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Relationship between Perceived Mathematics-control and Mathematics Achievement of Secondary School Students in Nakuru County, Kenya

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Abstract
Over the years in Kenya and in Nakuru County in particular, mathematics has been characterized by dismal achievement as evidenced by low grades attained by students in Kenya Certificate of Secondary Examination (KCSE). This poor achievement may result to loss of opportunities for students, both in their choice of preferred careers and ultimately in their employment. At the societal level, this may lead to inadequate human capital for social-economic development. However, despite this important role mathematics plays in the society, there is little effort in terms of research that has been undertaken to find out factors that influence mathematics achievement in secondary schools in Nakuru County. Therefore, this study was designed to examine the relationship between perceived mathematics-control and mathematics achievement. The research was anchored on self-determination theory. Correlational research design was used to establish the relationship between the study variables. The target population was all form three students in public secondary schools in Nakuru County. Purposive sampling was used to select the study location and schools while stratified sampling was used to select different categories of schools and simple random sampling was used to select the respondents. A sample of 585 respondents was used. Self-report questionnaire for students was used to collect data on demographic factors and perceived mathematics-control. Both descriptive and inferential statistics were used to analyze quantitative data using SPSS. The results revealed that there was a significant relationship between perceived mathematics-control and mathematics achievement, $r (585) = .77$, $p < .05$. R squared was 0.59 suggesting that 59% of changes in mathematic achievement in public secondary schools in Nakuru County was explained by perceived mathematics-control. It is recommended that teachers should guide and support students to enhance perceived mathematics-control in order to improve their mathematics achievement.
Keywords*: Perceived mathematics-control, mathematics achievement, Secondary schools*

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I. Introduction

Mathematics plays a key role in skills development at all levels of learning. Owing to the importance of mathematics, researchers have taken keen interest on the factors that can be manipulated to enhance achievement in this subject. Previous studies have examined different factors but the current study focused on perceived mathematics control because its under researched. According to Manzana (2019), perceived mathematics-control can be defined as students' perceptions or beliefs in their own capacity to determine and predict achievement outcomes of mathematics. Schimdt, (2021) observed that this perceived mathematics-control describes the variance between students in their beliefs and perceptions about their capacity to influence and predict outcomes and events in mathematics achievement. The importance of perceived mathematics-control also referred to as perceived academic-control for this study, has been confirmed by various studies based on the premise that the construct describes perceived ability of a student to influence his or her academic environment (Manzana, 2019). According to Gross (2021), perceived academic-control in this case perceived mathematics-control is sustained by individual attempts either to change the academic environment (primary academic-control) or to adjust psychologically to one's academic environment (secondary academic-control). Primary academic-control refers to the capability to influence one's environment to attain desired mathematics

outcomes while secondary academic-control refers to one's capability to influence his or her internal states. Engelbrecht (2020) states that strategies of primary academic-control include goal-directed persistence and effort whereas secondary academic-control comprise of various strategies such as downgrading of expectations, accepting limitations or perceiving benefits from otherwise an adverse experience.

Studies conducted in different countries have shown that perceived mathematics-control is associated with learning outcomes. Lazarides (2019) examined mathematics profiles and achievement based on perceived teaching. The study found that most students directed their efforts towards learning and problem-solving task in order to improve in mathematics achievement. The students were motivated by the perception that effort results in better grades in mathematics. Therefore, the students dedicated their efforts in doing practice and learning new concepts to improve on their mathematics achievement. The results suggest that perceived mathematics-control is linked to mathematics achievement.

In Nigeria, Igwe and Owan (2019) indicated that many students perceived that mathematics achievement could improve through teacher effectiveness, effort, ability and willingness to dedicate time to learn mathematics. The respondents indicated that the ability to control their learning of mathematics with the aim to improve, resulted in better grades in mathematics. It was also established that teacher support towards better achievement in mathematics was considered as one of the factors that promote positive perception towards mathematics-control.

In Kenya, Kipkemoi and Too (2019) in their study indicated that students who are motivated scored better grades in mathematics than those who are not motivated. The study established that there was positive relationship between mathematics achievement and student attitude towards mathematics. Since student attitude is acquired through their perception, perceived mathematics-control could be associated with mathematics achievement. This study aimed to establish if this was the case among secondary school students in Kenya.

Studies have also established that primary and secondary academic-control strategies are effective in fostering academic development of students. Hamm (2020) argues that to enhance mathematics achievement there is need for adoption of strategies aimed at addressing instructional challenges. Further, they documented significant positive association between high Mathematics-control and achievement in the subject. Respondek et al. (2017) in a related study reported that perceived academic-control is a significant predictor of academic achievement. Pheiffer and Jiang (2021) reported that perceived academic-control and wellbeing had no significant effect on academic achievement. Duckworth et al. (2019) that academic achievement was significantly affected by teaching skills and perceived academic-control. In this case, students are said to have a high or low mathematics-control in their ability to influence their desired mathematics outcomes. However, despite the important influence perceived mathematics-control has on the success or failure in mathematics, little has been done in Nakuru County on how it contributes to students' mathematics achievement in secondary schools.

II. Statement of the Problem

Every year, a majority of secondary school students in Nakuru County have been performing poorly in mathematics in national examinations. The continued poor achievement in mathematics nationally and particularly in Nakuru County over the years has caused deep concern to educational stakeholders ((K.C.S.E Essential Statistics, 2019). This is because at the individual level the poor achievement may result in loss of opportunities for students in career choice and ultimately affect their employment opportunities. At the societal level, this may lead to production of less human capital in the fields of science, technology and engineering which may greatly affect the socioeconomic growth and wealth creation of the county and the country at large. There was therefore need to investigate the psychological variables that may be associated with this poor achievement of mathematics in secondary schools.

From the reviewed studies in the background, there was evidence that perceived mathematics-control may have an influence on mathematics achievement of secondary school students. However, most of the studies available have been undertaken in developed countries with different cultural contexts. The few available studies undertaken in Kenya, have focused on different psychological factors. Hence the need for this study whose central focus was to establish the relationship between perceived mathematics-control and mathematics achievement of form three secondary school students' in Nakuru County.

III. Purpose of the Study

The purpose of this study was to examine the relationship between perceived mathematics-control and mathematics achievement of secondary school students in Nakuru county. The findings may be used to improve mathematics achievement in secondary schools in the county.

IV. Review of Related Literature

In the investigation of the relationship between perceived mathematics-control and mathematics achievement a few related literatures were found. A related study conducted by Perry et al. (2005) investigated the effect of perceived academic-control on students' academic achievement. The study was undertaken in Mid-Western University in Canada, using a 3-years longitudinal survey where a sample of 524 college students was used. The findings revealed that, those students who had high perceived academic-control obtained better 3-year Grade Point Average (GPAs) and withdrew from fewer courses as compared to the students who had low perceived academic-control. The research findings further revealed that those students, who had high academic-control were more concerned about failure. These students according to the study were less likely to drop out of university and also less likely to withdraw from courses as compared to the other group (Perry's et al., 2005). The study revealed that high academic-control is important in enhancing academic achievement. However, Perry's et al., study was carried out in Canada which is a developed country and college students were used hence the need for a study to find out the influence of perceived mathematics-control on mathematics achievement in a developing country, which was the gap the current study addressed. Further, Perry et al, used longitudinal survey design and the current study used a different research design that is, *ex post facto*.

In another related study by Ruthig et al. (2004) revealed the interactive effects of perceived academic-control and students' emotions on academic achievement. The study sample comprised 620 first year college students drawn from Mid -Western University in USA. One-year longitudinal survey research design was used. According to Ruthig et al. (2004), the findings revealed that first-year students' achievement in college were positively associated with perceived academic-control. The results as revealed concurred with previous findings by (Perry, 2008; Hall & Perry, 2008) that indicated that students with high academic-control greatly enhanced their academic achievement. These findings suggest that to enhance academic achievement among high-control group more effort should be geared towards instructional issues and strategies. The current study used a correlational research design and a sample of secondary school students in Kenya which may lead to differences in perceived mathematics -control.

The study by Respondek et al. (2017) on perceived academic-control and academic emotions predict undergraduate university student's success: examining effects on drop out intension and achievement. The study addressed the high risk of university students' academic failure. A sample of 883 undergraduate students across all disciplines of German STEM oriented University was used, using cross sectional survey. The findings revealed that perceived academic-control positively predictive academic achievement. The current research examined perceived mathematics-control and mathematics achievement to address the knowledge gap.

Relatedly, Ansah et al. (2012) investigated the effect of perceived academic control and wellbeing and academic performance of Ghana students with disability. Descriptive research design was adopted and primary data gathered through issue of questionnaires among 69 who were conveniently selected. Descriptive statistics, correlation and regression analyses were adopted to analyze the data. The study findings revealed that perceived control increased well-being and it was significantly moderated by gender. Moreover, secondary control had more contribution as compared to primary control. However, academic performance was not significantly affected by academic self-control and self-esteem. This research aimed to confirm these findings by focusing on perceived mathematics-control and mathematics achievement to further knowledge in this area.

Adria et al. (2017) investigated teaching skills, students' emotions, perceived control and academic achievement in university students. Cross sectional research design was adopted and primary data gathered through the use of questionnaires. Simple random sampling was applied in selection of 176 students. Structural equation modelling was used to analyze the data. Study findings revealed that characteristics of teaching had strong positive effect on enjoyments and hope and it affected inversely on stress reduction. Positive emotions and stress were contingent to teachers teaching skills and they impacted positively on perceived self-control. Academic achievement was significantly affected by teaching skills and perceived control. The current research involved secondary school students focusing on perceived Mathematics-control and mathematics achievement to fill the population and knowledge gaps.

V. Methodology

5.1 Research Design and Target Population

This study adopted correlational *ex post facto* research design. According to Lord (1973), *ex post facto* study can be described as a research design in which the investigation starts after the fact has occurred. It is also referred to as after-the-fact research. In this case, the researcher investigates what has already happened without any interference. As noted by Cohen et al. (2011), in this kind of study, the role of the researcher is to examine the data retrospectively to establish causes, relationships, associations, and their meanings. In this case, the researcher can only report what has already happened.

Correlational design was necessitated by the fact that the researcher wanted to establish the relationship between different variables. This design according to Sekaran and Bougie (2013) is used to establish whether two or more variables are related. Orodho (2005) asserts that correlational design is used to discover predictive relationships and the degree of relationship among variables. In this case, the design was used to establish the relationship between perceived mathematics-control and mathematics achievement.

5.2 Sampling Techniques and Sample Size

In this study, the researcher adopted both probability and non-probability sampling techniques. To select Nakuru County and secondary schools from the National, County and Sub County categories were selected using purposive sampling technique. According to Sekaran and Bougie, (2013), purposive sampling is very useful for situations where one needs to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. In this case, purposive sampling helped to get respondents with specific characteristics that were under study. Probability sampling methods; stratified sampling and simple random sampling were used in the selection of schools and respondents. This helped to ensure that all the subjects in the target population had an equal chance of being selected in the sample.

Yamane (1967) sample size formula was adopted in the study to obtain 611 students. In order to obtain the required number of participants from each school, the researcher first used the class list of all the form three students. The students were selected through random sampling by picking papers marked yes and others no. To obtain a random sample, the papers were thoroughly mixed before students were given an opportunity to pick from the basket. The students who picked yes were given code numbers as identification as the sample. The student's admission number were also used together with the codes so as to get each student's mathematics score at the end of term one examination of 2019.

5.3 Research Instruments

a) Perceived Mathematics-Control Scale

This scale was used to measure perceived mathematics-control of each student. To collect this data, perceived academic-control scale by Stupnisky et al. (2008) was modified and adapted to fit in the Kenyan context. The researcher sought permission for the use of this scale from the authors. This section is composed of twelve questions presented on a 5-point Likert-type scale ranging from 5 to 1 as follows; 5 (strongly agree), 4 (agree), 3 (neutral), 2 (disagree) to 1 (strongly disagree). The scale was scored by calculating the sum of the responses provided in each item. Negatively worded items were reverse scored. The expected highest score was 60 and the lowest 12. According to Stupnisky et al., (2008), the higher the score in the overall scoring rate, the stronger the perception of students' perceived mathematics-control, and vice versa. Any student with a score between 12 and 36 had low perceived mathematics-control while those with a score of between 37 and 60 had high perceived mathematics-control. This questionnaire comprised of two sub scales namely; primary and secondary control scales. Items 1 to 8 measured primary mathematics-control while items 9 to 12 measured secondary mathematics-control.

The primary academic control sub scale was modified to suit the Kenyan context. The eight item sub scale was used to measure students' perception of primary mathematics control. This scale was designed for students to indicate the extent to which they agreed with statements such as "The more effort I put in mathematics, the better I do in them" and "I have a great deal of control over my achievement in mathematics" (see Appendix B, Part II). These items were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Chronbach's alpha was .70. A score of 24 and below indicated low level of primary mathematics-control while a score between 25 and 40 indicated high level of primary mathematics-control.

The secondary academic-control sub scale was modified to suit the Kenyan context. Secondary mathematics-control beliefs and strategies were assessed using a four-item, five-point Likert scale measure from Hladkyj, Pelletier, Drewniak, and Perry's (1998) Secondary Academic-control Scale. Items included statements such as "No matter how well I do on a mathematics test, I try to see beyond my grades to how my experience helps me to learn about myself," and "Whenever I have a bad experience in school, I try to see how I can turn it around and benefit from it (1 = strongly disagree, 5 = strongly agree). Cronbach's alpha was 0.72. A score of 12

and below indicated low level of secondary academic-control while a score between 13 and above indicated high level of secondary academic-control.

b) Students' Mathematics Achievement Proforma

To obtain scores of mathematics achievement of the participants, document analysis of the school achievement records of form three students was done. In this case the average scores of mid-term and end of term one, 2019 examination were used. The scores were then transformed to z - scores and later to T-scores in order to standardize them to allow comparison among different secondary schools. The mathematics scores were categorized into three; below average, average and above average. A score of below 40 was categorized as being below average, a score between 41 and 60 was categorized as average while a score above 60 was categorized as above average.

5.4 Data Collection Procedures, Analysis and Presentation

In order to collect the data from the sampled secondary schools, the researcher first obtained a research permit and authority to conduct research. During the data collection exercise, the researcher administered the questionnaires to the students who were the participating respondents in this study. The researcher used drop off method to deliver the questionnaire to the sampled schools. This allowed the teachers and the trained research assistant to administer the questionnaires in the selected schools at the appropriate time. This was done during the normal class time hours or as agreed with the respective school administrators. The participants were given the instructions to be followed during data collection exercise and the need for accuracy and keenness was emphasized.

After the questionnaires were completely filled, the respondents handed them over to the research assistants. The researcher then collected the filled questionnaires for further processing. The self-report questionnaires were used to collect quantitative information. The data collected were cleaned, coded and entered in SPSS for analysis. Both descriptive and inferential statistics were used to analyze the data. Descriptive statistics that were used were; means, frequency, percentages and standard deviation. These were used to describe sample characteristics and presented in tables. Inferential statistics that were used in data analysis were; t-test, Pearson's moment correlation coefficient and regression analysis.

VI. Results and Discussions

6.1 Demographic Information of the Respondents

Demographic information sought in the study were; gender and age of the students. Table 1 shows the students age distribution by gender.

Table 1

Students Age Distribution by Gender

		Gender				Total Freq.	
		male		Female			
		Freq.	%	Freq.	%		%
Age	14	0	0	2	1	2	0.3
	15	14	5	34	11	48	8
	16	73	26	113	37	186	31.7
	17	116	42	117	38	233	40
	18	63	23	34	11	97	16
	19	9	3	6	2	15	3
	20	4	1	0	0	4	1
Total		279	100	306	100	585	100

Table 1 shows that only two girls had the lowest age of 14 years. The modal age was 17 as accounted by 233 students with 116 (42%) being boys and 117 (38%) girls. This was followed by 16 years with 73 (26%) boys and 113 (37%) girls. There were only 4 (1%) boys whose age was 20 years and above which was the highest age according to the study findings. This shows that though most students were aged within recommended age of 17, there is concern for those whose age was above and below recommended ages in form three. These findings concurred with a study undertaken by Mutweleli (2014) who indicated that the age of the majority of secondary school students in form three ranged between 15 and 17 years.

6.2 Descriptive Statistics of Perceived Mathematics-control and Mathematics Achievement

The findings in Table 2 show descriptive statistics of the scores obtained for perceived mathematics-control by gender.

Table 2
Descriptive Statistics of Perceived Mathematics-control by Gender

Gender	N	Minimum	Maximum	Range	Mean	SD
Male	279	29.00	54.00	25.00	41.12	4.56
Female	306	31.00	52.00	21.00	42.41	3.98
Total	585	29.00	54.00	25.00	41.75	4.28

The results in Table 2 reveals that the girls had the highest mean of 42.41 (*SD* = 3.98) with a minimum score of 31 and a maximum score of 52. For the boys, they obtained a lower mean score of 41.12 (*SD* = 4.56) on the perceived mathematics- control scale with a minimum score of 29 and a maximum score of 54.
To ascertain whether the differences on perceived mathematics-control by gender was significant, independent samples T test was conducted. The results are shown in Table 3.

Table 3
Independent Samples T test for Differences in Perceived mathematics-control by Gender

		t	*df*	Sig. (2-tailed)
Perceived Mathematics-control	Equal variances assumed	2.00	583	.04
	Equal variances not assumed	1.99	554.99	.04

The results in Table 3 indicate that the mean differences in perceived mathematics-control between boys and girls was statistically significant in favor of girls.

Table 4
Description of Mathematics Achievement by Gender

Gender	Freq	Min	Max	Range	Mean	Std. Dev	Skewness	Kurtosis
Male	279	33.21	78.29	45.08	48.55	10.67	.374	-.49
Female	306	33.21	77.75	44.55	51.32	9.16	.191	-.07
Total	585	33.21	78.29	45.08	50.00	10.00	.230	-.35

From Table 4, the male students had a minimum score of 33.21 and a maximum of 78.29. Their mean score was 48.55 with a standard deviation of 10.67. The females had a minimum score of 33.21 and a maximum score of 77.75. The mean score for the girls was 51.32 with a standard deviation of 9.16. This indicated that the female students did better than male students.
To confirm whether the mean difference between the achievement of boys and girls was statistically significant, the mathematics scores were subjected to independent samples T test. Table 5 indicates the results.

Table 5
Independent Samples T test for Differences in mathematics Achievement by Gender

		t	df	Sig. (2-tailed)
Mathematics achievement	Equal variances assumed	-3.39	583	.00
	Equal variances not assumed	-3.36	550.64	.00

The results in Table 5 indicates that the mean differences in mathematics achievement between boys and girls was statistically significant, F (2, 583) = -3.39, $p < .05$. These findings indicate that there is a significant gender difference in students' mathematics achievement in favor of girls. These findings differed with the study undertaken by Njoki (2018) in Nairobi, Kenya which revealed that girls had inferior mathematics achievement scores as compared to boys.

6.3 Hypothesis Testing

The study sought to determine the relationship between perceived mathematics-control and mathematics achievement in public secondary schools in Nakuru County. The null hypothesis was formulated as follows:

$H_{O1:}$ There is no significant relationship between perceived mathematics-control and mathematics achievement.

Linear regression analysis and product moment correlation were used to determine the relationship. First, the relationship between the two domains of perceived mathematics-control (primary and secondary) and mathematics achievement were examined. Product moment correlation results are shown in Table 6.

Table 6
Correlation Analysis on the Relationship between Perceived Mathematics-control and Mathematics Achievement

		Mathematics Achievement
Primary control	Pearson Correlation	.73**
	Sig. (2-tailed)	.00
	N	585
Secondary control	Pearson Correlation	.68**
	Sig. (2-tailed)	.00
	N	585
Perceived mathematics-control	Pearson Correlation	.77**
	Sig. (2-tailed)	.00
	N	585

Results in Table 6 revealed strong positive relationship between primary-control and mathematics achievement, r (585) = .73, p < .05. Secondly, there was strong positive and significant relationship between secondary-control and mathematics achievement, r (585) = .68, p < .05. Thirdly, there was a strong positive and significant relationship between perceived mathematics-control and mathematics achievement of students, r (585) = .77, p < .05. Therefore, the null hypothesis was rejected suggesting that high levels of perceived mathematics-control lead to high scores in mathematics and vice versa. Thus students with high levels of perceived mathematics-control perform better in mathematics compared to students with low levels of perceived mathematics-control.
To establish how perceived mathematics-control predict mathematics achievement, the researcher conducted regression analysis and the model summary is presented in Table 7.

Table 7
Model Summary on Perceived Mathematics-control and Mathematics Achievement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.81	0.65	0.65	11.07
2	.77	0.59	0.58	12.03

Results in Table 7 show that *R* squared was 0.65, which indicates that 65% of changes in mathematics achievement in public secondary schools in Nakuru County was explained by primary and secondary mathematics-control. The remaining percentage was accounted for by other factors. In the second model, *R* squared was 0.59 suggesting that 59% of changes in mathematic achievement in public secondary schools in Nakuru County was explained by perceived mathematics-control while the remaining percentage was attributed to other factors. Analysis of variance (ANOVA) was examined to show model goodness of fit as shown in Table 8.

Table 8
ANOVA on Perceived Mathematics-control and Mathematics Achievement

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	131902.60	2	65951.30	538.69	.00
	Residual	71253.42	582	122.43		
	Total	203156	584			
2	Regression	118838.71	3	118838.71	821.69	.00
	Residual	84317.31	581	144.63		
	Total	203156.02	584			

Results in Table 8 revealed that primary-control and secondary-control significantly predict mathematics achievement, F (2,582) = 538.69, $p < .05$. The second model indicated that perceived mathematics-control significantly predicted mathematics achievement, F (1,583) = 821.69, $p < .05$. Table 9 presents regression coefficients showing nature of relationship between perceived mathematics-control and mathematics achievement in secondary schools in Nakuru County.

Table 9

Regression Coefficients on Perceived Mathematics-control and Mathematics Achievement

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
		β	Std. Error	Beta		
1	(Constant)	28.03	0.62		45.43	.00
	Primary mathematics-control	11.89	0.67	0.51	17.79	.00
	Secondary mathematics - control	9.24	0.65	0.41	14.17	.00
2	(Constant)	33.15	0.572		57.917	.00
	Perceived mathematics-control	13.88	0.48	0.765	28.67	.00

Results in Table 9 revealed a positive and significant relationship between primary control and mathematics achievement in public secondary schools in Nakuru County (β = 11.89, t (584) = 17.79, $p < .05$). This implies that a unit increase in primary-control increases mathematics achievement by 11.89 percent. Secondly, there was positive and significant relationship between secondary perceived mathematics-control and mathematics achievement in public secondary schools in Nakuru County (β = 9.24, t (584) = 14.17, $p < .05$). This implies that a unit increase in secondary control increases mathematics achievement by 9.24%. Thirdly, perceived mathematics-control had a positive and significant relationship with mathematics achievement in public secondary schools in Nakuru County (β = 13.87, t (584) = 28.67, $p < .05$). This implies that unit increase in perceived mathematics-control increases mathematics achievement by 13.88%.

6.3 Discussion of the Results

The first objective was to determine how students' perceived mathematics-control was related to their mathematics achievement in secondary schools in Nakuru County. Perceived mathematics-control had two domains namely, primary and secondary mathematics-control. Perceived mathematics-control was measured by students' self-perception and sense of commitment to attain the desired grade in mathematics as adopted from Stupnisky et al. (2008). Both correlation and regression analysis proved existence of a strong positive and significant relationship between perceived mathematics-control and mathematics achievement. This is in agreement with related study by Perry et al. (2005) who studied Canadian university students of Mid-Western Province and established that high level of perceived academic-control were strongly associated with high 3-year GPA grade thus enabling students to achieve their set academic goals.

These findings support other related studies as reported by Respondek et al. (2017), Ruthig et al. (2007), and Perry's et al. (2005) who reported that there exists positive and significant relationship between perceived academic-control and academic achievement. The three studies involved a sample of university students and they found that students with high perceived academic-control achieved better grades than those with low academic-control. These findings demonstrate that the level of schooling may not influence the outcome of the relationship between the two variables.

Understanding student's perceptions of mathematics-control is underscored by Mutodi and Ngirande (2014) as a mental representation or view of mathematics, apparently constructed as a result of social experiences, mediated through interactions at school, or the influence of parents, teachers, peers or mass media. This implies that past experiences have a key role in determining the perceptions and the control that the students can have. The findings of these and the current study will enable change of perceptions of mathematics as a subject of selected few to be a favourite of most students.

Similarly, Wawire (2010) findings from selected secondary schools in Nairobi, observed that perceived-control and belief had impact on raising academic self-consciousness not only for mathematics but even for other subjects. Therefore, to achieve success, students should avoid situation that lead to self-handicap and defensive pessimism for better performance in their class work. On the other hand, Mutodi and Ngirande (2014) study on what influences students' perceptions on mathematics achievement in South African high schools' postulates that strength and weaknesses in mathematics, teacher support/learning materials, family background and support, interest in mathematics, difficulties or challenges in doing mathematics, self-confidence and myths and beliefs about mathematics were constructs having only a role in creating perception.

The duo scholars also established that gender does indeed have a significant difference on the perceptions. Based on these findings, teachers should pay more attention to aspects that affect perceived mathematics-control for a win in students' perceptions.

Student's perceived mathematics-control is an important predictor of student success as measured by grade achieved in the different subjects or unit of study and the rate of drop out (Respondek et al., 2017). This comes after the scholars found that perceived academic-control predicted achievement of academic among freshman students in the University. Therefore, a positive perceived mathematics-control towards mathematics is significantly correlated to achieving good grades in the subject. The current study reports the same for form three secondary school students in Nakuru County, Kenya and may be generalized to all students of interest in different subjects or units of study.

VII. Conclusions

The study findings showed the existence of a significant relationship between perceived mathematics-control and mathematics achievement in public secondary schools in Nakuru County. It was found that perceived mathematics-control had positive significant influence on mathematics achievement of secondary school students in Nakuru County.

Both primary and secondary mathematics-control had positive and significant relationship with mathematics achievement in public secondary schools. Hence it is important for mathematics teachers in public secondary schools in Nakuru County to devise measures geared towards enhancing primary and secondary mathematics-control amongst secondary school students. Students should be encouraged to develop self-discipline and positive attitude towards mathematics to enhance their mathematics achievement.

VIII. Recommendations

The study found that there was a positive and significant relationship between perceived mathematics-control and mathematics achievement among secondary school students in Nakuru County. The study recommends that students should be encouraged to develop primary and secondary mathematics-control measures. This will aid students in improving their mathematics achievement through taking responsibility of studying mathematics.

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