included students sex and KCSE performance. In specific concerning mean cost of program the model shows that the relative risk ration of studying pure and applied sciences over hospitality and hotel management reduced by 3.8146 times ($p=0.001$)

for students. However the effect statistically significant for the same group of student when it came to studying engineering over economics/ business related disciplines.

With the regards to KCSE performance the model indicated that a one point increase in KCSE performance (6-12) increased the relative ration of studying pure/applied sciences over hospitality and hotel management by 6.14 times ($p \leq 0.001$) the same relationship was not significant for engineering over economics/business related disciplines.

In the same model other student characteristics like sex was found to be insignificant in predicting the chances/likelihood of a student pursuing engineering over economics/business related disciplines.

In the third while controlling for both student characteristics and national polytechnic of study, the main cost of program became statistically significant at ($p=0.364$, $p=0.201$) in both cases o pure and applied sciences over hospitality and hotel management and Engineering over economics/business related disciplines. However the constant in both cases of Pure and applied sciences over Hospitality and Hotel management and Engineering over economics/business related disciplines was significant as well as the overall model ($P < 0.001$) with a pseudo ($R^2 = 0.3250$) this implies that the model only explained 32.5% of the variation in the choice of program of study by students in national polytechnics in Kenya.

The third model implied that the student characteristics such as KCSE Performance, SES still remained significant in explaining the cost of program of student by student in national polytechnic. In specific regarding the cost of program, the finding show that the relative risk ration of cost of program in studying pure and applied sciences over hospitality and hotel management reduced by 6.1437 times ($p < 0.01$) this points

the facts mean cost of program is indeed an important factor in considering course selection.

Considering student entry behavior as measured by performance in KCSE the study shows that a one point increase in KCSE performance (6-12) increased the relative risk ratio of studying pure and applied sciences over hospitality and hotel management courses by 4.2683 times ($p < 0.001$). the same relationship was significant in engineering model where a one point increase in KCSE (6-12) was associated with studying engineering over economics/business related disciplines by 2.3449 times ($p = 0.006$). the findings point to the fact that academic performance at KCSE remains an important predictor for choice of pure/applied sciences and engineering courses by students in national polytechnics in Kenya. This is attributed to the fact that pure/applied sciences and engineering programs by their nature require high level of intellectual capability. As such even if mean cost of program were lowered student who perform dismally in KCSE exams can still shy away from these programs. Findings also show that intellectually able student prefer Pure/Applied Sciences and Engineering programs. This is due to association with good returns and opportunities (Dickson and Harmon 2011; Sloane 2005; Blundel et al, 1999) these finding are in inline with the preposition that talented people choose occupations that are associated with increasing returns to ability (Muthui, 2013; Menon, 1999; Murphy, Shleifer & Vishny, 1991; Rosen, 1981) concerning families SES the findings show that the relative risk ratio of studying Pure and Applied Sciences courses over hospitality and hotel management for student from high SES increased by 4.1261 times ($P = 0.003$) these findings suggest that SES is a predictor of type of program of study among the students in National Polytechnics in Kenya.

Findings also show that parental participation and school resources may buffer the SES - Academic achievement association. This study suggests focused treatment for low income students.

Besides student characteristics the third model shows that national polytechnic play a significant factor in explaining the type of program of study by students in national polytechnics. In specific the findings indicates that the relative risk ratio of studying pure/applied sciences over hospitality and hotel management for students enrolled in Mombasa national polytechnic increased by 3.1763 times ($p=0.019$). However the relative risk ratio of studying engineering courses over economics/business related courses in Sigalagala decreased by 0.4057 times ($p=0.025$) This relationship was statistically significant for the same group of students in pure/applied sciences over engineering model. The findings of this study suggests that polytechnic of study plays an important role in student's choice of program. This findings are consistent with the findings of McFaddel 2015 which observed that college identity constructs such as geographical location, cost, age, infrastructure and reputation are important predictors of student college choice.

4.6 Effect of students sex on the type of program one enrolled in National polytechnic in Kenya

The second objective of this study was to determine the effect of sex on the type of program of study by students in National Polytechnics in Kenya. In order to effectively address the study objective, logistic regression analysis was used to model the effect of sex on choice of program of study by students in national polytechnics in Kenya while controlling for students characteristics

Prior to modelling, pairwise correlation and Chi Square with Crammer's V were used to correlate the outcome variable (program of study) with all possible continuous and

categorical explanatory variables respectively with the view of determining which plausible interactions to pursue in the regression models. The null hypothesis was rejected at 5%, if the significance level was $\alpha = 0.005$. Only variables which had significant relationship with the depended variable were pursued further in the regression model. The results of pairwise correlation showed that sex was the only statistically significant variable.

on the other hand the results of the chi square showed that the student SES and cost of programs were the only statistically significant categorical variables . Consequently three sequential regression models were developed. The first model fitted the outcome variable (type of program) against the predictor variable (sex). The second model fitted the outcome variable (type of program) against the predictor variable sex while controlling individual student characteristics. The third model fitted the outcome variable (type of program) against the explanatory variable sex while controlling for both individual student characteristics and national polytechnic of stud. The results of the three models were presented in table 4.6

Table 4.6 Logistic regression odds for the effect of sex on the choice of program by students in national polytechnics in Kenya

		Model 1	(a32)	Model 2	(a32)	Model 1	(a32)
Variable	Variable level	OR (Std.Err)	P	OR (Std.Err)	P	OR (Std.Err)	P
		1.00	0.002	1.00(0.00)	0.959	1.00	0.76
a32	Tuition fee			1.86(0.88)	0.017	0.337(0.00)	0.012
a33	Related Expenses (exam)			1.79(0.43)	0.012	0.109(0.45)	0.045
Meases 3.2	2=Middle SES			0.43(0.46)	0.456	0.104(0.44)	0.318
a41	Male Student = 1			4.15(0.46)	0.072	0.00(0.51)	0.105
a43	KCSE Score 6=C; 12=A			2.58(0.17)	0.032	0.00(0.19)	0.024
a611	1 = SGL 0=otherwise			2.72(0.16)	0.170	0.002(0.14)	0.072
a615	1=MBS 0=Otherwise			0.57(0.19)	0.189	0.019(0.17)	0.212
a616	1=SGL 0=Otherwise			1.89(0.88)	0.960	1.79(0.83)	0.832
Constant		0.04	<0.001	0.00	<0.001	0.08	0.001
N		1654		1654		1654	
LR chi ² (df); Value		(2) 400 0.	(10) 745	(85) 499 0.001			
Pseudo R ²		0.006		p=0.143		0.001	0.134

Table 4. 6 Logistic regression odds for the effect of sex on the choice of program by students in national polytechnics in Kenya

Note: LR=Likelihood Ratio; df=Degrees of freedom

In the first model logistic ratio was learned to determine the effect of sex on type of program of study by students in National Polytechnics in Kenya. The study revealed that there exist a statistically significant relationship between the sex of student and program of study. These results were statistically significant at $p=0.325$. the constants for the model were equally statistically Significant ($p=0.235$). as was the overall model $p=0.243$, further sex was statistically insignificant ($p=0.001$) when student characteristics were controlled for in the second model. The overall model was statistically significant $p<0.001$ with pseudo R squared = 0.1816. This implied that the model explained 18.16% of the variations in the type of study by students in National Polytechnics in Kenya.

The model indicated that student level characteristics were statistically insignificant in explaining the type of program of study, these included SES and mean cost of program. With reference to SES, the findings show that the odds of student choosing a program of study in National Polytechnics increased by 69.27% ($p=0.017$) for students in middle SES than those in other SES categories.

Concerning mean cost of program, the odds of a student picking a program in National Polytechnic in Kenya reduced by 40.89% ($p=0.012$) for a student who relied on funding from HEFP than those who relied on other modes of financing their tuition costs and other related expenses.

In the third model sex remains statistically significant ($p=0.1735$) with a pseudo R squared = 0.1970 when both student characteristics and National polytechnic factors were controlled for. However the overall model was statistically significant ($p<0.001$) with a pseudo R squared = 0.1782. This implied that the only explain 17.28% of the variations in the program of study. These findings show that the

students characteristics and college factors remain statistically significant in explaining variations in the study programs by students. For instance the odds of a male student pursuing a program in Mombasa polytechnic increased 76.34% ($p=0.012$) for students in the middle SES category over other SES categories. These findings suggests that even though the mean cost of program way high, SES has an effect on the choice of program by students in National Polytechnics in Kenya.

The findings of this study that female participation in TVET program is skewed towards non-STEM programs. It is estimated that women constitute half of the world's total population. Additionally they represents two-thirds of the world's workers. Ironically they earn one-tenth of the world's income and own one-hundredth of the property (Adelakun, Ovigwe and Barfa 2015).

These inequalities are linked to unequall success to training opportunities. For instance a study carried out in Nigeria found out female participation in TVETs and STEM programs showed that females are still underrepresented and occupied the middle and lower status inspite of the recent steady progression from this status over time (Udean, Ejikeme, 2011)

(Adelakun, Ovigwe and Barfa 2015).in their study confirmed that a large number of women are found mainly in poor paid jobs and several others go into early marriages, prostitution and child labour. Another study UNESCO (2010) concurs with this study by pointing that male students outnumber female students in 91% of countries globally despite increased parity in enrollment in college education. In the developed countries such as UK experience low rate of female of science related disciplines (National Academic Press, 2007). Female underrepresentation is therefore an issue in both in developed and underdeveloped countries, Kenya included. Many disparities,

obstacles, and inequities still exist in spite of the advancements throughout the years. The involvement of women in STEM disciplines at TVETs has been adversely impacted by cultural issues. According to (Molestsen & Reeddy, 2011), low female engagement is caused by gender discrimination, a macho corporate culture influenced by gender-blind work regulations, and the placement of women in supporting positions.

The finding from this study show that other student characteristics like mean cost of program was significant in explaining the program of study by students in national polytechnics. However the third model showed that National polytechnic of study was significant in explaining the variation in the type of program of study by student in national polytechnic in Kenya. In specific the findings show that the odds of choosing a program in Mombasa increased by 141% ($p=0.01$) for female students in National polytechnic compared to male students in other national polytechnics.

These findings are in line with those of earlier findings which indicated that the age of an situation matters when choosing a national polytechnic. This could be as a result of differentials in infrastructure, human resource and geographical location.

4.7 Effect of students socio-economic status on the type of program one enrolled in National polytechnics in Kenya

The first objective of this study was to determine the effect of the Socio-Economic Status (SES) on choice of program of study by students in national polytechnics in Kenya. In order to effectively address this study multinomial logistic regression analysis was used to fit the socio-economic status against the type of study pursued by students in national polytechnics in Kenya, while controlling for student characteristics and national polytechnics of study.

Prior to modelling, pairwise correlation and Chi-Square with Cramer's V were used to correlate the outcome variable (Type of program of study) with the continuous and categorical variable respectively, with the view of determining which plausible interaction to pursue in the regression models at $\alpha = 0.05$, the null hypothesis was rejected at 5% if the significance level was less than $\alpha = 0.05$. Only variables which had significant relationship with the dependent variable were pursued further in the regression analysis.

The results for pairwise correlation showed that mean tuition fee, related expenses (exam) academic performance and course duration were the only statistically significant continuous explanatory variables. The results of chi square test showed that student sex, SES and program of study were the only significant categorical variables. Consequently three sequential regression models were developed. The first model fitted socio economic status (predictor variable) against students program of study (outcome)

In the second model Socio-Economic Status was fitted against student type of program of study (outcome variable) while controlling for student characteristics. In the third model Socio-Economic Status (predictor variable) was fitted against student program of study (outcome variable) while controlling for both student characteristics and national polytechnic characteristics.

The findings from three models are summarized in table 4.7

Multinomial logistic regression for the association between students program of study and socio-economic status.

		Pure/Applied Sciences Vs H/Hotel Management						Engineering Vs Economics/Business					
		Model 1	(a32)	Model 2	(a32)	Model 3	(a32)	Model 1	(a32)	Model 2	(a32)	Model 3	(a32)
Variable	Variable level	RRR	P	RRR	P	RRR	P	RRR	P	RRR	P	RRR	P
		1.00	0.002					1.00	0.048				
a32	Tuition fee			1.00	0.337	1.00	0.378			1.00	0.282	1.00	0.21
a33	Related Expenses (exam)			1.79	0.109	1.85	0.100			1.495	0.242	1.14	0.344
Meases 3.1	1=Low SES			0.43	0.104	0.53	0.248			1.980	0.073	3.12	0.003
Meases 33	3=High SES			1.52	0.197	1.67	0.124			1.984	0.074	1.55	0.103
a41	Male Student = 1			4.15	0.00	4.13	<0.001			1.244	0.044	0.85	0.592
a43	KCSE Score 6=C; 12=A			2.58	0.00	2.68	<0.001			1.344	0.006	1.11	0.383
a611	1 = SGL 0=otherwise			2.72	0.002	2.93	0.002			1.508	0.117	1.38	0.260
a615	1=MBS 0=Otherwise			0.57	0.019	0.07	0.024					0.44	0.076
a616						0.56	0.298					0.57	0.113
Constant		0.04	<0.00	0.00	<0.001	0.00		0.08	0.001	0.01	<0.001	0	0.01
N		1654		1654		1654		1654		1654		1654	
LR chi ² (df); Value		(10)12	0.001	(24)750	0.004			(10)12	0.346			960	
Pseudo R ²		0.006				0.152				0.001			

Table 4. 7 Multinomial logistic regression for the association between students program of study and socio-economic status.

Note: LR = likelihood ration; df=degrees of freedom; RRR=Relative Risk Ratio

In the first model while holding all other factors constant a multinomial regression analysis was run to determine the effect of SES on the likelihood of studying pure and applied sciences over hospitality and hotel management. As shown in table 4.5 Socio-Economic Status had some effect on the type of program of study by students in national polytechnics in Kenya. In specific a one unit increase in the mean amount of fees (cost) reduced the relative risk ratio of studying pure and applied sciences by 1.05 times ($P=0.048$) respectively against the risk ratio of studying hospitality and hotel management. Furthermore the constants for model were statistically significant as was the overall model ($P=0.006$) with a pseudo ($R^2=0.0119$). However the model only explained 1.19% of the variability of the response data around the mean. This implied that the model only explained 1.21% of the variations in choice of program of study by the students in national polytechnic in Kenya.

Furthermore, when student characteristics were controlled for in the second model, the Socio-Economic Status became statistically insignificant ($p=0.316$, $p=0.291$) respectively. In both scenarios of pure and applied sciences over hospitality and hotel management courses, the constant in both scenarios were significant ($p<0.001$) as the overall model ($p<0.001$) with a pseudo ($R^2=0.2701$). this model implied that 27.01% of variations in choice of program of study in national polytechnics could be explained.

In the second model student characteristics was significant in explaining the choice of program of students by student in national polytechnics in Kenya. These variables included students sex and KCSE performance. In specific, concerning Socio-Economic Status the model shows that the relative risk ratio of studying pure and applied sciences over hospitality and hotel management reduced by 3.8146 times ($p=0.001$) for students. However the effect was statistically significant for the same

group of student when it came to studying engineering over economics/ business related disciplines.

With the regards to KCSE performance the model indicated that a one point increase in KCSE performance (6-12) increased the relative risk ratio of studying pure/applied sciences over hospitality and hotel management by 6.14 times ($p \leq 0.001$) The same relationship was not significant for engineering over economics/business related disciplines.

In the same model other student characteristics like sex was found to be insignificant in predicting the chances/likelihood of a student pursuing engineering over economics/business related disciplines.

In the third while controlling for both student characteristics and national polytechnic of study, the student SES became statistically significant at ($p=0.364$, $p=0.201$) in both cases of pure and applied sciences over hospitality and hotel management and Engineering over economics/business related disciplines. However, the constant in both cases of Pure and applied sciences over Hospitality and Hotel management and Engineering over economics/business related disciplines was significant as well as the overall model ($P < 0.001$) with a pseudo ($R^2 = 0.3250$) this implies that the model only explained 32.5% of the variation in the choice of program of study by students in national polytechnics in Kenya.

The third model implied that the student characteristics such as KCSE Performance, SES still remained significant in explaining the students SES in national polytechnic. In specific regarding SES, the finding show that the relative risk ratio of studying pure and applied sciences over hospitality and hotel management reduced by 6.1437

times ($p < 0.01$) This points to the fact that Socio-Economic Status is indeed an important factor in considering course selection.

Considering student entry behavior as measured by performance in KCSE the study shows that a one point increase in KCSE performance (6-12) increased the relative risk ratio of studying pure and applied sciences over hospitality and hotel management courses by 4.2683 times ($p < 0.001$). The same relationship was significant in engineering model where a one point increase in KCSE (6-12) was associated with studying engineering over economics/business related disciplines by 2.3449 times ($p = 0.006$). The findings point to the fact that academic performance at KCSE remains an important predictor for choice of pure/applied sciences and engineering courses by students in national polytechnics in Kenya. This is attributed to the fact that pure/applied sciences and engineering programs by their nature require high level of intellectual capability. As such even if tuition fees and related expenses were lowered student who perform dismally in KCSE exams can still shy away from these programs. Findings also show that intellectually able student prefer pure/applied sciences and engineering programs. This is due to association with good returns and opportunities (Dickson and Harmon 2011; Sloane 2005; Blundel et al, 1999) these finding are in line with the preposition that talented people choose occupations that are associated with increasing returns to ability (Muthui, 2013; Menon, 1999; Murphy, Shleifer & Vishny, 1991; Rosen, 1981) concerning families SES the findings show that the relative risk ratio of studying Pure and Applied Sciences courses over hospitality and hotel management for student from high SES increased by 4.1261 times ($P = 0.003$) these findings suggest that SES is a predictor of type of program of study among the students in National Polytechnics in Kenya.

Findings also show that parental participation and school resources may buffer the SES - Academic achievement association. This study suggests focused treatment for low income students.

Besides student characteristics the third model shows that national polytechnic play a significant factor in explaining the type of program of study by students in national polytechnics. In specific the findings indicates that the relative risk ratio of studying pure/applied sciences over hospitality and hotel management for students enrolled in Mombasa national polytechnic increased by 3.1763 times ($p=0.019$). However the relative risk ratio of studying engineering courses over economics/business related courses in Sigalagala decreased by 0.4057 times ($p=0.025$) This relationship was statistically significant for the same group of students in pure/applied sciences over engineering model. The findings of this study suggests that polytechnic of study plays an important role in student's choice of program. This findings are consistent with the findings of McFaddel 2015 which observed that college identity constructs such as geographical location, cost, age, infrastructure and reputation are important predictors of student college choice.

As tuition fees increases, colleges need to be concerned whether costs have risen to a point where students from low socio-economic families are being disproportionately excluded. Given the rate of increase in tuition fees in recent times, the outcome seems plausible and is often the point of discussion on that matter. However trends in college enrollment relative to trends in tuition fees would suggest otherwise. Contrary to what one would expect increased tuition were a wide spread impediment to attending college, enrollments have continued to grow as have participation rates. Junor and Usher in their "price of knowledge"; access ad student finance in Canada (2000) indicate that college enrollment increases by between 13% and 25%. Similarly

participation rates of 18-21 year olds have increased from about 11% to 17% nationally over time.

Another complexifying factor is that student from different socioeconomic strata may use compensatory mechanisms (student loans and concurrent employment) in different ways to accommodate the increasing cost thus confounding our understanding of whether the increased cost of attending college has a differential impact on participation by socioeconomic status". Overall student indebtedness has been increasing (Hemingway, 2004) though this happens with disproportionate degree among low SES students. Other findings also show that there is evidence of an "SES exclusivity effect" resulting from rising tuition levels in professional programs such as Law, medicine and dentistry. Kwong et al (2002) found out that almost half (43.5%) of medical students came from the neighborhoods with median family income in the top quantiles.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the main findings of the present study in line with the objectives, research hypotheses and analytical approach. In addition, conclusions and recommendations are made as well as suggestions for further research. The chapter is divided into four parts; summary of the research findings; conclusions; recommendations of the study; and, suggestions for further research.

5.2 Summary of the Research Findings.

The purpose of this study was to determine the effect of students Demand-side characteristics on the type of program one enrolled in National polytechnic in Kenya. Consequently, three objectives were developed for the study. The summary of the findings is hereby presented by objective.

5.2.1 Effect of cost of program on the type of program one enrolled in National polytechnics in Kenya.

The first objective of study was to determine the effect of cost of program on the type of program of study by students in National polytechnics in Kenya. Data was collected with the aid of questionnaires from sampled 2021/2022 cohort of students from the selected eight National polytechnics in Kenya. Multinomial logistic regression analysis was used to model the effect of cost of program on the type of program of study pursued by students in National polytechnics in Kenya why controlling for student- level characteristics and National polytechnic of study. Consequently, three sequential models were developed.

Thereafter, post estimation test of hypothesis for logistic regression was undertaken.

The findings of post estimation test of hypothesis for logistic regression revealed the likelihood-ratio for type of program of $\chi^2(10) 775$ $p= 0.006$, which was

statistically significant at $\alpha = 0.05$. The researcher therefore rejected the null hypothesis.

These findings point to the fact that cost of programs had statistically significant effect on the choice of program of study by students in National polytechnics in Kenya. The findings were attributed low capitation from the government , differentials in costs of different programs, other related expenses not factored in tuition costs and households SES.

5.2.2 Effect of Students sex on the type of program one enrolled in National polytechnics in Kenya.

The second objective of this study was to establish the effect of sex on the choice of program of study by students in National Polytechnics in Kenya.

Multinomial logistic regression analysis was used to model the effect of sex on the type of program of study by students while controlling for student –level characteristics and college of study. Consequently, three sequential models were developed. Thereafter, a post estimation test of the hypothesis for logistic regression was undertaken. The results of post estimation test of hypothesis for logistic regression revealed the likelihood-ratio for a female student pursuing a STEM course in National polytechnics of $\chi^2(3)=17.5$ $p= 0.016$ which was not statistically significant at $\alpha=0.05$. The researcher therefore failed to reject the null hypothesis.

These findings point to the fact that sex was insignificant on the choice of programs by students in National polytechnics in Kenya. However, findings of this study showed that SES, KCSE score and cost of programs were the only variables that were statistically significant in explaining variations in choice of programs by students in national polytechnics in Kenya.

5.2.3 Effects of students socio-economic status on the type of program one enrolled in national polytechnics in Kenya.

The third objective of this study was to determine the effect of students socio-economic status on the type of program of study by students in National polytechnics in Kenya. Data was collected with the aid of questionnaires from the sampled students in eight national polytechnics. Multinomial logistic regression analysis was used to model the effect of socio-economic status on the type of program of study by students in National Polytechnics in Kenya while controlling for student level characteristics and college factor.

Thereafter, post estimation test of hypothesis for logistic regression revealed the likelihood-ratio for the type of program of $\chi^2(3) = 57.3$, $p = 0.017$ which was not statistically significant at $\alpha = 0.05$. The researcher therefore failed to reject the null hypothesis. These findings point to the fact that socio-economic status was insignificant in choice of programs by students in National polytechnics in Kenya. These findings were attributed to the fact that students from low SES who choose to pursue expensive programs , other mechanisms of financing can be resorted to .

5.3 Conclusions

The following conclusions were made based on the findings of this study.

With reference to the first objective, the study concluded that the cost of programs had effect on enrolment in pure/applied sciences and Engineering courses over Economics/business related disciplines and H/Hotel management by students in National Polytechnics in Kenya

Sex revealed to be an insignificant factor in the second objective. The study revealed that sex had no effect on the type of program of study by students in National polytechnics in Kenya.

Regarding the third objective, the study concluded that SES was an insignificant factor in choice of programs in national polytechnics.

5.4 Recommendations

The following recommendations were made on the findings of this study.

- 1 Financing mechanisms should be put in place to enable students in all the programs they are willing and able to enroll. Cost should not be factor to deter students from taking expensive programs.
- 2 The government should provide direct support for ethnic minority girls to pay fees and other related expenses in order to remain in college education.
- 3 The government should shift from the current curriculum-based system of education to Demand-driven Approach (CBC) where certification should be based on demonstration of competence. This will favour student trainees from low SES since the cost and duration of study will be reduced

5.5 Recommendations for Further Research

There are important issues that this study was unable to address due to its scope. In view of this, the following are suggested for further research.

- 1 A study on the factors that influence student's decision to enroll in different types of programs in Kenya.
- 2 A study on the relationships between Demand side characteristics and program enrollment type among students in national polytechnics in Kenya.
- 3 A study on the patterns/trends in the data that suggests the presence of significant associations between Demand-side characteristics and program of study.

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APPENDICES

APPENDIX 1: Questionnaire for national polytechnic students in their respective programs

DEMAND-SIDE CHARACTERISTICS AND TYPE OF PROGRAMME ENROLLED IN NATIONAL POLYTECHNICS IN KENYA.															
THIS QUESTIONNAIRE SHOULD BE ADMINISTERED TO THE STUDENTS IN RANDOMLY SAMPLED NATIONAL POLYTECHNICS IN KENYA															
SECTION 1: INTRODUCTION AND CONSENT															
DEAN OF STUDIES CONSENT															
Good morning/afternoon/evening sir/madam. My name is (RA's NAME). I am a research assistant carrying out research demand-side characteristics and type of programme in National Polytechnics in Kenya. Your institution was randomly sampled to participate in the study and I visit you today to seek your consent to collect data concerning cost of programme and selected characteristics of interest to the topic. These data are for academic purposes only. Summary statistics will be used and no names of institutions or respondents/students will be made known. I have the necessary research permits and letters of introduction from relevant offices (SHOW RESPONDENT THE DOCUMENTS) and now seek your consent for the data requested. All data will be held with utmost confidentiality and will only be available to the Principal Researcher. Your responses will not cause you and your institution any disadvantage. If you accept to participate in the study, you will be doing so voluntarily and there will not be any monetary returns. Any benefits of the research will be policy oriented intended to improve the finance and programming in National Polytechnics in Kenya. You are free to ask questions as we proceed. You may also opt not to respond to questions you do not feel comfortable answering. This interview will take about 30 minutes. Please feel free to contact the Principal Researcher should you have questions you would like clarified or for further information about the study. Susan Chilande, Tel. +254															
1.1	Do you give consent to participate in the study?							1=YES; 2=NO							
[IF 1=YES, THANK YOU VERY MUCH. NOW PLEASE PROCEED AND COMPLETE THE QUESTIONNAIRE]															
[IF 1.1=2, KINDLY ANSWER 1.2]															
1.2	Kindly let me know the reason why you would not wish to participate in this research														
	1=TOO BUSY/DO NOT HAVE TIME; 2=TIRED OF RESEARCH; 3=RESEARCH NOT BENEFICIAL;														
	4=NOT INTERESTED; 96=OTHER (specify)														
1.3	FOR USE BY PRINCIPAL RESEARCHER				QUESTIONNAIRE ID										
SECTION 2: TYPE OF PROGRAMME ENROLLED															
2.1	What is the name of the programme of study that you are enrolled in at this Polytechnic currently?														
	1=PURE AND APPLIED SCIENCES; 2=ENGINEERING; 3=BUSINESS AND ECONOMICS														
	4=HOSPITALITY AND HOTEL MANAGEMENT														
SECTION 3: COST OF PROGRAMME															
3.1	How many years will the programme you mentioned in 2.1 take you to complete?														
3.2	What is the TUITION fee for your programme of study in 2.1 for one academic year as indicated in the fees structure?														
3.2	What is the cost of other tuition-related expenses such as books, stationery, photocopying, printing etc for your programme mentioned in 2.1 in one academic year?														
SECTION 4: STUDENT CHARACTERISTICS															
4.1	What is your Sex							1=FEMALE; 2=MALE							
4.2	What is your date of birth? [DD/MM/YYYY]							D	D	M	M	Y	Y	Y	Y

APPENDIX 2: INTERVIEW GUIDE FOR PRINCIPALS IN NATIONAL POLYTECHNIC

PRELIMINARIES

- 1.1 Introduction: interviewer introduces himself and states the purpose of the interview
- 1.2 Assure the respondent of the confidentiality of the information provided
- 1.3 Explanation of the process, ask for consent to record/tape the session if consent is given, then settle for note taking

Interview items/questions

- 1.1 What is the distribution of student population in the four categories of programs offered in your national polytechnic
- 1.2 Is enrollment in courses affected by factors like student factors
If yes, how do the following factors affect enrollment
 - 1. Cost of programs
 - 2. Sex
 - 3. Socio-economic – status
- 1.3 What is the major determinant in choosing courses by students
- 1.4 How are the courses offered priced. Is there any variation in the cost? If yes what caused the variation in fees charged.
- 1.5 Does sex affect enrollment in various courses? If yes, what is the enrollment
 - 1. Pure one applied science
 - 2. Engineering and economics
 - 3. Hospitality and Hotel management
- 1.6 Does the student's socio-economic status affect enrollment by students in various courses?
- 1.7 Is the total enrollment in the various courses optimal or below?
- 1.8 Are there any interactions by the polytechnic to encourage enrollment in some costly courses? If yes, name them.
- 1.9 Apart from tuition fee, are there other levies to students? If so, explain
 - State of accommodation for students
 - Upkeep and maintenance
 - Library and stationery

Students' personal effects and clothing

- 1.10 How does the polytechnic handle equity issue
- 1.11 Are there any issues you would like other stakeholders to assist? for instance, the NGO's, National Government and County Government
- 1.12 In conclusion, state some possible recommendation you would give to improve the current status of your institution
- 1.13 Any other comment.

Closing session

Thank the interviewee for providing data for their research

APPENDIX 3: DOCUMENT ANALYSIS

NORMINAL ROLL

SERIAL NUMBER	RIGISTRATION NUMBER	PROGRAM
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

FEE STRUCTURE

SERIAL NO.	NAME OF PROGRAM	FEE CHARGES
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Appendix 4: Outputs for objective 1,2 and 3

Table 5.1: Correlation matrix between the outcome variable (a21=type of program) and its continuous explanatory variables for objective 1

Variable	a21	a32	a33
a21	1		
a32	a -0.210	1	
	b 0.654		
a33	a -0.465	-0.317	1
	b P<0.001	0.006	

Table 5. 1 Correlation matrix between the outcome variable (a21=type of program) and its continuous explanatory variables for objective 1

Table 5.2 Correlation matrix between the outcome variable (a21=Type of program) and its continuous explanatory variable for objective 2

Variable	a21	a65
a21	1	
a65	a -0.029	1
	b 0.005	

Table 5. 2 Correlation matrix between the outcome variable (a21=Type of program) and its continuous explanatory variable for objective 2

Table 5.3 Correlation matrix between the outcome variable (a21=Type of program) and its continuous explanatory variable for objective 3

Variable	a21	a32	a56
a21	1		
a32	a -0.045	1	
	b 0.731		
a56	a -0.039	-0.437	1
	b P<0.001	0.019	

Table 5. 3 Correlation matrix between the outcome variable (a21=Type of program) and its continuous explanatory variable for objective 3

Note a=Pearson correlation coefficient; b=p-values(alpha=0.05); pairwise correlation:<0.35 = weak correlation; 0.36-0.67 = moderate correlation; 0.68-0.89 = strong correlation; >0.90=Very strong correlation.

Table 5.4: Chi-square association between outcome variable and statistically significant variable Objective 1

Association between	χ^2	Df	p	Cramer's V
a21=Student program of study verses a32 Tuition fee	57.37	3	P<0.001	0.1351
a21=Student program of study verses a33 Related Expenses (exam)	50.79	3	P<0.001	0.1921
a21=Student program of study verses Meases 3.1 1=Low SES	27.17	3	P<0.001	0.2444
a21=Student program of study verses Meases 3.3 3=Higher SES	35.61	3	P<0.001	0.2798
a21=Student program of study verses a41 Male Student = 1	6.74	3	P=0.034	0.1217
a21=Student program of study verses a43 KCSE Score 6=C; 12=A	45.77	3	P<0.001	0.3172
a21=Student program of study verses a611 1 = SGL 0=otherwise	11.77	3	P=0.003	0.1608
a21=Student program of study verses a615 1=MBS 0=Otherwise	10.21	3	P=0.006	0.1498
a21=Student program of study verses a651 1=P&AP Sciences	8.54	3	P=0.014	0.1370
a21=Student program of study verses a652 3=Econ/Business	9.05	3	P=0.011	0.1410

Table 5. 4 Chi-square association between outcome variable and statistically significant variable Objective 1

Note: df=degree of freedom; n=cases with no missing data for the variable' cramer's V:0-19 = Weak Association 20-49=Moderate Association; >49 =Strong Association ; SGL=Sigalagala National Polytechnic; MBS=Mombasa National Polytechnic

Table 5.5 Chi-square association between outcome variable and statistically significant variable Objective 2

Association between	χ^2	Df	p	Cramer's V
a21=Student program of study verses a32 Tuition fee	57.37	3	P<0.001	0.1351
a21=Student program of study verses a33 Related Expenses (exam)	50.79	3	P<0.001	0.1921
a21=Student program of study verses Meases 3.2 2=Middle SES	27.17	3	P<0.001	0.2444
a21=Student program of study verses a41 Male Student = 1	6.74	3	P=0.034	0.1217
a21=Student program of study verses a43 KCSE Score 6=C; 12=A	45.77	3	P<0.001	0.3172
a21=Student program of study verses a611 1 = SGL 0=otherwise	11.77	3	P=0.003	0.1608
a21=Student program of study verses a615 1=MBS 0=Otherwise	10.21	3	P=0.006	0.1498
a21=Student program of study verses a651 1=P&AP Sciences	8.54	3	P=0.014	0.1370
a21=Student program of study verses a652 3=Econ/Business	9.05	3	P=0.011	0.1410

Table 5. 5 Chi-square association between outcome variable and statistically significant variable Objective 2

Note: df=degree of freedom; n=cases with no missing data for the variable' cramer's V:0-19 = Weak Association 20-49=Moderate Association; >49 =Strong Association ; SGL=Sigalagala National Polytechnic; MBS=Mombasa National Polytechnic

Table 5.6: Chi-square association between outcome variable and statistically significant variable Objective 3

Association between	χ^2	Df	p	Cramer's V
a21=Student program of study verses a32 Tuition fee	57.37	3	P<0.001	0.1351
a21=Student program of study verses a33 Related Expenses (exam)	50.79	3	P<0.001	0.1921
a21=Student program of study verses Meases 3.1 1=Low SES	27.17	3	P<0.001	0.2444
a21=Student program of study verses Meases 3.3 3=Higher SES	35.61	3	P<0.001	0.2798
a21=Student program of study verses a41 Male Student = 1	6.74	3	P=0.034	0.1217
a21=Student program of study verses a43 KCSE Score 6=C; 12=A	45.77	3	P<0.001	0.3172
a21=Student program of study verses a611 1 = SGL 0=otherwise	11.77	3	P=0.003	0.1608
a21=Student program of study verses a615 1=MBS 0=Otherwise	10.21	3	P=0.006	0.1498
a21=Student program of study verses a651 1=P&AP Sciences	8.54	3	P=0.014	0.1370
a21=Student program of study verses a652 3=Econ/Business	9.05	3	P=0.011	0.1410

Table 5. 6 hi-square association between outcome variable and statistically significant variable Objective 3

Note: df=degree of freedom; n=cases with no missing data for the variable' cramer's V:0-19 = Weak Association 20-49=Moderate Association; >49 =Strong Association ; SGL=Sigalagala National Polytechnic; MBS=Mombasa National Polytechnic

Table 5.7: Post Estimation of the average marginal effect over the Estimation Sample using the delta method, Objective 1

Pure and applied sciences Vs Hospitality and Hotel management						
Variable	dy/dx	Std. Err	Z	P>z	[95% confidence interval]	
a32	0.00	0.00	0.48	0.432	0.00	0.00
a33	0.05	0.03	1.3	0.154	-0.02	0.12
Meases 3.1	-0.10	0.06	-1.90	0.058	-0.20	0.00
Meases 33	0.04	0.09	1.16	0.247	0.08	0.21
a41	0.14	0.03	4.79	<0.01	0.07	0.20
a43	0.09	0.01	9.18	<0.01	0.03	0.11
a611	-0.023	0.10	3.10	0.002	-0.44	0.15
a615	-0.04	0.04	-2.21	0.027	-0.12	0.05
a616	0.08	0.05	1.14	0.392	-0.03	0.18
3=Engineering Vs Economics/Business						
a32	0.00	0.00	0.48	0.432	0.00	0.00
a33	0.05	0.03	1.3	0.154	-0.02	0.12
Meases 3.1	-0.10	0.04	-1.90	0.058	-0.20	0.00
Meases 33	0.04	0.04	1.16	0.248	0.08	0.21
a41	0.14	0.03	4.79	<0.01	0.07	0.20
a43	0.09	0.01	9.18	<0.01	0.03	0.11
a611	-0.023	0.10	3.10	0.003	-0.45	0.15
a615	-0.04	0.04	-2.21	0.026	-0.12	0.05
a616	0.08	0.06	1.14	0.395	-0.03	0.18

Table 5. 7 Post Estimation of the average marginal effect over the Estimation Sample using the delta method, Objective 1

Table 5.8: Post-estimation Likelihood Ratio Test

a61	Df	Chi2	p>Chi2	-2*log ll	Res. Df	AIC
Original Model				408.86	1628	331.86
a32	2	0.09	0.670	305.96	1628	329.96
a33	2	0.40	0.101	312.28	1628	336.26
Meases 3.2	2	6.40	0.045	309.90	1628	333.9
a41	2	4.04	0.318	306.86	1628	330.86
a43	2	1.00	0.103	308.82	1628	332.52
a611	2	2.66	0.014	311.92	1628	335.92
a615	2	6.06	0.070	309.15	1628	403.85
a616	2	3.28	0.201	307.5	1628	329.87

Table 5. 8 Post-estimation Likelihood Ratio Test

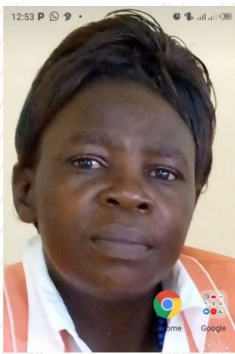
Note: Terms dropped one at a time in turn; Df=Degrees of freedom; ll=Likelihoof

Table 5.9: Post Estimation of the average marginal effect over the Estimation Sample using the delta method, Objective 3

Pure and applied sciences Vs Hospitality and Hotel management						
Variable	dy/dx	Std. Err	Z	P>z	[95% confidence interval]	
a32	0.00	0.00	0.48	0.432	0.00	0.00
a33	0.05	0.03	1.3	0.154	-0.02	0.12
Meases 3.1	-0.10	0.06	-1.90	0.058	-0.20	0.00
Meases 33	0.04	0.09	1.16	0.247	0.08	0.21
a41	0.14	0.03	4.79	<0.01	0.07	0.20
a43	0.09	0.01	9.18	<0.01	0.03	0.11
a611	-0.023	0.10	3.10	0.002	-0.44	0.15
a615	-0.04	0.04	-2.21	0.027	-0.12	0.05
a616	0.08	0.05	1.14	0.392	-0.03	0.18
3=Engineering Vs Economics/Business						
a32	0.00	0.00	0.48	0.432	0.00	0.00
a33	0.05	0.03	1.3	0.154	-0.02	0.12
Meases 3.1	-0.10	0.04	-1.90	0.058	-0.20	0.00
Meases 33	0.04	0.04	1.16	0.248	0.08	0.21
a41	0.14	0.03	4.79	<0.01	0.07	0.20
a43	0.09	0.01	9.18	<0.01	0.03	0.11
a611	-0.023	0.10	3.10	0.003	-0.45	0.15
a615	-0.04	0.04	-2.21	0.026	-0.12	0.05
a616	0.08	0.06	1.14	0.395	-0.03	0.18

Table 5. 9 Post Estimation of the average marginal effect over the Estimation Sample using the delta method, Objective 3

APPENDIX 6: Research Permit

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