Locus Of Control And Test Anxiety As Correlates Of Performance In Physics Among Form Two And Three Students In Laikipia County, Kenya

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Abstract: The central problem addressed by this study was the low enrolment and poor performance in physics in Laikipia County. The aim of this research was to examine locus of control and test anxiety as predictors of students' physics performance in public secondary schools in Laikipia County. The study was based on arousal performance theory and Locus of Control Theory. The researcher employed correlational research design targeting all the 22,091 students and 134 physics teachers in the 84 public secondary schools in Laikipia County. From the 84 public secondary schools in Laikipia County, 20 schools were randomly sampled to take part in the study. From the 20 schools, 400 students from Forms Two and Three were proportionately sampled. Purposive sampling method were used to select one Physics teacher per school. The respondents for the study were therefore 400 students and 20 teachers which made a total sample of 420 respondents. Adapted locus of control and test anxiety questionnaires and interview guide were used to collect information. Piloting study was carried out in three schools using a sample of 30 students to test the validity and reliability of the research instruments. Data collected from the respondents were both qualitative and quantitative in nature. Inferential and descriptive statistics were used to analyze quantitative data. The statistics used include frequency counts, means, percentages, Pearson correlation analysis, ANOVA and the t-test. Qualitative data were thematically analyzed as per the research questions and then the results presented using tables, bar graphs and pie charts. The findings revealed that was a negative correlation between locus of control and physics performance (r_{pb} (400) = -.013, p = .79). The correlation was not statistically significant. Qualitative data obtained from the physics teachers showed that most of the students relied on external locus of control to perform well in physics. Regarding the association between test anxiety and physics performance, it was found that the two variables had significant negative correlation, r (400) = -.148, p < 0.05. Qualitative data showed that nearly half of the students scored low marks in physics because of test anxiety. It was established that the mean difference in locus of control scores between male and female respondents was not statistically significant (t (398) = - 1.13, p > 0.05). There was a significant mean difference in test anxiety scores between male and female respondents, t (398) = - 4.25, p < 0.00. The mean score difference in physics performance between male and female respondents was statistically significant, t (398) = 2.33, p < .020. The findings indicated that the differences in the mean scores of locus of control across the school categories were not statistically significant, F (2, 397) = 2.38, P > 0.05. It was also established that the mean differences in test anxiety scores across the school types were statistically significant, F (2, 397) = 2.25, p < 0.05. The mean difference in physics performance across the three categories of schools was significant, F (2, 397) = 33.78, p < .00. Based on the findings, policy makers should develop learning resources that should be included in life skills content to train students on how to develop internal locus orientation to enhance physics performance.

Keywords: Internal Locus of control; External Locus of control; Test Anxiety; Physics Performance

I. INTRODUCTION

Physics is one of the sciences that are taught in secondary schools in all education systems across the world. It is believed that physics is one of the oldest subjects taught in schools dating back to the time of great philosophers such as Aristotle, Plato and Socrates (Sutton, 2006). The subject has evolved over time to become a key pillar in the leading technologies that play a significant role in economic and social development all over the world. In this subject, concepts such

as properties of matter and energy and nature, patterns and laws of the universe are taught. Owing to the technology based direction that world of schooling and work has taken; the role of physics knowledge and skills cannot be overemphasized (Frazer & Walberg, 1995). Secondary education in this subject forms a basis for further education and training in physics related fields in tertiary institutions and universities.

Ojih, Besiekpe and Okafor (2016) state that despite the importance of physics as a unifying factor in this technological era, over the years enrolment and performance in the subject has been deteriorating. The problem cuts across the secondary schools, tertiary colleges and universities. For example in tertiary institutions, the physics department enrolls a scanty number of students (Taale, 2011). This problem is universal and it seems to be creeping even to other physics related courses. Primarily, this problem begins in secondary schools when a few students choose to take physics, a situation that is even complicated the more when majority of them perform poorly. Mbamara and Eya (2015) argued that the disparity in enrolment and performance between physics and other sciences is unacceptable. This challenge continues to persist even when efforts have been made to ensure that all the sciences are given equal attention. Furthermore, the subject lags behind in achievement compared to other sciences.

Regionally, Semela (2010) noted that the rate of enrollment in physics related undergraduate programmes was dwindling. The researcher also revealed that physics mean score in Ethiopian National Entry examination was low compared to other subjects. According to Munene (2014), enrollment and performance in physics in Kenya has remained low over the years. It was established that a substantial number of schools were not offering physics in form three and four. Murei (2016) avers that despite the importance of physics education, enrollment and performance has not been remarkable. Very few students have been choosing the subject compared to other science subjects.

A number of studies have been conducted to investigate the factors associated with low enrolment and performance in physics. The factors that have been associated with this problem include; negative attitude towards the subject, teaching methods, learner's ability and lack of learning materials (Kweya, Twoli & Waweru, 2015; Lyons, 2005; Munene, 2014). However, little is known on how psychological variables such as locus of control and test anxiety influence enrolment and performance in physics, a gap this study sought to fill.

Locus of control is a popular construct in educational research that is based on social learning theory. It refers to the way students account for personal successes and failure in school (Zisan, 2010). According to Miu (2010), those people having an internal locus of control are said to attribute happenings in their lives to the consequences of their own deeds while those people having an external locus of control hold the belief that most of life events occur by chance. Therefore, those students having internal locus of control believe that their behaviours and the outcomes of such behaviours are directly related. As a result, such students seek to gain more control over their academic experiences than those students with external locus of control. Locus of control greatly impacts on the lives of learners, primarily because

their decisions in relation to academic achievement, discipline, interpersonal relationships, career decisions, and health are affected by their perception of control (Shinde & Joshi, 2011). It is also one of the major factors which influence people's test anxiety level and consequently their academic performance (Akca, Demir & Yilmaz, 2015).

Test anxiety refers to that feeling of apprehension or uneasiness that students normally experience before, during or after a test because of fear of uncertainty, concern, or worry. Zeidner (1998) defines test anxiety as the physiological, behavioral, and phenomenological responses accompanying concerns regarding possible negative outcomes (such as failure) in a test or other evaluation situations. Test anxiety may be described as the feeling that students have in situations where the outcome really counts or where there is intense pressure to perform well. Some students are considerably distressed by the test taking experience to a point where they are unable to fully demonstrate their potential. For such students, the time spent in examinations becomes excruciatingly painful moments where their self-efficacy and motivation are at risk (Hu, 2017). Students who continuously experience failure in examinations or low-test performances in spite of great effort may develop feelings of incompetence and shame. In addition, test anxiety, and the consequent poor performance in tests, has been shown to negatively influence both self-esteem and self-efficacy (Valiune & Perminas, 2016). Therefore, it can be concluded that students are influenced psychologically, physically and academically by the examinations that they take.

A Kenyan study by Syokwaa, Aloka and Ndeke (2014) revealed a prevalence of test anxiety level of 27% among students in secondary schools. The study also established that test anxiety was significantly related to academic performance, with girls being more prone to test anxiety. The researchers also found that students with high test anxiety levels performed poorly in examinations, suggesting a negative correlation between the two variables. Similarly, Mukholwe (2015) found that majority of Kenyan students experienced test anxiety which correlated negatively with academic achievement. Poor performance in physics by most students in Kenyan secondary schools has been of concern to researchers such as Njiru and Karuku (2015). As such, this study sought to find out the role of locus of control and test anxiety in predicting students' physics performance in secondary schools in Laikipia County.

II. STATEMENT OF THE PROBLEM

The central problem addressed by this study was the low enrolment and poor performance in physics. The fact that a small percentage of students in Kenya, and specifically in Nyahururu Sub County, choose physics as an examinable subject presents a significant challenge to the overall qualification of the general work force. Despite the low enrolment in physics, performance in the subject has been consistently below average. In secondary schools, the fact that selection of a course has a direct relationship with the student's achievement in the subject could be the reason why

physics is less appealing to many students especially the weak ones.

Many studies have been conducted globally and nationally on causes of poor performance in physics and the findings have attributed these to; lack of instructional materials, inappropriate pedagogy, poorly equipped laboratories, low mastery of the content by teachers and negative attitude of the teachers and students among others (Heidi *et al.*, 2007; Omar, 2017). However, empirically it is not clear the role played by test anxiety and locus of control in determining students' performance in physics. Students with internal locus of control believe that they are the cause of their success or failure which makes them to become more self-reliant in problem solving and achieving their goals due to believing in their ability to do so. Does it automatically follow that internal locus of control is associated with lower levels of test anxiety and better performance in physics? This study explored for answers to this research problem.

III. OBJECTIVES

✓ To find out the relationship between locus of control and physics performance among secondary school students in Laikipia County.
✓ To establish the relationship between test anxiety and physics performance of secondary school students in Laikipia County.
✓ To find out whether there is gender difference in locus of control, test anxiety and physics performance among secondary school students in Laikipia County.
✓ To find out whether locus of control, test anxiety and physics performance of secondary school students differ by school type.

IV. RESEARCH HYPOTHESES

✓ There is a significant relationship between locus of control and physics performance among secondary school students in Laikipia County.
✓ There is a significant relationship between test anxiety and physics performance among secondary school students in Laikipia County.
✓ There are significant gender differences in, test anxiety, locus of control and physics performance among secondary school students in Laikipia County.
✓ There are significant differences in locus of control, test anxiety and physics performance of secondary school students across school type.

V. SIGNIFICANCE

The study findings may help teachers of physics to understand the individual differences that influence students' performance in physics. Similarly, teachers and teacher counselors may be in a position to assist those students with external locus of control, thus improving performance in physics. The study may also make a contribution to empirical literature on test anxiety, locus of control and students' performance in physics.

VI. REVIEW OF RELATED LITERATURE

A. LOCUS OF CONTROL AND ACADEMIC PERFORMANCE

Academic performance is considered to be a very crucial factor to measure learners' performance in educational settings. It is also used to determine one's future in the occupation sector and promotion related aspects. According to Al-Anzi (2005), academic achievement has a great impact not only to the learners, but also to the people and the environment surrounding them. An individuals' personality and belief in the causes of his/her success or failures plays a very important role in influencing their academic achievement. Students' LOC is one of the vital aspects in academic settings (Choudhury & Borooah, 2017). The following are the previous studies conducted to examine the relationship between LOC and academic achievement among students.

A research by Nejati et al. (2012) examined the association between LOC and academic performance of learners while controlling for satisfaction with quality of life. The study sample consisted of 267 university students. The findings of the study revealed a significant positive correlation between LOC and students' academic achievement. However, LOC was found not to be significantly related to quality of life and life satisfaction.

In another study, Kader (2014) examined the association of locus of control, student's motivational orientation, and performance in a microeconomics course. The findings of the analysis revealed that students with internal LOC performed better in examinations, reported lower levels of test anxiety, were more superior in mastery approach, and expended more effort in academics than students with external LOC. In addition, linear regression results showed that LOC had significant negative effect on academic achievement. In his study on the link between LOC and the academic achievement of first-and second-generation learners, Bostic (2010) established that students with an internal LOC significantly differed in academic performance with their counterparts with external LOC, with the internally oriented students performing better.

Nongtdu and Bhutia (2017) conducted a study to investigate the relationship between LOC and academic achievement of students sampled from a university in Meghalaya state of India. This study employed a descriptive survey design targeting a sample of 797 students. The study established that a significant proportion of students had an average internal and external LOC. In particular, Nongtdu and Bhutia (2017) found significant differences in internal LOC scores of urban versus rural students, commerce versus science students, and science versus students taking arts courses but it was revealed that there were no significant gender differences in internal LOC score and arts versus commerce students. It was also revealed that no significant differences existed in external LOC across gender, locale, and

between commerce versus arts students; but significant differences were identified between commerce versus science and between arts versus science students. From these findings, the researchers arrived at the conclusion that internal LOC and academic performance were positively correlated for learners pursuing different courses, and with respect to both gender and rural-urban college settings. The study also concluded that students in both urban and rural colleges didn't have significant difference across gender in terms of their external LOC and academic performance.

Hassaskhah and Jahedi (2015) examined the association between LOC and academic performance. The researchers adopted non-experimental ex-post facto design. The study sampled 387 students majoring in English from different universities in Iran. Data used for this study was collected using internal-external LOC scale (Rotter, 1966). The findings of this research revealed that there was a significant correlation between LOC orientation and academic performance. It was further established that high levels of external LOC were associated with an increase in the probability of performing poorly in examinations whereas an increase in internal LOC led to improved academic performance.

B. TEST ANXIETY AND ACADEMIC ACHIEVEMENT

The phenomenon of anxiety is a common occurrence in the lives of human beings, and its effects are felt in how effectively people perform different tasks. A moderate amount of anxiety is necessary to keep people working hard and taking responsibility of what they do (Donnelly, 2009). However, when anxiety level increase, people's physical and mental health is threatened, and this could negatively affect their performance at personal, social or educational settings (Zahrakar, 2008). Tugan (2016) examined the link between test anxiety and academic performance of Turkish students attending 9th grade in a private high school. Data used for this study were collected using Driscoll's (2007) WTA scale. Academic performance of the students was measured using English language proficiency and high school placement scores. The researcher used Pearson correlation analysis to examine the relationship between academic performance and students' test anxiety scores. From the study findings, it was established that test anxiety and academic performance were negatively correlated.

Onyekuru and Ibegbunam (2014) designed a correlational research to investigate the relationships of LOC, test anxiety, and academic performance of students. The target population comprised of 498 respondents. Among them, 364 students were sampled to participate in the study. The researchers utilized two instruments to collect data: college students' LOC Scale and college students' test anxiety questionnaire. The study established that 28.6 percent of the participants reported low levels of test anxiety, 18.1 percent reported high levels of anxiety, while 53.3 percent of the respondents reported moderate levels of test anxiety. Correlation analysis results revealed that test anxiety and academic performance were negatively correlated ($r = - 0.22$, $p <0.05$). This is an indication that learners with low test anxiety have higher chances of performing better in academics compared to those

with high test anxiety. It was further revealed that internal LOC and academic achievement had a weak positive correlation ($r= 0.191$, $p <0.05$) and a negative association between external LOC and academic performance ($r= - 0.081$, $p<0.05$).

A correlational study by Akinleke (2012) investigated the relationships among test anxiety, self-esteem, and academic achievement among students. It was found out that low anxiety levels were associated with high academic achievement whereas high anxiety was associated with low academic achievement. It was also established that students' self-esteem and their academic achievement had a significant positive relationship. This means that learners with higher self-esteem get higher scores in academics than students' with low self-esteem. With this regard, Akinleke (2012) suggested that education stakeholders should come up with policies that will assist learners to deal with anxiety and also come up with a curriculum that will help them during their learning process. As a consequence, this would lead to improved academic performance of individual students.

Balogun, Balogun and Onyencho (2017) set out to investigate the mediating influence of motivational orientation in the association of test anxiety with academic achievement. A sample of 393 university students was used among them 192 male students and 201 female students. Test anxiety was found to negatively affect academic achievement ($\beta = -.23$; p< .05) whereas motivational orientation was found to positively influence academic achievement ($\beta = .38$; p< .05). It also emerged that motivational orientation acted as a significant moderator of the correlation between test anxiety and learning outcomes ($\beta = .10$; p< .01).

Ramezani, Hossaini and Ghaderi (2016) examined the association between test anxiety and student's academic performance among medical students. The researchers established that the mean score of respondents' test anxiety was 10.10±4.99 and the average GPA of their end semester was 15.56 ± 1.58, respectively. The results further showed 37.8% of the students' test anxiety was mild, 26.5% of the students' were found to have moderate test anxiety while the remaining proportion had a severe test anxiety. Correlation analysis results revealed that students' severe anxiety test scores and academic achievement were not significantly related ($p=0.385$, $r=-0.152$). However, it was established that the anxiety level in female students was higher than that of male students ($p = 0.012$, $t = -2.563$).

In their study, Dawood et al. (2016) explored the link between test anxiety and academic performance among university students studying nursing. The cross sectional study sampled of 277 students to fill the questionnaires. The findings of the analysis indicated that test anxiety score of the respondents ranged from 20 to 74. Among the respondents, 14.4% showed severe test anxiety, 50.9% experienced moderate test anxiety while 24.7% of them experienced mild examination anxiety. Pearson's correlation analysis results revealed a significant but negative correlation between examination anxiety and academic performance, ($r = -0.144$, $p = 0.01$). However, it further emerged that student's academic scores and their GPAs had a negative insignificant correlation ($r = -0.090$, $p = 0.157$).

Dordi et al. (2011) determined the association of test anxiety with academic achievement of university students in Iran. The researchers sampled 150 students to complete questionnaires. The collected data were analyzed using Man Whitney and Spearman correlation. The study found out that test anxiety negatively affected students' performance in academics. It also emerged that those students enrolled for lower degrees were likely to be more anxious than the students in higher levels; as such students were more familiar with the process of taking tests.

Rana and Mahmood (2010), working with post-graduate students, examined the association of test anxiety with academic achievement. The study sample comprised of 414 students who were sampled using random sampling from various departments in a public university. Data used for this study were collected using the Test Anxiety Inventory (TAI) and analyzed using Pearson correlation and multivariate regression analyses. The study established that test anxiety was negatively associated with academic performance scores. The findings further indicated that worry, a cognitive factor included in the study, contributed more to test anxiety scores than affective factors (emotional).

VII. METHODOLOGY

A. RESEARCH DESIGN

The researcher adopted a correlational research design. Kothari (2004) opines that the aim of correlational design is to give a portrayal of the current situation in a given population. The proposed study fitted within the design because the interest of the researcher was to simply collect data on the current situation regarding LOC, test anxiety and physics performance of students in Laikipia County without manipulating any variable. The choice of this design was made on the account that there was no manipulation of the independent variables of the study random assignment of the participants to treatment conditions. It is on the strength of the foregoing reasons that the researcher found this design appropriate for the study. Thus the design enabled the researcher to examine the role of LOC and test anxiety in predicting physics performance.

B. LOCATION OF THE STUDY

This research was conducted in Laikipia County, Kenya which is located in the Rift Valley in Kenya. Laikipia County borders Samburu County to the North and Baringo County to the West. The county covers an area of 9,462 square kilometers. The County has a population of 399,227 people (with 49.8% male and −50.2% female). Laikipia County has a total of 84 public secondary schools with an enrolment of 22,091 students. Laikipia County was preferred for this study for several reasons. First, the division has various types of public secondary schools, and thus fits in survey research designs. These are boys, girls, mixed, day and boarding as well as national, extra-county, county and sub-county schools, which represent the diversity of schools in the nation. Secondly, the researcher was familiar with the study area,

having worked there for several years. Lastly, a study carried out in Kakamega County by Mukolwe (2015) recommended that other studies on exam anxiety should be carried out in other regions for more conclusive findings.

C. SAMPLING TECHNIQUES AND SAMPLE SIZE

A representative sample was selected using Krejcie and Morgan's (cited in Cohen, Manion & and Morrison, 2007) sample size determination formula. The sample size of schools consisted of 20 out of 117 public secondary schools in Laikipia County. Stratified random sampling with proportionate allocation was used in selection of schools. The schools were first stratified based on type, with three strata – boys only, girls only and mixed-gender schools. After this, the proportionate number of schools were selected per stratum totalling to 20 schools. Proportionate sampling was used to select students from form two and three giving a total of 400 students. Purposive sampling technique was used to select Physics teachers. The respondents for the study were therefore 400 students and 20 teachers, a total of 420 respondents.

D. RESEARCH INSTRUMENTS

a. QUESTIONNAIRE

According to Peil (1993), the use of a questionnaire ensures that respondents remain anonymous; they have more time to reflect on the questions and may result in more meaningful answers, which are more objective than those of interviews. Questionnaires also enable researchers to gather information from a large population over a short period of time than is possible using the interview method. Since the study targeted a large number of students (400), the researcher considered questionnaires more appropriate.

The questionnaire consisted of three sections: Section one collected background data, including gender, age, class and performance of the students in Physics. Section two collected information on test anxiety among the students. This section comprised of test anxiety scale, which was developed by Nist and Diehl (1990) to measure the level of student' exam anxiety. The scale consisted of ten items on a 5-point Likert-type format. The total scores for the scale range from 10 – 50, with scores between 10 and 19 indicating low exam anxiety; scores between 20 and 35 denote moderate exam anxiety, while scores between 36 and 50 indicate high exam anxiety levels.

Section three comprised of a standardized scale called the Internal-External LOC Scale (I-E), developed by Rotter (1966) to measure LOC. The Internal-External LOC scale consisted of 29 pairs of questions, including 6 filler items, using a forced choice design. The respondent chooses from each pair a statement that corresponds to his or her description of the generalized expectancy. The self-administered took about 25 minutes to complete.

b. INTERVIEW SCHEDULE

Semi structured interview schedule was used in conducting interviews with Physics teachers on the problems

noted among their students during examinations related to test anxiety, and the interventions in place to assist students manage anxiety during examinations.

VII. DATA COLLECTION PROCEDURES

An introductory letter was obtained from Kenyatta University which was used to apply for a research permit from the National Council of Science and Technology (NACOSTI). Once the permit was granted, authorization to carry out the study in Laikipia County was sought from the County education office. The researcher then organized with the school principals on when to collect data. The researcher personally administered the questionnaires to the students and conducted interviews with Physics teachers. The data collection process took a period of two weeks. Upon completion, the researcher collected the filled research tools for analysis.

VIII. DATA ANALYSIS

The study employed quantitative and qualitative approaches to analyze the data. The raw data were first checked for incomplete items and then coded. The research instruments were then scrutinized for completeness and adequacy of responses. The researcher checked for errors, omissions, illegible responses, blankness and irrelevant responses. Once all questionnaires were scanned, the coding process began. Coding entailed identification and classification of the responses in a codebook as per research questions for quantitative analysis. For interview data and open-ended questionnaire items, the transcripts were arranged as per research questions or objectives of study in a thematic manner which included the respondent's direct quotes. Quantitative data analysis was performed using SPSS software Version 25.

IX. RESULTS

A. DEMOGRAPHIC DATA

The study was carried out in boys' schools, girls' schools and mixed gender schools. The sample consisted of physics students and physics teachers and the distribution of gender of the respondents is presented in Table 1.

a. GENDER OF THE RESPONDENTS

	Students		Teachers	
	Frequency	Percent	Frequency	Percent
Male	228	57.0	13	65
Female	172	43.0	7	35
Total	400	100.0	20	100

Table 1: Gender of the Respondents

Table 1 indicates that there were two categories of respondents; students and teachers. Majority of students (228) representing 57% were males while 172 (43%) were female.

The findings reveal that majority of the students who were taking physics were boys. The same trend was observed among the teachers. The results showed that 13 (65%) physics teachers were males while 7 (35%) were females. The results revealed that still science subjects such as physics are male dominated.

b. DESCRIPTIVE STATISTICS FOR THE STUDENTS' PHYSICS PERFORMANCE

The physics scores of the students were transformed into T scores. The descriptives of the T scores are presented in Table 2.

N	Mean	SD	Min	Max	Range	Skewness	Kurtosis
400	50.00	10.00	31.14	68.68	37.54	.10	-.92

Table 2: Descriptives of Physics Performance T scores

The mean of the T scores was 50.00 with a standard deviation of 10.00. The maximum score was 68.68 while the minimum score was 31.14. The range was 37.54 and the skewness coefficient of .10 indicated that the scores were near normal distribution.

Physics performance of the students was categorized into low, average and high levels and the results are presented in Table 3.

Level	Frequency	Percent
Low	42	10.5
Average	279	69.8
High	79	19.8
Total	400	100.0

Table 3: Levels of Physics Performance Scores

The results indicate that majority of the respondents (279) representing 69.8% had average performance in physics, 79 respondents (19.8%) had high scores while 42 respondents (10.5%) had low scores in physics performance. The results are consistent with qualitative information obtained from physics teachers. Most of the teachers reported that physics performance in their schools was average. The reasons given by the teachers concerning the relatively better performance in physics include; motivation, positive attitude among the students, most of the topics are practical and the importance of careers that require physics knowledge. Most of the teachers also indicated that physics performance was average.

The researcher also analyzed the physics performance mean scores for the three categories of schools and the results are presented in Table 4.

School Type	Mean	N	Std. Dev.	Kurtosis	Skewness
Boys' schools	58.37	43	6.12	-.99	-.15
Girls' schools	55.78	46	7.61	-.41	-.06
Mixed gender schools	47.99	311	9.82	-.73	.36
Total	50.00	400	10.00	-.92	.10

Table 4: Physics Performance Mean Scores for the School Categories

The physics mean score for boys' schools was 58.37 9 ($SD = 6.12$) while the mean for girls' schools was 55.78 ($SD = 7.61$). The mean score for mixed gender schools was 47.99 with a standard deviation of 9.82. The findings show that boys' schools performed better in physics than girls' school and mixed gender day secondary schools. The interviewed teachers indicated that most female students had negative

attitude towards physics. Qualitative data also indicated that some female students did not have interest to work hard in physics.

Similar results were obtained when the mean of boys and girls sampled from mixed gender schools was computed.

Gender	N	Mean	Std Dev.	Minimum	Maximum
Male	185	51.56	5.28	32.24	67.32
Female	126	44.56	6.11	31.14	62.21

Table 5: Physics Mean score by Gender in Mixed Gender Schools

The results presented in Table 5 show that the physics performance mean score for boys was 51.56 ($SD = 5.28$) with 32.34 and 67.32 as the minimum and maximum scores respectively. The mean score of the girls was 44.56 ($SD = 6.11$). The maximum score was 62.21 while the minimum score was 31.14. Imbova (2018) reported that the gender difference in performance in science subjects with boys performing better than boys was attributed to the negative attitude girls have towards science subjects. The disparity was also attributed to socio-cultural belief that sciences and mathematics subjects are   for boys while arts and language subjects are for girls.

c. HYPOTHESIS TESTING

The first objective of this study was to find the association between locus of control and physics performance among students in public secondary schools. To find out if the two variables were significantly related or not, the researcher advanced the following hypothesis;

H_{01} There is no significant relationship between locus of control and physics performance.

To test the hypothesis, the collected data was analyzed using Point Biserial correlation analysis and the results are presented in Table 6.

		Physics score
Locus of control score	Pearson Correlation	-.013
	Sig. (2-tailed)	.79
	N	400

Table 6: Correlation between Locus of Control and Physics performance

The researcher hypothesized that there is no significant relationship between locus of control and physics performance. The correlation results presented in Table 4.12 indicate that locus of control and physics performance had negative correlation (r_{pb} (400) = -.013, p = .79). The correlation was not significant. Based on the findings, therefore, the null hypothesis was retained. The findings indicate that an increase in locus of control score is associated with a decline in physics performance. According to the Rotter (1966) scale that was used to measure locus of control, increasing scores mean external locus of control orientation whereas decreasing scores mean internal locus of control orientation. Therefore, to a small extent external locus of control orientation was linked to low scores in physics performance while internal locus of control was associated with high scores in physics performance.

Based on the scale that was used, increase in the scores was associated with external locus of control while decrease in scores was associated with internal locus of control. The findings imply that an increase in external locus of control score leads to a decrease in physics performance. On the other hand, an increase in internal locus of control leads to a slight increase in physics performance. The findings were supported by qualitative data obtained from the physics teachers which showed that most of the students relied on extrinsic motivation to perform well in physics. The teachers interviewed indicated that they had to make their lessons interesting so that the students would like the subject. The use of diverse teaching methods and practical were reported to have an influence on physics performance.

From the findings presented in Table 6, the researcher got interested in establishing if the mean difference in physics performance between students with internal locus of control and external locus of control was significant or not. The data was subjected to independent samples T test and the results are presented in Table 7.

		T	Df	Sig. (2-tailed)	Mean difference
T_Score for physics performance	Equal variances assumed	.47	398	.64	0.71
	Equal variances not assumed	.43	63.601	.67	0.71

Table 7: Independent Samples T test

The results shown in Table 7 indicate that the mean difference in physics performance scores for students with internal locus of control and external locus of control was not statistically significant (t (398) = 0.47, p = .64). The results imply that even though the mean score of students with internal locus of control was higher than that of students with external locus of control, the difference was not statistically significant.

d. DISCUSSION OF THE RESULTS

The findings that there is a negative association between locus of control and physics performance are consistent with the results of studies conducted earlier even though the relationship was not significant. Most of the studies conducted on locus of control focused on academic achievement as the outcome variable. A study by Nejati, Abedi, Agbaci and Mohammadi (2012) among university students revealed that locus of control was significantly related to academic achievement. However, the study did explore the relationship between internal locus of control, external locus of control and academic achievement. The current study established that internal locus of control had a positive correlation with physics performance. The correlation was not significant. On the other hand, external locus of control was found to have a negative and significant correlation with physics performance.

Similar findings were reported by Abid et al. (2016) in a research conducted using a sample of college students. The researchers established that students with internal locus of control performed better in academics than those students with

external locus of control. Students with internal locus of control where reported to be more active and effective in the classroom while students with external locus of control where reported to be passive. The characteristics of students with internal locus of control are associated with more academic engagement which results to meaningful learning and hence better academic results. On the contrary, students with external locus of control do not actively participate in learning activities. As a result, they learn very little and end up performing lowly in academics.

Kader (2014) studied the association between locus of control and academic achievement in economics course. The results showed that learners with internal locus of control performed better in the course than students with external locus of control. Respondents with internal locus of control reported lower levels of test anxiety, used mastery goal approach and expended more in academics. In a non-experimental study by Hassaskhah and Jahedi (2015), it was established that locus of control significantly correlated with academic achievement. High levels of external locus of control were associated with high probability of poor performance in academics whereas high levels of internal locus of control were associated with better scores.

Based on the findings of this study and the theoretical conceptualization of the association between locus of control and academic performance, the problem of low enrollment and poor performance in physics may be associated with locus of control. Even though the findings revealed that majority of the respondents had internal locus of control, Table 4.13 shows that in a continuum, the scores were close to external locus of control. Therefore, the poor performance in physics in Laikipia County is associated with expectation of the students about causation of enrollment and performance in the subject.

e. RELATIONSHIP BETWEEN TEST ANXIETY AND PHYSICS PERFORMANCE

This section contains descriptive statistics for test anxiety scores, hypothesis testing and discussion of the results.

Descriptive Statistics For Test Anxiety Scores

The descriptive statistics for the students' test anxiety scores that were computed are presented in Table 8.

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Test anxiety	400	31.00	10.00	41.00	22.90	5.84	.21	-.16

Table 8: Descriptives Statistics for Test Anxiety Scores

The mean of test anxiety scores was 22.90 with a standard deviation of 5.84. The maximum score was 41.00 while the minimum score was 10.00. The expected maximum and minimum scores were 50 and 10 respectively. The results indicate that generally the students involved in the study had moderate level of test anxiety.

The levels of test anxiety scores were categorized into low, moderate and high as shown in Table 9.

	Frequency	Percent
Low	111	27.8
Moderate	281	70.3
High	8	2.0
Total	400	100.0

Table 9: Levels of Test Anxiety

The results indicate that 281 respondents representing 70.3% had moderate level of test anxiety, 111 respondents (27.8%) had low level of test anxiety while only 8 respondents (2%) had high level of test anxiety. The results confirm the findings presented in Table 9 showing that on average the respondents had moderate level of test anxiety.

School Type	Low	Moderate	High	Total
Boys' schools	12(28)	31(72)	0	43(100)
Girls' schools	9(20)	36(78)	1(2)	46(100)
Mixed gender schools	90(29)	214(69)	7(2)	311(100)
Total	111	281	8	400

Table 10: Levels of Test Anxiety by School Type

Table 10 shows that 31 (72%) respondents sampled from boys' schools had moderate levels of test anxiety while 12 (28%) respondents had low level of test anxiety. In girls' schools, 9 (20%), 36 (78%) and 1(2%) respondents had low, moderate and high levels of test anxiety respectively. In mixed day schools, 90 (29%) respondents had low level of test anxiety, 214 (69%) respondents had moderate level of test anxiety while 7(2%) students had high level of test anxiety.

1)ii. Hypothesis Testing

The second objective of this study was to investigate the relationship between test anxiety and physics performance. To examine how the variables correlated, the following null hypothesis was advanced;

H_{01} There is no significant relationship between test anxiety and physics performance among secondary school students.

To test the hypothesis, the data were subjected to Pearson analysis and the results are presented in Table 11.

		Test Anxiety
T-score for physics performance	Pearson Correlation	-.148[**]
	Sig. (2-tailed)	.003
	N	400

Table 11: Relationship between Test Anxiety and Physics Performance

The results showed that there was a significant negative correlation between test anxiety and performance in physics, *r* (400) = -.148, *p* < 0.05. Therefore, the null hypothesis was rejected. The results were supported by qualitative data obtained from the physics teachers. Majority of the teachers indicated that low performance in physics was associated with high levels of test anxiety. Most of the teachers reported that nearly half of the students scored low marks in physics because of text anxiety. Students who appeared to be good in physics failed tests because they exhibited high levels of test anxiety. The findings imply that an increase in test anxiety leads to a significant decline in physics performance.

On the other hand, low test anxiety level is associated with high performance in physics in performance. This is demonstrated in Table 12.

Levels of test anxiety	Mean	N	Std. Deviation
LOW	51.07	111	10.73
Moderate	49.76	281	9.66
High	43.52	8	9.48
Total	50.00	400	10.00

Table 12: Levels of Test Anxiety and Physics Mean Score

Table 12 indicates that respondents with low level of test anxiety had the highest mean of 51.07 (SD = 10.73) while those with high level of test anxiety scored the least mean of 43.52 (SD = 9.48).

The researcher sought to find out if the mean differences across the levels of test anxiety were significant or not. The data were analyzed using ANOVA and the findings are shown in Table 13.

	Sum of Squares	*Df*	Mean Square	*F*	*Sig.*
Between Groups	478.70	2	239.35	2.41	.019
Within Groups	39421.31	397	99.30		
Total	39900.00	399			

Table 13: One Way Anova

The results presented in Table 13 show that there were significant mean differences in physics performance among the students with different levels of test anxiety, F = 2.41, p < 0.05. The researcher conducted post hoc analysis to establish if there were significant mean differences in physics performance in each of the pairs of the levels of test anxiety.

(I) Levels of test anxiety	(J) Levels of test anxiety	Mean Difference (I-J)	Std. Error	Sig.
LOW	Moderate	1.30	1.12	.013
	High	7.55	3.65	.007
Moderate	LOW	-1.30	1.12	.013
	High	6.25	3.57	.019
High	LOW	-7.55	3.65	.007
	Moderate	-6.25	3.57	.019

Table 14: Tukeys' HSD Analysis Results

The results show that there were significant mean differences in physics performance among students with low, moderate and high levels of test anxiety. The results imply that the level of test anxiety significantly affected the performance of the students in physics.

Similar findings were reported by Faqe, Moheddin and Kakamad (2017) in a study that was carried out among primary school pupils. The researchers established that pupils who experienced high levels of test anxiety scored poorly in academics.

f. DISCUSSION OF THE RESULTS

The findings that there was a significant negative relationship between test anxiety and physics performance support the results of past research conducted in the area. A study by Tugan (2016) that was conducted among 9th grade children, established that test anxiety was negatively related to academic achievement. The researcher reported that children who had low level of test anxiety scored high marks in achievement test while those with high level of test anxiety scored low marks. The inverse relationship between test anxiety and academic achievement is attributed to the fact that at the beginning of arousal (low level of test anxiety) students are confident about their ability to perform well in academics and are able to control the arousal. When the arousal is high (high level of test anxiety), the students begin to doubt their ability and therefore are unable to control the arousal which negatively affects their performance.

Another research carried out by Onyekuru and Ibegbunam (2014) among college students showed that test anxiety and academic achievement were negatively correlated (r = - 0.22, $p < 0.05$). It was further revealed that there was a weak positive correlation between low level of test anxiety and academic performance. High level of test anxiety was associated with low scores in academic performance. The findings of Onyekuru and Ibegbunam support the descriptive statistics of the current research presented in Table 4.34. The results show that students with low level of test anxiety had a better mean score in physics performance than those students with high level of test anxiety. Akinleke (2012) suggested that to enable learners to perform well in academics, they should be assisted to deal with anxiety.

g. GENDER DIFFERENCE IN LOCUS OF CONTROL, TEST ANXIETY AND PHYSICS PERFORMANCE

The researcher sought to find out if there were gender differences in the scores of locus of control of the students.

Description Of Locus Of Control Scores

The descriptives of locus of control scores are presented in Table 15.

	Gender	N	Mean	Std. Deviation
Locus of Control Score	Male	228	9.49	2.75
	Female	172	9.80	2.77

Table 15: Description of Locus of Control by Gender

The results indicate that male students scored a mean of 9.49 (SD = 2.75) which was higher than that of female students which was 9.80 (SD = 2.77). To establish if the mean difference was significant or not, the researcher conducted independent samples T test and the results are presented in Table 16.

		t-test for Equality of Means		
		T	Df	Sig. (2-tailed)
Locus of control score	Equal variances assumed	-1.13	398	.26
	Equal variances not assumed	-1.13	367.06	.26

Table 16: Independent Samples t-test

The results presented in Table 16 revealed that the mean difference in locus of control scores between male and female respondents was not statistically significant (t (398) = - 1.13, $p > 0.05$). Therefore, the null hypothesis which stated that there were no significant gender differences in locus of control among secondary school students was retained. The findings imply that even though male respondents scored a slightly higher mean than female respondents, the difference was not statistically significant in favour of female respondents.

h. GENDER DIFFERENCES IN TEST ANXIETY

To examine gender differences in test anxiety scores, the mean of test anxiety scores and independent samples t – test were computed.

Description Of Test Anxiety Scores By Gender

	Gender	N	Mean	Std. Deviation
Test Anxiety Scores	Male	228	21.84	5.46
	Female	172	24.30	6.03

Table 17: Description of Test Anxiety Scores by Gender

The results indicate that female respondents scored a mean of 24.30 with a standard deviation of 6.03 while male respondents scored a mean of 21.84 with a standard deviation of 5.46. The findings showed that female respondents scored a higher mean than male respondents.

Hypothesis Testing

The researcher hypothesized that there are no significant gender differences in test anxiety among secondary school students. To test this hypothesis, the researcher conducted independent samples t-test and the results are presented in Table 18.

		t-test for Equality of Means		
		T	Df	Sig. (2-tailed)
Test Anxiety scores	Equal variances assumed	-4.252	398	.00
	Equal variances not assumed	-4.193	347.77	.00

Table 18: Independent Samples t-test

Table 18 shows that there was a significant mean difference in test anxiety scores between male and female respondents, $t(398) = -4.252$, $p < 0.00$. The mean difference was in favour of female students. Therefore, the null hypothesis was rejected. The results imply that female students had higher test anxiety than male students. The study established that there was a negative significant relationship between test anxiety and physics performance. This explains why male respondents performed better in physics than female respondents. The results support the findings of Karatas, Alci and Aydin (2013) who established that there were significant differences in test anxiety scores and academic achievement with respect to female learners and in university entry exams with respect to male learners.

i. GENDER DIFFERENCE IN PHYSICS PERFORMANCE

The third sub objective in objective four was to establish if there was gender difference in physics performance.

Description Of Physics Mean Scores By Gender

Table 19 presents the description of physics mean scores for male and female respondents.

	Gender	N	Mean	Std. Deviation
T Score	Male	228	51.01	10.28
	Female	172	48.66	9.47

Table 19: Physics mean Scores by Gender

The results indicate that male respondents had a mean score of 51.01 with a standard deviation of 10.28 while the female respondents scored a mean of 48.66 with a standard deviation of 9.47. As indicated, the male respondents had a higher mean score than female respondents.

Hypothesis Testing

To establish if the mean difference was statistically significant or not, the researcher advanced the following hypothesis;
There is no significant gender difference in physics performance.
The hypothesis was tested using t test and the results are presented in Table 20.

		t-test for Equality of Means		
		T	Df	Sig. (2-tailed)
T Scores	Equal variances assumed	2.33	398	.020
	Equal variances not assumed	2.36	382.47	.019

Table 20: Independent Samples t-test

Table 20 indicates that the mean score difference in physics performance between male and female respondents was statistically significant, $t(398) = 2.33$, $p < .020$. The mean difference was in favour of male respondents. The results imply that male respondents performed better in physics than female respondents. Ghazvini and Khajehpour (2011) also found that male students performed better in academics than female students.

j. DISCUSSION OF THE RESULTS

The study aimed at establishing if there was gender difference in locus of control or not. The findings showed that the mean difference in locus of control scores between male and female respondents was not statistically significant. Past research work reviewed also reported similar findings. A study by Majzub, Bataineh, Ishak, and Rahmah (2015) which was conducted among university students established that female students were characterized by internal locus of control and use of self-testing strategies while male students were characterized by internal locus of control and were more likely to concentrate in studies for long. The results further revealed that male students were more likely to be internal and external than their female counterparts. Another study by Mukolwe (2015) among secondary school students established that female students were more of internalizers while male students were more of externalisers.

The study established that there were significant gender differences in test anxiety. Female students reported high levels of test anxiety compared to the boys. The findings corroborate the results of Syokwaa, Aloka and Ndeke (2014). The study used a sample of secondary school students and the findings revealed that girls were more prone to test anxiety

than boys. Students with high levels of test anxiety performed poorly in examinations. This might be the reason why female students lag behind the male students in physics performance. The qualitative data obtained from physics teachers also indicated that high levels of test anxiety negatively affected performance in physics. The teachers stated that test anxiety is manifested in several ways such as uneasiness, forgetting basic concepts, confusion, missing school during exams, restlessness, faking sickness, last minute revision, sweating and cheating. These characteristics make it difficult for the students to remember the concepts resulting to poor performance in physics. The low enrolment and poor performance in physics in Nyahururu Sub County may be attributed to high levels of test anxiety.

The study findings showed that there was a significant gender difference in physics performance. The boys performed better in physics than the girls. The findings were consistent with the results of other studies conducted earlier. Ghazvini and Khajehpour (2011) reported that male and female students vary in their motivational orientation and academic achievement. Mukolwe (2015) also found that there were significant gender differences in academic resilience and procrastination. The gender differences in physics performance may be attributed to cultural factors beliefs that science subjects belong to boys. Some of the teachers who were interviewed also indicated that majority of the girls did not select physics. It was also reported that even those girls who were taking physics had the perception that physics is a difficult subject. This perception and other cultural beliefs contribute to low enrolment and poor performance in physics witnessed in Nyahururu Sub County.

k. DIFFERENCES IN LOCUS OF CONTROL, TEST ANXIETY AND PHYSICS PERFORMANCE BY SCHOOL TYPE

The fourth objective of this study was to find out if there were gender differences in locus of control, test anxiety and physics performance by school type. This section presents differences in locus of control, test anxiety and physics performance by school type.

Differences In Locus Of Control By School Type

Table 21 presents the descriptive statistics of locus of control scores by school type.

School Type	Mean	Std. Deviation	Minimum	Maximum
Boys' schools	8.77	2.91	2.00	16.00
Girls' schools	9.61	2.74	3.00	15.00
Mixed gender schools	9.74	2.73	3.00	17.00
Total	9.62	2.76	2.00	17.00

Table 21: Description of Locus of Control Scores

The results indicate that students from mixed gender schools had a mean score of 9.74 (SD = 2.73). The maximum score was 17 while the minimum score was 2. Students from girls' schools scored a mean of 9.61 (SD = 9.61). The maximum score was 15 while the minimum score was 3. Students from boys' schools had the lowest mean score of

8.77 (SD = 2.91). In this category of schools, the maximum score in locus of control was 16 while the minimum score was 2.

Hypothesis Testing

The study hypothesized that there was no significant mean difference in locus of control scores across the different categories of schools. The hypothesis was tested using ANOVA and the results are presented in Table 22.

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	35.945	2	17.97	2.38	.09
Within Groups	3002.05	397	7.56		
Total	3037.98	399			

Table 22: One way ANOVA

The findings indicate that the differences in the mean scores of locus of control across the school categories were not statistically significant, $F (2, 397) = 2.38$, P > 0.05. The researcher conducted post hoc analysis to find out if the mean differences in the groups of the school categories were significant or not. The results are presented in Table 23.

(I) School Type	(J) School Type	Mean Difference (I-J)	Std. Error	Sig.
Boys' schools	Girls' schools	-.84	.58	.32
	Mixed gender schools	-.98	.45	.07
Girls' schools	Boys' schools	.84	.58	.32
	Mixed gender schools	-.13	.43	.94
Mixed gender schools	Boys' schools	.98	.45	.07
	Girls' schools	.13	.43	.94

Table 23: Tukey's HSD Analysis Results

The results indicated that none of the mean differences in locus of control scores for the groups of school categories was statistically significant. The results indicate that even though there were mean differences in locus of control across the three categories, the scores did not differ greatly.

l. DIFFERENCES IN TEST ANXIETY BY SCHOOL TYPE

Description Of Test Anxiety Scores By School Category

The descriptive statistics of differences in test anxiety by school type are presented in Table 24.

School Type	Mean	Std. Deviation	Minimum	Maximum
Boys' schools	21.58	5.38	13.00	35.00
Girls' schools	22.61	5.83	12.00	37.00
Mixed gender schools	24.51	5.88	10.00	41.00
Total	22.90	5.84	10.00	41.00

Table 24: Description of Test Anxiety Scores by School Category

The results showed that the mean of test anxiety scores for students sampled from boys' schools was 21.58 (SD = 5.38). The maximum score was 35 while the minimum score was 13. The mean of test anxiety scores for students from girls' schools was 22.61 (SD = 5.83). In this category, the

maximum score was 37 while the minimum score was 12. Students from mixed gender schools had the highest mean score of 24.5 (SD = 5.88) in test anxiety. The maximum score was 41 while the minimum score was 10. The results presented in Table 12 shows that there was a negative correlation between test anxiety scores and physics performance and as indicated in Table 4students from boys' schools scored the highest mean while students from mixed gender schools scored the lowest mean. Therefore, the results also confirm the findings that an increase in test anxiety is associated with a decline in academic performance as reported by Karatas, Alci and Aydin (2013).

Hypothesis Testing

To establish if the mean differences were statistically significant the researcher advanced the following hypothesis;

There is no significant mean difference in test anxiety across the school types

The hypothesis was tested using ANOVA and the results are presented in Table 25.

	Sum of Squares	*Df*	Mean Square	*F*	*Sig.*
Between Groups	152.63	2	76.32	2.25	.01
Within Groups	13442.17	397	33.86		
Total	13594.80	399			

Table 25: One way ANOVA

The findings indicate that the mean differences in test anxiety scores across the school types were statistically significant, $F (2, 397) = 2.25$, p < 0.05.

To establish how the groups of the school type contributed to the significant mean difference in test anxiety scores, post hoc analysis was conducted using Tukey's HSD and the results are presented in Table 26.

(I) School Type	(J) School Type	Mean Difference (I-J)	Std. Error	Sig.
Boys' schools	Girls' schools	-2.03	1.23	.23
	Mixed gender schools	-.11*	.95	.00
Girls' schools	Boys' schools	2.03	1.23	.23
	Mixed gender schools	1.92*	.92	.00
Mixed gender schools	Boys' schools	.11*	.95	.00
	Girls' schools	-1.92*	.92	.00

Table 26: Tukey's HSD Analysis Results

The results indicate that the mean difference in test anxiety scores between students from girls' schools and those from boys' schools was not statistically significant. The mean difference between test anxiety scores for students from girls' schools, boys' schools and those from mixed gender schools was statistically significant. The results imply that students from mixed gender schools scored a lower mean in physics performance compared to students from boys' schools and girls' schools.

m. DIFFERENCES IN PHYSICS PERFORMANCE BY SCHOOL TYPE

Description Of Physics Performance Scores By School Type

The descriptive statistics in physics performance by school type are presented in Table 27.

School Type	Mean	N	Std. Dev.	Min	Max
Boys' schools	58.37	43	6.12	48.21	68.68
Girls' schools	55.78	46	7.61	37.97	68.68
Mixed gender schools	47.99	311	9.82	31.14	68.68
Total	50.00	400	10.00	31.14	68.68

Table 27: Description of Physics Performance scores by School Categories

As indicated in Table 27, students from boys' schools had the highest mean of 58.37 (SD = 6.12) physics performance, students from girls' schools had a mean of 55.78 (SD = 7.61) and students from mixed gender schools scored a mean of 47.99 (SD = 9.82).

Hypothesis Testing

To find out if the mean differences in physics performance were statistically significant or not, the researcher tested the following hypothesis.

There is no significant difference in physics performance across the school types

The hypothesis was tested using ANOVA and the findings are presented in Table 28.

	Sum of Squares	*Df*	Mean Square	*F*	*Sig.*
Between Groups	5802.97	2	2901.48	33.78	.00
Within Groups	34097.03	397	85.89		
Total	39900.00	399			

Table 28: One way ANOVA

Table 28 shows that the mean difference in physics performance across the three categories of schools was statistically significant, $F (2, 397) = 33.78$, $p < .00$.

Post hoc analysis was conducted to establish how the means of each of the groups differed.

(I) School Type	(J) School Type	Mean Difference (I-J)	Std. Error	Sig.
Boys' schools	Girls' schools	2.59	1.97	.39
	Mixed gender schools	10.38*	1.51	.00
Girls' schools	Boys' schools	-2.59	1.97	.39
	Mixed gender schools	7.79*	1.46	.00
Mixed gender schools	Boys' schools	-10.38*	1.51	.00
	Girls' schools	-7.79*	1.46	.00

Table 29: Tukey's HSD Analysis Results

The results indicated that the mean difference in physics performance between boys' schools and girls' schools was not statistically significant. The mean difference in physics performance of students from boys' schools, girls' schools and mixed gender schools was statistically significant. Students

from mixed gender schools lagged behind in physics performance due to high levels of test anxiety among majority of the students. Tugan (2016) reported that test anxiety and academic performance were negatively correlated.

n. DISCUSSION OF THE RESULTS

The study established that there were no significant mean differences in locus of control across the school categories. These findings may be attributed to the fact the most of the students across the school types had internal locus of control orientation. Majzub, Bataineh, Ishak, and Rahmah (2015) male students were more likely to have internal locus of control while female students were more likely to have external locus of control. Some of the teachers interviewed stated that most girls had external locus of control. They assisted the girls through thorough revision, consultation and counseling.

The findings revealed that the mean differences in test anxiety scores across the school types were statistically significant. Students from boys' schools had the lowest mean score in test anxiety while students from mixed gender schools had the highest mean score in test anxiety. The results explain why students from boys' schools scored the highest mean in physics performance while students from mixed gender schools scored the lowest mean. Similar findings were reported by Onyekuru and Ibegbunam (2014) in a study among college students. The study examined the relationship between test anxiety and academic achievement and the findings showed that the two variables were negatively correlated. Students with low test anxiety performed better in achievement tests compared to students with high levels of test anxiety. Balogun, Balogun and Onyencho (2017) also established that test anxiety negatively affect academic achievement. High levels of test anxiety makes the students to lose confidence in their academic ability resulting to poor performance. Qualitative data also revealed that test anxiety negatively affected performance in physics. It was reported that students who manifested high levels of test anxiety performed poorly in physics.

X. CONCLUSIONS

The study sought to find out the association between locus of control and physics performance among secondary school students in Laikipia County. The findings indicated that locus of control was negatively associated with physics performance. The correlation was not statistically significant. High scores of locus of control (external locus) negatively affected physics performance while low scores of locus of control (internal locus) positively affected physics performance. Students with internal locus of control believe that their effort and qualities determine their academic performance while those with external locus of control belief that academic performance is influenced by external factors such as luck and the school environment. Based on these results, internal locus of control is more important in determining academic performance than external locus of control.

The study established that there was a negative and significant relationship between test anxiety and physics performance. Students with low levels of test anxiety score highly in academics whereas students with high levels of test anxiety score low grades in academics. At the beginning of arousal students feel confident about themselves to perform well but when the arousal becomes too high, academic performance begins to decline. When the students are very anxious, they concentrate more on the anxiety thus losing concentration on the learning task. The shift in attention results to more anxiety making the student to loose balance that is required to performance effectively in learning tasks. Therefore, its important that secondary school students are guided on how to reduce test anxiety levels for better academic performance.

The findings showed that there was gender difference in locus of control with more boys exhibiting internal locus of control than girls. Since the results indicated that internal locus of control enhanced physics performance, its necessary that students are made to understand that inner drive in more important in learning than relying on external factors. Female students were also found to have high levels of test anxiety than male students. This negatively affected their performance in physics. Male respondents performed better in physics than female respondents. From the results obtained, girls need to be sensitized on the importance of physics to the society and in career development so that they can compete favorably with male students.

The findings on gender differences in locus of control, test anxiety and physics performance by school type showed that students from mixed gender schools were disadvantaged in all the aspects that were studied. Therefore, there is need strengthen programs in mixed gender schools to address test anxiety and motivation to enhance their performance in physics.

XI. RECOMMENDATIONS

A. POLICY RECOMMENDATIONS

✓ Based on the findings that locus of control was negatively and significantly related to physics performance, policy makers should develop learning resources that should be included in life skills content to train students on how to develop internal locus orientation to enhance physics performance.

✓ Parents, teachers and other stakeholders should constantly assist the students so that they can build confidence in their academic abilities and examination preparation strategies to reduce test anxiety. This will go a long way in improving the quality of learning outcomes. Policy makers should also formulate guidelines and learning content that can be used to train students on how to reduce test anxiety. Guidance and counselling programs in schools should also be strengthened to constantly guide the students on effective test taking strategies. This will reduce test anxiety and hence better physics performance.

✓ Policy makers and all other stakeholders in the education sector should come up with training and support programs

that target girls to help them develop internal locus of control and reduce test anxiety levels. This will enhance physics performance among female students and hence make them compete favorably with boys in physics and science related courses.

B. RECOMMENDATIONS FOR FURTHER RESEARCH

✓ The study was carried out in Laikipia County and therefore similar studies should be carried out in other counties for more conclusive findings.

✓ Since the study esbalished that locus of control and test anxiety were negatively related to physics performance, there is need for further research on the causes of test anxiety internal and external locus of control. The findings may be used to guide students to improve in physics performance.

✓ The study used a sample of secondary school students and correlational research design. Further studies should be carried out using samples of college and university students with other research designs extend this knowledge.

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