

The Influence of Kenyan Secondary School Students' Gender on their Subject Choices

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ABSTRACT

Subject choice decision plays a major role in establishing youth in a path that opens as well as closes opportunities. Subject choice decisions in Kenya have been known to take a gendered perspective, thus condemning students to certain career paths. The main purpose of this study was to find out the influence of secondary school students' gender on their subject choices. Descriptive Survey Design was employed. The study concluded that subject choices in high schools take a gendered perspective. Different perceptions male and female students have in regards to their ability and competency in those classes influenced choice of subjects. School has a great role to play in influencing students' choice of subjects as availability of subjects depends entirely on what a school can offer. The study recommends students to consider their interests, personal academic goals while choosing subjects. The school should support subjects and careers decision making.

Key words: Career aspirations, Subject Choices, Secondary schools, Influence.

1.1 INTRODUCTION

Subject choice is considered as the most important thing for senior secondary school students because it is responsive to all sides of learners' interests, needs, preferences and choices. According to Barnes & McInerney, (2005); Lyons, (2006) a vast array of factors has been considered to be influential in enrolments and subject choice, particularly gender and achievement (Skelton, Francis & Read (2010). Similarly, Ainley, Robinson, Harvey, Beavis, Elsworth & Flemming, (1994) in their study among Australian students, identified a range of external factors which constraint subject selection including diminished subject availability, limited time frame for subject selection, time tabling restrictions, compulsory subjects, tertiary prerequisites, eligibility for entry to tertiary courses. They assert that internal issues such as locus of control, self-assessment of ability, vocational awareness, gender and interest in the subject offered also appear to affect the manner in which the students choose subjects. According to Tenenbaum (2008), the gender of a student can often affect their enrollment in a class. Men and women can have different values, and there are also certain standards or expectations that vary between genders. This study is an attempt to examine the influence of students' gender on their subject choices with a view to suggesting ways of assisting teachers, parents and school counselors in guiding the Kenyan students in their subject choices. It is hoped that the outcome of the study will serve useful purpose to teachers and school career teachers in particular, in their operation in secondary schools.

1.1.1 Gender and Students' Choices of Subjects in Secondary Schools

All over the world, Students look forward to the opportunity to choose their academic plans and classes. According to Barnes & McInerney, (2005); Lyons, (2006) a vast array of factors has been considered to be influential in enrolments and subject choice, particularly gender and achievement (Skelton, Francis & Read (2010). According to Tenenbaum (2008), the gender of a student can often affect their enrollment in a class. Men and women can have different values, and there are also certain standards or expectations that vary between genders. Tenenbaum asserts that gender differences are especially apparent in high school aged students. Females are less likely to enroll in science and math classes compared to men, but more likely to enroll in English classes. Nagy, Trautwein, Baumert, Koller and Garrett, (2006) explains that one reason for such disparity could be the different perceptions men and women have in regards to their ability and competency in those classes because students are more likely to enroll in classes where they think they can excel.

Despite the scores indicating that girls are capable, the gender gap still exists in classes like science and math. The main reason for this could be that, according to Tenenbaum, (2008) in a study in the U.K, parents use double the amount of discouraging comments towards daughters than they do to sons when it comes to the subjects their children take, which only enforces the stereotypes that already exist about gender differences leading females to feel less secure in certain subjects and opting to take other classes. In their research, Ainley & Ainley (2011a) found out that having a general interest in learning science predicts both current and intended future participation in science related activities and concluded that where science education is perceived as personally important to students and where they are doing well, a strong interest in learning science will result.

Some studies in Africa, similarly, reveal that there is gender disparity in subject choices among female and male students. At a conference organized by the Federation of African Women Educationists (FAWE), it was acknowledged that in many African states, girls are still restricted to studying what is perceived to be "soft option" Subjects, which has limited their access to scientific and technical disciplines in institutions of higher learning (Ramani, 2004). In a study carried out in

1999 by Female Education in Science and Technology in Africa (FEMSA, 1999), it was found out that certain subjects, such as home science was considered as meant for girls while certain subjects such as woodwork and metalwork was meant for boys. The imbalance trends also continue to tertiary level (Dlamini, Ngenye & Dlamini, 2004).

According to Jansen (2003), the issue of career choice and aspirations is aptly expressed in curriculum scholarship concerned with school subjects which focuses on their nature, design, and organization effects on learning and teaching, and attitudes among various categories of learners. Gordon (1995) asserts that even though schools may offer girls and boys the same school subject options, girls still tend to opt for the subjects perceived as feminine and those formally offered to girls only. Despite various initiatives towards integrating subjects or attempting towards interdisciplinary curricula, some school subjects continue to enjoy a superiority complex while others endure an inferiority complex (Gordon, 1995). According to Dorsey (1996) & Marira (1991), studies of school subjects are often fragmented and proceed with insular discourse of the discipline. They assert that these studies also tend to be conservative, focusing on technical limitations or deficiencies in teaching, learning and curriculum and assessment within the context of a particular school subject or subjects and their relative importance and suitability for boys or girls, thus setting the stage for the perpetual gender stereotyping of occupations. Certain subjects were deemed a male or female domain. Gordon (1995) & Dorsey (1996) concur that in Zimbabwe, the general perception among educators on the nature and power of subjects is that mathematics and science subjects are a preserve for boys while languages and humanities are considered a female domain.

Arowolo (2010) posits that schools through streaming practices stereotype the participation of girls and boys in secondary school technology subjects. Kithyo and Petrina (2002) argue that boys tend to be more equipped and oriented towards science and technology. Boys in mixed schools are also encouraged to enroll and perform well in these subjects. Furthermore, girls' schools do not offer technology subjects such as engineering; instead they offer domestic science and secretarial subjects.

According to Whitelaw, Milosevic & Daniels, (2000) in Nigeria, sex is probably the most important variable related to pupils' attitudes to science. Many studies for instance, Francis & Greer (1999), Jones, Howe & Rua (2000), reported that males have more positive attitudes toward science than females. Also, Osborne, Simons & Collins (2003) stressed that there is still a bias against physical sciences held by girls, suggesting that at an individual level the overwhelming majority of girls still choose not to do physical science as soon as they can. In the same vein, Aigbomian (2002) observed that boys perform better than girls in science, technical and mathematical subjects.

Drew (2011) posits that it could be argued that today the gender gap in STEM, meant as a women's gap in science, is no longer the most relevant question. Rather, the main issue is the persistent gender heterogeneity occurring in STEM studies and later careers. Men and women are indeed both quantitatively present in sciences, but differently enrolled in them. As found by (Drew, 2011), 58% of all bachelors, masters and doctorate in biology are awarded to women in the United States. More than 50% of the total number of PhD students in medicine and biological science are women, while they are a minority in physics, mathematics and statistics, computer and engineering (European Commission 2009) as cited by Drew (2011). This gender heterogeneity follows a traditional gender role division, structuring a general order among male-dominated sciences and female-dominated

sciences that might be considered the most topical issue distinguishing the gender gap in STEM studies and careers at present time (Drew, 2011).

Secondary school education in Kenya is designed to enable the youth to play an effective role in the life of the nation by impacting on them the necessary skills and knowledge and inculcating the right attitudes. According to Ayot and Patel as cited by Githaiga (2011), this is achievable through the 8-4-4 system of education which provides a diversified education consisting of twenty seven subjects in Secondary school curriculum. The Koech commission in reviewing the 8-4-4 system of education noted that there was need to reduce examinable subjects in secondary schools to a minimum of seven subjects and a maximum of nine in order to lessen the curriculum burden, thus the need for subject choices.

One alienable right granted to secondary school boys and girls in Kenya is the right to choose subjects at form two that they would like to pursue further and sit for at the form four examinations. Under the 8-4-4 system of education, it is stipulated that a boy and a girl cannot, in all honesty, sit for all subjects offered at the end of secondary school course. The Kenyan education system comprises of twenty seven subjects at secondary school level, the current Kenya National Examination Council, guidelines has categorized the subjects into five major groups.

- Group 1 - English, Kiswahili and Mathematics
- Group 2 - Biology, Physics and Chemistry
- Group 3 - History and Government, Geography, Religious Education.
- Group 4 - Agriculture, Computer, Home science, Woodwork, Metalwork, Building & Construction, Power Mechanics, Electricity, Drawing & Design, Aviation Technology and Computer
- Group 5 - Music, Business Studies, French, German, Arabic or Sign Language).

However, the candidates must enter for at least seven subjects selected from the above groups as follows: - All the three subjects in Group One, at least two subjects from Group Two, at least one subject from Group Three, At least one subject from the remaining groups 2, 3, 4 and 5. Candidates can sit for a maximum of nine and the extra one or two subjects can be selected from any of groups 2,3,4 and 5 (KNEC 2006).

From the above requirements it can be noted that only subjects in group one are compulsory. The rest of the 4 groups involve subjects that must be selected and these are the elective subjects, boys and girls require career guidance to be able to make informed decisions on subject choices. The choice of which subjects to study in third and fourth forms has been an issue to many of the students; an issue that has since received varied interpretations among the students themselves and the various stakeholders in the education fraternity. It is of paramount importance for students to make the right choice of subjects for this will impact them negatively or positively for the rest of their lives. From the literature reviewed, Stereotyping starts from the subject choice level and by the time students come to choose careers, they have internalized gender norms. The present study seeks to establish the influence of gender on subject choices of secondary school students and imbalance trends in subject choices.

1.2 Statement of the Problem

Education system in Kenya allows students to choose their career paths in secondary school, depending on the subjects they opt to specialize in. The choice is further affirmed through the performance in Kenya Certificate of Secondary Education (KCSE) before making their careers from which they are supposed to make choices.

Subject choice decision plays a major role in establishing youth in a path that opens as well as closes opportunities. Granrose and Portwood (1987) posit that the stage at which an individual first decides to take specific subjects in high school impacts significantly on an individual's subsequent career trajectory. Even though studies conducted by Ogungbemi and Ajayi (2009) has shown that adolescents think and plan their education in relation to their future vocational goals, experience revealed that lack of guidance at the time of selection often shatter the plans for them. Gender still play a major role in schools in subject choices thus defining students' career paths. Boys' schools offer woodwork while girls' schools offer Homescience. It is out of this concern therefore, that this study was conceived to investigate on the influence of students' gender on their subject choices.

1.3 RESEARCH METHODS

This study employed descriptive survey design. The design of the research was based on the survey method which is an attempt to collect data from a representative sample of the population in order to determine the current status of that population with respect to one or more variables, and generalize its findings (Mugenda & Mugenda, 2003). Survey was used in this study because it enabled the researcher to collect data from the point of views or opinions, information on attitudes and reasons for the choices they made. The design was adopted because the population to be studied was large to be observed directly and thus useful because of the economy both in time and money of taking a sample of population to generalize results for the whole population, resulting to in-depth, rich and meaningful research findings. Stratified random sampling was used to select a representative sample of 235 male and 157 female students from the selected schools. Use of form four students is quite significant since they had done four years of secondary education and were preparing to sit for K.C.S.E at the end of four year program. It is at the end of form four where transition occurs in one's career plans. It was therefore hoped that they were mature, had career plans and would give more realistic responses. The main instruments of data collection were questionnaires. Students' questionnaires were used. Validity of the research tools was determined by having experienced supervisors in the School of Education Moi University, who checked the questionnaires to evaluate the exactness of the items contained in the various instruments, while reliability of the research instruments was established by a pilot study in the neighboring Nandi Central Sub-county. Both descriptive and inferential statistics were used for data analysis.

1.4 RESULTS AND DISCUSSION

1.4.0 Influence of Gender on Subject Choices

1.4.1 Gender and group two subjects

The study sought to establish the influence of gender on students' subject choices. The results were as follows:

Cross tabulation was done in order to establish the subjects selected from group two by gender. The results are presented in Table 1.1.

Table 1.1 Cross Tabulation of Gender and Group two Subjects Selected

Gender		GROUP TWO SUBJECTS						Total	
		Bio/chem.	Phy /chem	phy/ Bio	Chemistry	Physics	Biology		
MALE	Frequency	93	10	4	3	9	0	92	211
	%	25.5	2.7	1.1	0.8	2.5	0.0	25.3	58.0
FEMALE	Frequency	104	7	1	0	2	3	36	153
	%	28.6	1.9	0.3	0.0	0.5	0.8	9.9	42.0
Total	Frequency	197	17	5	3	11	3	128	364
	%	54.1	4.7	1.4	0.8	3.0	0.8	35.2	100.0

The secondary school curriculum is structured in a way that a student has to at least take two science subjects. This study found out that girls go for Biological sciences while boys favor Physical sciences. As shown in Table 1.1, Biology/Chemistry combination was selected by 54.1% of the students who participated in this study, of which 25.5 % (N=364) were male students while 28.6 % (N=364) were female. It can be inferred that 44.1 % (n₁=211) of the male students chose Biology/Chemistry whereas 68.0% (n₂=153) of the female students chose Biology and Chemistry from group two subjects. This implies that more female students chose Biology and Chemistry combination from group two as compared to the male students. Physics/Chemistry was chosen by 4.7 % (N=364) of the students who participated in this study of which 2.7 % (N=364) were male students and 1.9 % (N=364) were female students.

The findings of this study indicate that gender gap still exist in sciences. The findings of this study agree with (Murithi, 1996) that female students have been noted to shy away from Physics. In the same vein, Osborne et al. (2003) stressed that there is still a bias against physical sciences held by girls, suggesting that at an individual level the overwhelming majority of girls still choose not to do physical science as soon as they can. The findings of this study further agree with those of (Drew, 2011), who posits that , today, the gender gap in STEM, meant as a women's gap in science, is no longer the most relevant question. Rather, the main issue is the persistent gender heterogeneity occurring in STEM studies and later careers. Men and women are indeed both quantitatively present in sciences, but differently enrolled in them. As found by (Drew, 2011), 58% of all bachelors, masters and doctorate in biology are awarded to women in the United States. More than 50% of the total number of PhD students in medicine and biological science are women, while they are a minority in physics, mathematics and statistics, computer and engineering (European Commission, 2009) as cited by (Drew, 2011).

Further statistical analysis indicates that there is a significant relationship between gender and the selection of subjects in group two. These results are presented in Table 1.2.

Table 1.2: chi-square results on gender and group two subject choice

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.403	6	.000
Likelihood Ratio	32.277	6	.000
Linear-by-Linear Association	18.731	1	.000
N of Valid Cases	364		

As shown in Table 1.2, a chi-square value of 29.403 was obtained with d.f. =6 and p<0.05. Since p<0.05, it implies that there is a significant relationship between gender and group two subjects.

1.4.2 Gender and group three subjects

It was important for this study to establish the relationship between gender and selection of subjects in group three. The findings are shown in Table 1.3.

Table 1.3: Cross Tabulation of Gender and Group three Subjects Selected

Gender		GROUP THREE SUBJECTS							
		CRE/Geo	CRE/Hist	GEO/Hist	Rel.	Geo.	Hist.	All	Total
Male	Frequency	28	77	16	6	55	27	2	211
	%	7.7	21.2	4.4	1.6	15.1	7.4	0.5	58.0
Female	Frequency	59	69	0	10	15	0	0	153
	%	16.2	19.0	0.0	2.7	4.1	0.0	0.0	42.0
Total	Frequency	87	146	16	16	70	27	2	364
	%	23.9	40.1	4.4	4.4	19.2	7.4	0.5	100.0

Table 1.3 shows that 7.7 % (N=364) of the students who participated in this study were male students who chose CRE/Geography combination while 16.2 % (N=364) were female. A further 21.2% were male students who chose CRE/History whereas 19.0 % (N=364) were female. It is instructive to note that more (67.8%, $n_2=153$) female students chose CRE/Geography while more (52.7%, $n_1=211$) male students chose CRE/History. However, a small proportion (0.5%, N=364) of the students who participated in this study chose all the subjects in group three. The findings of the study indicate that History, History/CRE combination is popular among the boys while CRE, Geography/CRE combination is popular among the girls. Further statistical analysis indicates that there is a significant relationship between gender and the selection of subjects in group three. These results are presented in Table 1.4.

Table 1.4: Chi-square results on Gender and group Three Subject Choice

	Chi-Square Tests		
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	72.952	6	.000
Likelihood Ratio	90.143	6	.000
Linear-by-Linear Association	52.001	1	.000
N of Valid Cases	364		

As shown in Table 1.4, a chi-square value of 72.952 was obtained with d.f. =6 and $p<0.05$. Since $p<0.05$, it implies that there is a significant relationship between gender and group three subjects selected by the students who participated in this study. This relationship was also revealed through the descriptive statistics that indicated that there were more female students who chose CRE and CRE/Geography combination whereas more male students selected History and CRE/History combination.

1.4.3 Gender and group four subjects

Cross tabulation of gender and group four subjects selected by the respondents was done and the results presented in Table 1.5.

Table 1.5: Cross Tabulation of Gender and Group four Subjects Selected

		Technical Subjects					Total
		computer	agriculture	woodwork	home science	none	
MALE	Frequency	14	93	2	0	102	211
	%	3.8	25.5	0.5	0.0	28.0	58.0
FEMALE	Frequency	5	56	2	3	87	153
	%	1.4	15.4	0.5	0.8	23.9	42.0
Total	Frequency	19	149	4	3	189	364
	%	5.2	40.9	1.1	0.8	51.9	100.0

As indicated in Table 1.5, 28.0 % (N=364) of the students who did not choose any subject from group four were male students while 23.9 % (N=364) were female. Another 25.5 % (N=364) of the students who chose agriculture from group four subjects were male whereas 15.4 % (N=364) were female.

Results on the relationship between gender and group four subject choice are presented in Table 1.6. The results show that gender and selection of group four subjects is not significant as indicated by a p-value of 0.071 which is greater than 0.05.

Table 1.6: chi-square results of gender and group four subject choice

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.619	4	.071
Likelihood Ratio	9.793	4	.044
Linear-by-Linear Association	3.592	1	.058
N of Valid Cases	364		

1.4.5 Gender and group five subjects

Table 1.7 shows cross tabulation of gender and group five subjects selected.

Table 1.7: Cross Tabulation of Gender and Group five Subjects Selection

		Creative subjects						Total	
		business	French	German	Arabic	sign language	music		None
MALE	Frequency	114	4	1	1	2	1	88	211
	%	31.3	1.1	0.3	0.3	0.5	0.3	24.2	58.0
FEMALE	Frequency	105	0	0	0	2	1	45	153
	%	28.8	0.0	0.0	0.0	0.5	0.3	12.4	42.0
Total	Frequency	219	4	1	1	4	2	133	364
	%	60.2	1.1	0.3	0.3	1.1	0.5	36.5	100.0

Table 1.7 reveals that 31.3 % (N=364) of the students who chose business studies were male while 28.8 % (N=364) were female. Further, 24.2 % (N=364) of the students who did not choose any group five subjects were male as 12.4 % (N= 364) were female.

Table 1.8 shows the chi-square results on the relationship between gender and group five subjects selected by the students who participated in this study. The study found out that Business Studies was the only subject in group five that was offered in all schools. Other subjects in this group such as Foreign Languages, Music and Kenyan Sign Language were not offered in most schools.

Table 1.8: chi-square results on gender and group five subject choices

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.318	6	.079
Likelihood Ratio	13.562	6	.035
Linear-by-Linear Association	6.123	1	.013
N of Valid Cases	364		

The results recorded in Table 1.8, show that there is no significant relationship between gender and group five subjects selected by the students who participated in this study. The results obtained indicates a chi-square value of 11.318 and a p-value of 0.079 with degrees of freedom=6. The findings of this study agree with those a study carried out by Female Education in Science and Technology in African (FEMSA, 1999) in Nigeria, it was established that schools through streaming practices stereotype the participation of girls and boys in secondary school technology subjects. The study found out that certain subjects such as home science was considered as meant for girls while certain subjects such as woodwork and metal work as meant for boys. Based on their study in Kenya secondary schools, Kithyo and Petrina (2002) argue that boys' schools tend to be more equipped and oriented towards science and technology subjects while girls' schools do not offer technology subjects such as engineering; instead they offer domestic sciences and secretarial subjects. They assert that by the time students come to choose careers, they have internalized gender norms.

Cumulatively, the study sought to establish whether there exists a relationship between gender and subject choices. This was done using the scale provided where the students' perception on subject choices was categorized into negative, ambivalent and positive. Using the observed scores from the raw data, the findings indicate that a high percentage of male and female were ambivalent as far as subject choices was concerned. The specific descriptive statistics on the difference in students' perception on subject choices based on gender is presented in Table 1.9.

Table 1.9 Descriptive statistics on students' perception on subject choices

Gender	Subject choice							
	Negative		Ambivalent		Positive		Total	
	f	%	f	%	f	%	F	%
Male	50	13.7	105	28.8	58	15.9	211	58.0
Female	38	10.4	84	23.1	31	8.5	153	42.0
Total	88	24.1	189	51.9	89	24.4	364	100.0

As shown in Table 1.9, 28.8 %(105) of the male students and 23.1 %(84) of the female students who participated in this study were at ambivalent as far as subject choice is concerned. The findings also reveal that there were more male students (15.9%) who were positive towards subject choices than female students (8.5%). Further, 13.7 %(50) of the students were male with negative perception towards subject choice as compared to 10.4 %(38) of the students who were female students with negative perception towards subject choices.

There was need to establish statistically whether there exists a relationship between gender and subject choices. The results are presented in Table 1.10. This was necessary in testing the null hypothesis:

HO₁: There is no significant relationship between students' subject choices and their gender.

Chi-square was used to test the hypothesis. The results are shown in Table 1.10.

Table 1.10: chi-square results on relationship between gender and subject choice

	Value	df	Asymp. Sig. (2-sided)
Chi-Square	2.40	2	.001
N of Valid Cases	364		

As shown in Table 1.10, a chi-square of 2.40, d.f. =2 and p-value of 0.001 was obtained. Since $p < 0.05$, the null hypothesis was rejected. This implies that there is a significant relationship between gender and subject choice.

1.5 CONCLUSIONS AND RECOMMENDATIONS

From the findings of the study, it can be concluded that gender is factor that impacts on the choices of subjects that students make. In this study, male students dominated in all the combinations of science subjects except in Biology and Chemistry where there were more female students than male students. It was found that majority of the female students were taking Biology and Chemistry combination as opposed to the male students who favored physical sciences. Though from group three (humanities) subjects are not popular among high school students, the findings also indicated that the choices in this group took a gendered perspective with more female students taking CRE and Geography. Male students preferred Geography and History. The findings also revealed that there were more male students who were taking Agriculture than female students in group four subjects. In group five subjects, majority of the female students preferred business studies as compared to male students. Schools cultivated gender disparity in subject choices by being bias in the subjects they offer. Boys' schools offered woodwork while girls' schools offered Home science. Results of the hypothesis on subject choices indicate that the relationship is significant implying that there is significant influence of gender on students' subject choices.

Based on the findings of this study, the following recommendations are made;

Schools should ensure that they have working Career guidance departments with staff trained to offer the students services to achieve self-direction necessary to make informed choices and move towards personal goals. Further, programmes that will help the learners to have a positive attitude towards learning and take variety of subjects are recommended in schools. There is also need for schools to be equipped to be able to provide a variety of subjects especially in group 4 & 5 to enable students to have a wide range of options to make in order to take care of individual needs of the students.

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