

## Gender Differences in Career Aspiration among Public Secondary Schools Students in Nairobi County, Kenya.

Dr. Mwaura Margaret Nduta  
*Lecturer, St Paul University*

### ABSTRACT

Education precipitate career goals of which governments itself to achieve for economic productivity. The aim of this study was to investigate the relationship between gender and career aspiration of secondary schools' students. The Self-determination Theory and the Social Cognitive theory formed the theoretical framework in this study. The study took place in Nairobi County, Kenya. The sample of this study consisted of 397 form four students who were registered by KNEC to sit for KCSE exam in 2017 in public secondary schools in Nairobi County. Questionnaires containing career aspiration was piloted and used for data collection. The study adopted a correlation research design while Statistical Package for Social Sciences (SPSS) aided in inferential and descriptive statistical analysis. The data was analyzed qualitatively and quantitatively, guided by the study objective and the Chi-Square tests was carried out at 0.05 level of significance. The findings indicated some evidence of a significant gender difference with regard to career aspiration ( $\chi^2 = 9.31, df = 2, P = 0.019, P < 0.05$ ). The study concluded that gender is a real phenomenon that affected students' career aspirations. A major implication and recommendation of the study was that all educational stakeholders should work together in nurturing educational and home surroundings that can disable gender gaps and stereotypes in career choices. In this regard, encouraging flexibility in career aspirations is likely to deflect students to other vocations that are entirely different from their gender orientations. Further research should also consider other determinants of career aspiration such as cognitive factors, social structure, parental and teachers' characteristics.

**Keywords:** Gender, Career Aspirations, Career Choice, STEM, Femininity and Masculinity.

### I. INTRODUCTION

Career aspiration typically refers to a personal long-term career goal, plan, or dream that is far away in the future. Career aspiration is therefore complex and unique for each individual since it depends on cognitive factors and the social structure of the person. Self-awareness in career the process of career plan is crucial to avoid biased and stereotypical career choices. Career aspiration takes place in Secondary schools where students are prepared for their future occupation. However, the question of how gender differences arise in career aspiration is a central topic in psychology. This understanding can enable the development of intervention programs of career programs and development of educational policies (Wegemer & Eccles, 2019).

Gender is one of the most stable features that humans are born with it and upon which humans are classified as male and female and prejudiced. It is argued that adolescents internalize gender expectations as to what is "appropriate" male and female behavior in their gender ideology and this return affect career aspirations, academic motivation and academic self-efficacy (Maaik, Eva, Ineke & Tanja, 2016). Despite recognition by researchers of the importance of gender in career aspiration, relatively little attention has been given to the secondary schools' students in this regard. There are also scanty studies that have examined the value of gender differences in career aspiration in developing countries and especially Kenya making this study needful.

Although both girls and boys are accorded equal educational opportunities in our modern educational system, gender seem to fortify difference in career aspirations (Dasgupta & Stout, 2014, Wang & Degol, 2013). Moreover, boys seem to benefit more from higher school quality (Autor *et al.*, 2016) and perceived teacher quality (Hochweber & Vieluf 2018) than girls. Nevertheless, the reason for this disparity has not been adequately researched on. Women also seem to be overrepresented in traditionally feminine careers, (e.g. clerical and service fields) and underrepresented in traditionally masculine careers (e.g. in math- and science-related fields). For example, statistics shows that 91.9% of registered nurses are women, but women make up only 32.3% of physicians and surgeons (U.S. Bureau of Labor Statistics, 2011). This is despite bargains in women empowerment and operational barriers to the advancement of women in the labor force. Understanding career

aspiration can mitigate this disparity. Furthermore, careers chosen by women in disproportionately large numbers are often those careers that have lower prestige, status, and salary than their more “masculine” counterparts.

Career aspirations are formed at school level (Nyugen & Blomberg, 2014). More specifically, evidence suggests gender disparities in career aspiration appear early in adolescence, illustrating the need for early intervention. The motivation to pursue (or not pursue) a career may begin in adolescence where a variety of macro- and micro-level factors can inhibit later gender equity across STEM fields (Sinclair *et al.*, 2019, Stoet & Geary, 2018). Wang and Degol (2017) noted that career paths and preferences are often established in adolescence, and gender frequently plays a meaningful role in this decision-making process. Therefore, programs that cultivate aspiration towards STEM-centered learning in adolescence could lead to meaningful decreases in the gender gap within STEM (Wegemer & Eccles, 2019).

Career aspiration has been associated with academic performance in longitudinal studies (Nabil, 2015; Galyon *et al.*, 2012). Further, an array of studies by Rebecca *et al.*, 2014; Hafsyah *et al.*, 2015; Fericiano, 2014; Igere (2017), and Mettol and Kisilu (2016) found a relationship between career aspiration and academic performance making it necessary to investigate gender difference in career aspiration in order to facilitate the exploitation of full potential of both boys and girls. Unfortunately, gender-based stereotype may limit students' selection of some subject underpinned by low aspirations. Such need career information to demystify their perceived masculine and feminine pursuits.

Several studies have investigated gender with widely differing conclusions making it worth investigating gender differences in Kenyan context so as to offer valuable conclusions. Some studies found gender differences in educational orientations and career aspiration (Margriet, Hek, and Gerbert, 2019; Akos *et al.*, 2007; Adragna, 2009; Nadeem & Khalid, 2018; 2018; Bindu & Padmanabhan, 2016; Al- Bahrani *et al.*, 2020, Steven & David, 2015; Kiani, Hassan & Irfan, 2013, Wang & Degol, 2017) while others found gender difference insignificant (Jan-Ardies, Maeyer & Gijbels, 2015; Wairimu, 2012).

Some researchers (Makarova & Herzog, 2015) found that in comparison to males, female students had more diverse career aspirations though more inclined toward care giving careers. It is also argued that girls tend to have lower perceived self-efficacy for careers with a strong masculine gender construct orientation, like science, technology, engineering and math (STEM) careers due to gender stereotypes which has played a role of associating men with science and women with humanities. Kang, Hense, Scheersoi, & Keinonen (2019) confirmed that females preferred subjects such as biology, and males favored physics and chemistry. It appears the early competencies and requisite skills sets are present in both adolescent females and males, but females tend to engage in STEM careers at lower rates and in many cases forgo participating in a STEM centered college major. This may represent a potential departure of talents among girls and women who could otherwise become the next generation of scientists, engineers, and creators of technology (Dasgupta & Stout, 2014; College Board, 2014). These gender inequalities in course enrollments may also dissuade women from considering male-dominated STEM courses as viable options in the first place (Spencer, Logel, & Davies, 2016; Stoet & Geary, 2018;)

An aggregate of research indicates a longstanding marginalization and absence of women from the STEM field (Hughes *et al.*, 2013, Wang and Degol, 2017) making it necessary to initiate career programs in the schools to encourage girls to consider STEM oriented subjects in their future careers (Beier *et al.*, 2018). This is confirmed by the UNESCO statistics which indicate that; 18% of the girls take education against 11% who are boys; there are 14% female pursuing health and welfare against 7% who are boys. 7% of the girls take science against 12% who are male. There exist 5% girls in engineering and manufacturing against 20% who are girls.

However, research in this area is relatively scant and based primarily upon college students samples rather than adolescents, illustrating a gap in our understanding of how these programs may decrease gender effects on STEM career decidedness at earlier phases (Kang *et al.*, 2019).

In contrast, a study by Sadler *et al.*, (2012) observed that females in high schools were aspiring to pursue health and medicine related careers which were formally dominated by males while males aspired more for STEM related career. Kiani, Hassan and Irfan (2013) study with high school sample from both urban and rural zones of Rawalpindi found that medicine seemed to be a favorite for both females and males. Military was predominantly aspired by males whereas teaching was liked mostly by girls. Law was a favorite for the females and engineering was liked mostly by boys. This study shows a clear gender disparity in career aspiration.

Another study by Al-Bahrani *et al.*, (2020) which examined a sample of 2717 adolescent students representing tenth and eleventh grades revealed a statistically significant differences in the scores of aspirations among males ( $M = 27.83$ ,  $SD = 4.42$ ) and females ( $M = 29.75$ ,  $SD = 4.11$ ).

Other researchers (O'Dea, Lagisz, Jennions, & Nakagawa, 2018; Kiani, Hassan & Irfan, 2013) reported that the ability overlap between girls and boys is much greater in STEM, and smaller in non-STEM subjects, meaning that there are fewer boys competing with girls in non-STEM subjects. Boys should therefore be encouraged to venture into humanity subjects that are traditionally dominated by girls to widen their range of potential career. Bindu and Padmanabhan's (2016) study explored the level of career aspiration among higher secondary school students in Kerala state, India and the results suggested that gender influence the level of career aspiration.

A local study by Migunde, Agak and Odiwuor (2012) investigated the high schools students' career aspirations in Kisumu municipality, Kenya using RIASEC model by John Holland. The findings indicated social oriented career types were more popular with females than males at 86.84%. Artistic and conventional career types were preferred more by females than males while Realistic career types were chosen by more males at 81.8% followed by investigate and enterprising career types (Migunde *et al.*, 2012). Gender according to this study influences career aspiration. Career guidance should empower the girls so that they do not believe that boys are genetically better at math for they would be frustrated if they internalize that they have limited abilities in the study of mathematics and ended their struggle to excel at it. Some intentional exposure of girls to active scientist environments and models behaviors, may narrow the gender gap within STEM (Kang *et al.*, 2019).

Yet, a longitudinal study on boys' and girls' career aspirations and interest in technology by Jan-Ardies, Maeyer and Gijbels (2015) with first and second grade of the first cycle in general secondary education in the North region of Belgium, Flanders, did not find any significant difference in career aspiration between boys and girls. Consistent with this study is a local study by Wairimu's (2012) found insignificant gender influence in career aspiration. though in a different context. More studies are needed to clarify how career choices are made by secondary schools' students in relation to gender so as to prepare students to transition successfully toward a successful future career path. The current study explored gender difference in career aspiration among secondary public schools' students in Nairobi County. This allows valuable comparisons and possible effects of geographical demographics on gender in career aspirations if any.

The above literature shows discrepancy in the research findings. Some proposing gender disparity in career aspirations of secondary school students, (Bindu & Padmanabhan's, 2016; O'Dea, Lagisz, Jennions & Nakagawa, 2018; Kiani, Hassan & Irfan, 2013), others found no significant gender difference in career aspiration. More studies are recommended to bring clarity in this relationship. A number of studies carried out have provided data that illustrates the gross under representation of females in Science subjects and careers (Michela, 2019). Specifically, Kenya is reported to have gender disparities in students' enrolment in all levels of higher education especially at higher degree levels and in sciences, with special reference to mathematics and technical disciplines. Women academicians are concentrated in what is perceived as traditional female social science and education disciplines. While girls in Kenya are exposed to the same curriculum as boys and taught by qualified teachers as their male counterparts, the statistics given in the background and in the reviewed literature shows that there is disparity in perception of career aspirations among male and female students. Gender seem to limit the full exploitation of career potentials by influencing a wide range of career-related attitudes, behaviors, and outcomes. Therefore, to understand students' careers aspirations, gender must be put into consideration. Nevertheless, when a responsive and supportive teacher is present within a STEM course, students may tend to become more motivated and perform better (Kramer *et al.*, 2018) since the disparity in career aspirations might be attributed to the way students perceived certain careers. Effective career programs can lead to greater engagement with STEM coursework, greater aspirations towards STEM college majors, career interests, and improved self-confidence among males and females (Dieker *et al.*, 2012, Fields, 2009, Kong *et al.*, 2014).

## **II. RESEARCH PROBLEM**

Academic performance strongly links students to positive outcomes in fulfilling a productive future life. But from the foregoing discussion, it is clear that the problem of gender-oriented career aspiration is one of the biggest challenges facing the modern educational institutions and labor market. There has also been an incessant low academic performance in Sciences, Technology, Engineering and Mathematics (STEM) subjects especially among girls at form four level in Kenya over the years. This has led to shortage of local labor supply in the field of science. Additionally, it has led to under-representation and under-achievement of girls in science and technology subjects and in labor market. This fact discourages girls from learning efficaciously and restricts their career choices which is a serious inefficiency in educational systems in countries whose development depends crucially on the generation of human technological capacity.

In Nairobi County, majority of the boys qualified for enrolment in science-based courses while majority of the girls qualified for enrolment in arts-based courses. This is the case in most African countries. This may have far reaching implications for the students in terms of missing more rewarding career opportunities embedded in STEM fields and inadequate manpower to the country. If only more girls could be persuaded to take up science and technology subjects in schools, they could perform better in them. Therefore, there is need to explore more on the relationship between gender and career aspiration at secondary school level with a view of suggesting possible intervention strategies and mitigate the career disparities

### **III. OBJECTIVE OF THE STUDY**

To establish any gender differences in career aspiration among the public secondary schools' students in Nairobi County, Kenya

### **IV. METHODOLOGY**

The correlation design was adopted for this study due to its capacity in determining the strength and direction of a relationship. According to Mugenda & Mugenda (2003), the degree of such a relationship is expressed as a correlation co-efficient. In the current investigation gender's influence on career aspiration was investigated. The design was also considered appropriate for this study because it was not possible for the researcher to manipulate the independent variables that are naturally occurring. In this study, the dependent variable was the levels of the form four students' career aspirations. Independent variables were the form four students' gender which was categorized as boys and girls

The sample was obtained through simple random and stratified sampling in case of mixed schools. Yamane (1967) formula was used to determine a sample size of 397 participants drawn from 12 out of 84 public secondary schools. This represents 14 % of the total numbers of public secondary schools in Nairobi County which is considered enough in social science study which recommend a minimum of 10% (Gay, 1981). This formula allows the calculation of an ideal sample size given desired level of precision, confidence level, and estimate of the attribute present in the population. This formula is also considered appropriate for a large and known population

The Yamane (1967) formula is stated as:

$$n = \frac{N}{1+N(e)^2}$$

Where n is the corrected sample size, N is the population size and e (0.05) is the desired level of precision (margin of error). A 95% level of confidence is assumed. Calculation of sample size was done as follows;

$$n = \frac{26477}{1+26477(.0025)} = 394.$$

The sample for this study (397) is slightly more than the one endorsed by Yamane (1967). Career aspiration questionnaire was used as the tool for data collection in this study which was subjected to both qualitative and statistical analysis for the purpose of ascertaining validity and reliability respectively. Orodho (2004) recommend the use of questionnaire for quality and quantity information from any sample. A group of thirty-two (32) diverse career types were also presented to the students to pick the most preferred

### **V. ANALYSIS OF FINDINGS**

Both qualitative and quantitative data were obtained from the questionnaire which were then scored and coded for statistical analysis by using Statistical Packages for Social Sciences – SPSS – software. The null hypothesis was tested at .05 level of significance using Independent Sample t-test to determine if the mean of males and females is related to the levels of career aspiration.

Descriptive statistic of students' gender was computed and results shown in Table 1

**Table 1** Characteristic of the Respondents by Gender, Residential Status and School Category

Variable	Levels	Frequency	Percentage (%)
<b>Gender</b>	Female	182	45.8
	Male	215	54.2
	<b>Sub-total</b>	<b>397</b>	<b>100</b>
<b>Residential Status</b>	Boarder	217	54.7
	Day Scholar	180	45.3
	<b>Sub-total</b>	<b>397</b>	<b>100</b>
<b>School Category</b>	National	62	15.6
	Extra- County	126	31.7
	County	49	12.3
	Sub- County	160	40.3
	<b>Sub-total</b>	<b>397</b>	<b>100</b>

The result in Table 1 shows that genders, categories of schools, and both boarding and day scholars proportionately provided respondents for the study. This gave a reasonable representation of respondents for this study. Nevertheless, on gender comparison, majority of the respondents were boys, indicating a lower population of girls in public secondary schools in Nairobi County. In relation to residential status, boarders are more (217, 54.7%) than day scholars (180, 45.3%) which could have been attributed to the conversion of all girl's day schools into boarding schools which are perceived to offer quality education and less prone to distractions inherent in urban city like Nairobi.

Analysis was done to establish if there is a relationship between the respondents' choice of career type and their gender. The students were presented with thirty-two (32) types of careers to pick the most preferred. The findings are shown in Table 2.

**Table 2: Respondents' Career Type versus Gender**

Sno	Career Choice	Gender			
		Female		Male	
		Frequency	%	Frequency	%
1	Medical Doctor	29	44.6	36	55.4
2	Lawyer/Magistrate	24	40.7	35	59.3
3	Teacher	11	55	9	45
4	Engineer	21	29.2	51	70.8
5	Architecture/ Interior Design	23	65.7	12	34.3
6	Agriculturalist	5	33.3	10	66.7
7	Environmental scientist	3	75	1	25
8	Food Nutritionist	18	90	2	10
9	International Relations	13	56.5	10	43.5
10	Social Worker/ HR/ Counselor	10	52.6	9	47.4
11	Military/Police	5	22.7	17	77.3
12	Accountant/ Economist	21	40.4	31	59.6
13	Journalist	23	42.6	31	57.4
14	Pharmacist	5	62.5	3	37.5
15	Theology	2	28.6	5	71.4
16	Pilot/Aviation	7	38.9	11	61.1
17	Geology	1	20	4	80
18	Musician / Artist	13	35.1	24	64.9
19	Building/ Construction	2	16.7	10	83.3
20	Commercial Farming	0	0	4	100
21	Nursing	6	50	6	50
12	Hotel Management	23	62.2	14	37.8
13	Clerk	3	60	2	40
14	Criminologist	4	25	12	75
15	Tourist Guide	9	50	9	50



16	Business Management	16	33.3	32	66.7
27	Beautician	5	71.4	2	28.6
28	Cloth Designer	7	46.7	8	53.3
29	Whole sale/Retail trade	7	100	0	0
30	Transport Trade	5	62.5	3	37.5
31	Actuarial science	12	66.7	6	33.3
32	Financial Engineering	10	43.5	13	56.5

Note. f= frequency; %= percentage

Marked gender stereotypes are shown to have a significant influence on career choice patterns among secondary school students in Nairobi County. For example, there were more girls than boys in care giving oriented careers such as Nutrition (90%), Beautician (71.4%), and whole sale trade/Retail Trade (100%). Men majored in perceived masculine careers like Building Construction (83.3%), Geology (80%), Military/ Police (77.3%) and Theology (71.4%). Additionally, girls registered a relatively weak presence in STEM fields. A case in point is engineering with 70.8% male and only a paltry 29.21% female. Interestingly, more females than males chose careers that were formally dominated by men like Actuarial Science (66.7%), architecture (65.7%), and Pharmacy (62.5%) while more men seems to prefer Cloth Design (53.3%) which was previously considered feminine. This flexible pattern of breaking the career traditionality should be encouraged among the students to widen their range of preferences.

Levels of respondents' career aspiration was determined and analysis is availed in Figure 1

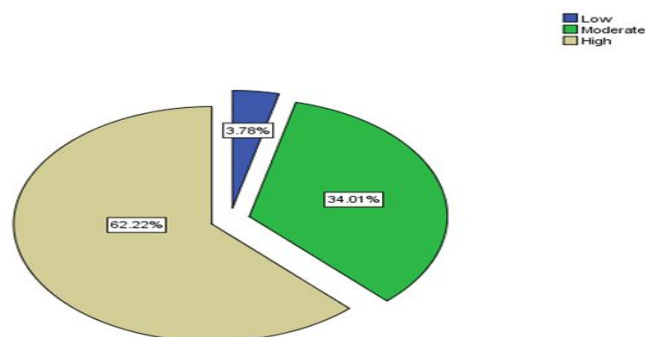


Figure 1: Distributions of Respondents' Levels of Career Aspirations

Figure 1 depict a high career aspiration for majority of the respondents (62.22%) and just about a third (34%) of the total respondents reported moderate levels of career aspiration. A marginal number of respondent (3.8 %) registered low career aspiration suggesting that students are potentially aspiring to careers but they are not efficacious enough to attain those career goals or they lack knowledge of academic requirements of that career.

Gender differences in the levels of career aspiration is examined in Table 3.

Table 3: Gender Differences in Levels of Career Aspiration of the Respondents

Gender		Level of Career Aspirations			Total
		Low	Moderate	High	
Girl	F	2	56	124	182
	% within Gender	1.1	30.8	68.1	100.0
Boy	F	13	79	123	215
	% within Gender	6.0	36.7	57.2	100.0
Total	F	15	135	247	397
	% within Gender	3.8	34.0	62.2	100.0

Note : f = Frequency; % = Percentage

Table 3 demonstrates gender differences in the levels of career aspirations with more girls (124, 68.1%) than boys (123, 57.2%) having high level of career aspirations. Conversely, more boys (13, 6%) than girls (2, 1.1%) have low career aspirations. Indeed, this is a reflection of weakly professionalized career guidance among boys. It also indicates a successful execution of affirmative actions and empowerment programs among girls which should be extended to the boy child.

Chi-Square inferential test was used to assess the null hypothesis relating to gender differences in career aspiration at 0.05 level of significance. The gender independent variable was indicated whether male or female in the questionnaire and tallies were cross-tabulated in relation to career aspiration variable in the study. The findings are obtainable in Table 4

**Table 4: Chi-Square Test on Gender Differences in Career Aspirations**

Chi-Square Tests	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.310 <sup>a</sup>	2	.010
Likelihood Ratio	10.210	2	.006
Linear-by-Linear Association	7.776	1	.005
N of Valid Cases	397		

a. 0 cells (0.0%) have expected frequency less than 5. The minimum expected frequency is 6.88.

Note. Df= degree of freedom

The chi-square test in Table 4 revealed the presence of a significant difference in career aspirations in favor of girls among the secondary school students ( $X^2 = 9.31$ ,  $df = 2$ ,  $P = 0.019$ ,  $P < 0.05$ ). The difference in the career aspiration of boys and girls was statistically significant since the p-value was less than 0.05. The null hypothesis was therefore rejected.

## VI. DISCUSSION

The current study yielded significant results concerning the perceived gender differences in career aspiration in favor of girls. The findings are consistent with previous studies which reported differences in career aspiration in regard to gender (Akos et al., 2007; Adragna, 2009; Nadeem & Khalid, 2018; Nadeem & Khalid, 2018; Bindu & Padmanabhan, 2016; Al-Bahrani et al., 2020; Steven & David, 2015; Kiani, Hassan & Irfan, 2013; Wang & Degol, 2017; O’Dea, Lagisz, Jennions & Nakagawa, 2018; Maarike et al (2016). However, some studies found that levels of career aspirations are subject to the field of study. For example, boys had higher career aspiration in STEM domains in comparison to girls who ranked high in social sciences (Cervoni, 2013; Howard et al., 2011; O’Dea et al., 2018). According to these studies, men and women may have equal abilities, but STEM is not an equal playing field for women—and so women often go down paths with less male competition in the same.

The gender disparity in career aspiration has been attributed to the stereotypical beliefs about what field each gender is found to be successful (Maarike et al., 2016; Lane et al., 2011; Nosek et al., 2009) and the effects of femininity and masculinity (Kiani et al., 2013; Cervoni & Iverson, 2011) in the society. Unfortunately, Kiani, Hassan and Irfan (2013) observed that gender disparity in relation to career choices affect performance in that given fields. This may lead to lagging in educational performance of students and underrepresentation of gender in some fields of work (Von-Kraaykamp & Pelzer, 2018). Kenya really needs more women to enter, stay, and succeed in STEM areas. It is absolutely needful therefore to change the structural barriers to gender equality, strong negative stereotypes and unconscious career biases that lead to underrepresentation of women in STEM oriented careers.

Studies have shown that girls tend to exhibit signs of depression and anxiety in male-stereotyped tasks (Kiran & Sunger, 2012; Spencer et al., 2016). Girls who try to succeed in these fields are often hindered by backlash effects. Consequently, girls may hesitate toward or avoid certain educational trajectories making them more susceptible to conforming to stereotypes in the traditionally male-dominated fields of STEM. Nevertheless, the current study reveals that girls are slowly overcoming this by having high career aspirations and shifting their interest to formally male dominated careers. This trend should be encouraged in order to bring balance in the work place.

These findings, however, are contrary to a number of previous studies such as Jansen et al., (2016), Stevens and David (2015), and Wairimu (2012) who did not find any significant gender difference in career aspiration. This difference could be attributed to context into which the study was done and the developmental stage of the respondents. Career aspiration is not static and that with new experiences and knowledge, the aspirations usually change, develop or be confirmed through social interaction.

All in all, career guidance should be inherently practiced to provide the students with indispensable information and competence required in the world of work. More focus should be directed to the boys who exhibited low career aspiration. Quality career aspirations and subsequent career decisions will benefit the economy by having quality, qualified and productive personnel.

## VII. CONCLUSION

It is in secondary schools where students are prepared for their future careers and this is generally preceded by their career aspiration. Nevertheless, gender seems to limit the full exploitation of career potentials. The study showed that gender is one of the factors that may account for differences in students' career aspiration. So, gender has been influencing a wide range of career-related attitudes, behaviors, and outcomes. The study represented gender difference in favor of girls. To mitigate this low career aspiration and boost academic optimism, appropriate boy-targeted intervention programs should be developed. Motivational strategies that benefit the boy child should be reinforced and supplemented by the encouragement by all stakeholders by instilling hope about present and future endeavors. Creating a nurturing environment for boys' schools with a lot of career guidance and career-related experiences will adequately prepare and equip them for academic and career success. This will ensure equity or fairness in education by basically making sure that gender does not become an obstacle to achieving educational labor potential.

## REFERENCES

- [1]. Abdullah, A., Suad, M., Yousef, A. A. & Bakkar, S.B. (2020). Career aspiration and related contextual variables. *International Journal of Adolescence and Youth* 25(1), 703-711
- [2]. Adragna, D. (2009). Influences on career choice during adolescence. *Psi Chi Journal of Undergraduate Research*, 14(1), 3-7.
- [3]. Autor, D., D. Figlio, K. Karbownik, J. Roth, and M. Wasserman. 2016. "School Quality and the Gender Gap in Educational Achievement." *American Economic Review*, 106 (5): 289-295. doi:10.1257/aer.p20161074.
- [4]. Beier, M.E., Kim, M.H., Saterbak, A., Leautaud, V., Bishnoi, S., J.M. & Giberto, J.M. (2018). The effect of authentic project-based learning on attitudes and career aspirations in STEM. *Journal of Research in Science Teaching*, 56 (1), 3-23.
- [5]. Bindu, V.K. (2016). Career Aspiration among High Secondary School Students in Kerala. *Journal of Social Welfare and Management*, 8, (1), 5-9.
- [6]. Bong, M., Hwang, A., Noh, A. & Kim, S. I. (2014). Perfectionism and motivation of adolescents in self-Efficacy and Academic performance. *Journal of Educational Psychology*, 106(3), 711-729.
- [7]. Cervoni, C., & Ivinson, G. (2011). Girls in primary school science classrooms: Theorizing beyond dominant discourses of gender. *Gender & Education*, 23(4), 461-475. doi:10.1080/09540253.2010.5068683.
- [8]. Dasgupta, N. & Stout, J.G. (2014). Girls and women in science, technology, engineering, and mathematics: STEMing the tide and broadening participation in STEM careers. *Policy Insights from the Behavioral and Brain Sciences*, 1 (1), 21-29, 10.1177/2372732214549471.
- [9]. Dieker, L., Grillo, K., N. & Ramlakhan, N. (2012). The use of virtual and simulated teaching and learning environments: Inviting gifted students into science, technology, engineering, and mathematics careers (STEM) through summer partnerships. *Gifted Education International*, 28 (1), 96-106, 10.1177/0261429411427647
- [10]. College Board. (2014). *AP program participation and performance data 2013*. Retrieved from [research.collegeboard.org/programs/ap/data/participation/201](http://research.collegeboard.org/programs/ap/data/participation/201)
- [11]. Feliciano, H. V., Íris, M. O. & Maria, C.T. (2014). *Students' Engagement in School, Academic Aspirations and Career Exploration of Portuguese adolescents*, 8th International Technology, Education and Development Conference Proceedings. <https://www.researchgate.net/publication/319087652>, pp.7545-7553
- [12]. Fields, D.A. (2009). What do students gain from a week at science camp? Youth perceptions and the design of an immersive, research-oriented astronomy camp. *International Journal of Science Education*, 31 (2), 151-171, 10.1080/09500690701648291
- [13]. Galyon, C. E., Blondin, C. A., Yaw, J. S., Nalls, M. L. & Williams, R. L. (2012). The relationship of academic self-efficacy to class participation and exam performance. *Social Psychology of Education*, 15(2), 233-249. doi:10.1007/s11218-011-9175-x
- [14]. Gay, L. R. (1981). *Educational Research: Competencies for Analysis and Application*. London: Abell & Howell Publishing Company.
- [15]. Hafsyhan, A.S. (2015). Educational and Career Aspirations of University Honors and Non-Honors Students. Doctoral Dissertations Connecticut Graduate School of University of Connecticut.



- [16]. Hochweber, J., and S. Vieluf. 2018. "Gender Differences in Reading Achievement and Enjoyment of Reading: The Role of Perceived Teaching Quality." *The Journal of Educational Research* 111 (3): 268–283. doi:10.1080/00220671.2016.1253536.
- [17]. Howard, K.A.S., Carlstrom, A.H., Katz, A.D., Chew, A.Y., Ray, G.C., Laine, L. & Caulum, D. (2011). Career aspirations of youth: Untangling race/ethnicity, SES, and gender. *Journal of Vocational Behavior*, 79(1), 98-109.
- [18]. Jan- Ardies, J., Maeyer, D. & Gijbels, D. (2015). Longitudinal Study on Boys' and Girls' Career Aspirations and Interest in Technology. *Research in Science & Technological Education*, 33 (3), 366-386.
- [19]. Kang, J., Hense, J., Scheersoi, A. & Keinonen, T. (2019). Gender study on the relationships between science interest and future career perspectives
- [20]. *International Journal of Science Education*, 41 (1), 80-101, 10.1080/09500693.2018.1534021
- [21]. Kiani, S., Hassan, S.M. & Irfan, S. (2013). Vocational Aspirations of High School Students. *Journal of Science and Technology*, 3 (12), 1193-1189.
- [22]. Kiran, D., & Sunger, S. (2012, October). Middle school students' science self-efficacy and its sources: Examination of gender difference. *Journal of Science Education and Technology*, 21(5), 619-630. DOI: 10.1007/s10956-011-9351-y
- [23]. Kong,X., Dabney,K.P., R.H. & Tai,R.H. (2014).The association between science summer camps and career interest in science and engineering. *International Journal of Science Education*, 4 (1), 54-65, 10.1080/21548455.2012.760856
- [24]. Kramer,N.C., Kracora,B., G. Lucas,G., Deghani, M.,Ruther, G.,J. Gratch,J. ( 2016). Closing the gender gap in STEM with friendly male instructors? On the effects of rapport behavior and gender of a virtual agent in an instructional interaction. *Computers and Education*, 99, 1-13, 10.1016/j.compedu.2016.04.002
- [25]. Igere, A. M. (2017). Career choice and its influence on academic performance of library and information science students in a Nigerian University. *Journal of Information and Knowledge Management*, 8 (2), 90-98.
- [26]. Kiani, S., Hassan, S.M & Irfan, S. (2013) Vocational Aspirations of High School Students. *Journal of Science and Technology*, 3 (12), 1193-1189
- [27]. Michela, C. (2019). "Implicit Stereotypes: Evidence from Teachers' Gender Bias," *The Quarterly Journal of Economics*, 134(3), 1163-1224.
- [28]. Maaiké V., Eva J., Ineke, M. & Tanja, L. (2016.). Boys' and Girls' Educational Choices in Secondary Education. The Role of Gender Ideology. *Journal of Educational Studies*, 42(2), 181-200. DOI: 10.1080/03055698.2016.1160821
- [29]. Margriet, Hek.,Claudia B., Gerbert, K. (2019). Educational Systems and Gender Differences in Reading: A Comparative Multilevel Analysis. *European Sociological Review*, 35 (2), 169–186, <https://doi.org/10.1093/esr/jcy054>
- [30]. Makarova, E., & Herzog, W. (2015). Trapped in the gender stereotype? The image of science among secondary school students and teachers. *Equality, Diversity, and Inclusion: An International Journal*, 34(2), 106-123. DOI: 10.1108/EDI-11-2013-0097.
- [31]. Mettol, J.M. & Ksilu, K. (2016). Influence of Career Preference on Academic Performance and Graduation of male students: A Case Study of a University in Western Region of Kenya. *Journal of Research in Humanities and Social Science*, 4 (8), 9-20.
- [32]. Migunde, Q., Agak, J., & Odiwuor, W. (2012). Gender differences, career aspirations and career development barriers of secondary school students in Kisumu municipality. *Gender & Behaviour*, 10(2), 4987–4997. Retrieved from <https://search.proquest.com/docview/1270297810?accountid=27575>.
- [33]. Nadeem, F., & Khalid, R. (2018). The relationship of gender role attitudes with career aspirations and career choices among young adults. *Pakistan Journal of Psychological Research*, 33(2), 455–471. Retrieved from <https://search.proquest.com/docview/2240045967?accountid=27575>
- [34]. Migunde, Q., Agak, J. & Odiwuor, W. (2012). The Impact of Secondary Schools Students' Career Aspirations in Kisumu Municipality, Kenya. *Research Journal in Organizational Psychology and Educational Studies*, 10(2), 233-237.
- [35]. Mugenda, O. and Mugenda, A.G. (2003). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: Acts press.
- [36]. Nabil, K. (2015). Students' Aspirations, Expectations and School Achievement: What really matters? *British Educational Research Journal*. 4 (5),731-748.
- [37]. Nguyen, N & Blomberg, D (2014). The role of aspirations in the educational and occupational choices of young people, NCVER, Adelaide. Briefing Paper, 29. Retrieved from

- <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/the-role-of-aspirations-in-the-educational-and-occupational-choices-of-young-people>
- [38]. Nosek, B.A., Smyth, F.L., Sriram, N., Lindner, N.M., Devos, T..... & Greenwald, A.G. (2009). National differences in gender science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences of the United States of America*, 106(26), 10593-10597.
- [39]. O’Dea, R. E., Lagisz, M., Jennions, D., S. Nakagawa, S. (2018). Gender differences in individual variation in academic grades fail to fit expected patterns for STEM. *Nature Communications*, 9 (1). DOI: 10.1038/s41467-018-06292-0.
- [40]. Orodho, A.J. (2012). *Techniques of Writing Research Proposals and Reports in Education and Social Science*. Kanisha Publishers, Nairobi
- [41]. Rebecca N. D., Paul J. C., Bergen, B. N., Mitchell, D. W. (2017). What do you want to be when you grow up? Career Aspirations as a Marker for Adolescent Wellbeing? *The official journal of pediatric*, 17(2), 153-160. doi: 10.1016/j.acap.2016.08.006
- [42]. Sadler, P.M., Sonnert, G., Hazari, Z., & Tai, R. (2012). Stability and volatility of STEM career interest in high school. *A gender studies. Science Education*, 96(3), 411-427.
- [43]. Sinclair, S., Nilsson, A., E. Cederskar, E. (2019). Explaining gender-typed educational choice in adolescence: The role of social identity, self-concept, goals, grades, and interests. *Journal of Vocational Behavior*, 101 (A), 54-71, 10.1016/j.jvb.2018.11.007
- [44]. Spencer, S.J., Logel, C., & Davies, P.G. (2016). Stereotype threat. *Annual Review of Psychology*, 67, 415-437. doi: 10.1146/annurev-psych-073115-103235
- [45]. Steffens, M. C., & Jelenec, P. (2011). Separating implicit gender stereotypes regarding math and language: Implicit ability stereotypes are self-serving for boys and men, but not for girls and women. *Sex Roles*, 64, 324–335.
- [46]. Stoet, G., D.C. Geary, D.C. (2018). The gender-equality paradox in science, technology, engineering, and mathematics education. *Psychological Science*, 29 (4), 581-593, 10.1177/0956797617741719
- [47]. Stoet, G., & Geary, D. C. (2013). Sex differences in mathematics and reading achievement are inversely related: Within- and across-nation assessment of 10 years of PISA data. *PLoS One*, 8(3), e57988. doi: 10.1371/journal.pone.0057988
- [48]. Van Hek, M., Kraaykamp, G., Pelzer, B. (2018). Do schools affect girls’ and boys’ reading performance differently? A multilevel study on the gendered effects of school resources and school practices. *School Effectiveness and School Improvement*, 29, 1–21.
- [49]. Wairimu, L. (2012). *Career Aspirations and Expectations of Secondary School Students of 8-4-4 System of Education in Kiambu, Kajiado and Machakos Districts*. Retrieved from Kenyatta University Institutional Repository: <http://ir.library.ku.ac.ke/handle/123456789/4548>.
- [50]. Wang, I.V., Sylvia, Y.S., Zhansheng, C. (2018). Students from single-sex schools are more gender-salient and more anxious in mixed-gender situations: Results from high school and college samples, *Pros One Journal* 13(12), 289-305. doi: 10.1371/journal.pone.0208707
- [51]. Wang, M.T., Degol, J.L. (2017). Gender gap in science, technology, engineering, and mathematics (stem): Current knowledge, implications for practice, policy, and future directions. *Educational Psychology Review*, 29 (1), 119-140, 10.1007/s10648-015- 9355-x
- [52]. Wegemer, C.M., Eccles, J.C. (2019). Gendered STEM career choices: Altruistic values, beliefs, and identity. *Journal of Vocational Behavior*, 110 (A) (2019), pp. 28-42, 10.1016/j.jvb.2018.10.020
- [53]. Van Hek, M., Kraaykamp, G., & Wolbers, M. H. J. (2015). Family resources and male–female educational attainment: Sex specific trends for Dutch cohorts (1930–1984). *Research in Social Stratification and Mobility*, 40, 29–38. doi: 10.1016/j.rssm.2015.02.001
- [54]. Van Hek, M., Kraaykamp, G., & Wolbers, M. H. J. (2016). Comparing the gender gap in educational attainment: The impact of emancipatory contexts in 33 cohorts across 33 countries. *Educational Research and Evaluation*, 22, 260–282. doi:10.1080/13803611.2016.1256222.
- [55]. Yamane, T. (1967). *Statistics: An Introductory Analysis*, (2nd ed). New York: Harper & Row