



Influence of Institutional Context Factors on Female Students' Career Choice in TVET Science Programmes in Technical Training Institutes in Siaya County, Kenya

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Abstract

Choice of science-based careers by female students in Technical and Vocational Education and Training (TVET) institutes and particularly Technical and Training Institutes (TTIs) has attracted a lot of attention of education planners, economists and administrators the world over. To that extent, the government of Kenya has made numerous interventions including lowering of college entry points to favor female students. In spite of such affirmative action, female students choosing careers in TVET science programmes are still few and especially in Siaya County, Kenya. The purpose of this proposed study was to determine the Influence of institutional context factors on female students' career choice in TVET science programmes in Technical Training Institutes in Siaya County, Kenya. The objective of this study is to establish the influence of institutional context factors on female students' career choice in TVET science programmes in Technical Training Institutes in Siaya County, Kenya. The study was adopted descriptive survey design. The sample size for the study was 437 female students, 121 lecturers and 327 male respondents. Census, proportionate and simple random sampling techniques was used to select respondents in different strata and TTIs. The finding of the study showed that Institutional Context Factors have a significant influence of 22.8% with negative variation on Female Students' Career Choice in Science TVET Programmes. The study recommended that institutional factors must be strengthened to enable more female students to choose careers in TVET science programmes.

Key words: Institutional Context Factors, Female Students', Career Choice, TVET Science Programmes

INTRODUCTION

Background of the Study

It is believed that TVET is the foundation of any sustainable technological development (Medugu, & Bappah, 2013). 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. United Nations Educational Scientific and Cultural Organization UNESCO (2003) recorded that in Arab states, 35% of students are women and that in India access to higher education is restricted to girls, while in Indonesia, there are fewer women in college yet there are more 19-29-year-old age group women than men in the country.



A closer look at the courses young women choose and the career opportunities these fields open up shows that a gender gap still exists in the field of technical courses such as Science, Technology, Engineering and Mathematics. Women opt for language, literature and arts when they have to choose their major. The proportion of female students in the field of engineering at universities in Germany is only 14%, and the same trend, although not as pronounced, can be identified in other countries in the EU, for example, the percentage in Poland is 24%, and in France 27%. This situation is similar in countries outside Europe (European Commission, 2009).

Kenya recognizes the role of education and training in contributing to the Gross Domestic Product (GDP) with particular emphasis on TIVET (Republic of Kenya, 2007). The subsector has been identified as one that will be able to spur economic development within the next 13 years and help achieve Vision 2030. Recently, Kenya revitalized the TVET subsector in order to locate herself strategically in the international scene (Republic of Kenya, 2012). According to Ramani (2004), a workshop organized by Kenyatta University and the World Bank on gender mainstreaming in public universities in Kenya, reported that although gender disparities in students' enrolment exist at all levels of tertiary education, they are particularly wide in sciences programs, with special reference to mathematics and technical disciplines. It was also reported that women are concentrated in what is perceived as traditional female social science and education disciplines (Sifuna, 2006). Enrolment in TVET programmes also show the same trend whereby fewer female students enroll in TVET science programmes. A typical case is that of Siaya County, Kenya. In view of the low enrolment in TVET science programmes by female students, the researcher sought to investigate the influence of institutional context factors on female students' career choice in TVET science programmes in Technical Training Institutes in Siaya County, Kenya.

Statement of the Problem

The problem which this study sought to address is that fewer female students choose careers in TVET science programmes in TTIs in Siaya County. It is clear that fewer female students than male choose careers in TVET science programmes. Kenya's Vision 2030 initiative aims at making the country a fully industrialized middle-income country providing high quality life for all its citizens (Government of Kenya, 2017). Realization of vision 2030 also calls for harnessing of technological ability of both men and women in the country. However, from the background of the study, it is clear that choice of career in science TVET programmes by female students in TTIs is not at par with their male counterparts. Low number of female students choosing careers in science TVET programmes portends a problem because it implies that more women may remain unemployed. This study sought to investigate the influence of institutional context factors on female students' career choice in TVET science programmes in Technical Training Institutes in Siaya County, Kenya.

Research Objective

The objective of this study was to assess the influence of institutional context factors on female students' career choice in TVET science programmes in Technical Training Institutes in Siaya County, Kenya.

Research Hypothesis



H₀₁: Institution context factors do not have a significant influence on female students' choice of careers in TVET science programmes in Technical Training Institutes in Siaya County, Kenya.

Scope of the Study

This study concentrated on the institution institutional context factors, which influence female students' career choice in science TVET programmes. The variables under study shall be investigated only in Technical Training Institutes in Siaya County, Kenya

LITERATURE REVIEW

Female Students' Enrolment in Science Courses in Tertiary Education

A study conducted in Nigeria found out that 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). The matter of female students' enrolment in TVET courses is of great concern in Kenya because not only are some of the fastest growing job categories computer related and have the highest average pay rates, but also, women need to be part of an industry that is shaping their lives in profound ways (Kerre, 2001). It is therefore imperative that further research is undertaken to identify factors that influence women's choice of career in TVET courses in TTIs.

Institutional context Factors Which Influence Female Students' Career Choice in Science TVET Programmes

Lecturers' Experience

Generally speaking, most of the TTIs in Kenya have an acute shortage of qualified lecturers. This discourages students from taking such courses, in general (Kiamanesh, 2014). Lecturer style was among the top two considerations when selecting a course. Lack of qualified lecturers can contribute to the success or failure of the students at the technical and vocational institutions (Babad, & Tayeb, 2003). It is therefore necessary to look into the influence of quality of lecturers on female students' career choices in science TVET programmes.

Curriculum Based Factors

In India, girls undertaking engineering disciplines admitted that they were slightly handicapped due to less physical strength when working in some of the laboratories and workshops (Nguyen, 2000). Therefore, the curricula should be revised and developed in a way that it favors female students. Nguyen (2000) proposes therefore that there is a need to revise the curricula for engineering courses.

Classroom Environment

Classroom environment is a close second to college peer group influence, interns of overall effect upon students. Thus, the characteristics of the teaching force, in terms of gender, qualifications and competency are a major component of the classroom environment (Muhonja, 2011). Glynn et al. (2011) postulated that, individual achievement, behavior, self-esteem, and feeling of loneliness and alienation, especially women, are often the result of a mismatch between the student and the college environment.



Theoretical Framework

Social Cognitive Theory

Many studies on student motivation in science education have been conducted based on social cognitive theory (SCT) (Bandura, 1986). Based on SCT, motivation to learn is explained by the premise that a learner's thoughts, beliefs, and emotions enable his or her behavior to be energized, directed, and sustained (Glynn, Brickman, Armstrong, & Taasoobshirazi, 2011; Schunk, Pintrich, & Meece, 2008). Intrinsic motivation occurs naturally in a learner's mind; thus, it is the core factor that drives a learner's self-efficacy and self-regulation (Ryan, & Deci, 2000; Ahmed et al., 2013). Value judgments have been studied based on their intrinsic interest, usefulness, and necessity for one's life (Eccles, & Wigfield, 2002). This theory is applicable to this study because female students' choice of specific TVET courses is herein assumed to be motivated by extrinsic factors (economic, institutional context and social cultural factors). Female students' choice of specific TVET courses is also herein assumed to be motivated by intrinsic factors (psychological factors such as interests).

RESEARCH DESIGN AND METHODOLOGY

Research Design

The design for this study will be descriptive survey design. Descriptive surveys are designed to obtain pertinent and precise information concerning the current status of phenomena and whenever possible to draw valid general conclusions from the facts discovered (Kothari, 2004). The design is suitable because surveys are non-experimental and that they deal with occurrences and relationships among non-manipulated variables.

Location of the Study

Siaya County is located in western part of Kenya. It consists of Bondo, Gem, Siaya, Ugenya, Ugunja and Rarieda Sub-Counties. It neighbours Busia County to the North and North West, Kakamega County to the North East, Vihiga and Kisumu Counties to the East and Lake Victoria to the South. The County has three public Technical Training Institutes namely Bondo and Nyang'oma TTIs in Bondo Sub-County and Siaya TTI in Siaya Sub-County.

Population of the Study

The study was conducted in 3 Public Technical Training Institutes in Siaya County that offer TVET science programmes. Siaya, Bondo and Nyangoma TTIs have totals of 386, 109 and 132 female students respectively who chose careers in TVET science programmes in 2016 and 2017. Therefore, the target population of female students is 627. The institutions also have 44(30 male and 14 female), 36(25 male and 9 female) and 41(35 male and 6 female) lecturers respectively making a target population of 121 for lecturers. The target population for male students who chose TVET science programmes in 2016 and 2017 is 2191: 1060 (Siaya TTI), 504 (Bondo TTI) and 627(Nyangoma TTI). These are the students who persist in the institutions given the length of the certificate and the diploma programs.

Sampling Procedure and Sampling Size

Sampling Procedures

Using census method, all female students enrolled in certificate and diploma programmes in Bondo and Nyangoma TTIs were sampled because they are few. Krejcie and Morgan Table of Sample Size Determination were used to determine the sample size from 386 female from Siaya



TTI students given that the number is large. Census method was used to sample all lecturers, male and female. Krejcie and Morgan table of sample size determination was used to sample male students who chose TVET science programmes in each TTI. Finally, simple random sampling technique was used to select female students from Siaya TTI and male students in the three TTIs who participated in the study. Census method shall was used to select all the three principals from the TTIs to participate in the study.

Sample Size

Table 1: Sample Size for Female Students and Lecturers per TTI

Siaya TTI	Bondo TTI	Nyangoma TTI	Total
Sample size allocation for female students 196(K and M table)	Sample size for female students 109(census)	Sample size allocation for female students 132(census)	437
Sample size allocation for lecturers 44	Sample size for lecturers 36	Sample size allocation for lecturers 41	121

Table 2: Sample Size for Male Students per TTI

Siaya TTI	Bondo TTI	Nyangoma TTI	Total
Sample size allocation for male students 158	Sample size for male students 75	Sample size allocation for male students 94	327

Instrumentation

This research study used an Interview Schedule for principals, Lecturers’ Questionnaire, Female Students’ Questionnaire and Male Students’ Questionnaire. Female Students’ Questionnaire sought data on institutional context factors, which influence female students’ choice of careers in TVET science programmes.

Validity of Instruments

Experts in area of education management and leadership analyzed each item so as to ascertain both construct and content validity.

Reliability of Instruments

Table 3: Test retest Reliability

Variable	N	Pearson Correlation	Assessment
Institutional Context Factors	89	0.972	Reliable

Test re-test results yielded Pearson Correlation coefficient above 0.7 indicating that the questionnaire was reliable.

RESULTS AND DISCUSSIONS

Frequencies of Institutional Context Factors



Table 4 presents the frequencies of institutional context factors which influence female students' choice of career in TVET institutions

Table 4: Frequencies of Institutional Context Factors reported by Female Students

Statement	N	SD	D	A	SA
students chose careers in TVET because my TTI gives them career counseling	435	20.7%	52.2%	27.1%	0.0%
students chose careers in TVET because my TTI has well trained tutors	435	10.6%	38.6%	50.8%	0.0%
Students choose careers in TVET because my TTI has enough relevant books	435	14.7%	63.0%	22.3%	0.0%
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	435	12.6%	13.8%	36.3%	37.2%
My TTI has spacious workshops	435	12.6%	63.2%	22.5%	1.6%
My TTI has enough laboratories	435	7.6%	9.0%	31.3%	52.2%
My TTI has enough lecture halls	435	5.3%	41.8%	14.7%	38.2%
TTI Principal gives approval of students' choice of career in science TVET programmes	435	6.9%	14.7%	25.3%	53.1%
Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	435	3.9%	10.3%	34.3%	51.5%
Students motivated one another to choose careers in science TVET programmes during registration	435	4.1%	11.5%	33.3%	51.0%
Classroom environment influences female students from choosing careers in science TVET programmes	435	5.3%	9.7%	31.7%	53.3%
Curriculum design favors male students but not female students in regard to career choice in science TVET programmes	435	5.3%	12.0%	32.2%	50.6%
Female students attain the entry requirement for pursuing the TVET courses they choose	435	9.4%	9.4%	41.4%	39.8%
Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	435	5.7%	11.3%	58.9%	24.1%

Table 4 shows that female students disagree that they chose careers in TVET because their respective TTIs provide career counseling (72.9% disagree and strongly disagree). It means that career counseling is largely lacking in TTIS. Career counseling is crucial in career choice. This could explain why many female students do not choose careers in TVET. Students chose careers in TVET because the TTI has well trained tutors (49.2% disagree and strongly disagree). This is because they are not able to tell whether tutors are well trained prior to choosing a particular TTI. However, some female students noted that they choose careers in TVET because the TTI is well known for quality training in TVET programmes (73.5% agree and strongly agree). It implies that choice of a career in a given TTI is based on its reputation. That sits well with the 50.8% who



chose careers in TVET because a TTI has well trained tutors. Quality of lecturers has been established to influence choice of a course in a specific institution.

Female students (63.2%) disagree that that they choose careers in TVET because their respective TTIs have enough relevant books. This is because they are not able to tell whether books are available prior to choosing a particular TTI. However, quality or availability of books has been established to influence choice of a career in a specific institute. About 63.2% of the respondents disagreed that female students choose careers in TVET because their respective TTIs have spacious workshops. Another 41.8% also disagreed that female students choose careers in TVET because the TTI has lecture halls. This is because either lecture halls or workshops are not available or they are not able to tell whether lecture halls or workshops are available prior to choosing a particular TTI. Both cases do not auger well for career choice in TVET. Good workshops and lecture halls influence choice of career and quality of career training. If there are no good lecture halls and workshops, few students are likely to enroll in TVET programmes. Up to 83.5% agreed that female students choose careers in TVET because their respective TTIs have enough laboratories. That TTI principal give approval of students' choice of career in science TVET programmes was agreed to by 78.4% of the female students. This makes factual sense because principals are the ones who sign admission letters. College principals seem to have an influence over what students choose as careers.

Female students (85.8%) agreed or strongly agreed that lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration. Many lecturers are involved in registration exercises for college students. Similarly, students noted that they motivate one another to choose careers in science TVET programmes during registration. Classroom environment influences female students' choice of careers in science TVET programmes (85% agreed or strongly agreed). About 83% of female respondents reported that curriculum design favors male students but not female students in regard to career choice in science TVET programmes. Gender biases in curriculum design could explain why fewer female students chose careers in science TVET. Female students attain the entry requirements for pursuing chosen TVET courses (81.2% agreed or strongly disagree). It implies that those who do not enroll in the programmes may not be qualified: which could be another plausible explanation for fewer female students choosing careers in TVET.

Means of Institutional Context Factors reported by female students.

Table 10: Means of Institutional Context Factors reported by female students

Statement	N	Mean	SD
Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	435	3.01	0.76
Female students attain the entry requirement for pursuing the TVET courses they choose	435	3.11	0.93
Curriculum design favors male students but not female students in regard to career choice in science TVET programmes	435	3.28	0.87
Classroom environment influences female students from choosing careers in science TVET programmes	435	3.33	0.86
Students motivated one another to choose careers in science TVET programmes during registration	435	3.31	0.83



Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	435	3.33	0.82
TTI Principal gives approval of students' choice of career in science TVET programmes	435	3.25	0.95
My TTI has enough lecture halls	435	2.86	0.99
My TTI has enough laboratories	435	3.28	0.92
My TTI has spacious workshops	435	2.13	0.63
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	435	2.98	1.00
Students choose careers in TVET because my TTI has enough relevant books	435	2.08	0.60
students chose careers in TVET because my TTI has well trained tutors	435	2.40	0.67
students chose careers in TVET because my TTI gives them career counseling	435	2.06	0.69
Institution Context Factors Overall Index	435	2.89	0.41

Table 5 shows that respondents agreed that institutional context factors influence female students' choice of careers in TVET. The respondents however disagreed that students chose careers in TVET because their respective TTI gave them career counseling, had well trained tutors or had enough relevant books.

Difference in Perception of Institutional Context Factors by Institute

ANOVA test was conducted to determine whether there existed a significant difference in perception female students of Institutional Context factors among X, Y and Z Technical Training Institutes at 0.05 alpha levels. Table 7 illustrates the finding of the analysis.

Table 7: Difference in Perception of Institutional Context factors by Females respondents by Institute.

	Sum Squares	ofDf	Mean Square	F	Sig.
Between Groups	3.345	2	1.673	10.518	.000
Within Groups	68.697	432	.159		
Total	72.042	434			

The finding showed that there exists a statistically significant difference in perception of Institutional Context factors across X, Y and Z Technical Training Institutes by female respondents at the 0.05 alpha level, $F(2, 432) = 10.518, p < 0.05$.

Multiple Comparisons of Institutional Context Factors among the TTIs

A post hoc test using Tukey tests were carried out for the three pairs of groups. The Tukey post hoc test is generally the preferred test for conducting post hoc tests on a one-way ANOVA. The findings are shown in Table 8.

Table 8: Multiple Comparisons of Institutional Context Factors among the TTIs

Paired Group	Mean Difference (I-J)	Std. Error	Sig.
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Nyangoma TTI - Siaya TTI	-0.19264*	.045	.000
Bondo TTI - Siaya TTI	-0.14892*	.048	.006
Bondo TTI- Nyangoma TTI	.04372	.052	.676

*. The mean difference is significant at the 0.05 level.

The study shows that there was a significant difference between X TTI and Z TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET ($p < 0.05$) in favor of Z TTI.

Further, Table 8 it shows that there was a significant difference between Y TTI and Z TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET ($p < 0.05$) in favor of Z TTI. There was no significant difference between Y TTI and X TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET (p is greater than 0.05) in favor of Z TTI. That could explain why Z TTI has more female students choosing careers in TVET.

Correlation between Institutional Context Factors and Female Students' Choice of Career in TVET

Table 9: Correlation between Institutional Context Factors and Female Students' Choice of Careers in TVET

		Institutional Context Factors
Female Students' Career Choice in Science TVET programmes	Pearson Correlation Coefficient	-.511**
	Sig. (2-tailed)	.000
	N	555

**.. Correlation is significant at the 0.01 level (2-tailed).

The findings revealed that there exists a negative and statistically significant relationship between institutional context factors and female students' career choice in science TVET Programmes ($r = -0.511^{**}$; $p < 0.01$). This implies that the persistent lack of institutional context factors such as classroom environment, lecture halls, nature of workshops and laboratories could cause fewer female students to choose careers in science TVET programmes. It appears that lack of instructional resources can discourage students from choosing careers in science courses.

Regression Analysis

Table 10: Regression Constants

MODEL	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
(Constant)	3.595	.153	23.463	.000
Institutional Context Factors	-.228	.027	-8.325	.000

a: Dependent Variable: Female Students' Career Choice in Science TVET Programmes



As regards the unstandardized beta coefficients, Institutional Context Factors have a significant influence of 22.8% with negative variation on Female Students' Career Choice in Science TVET Programmes.

Hypothesis Testing

H₀₁: Institution context factors do not have a significant influence on female students' choice of careers in TVET science programmes in Technical Training Institutes in Siaya County, Kenya. From Table 9, the unstandardized Regression Beta co-efficient of Institution context factors variable is 0.228 and its p value is less than 0.05 alpha. This leads to the rejection of the null hypothesis. The decision is made that Institution context factors have a significant influence on female students' choice of careers in TVET science programmes in Technical Training Institutes in Siaya County, Kenya.

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