Learning Strategies as Predictors of Academic Achievement Among Form Two Secondary School Students in Kilifi County, Kenya

By

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Abstract

Continuous decline in students' academic achievement remains a threat not only to individual students but also to the country's economic development at large. Over the years, students' academic achievement in KCSE in Kaloleni Sub-County has been considerably unsatisfactory and declining. The trends are detrimental and unless something is done, the Kaloleni Sub-County, Kilifi County and the Country in general will suffer huge loses as the inputs in education sector will not equate to students' attainment in KCSE. Consequently, many students will continue to miss opportunities to advance on their careers, compete effectively on the job market and to take part in national development. Although, previous studies have consistently documented the importance of learning strategies on students' academic achievement, there is dearth of research on this area in Kaloleni Sub-County, Kilifi County. Therefore, the researcher aimed to fill this knowledge gap by conducting this study in Kaloleni Sub-County. Social cognitive theory of self- regulation guided the study. The investigations utilized correlational research design. The study locale was Kaloleni Sub-County, in Kilifi County and all the 1975 form two students in 22 public secondary schools were targeted. Purposive sampling was used in selection of Sub-county and the form two class, while recruitment of students in the study was done via simple random. Then through stratified sampling, schools were classified into different strata including boarding (boys and girls) and co-educational schools. The sample size consisted of 320 students. GOAL-S scale was used to collate data. Students' academic achievement were measured using cumulative mean grade. Statistical analysis was done using SPSS version 21. Inferential statistics, that is, Pearson's coefficient, and regression analysis were utilized to test hypotheses of the study at Alpha of 0.05. The findings revealed that metacognitive planning and academic achievement had a significant positive relationship, r (295) =.43, p <.05. A significant and positive relationship was also found between metacognitive monitoring and academic achievement, r (295) = .42, p <.05. The study furthermore found a positive and significant relationship between metacognitive regulation and academic achievement, r (295) = .46, p <.05). R square was 0.15 suggesting that 15% variance in academic achievement is predicted by learning strategies. The study makes the following recommendations: Students should always strive to effectively use metacognitive strategies to enhance their academic achievement scores, curriculum designers and content creators should consider including learning strategies in the course content, school administrators should create learning environment that foster skills on effective learning strategies.

Key Words: Academic Achievement, Metacognitive Monitoring, Metacognitive Planning, Metacognitive Regulation

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1. Background to the Study

Today's fast –growing economy, require students to have at least a college degree or advanced certificate to fit in any rewarding careers and to lead fulfilling lives (Anthony et al., 2016; Cooper, & Robert, 2016). Performing well in secondary education forms the key entry ticket to the best colleges and universities. However, in today's world students' academic achievement in secondary schools is not satisfactory for that reality. For instance, in USA, despite the government high levels of public funding to education sector, half of the students leave high school unprepared academically for college-level work (NCES, 2019). According to NCES report, these students are disadvantaged as they cannot secure jobs that require postsecondary education to fully support themselves and their families (McFarland et al., 2019). This trend is an indicative that other than financial support, other factors such as learning strategies influence student's academic achievement. A similar case in South Africa shows that despite government spending about 6% of its GDP on education, about a quarter of the students graduate from high school with quality grades (Mlachila & Moeletsi, 2019). This shows that student's academic success is a function of complex and multifaceted factors including use effective learning strategies and even seeking of academic assistance from knowledgeable persons

Annual reports by Kenya National Examination Council (KNEC), majority of students continue to perform dismally in secondary school national examinations. For instance, in the year 2019, about 421,058 (60.17%) out of 699,745 candidates scored grade D+ to E in KCSE. This performance is unwarranted and unless arrested the country may not be able to attain the vision 2030 goals. To exhaustively address this dreary issue of poor performance in the country, the educators must consider students' academic achievement from the county levels. This is because each county contributes vastly to this poor performance. For example, Kilifi County, specifically, Kaloleni Sub-County had 726 students who scored grade D+ to E. This accounts for 46.48% of 1562 candidates who sat for KCSE in that year. Nationally, this accounts for 0.17% of 421058 candidates who scored lower grades in Kenya. This poor performance has attracted attention of educational psychologists and various education stakeholders to investigate into a myriad of factors that influence academic achievement.

Regardless of myriad of variables that might influence learners' academic achievement, the current study examined the learning strategies as predictors of academic achievement. The concept of self- regulated learning strategies (SRL) has for a long time remained a topic of interest to many researchers, especially in regard to how they relate to students' academic success (Adıgüzel & Orhan, 2017; Kaur et al., 2018; Zimmerman, 1986). Moreover, Zimmerman (1986) refers to self-regulated learning as the state of being motivated, meta-cognitively involved, and actively engaged in one's own learning process. SRL consists of three categories of strategies, that is, cognitive, metacognitive, and resource management strategies (Pintrich et

al., 1991). According to Pintrich, et al. (1991) metacognitive strategies entail those used by students to regulate and control their thoughts with a purpose of achieving a learning objective and they comprise planning, monitoring and regulation.

Regarding the relationship between metacognitive planning and students' academic achievement, a study by Kim and Mariani (2019) in Malaysia found that metacognitive planning and goal setting were strong predictors of early writing performance. Fishman et al. (2017) did a study among university students in Korea and USA and found that planning/time-related learning strategy was significant predictors of students' GPA at the Korean university but not in USA. Some studies have shown that metacognitive monitoring is associated with student's academic achievement. For example, López-Vargas et al. (2016) study among university students in Bogotá, Colombia found a positive correlation bet ween metacognitive self- monitoring and students' GPA. In line with this research, an experimental study in USA by Scheithauer and Kelley (2017) found significant improvement on academic achievement for the group of students that received self-monitoring instruction compared to the control group. Similarly, Olakanmia and Gumboa's (2017) experimental study among Nigerian high school learners, found out that chemistry achievement was significantly better among students with SRL training compared to students in control group. According to this research, students trained in SRL such as planning strategy are able to set learning goals at start of the lesson, demonstrate better understanding of learning context, review prior knowledge on the topic and also perform better in their studies compared to those with no SRL training. They also evaluate and track the progress of their goals, that is, whether they have met them or not.

Regarding the association between metacognitive regulation and academic achievement, an investigation in Punjab by Kaur, et al. (2018) found that metacognition and self-regulation were directly and significantly related to learners' academic achievement. In line with this research, Adıgüzel, and Orhan (2017) study in Turkey revealed a positive and significant correlation between self-regulation skills and students' English academic achievement. Mirzaei-Alavijeh et al. (2019) conducted a study to determine the connection between meta-cognitive self-regulation and students' academic achievement in Kermanshah University of Medical Sciences, Iran. These researchers found significant association between the meta-cognitive self-regulation and academic performance. However, majority of these investigations concentrated on learners in higher learning settings. Though some researcher targeted secondary school students, their findings are limited to specific subjects. In addition, most of these studies are limited to other contexts such U.S.A, Europe, and Asia. In Kenya, there was no research on this area done in Kilifi County which prompted the need to investigate learning strategies and academic help-seeking behavior as antecedents of academic achievement among form two students in Kilifi County.

2. Statement of the Problem

Continuous decline in students' academic achievement remains a threat not only to individual student but to the country's economic development at large. Over the years, students' academic achievement in KCSE in Kaloleni Sub-County has been considerably unsatisfactory and declining (Kaloleni Sub-County Education Office, 2020). For instance, KCSE analysis at Sub County level for the last five years show that majority of students attain lower grades of D to E.

In the year 2015, 57% of 1649 students who registered for KCSE scored grade D to E. In year 2016 and 2017, 79.92% and 83.16% of the candidates scored grade D to E respectively. In the year 2018 and 2019, half (50%) of the candidates who registered for KCSE got lower grades. The trends are detrimental and unless something is done, the Kaloleni Sub-County, Kilifi County and the Country in general will suffer huge loses as the inputs in education sector will not equate to students' attainment in KCSE. Consequently, many students will continue to miss opportunities to advance on their careers, compete effectively on the job market and to take part in national development. This has far reached consequences to the country in the realization of vision 2030. Earlier researchers have documented that effective learning strategies and seeking of academic help are crucial for learners to be able to learn effectively, meaningfully and achieve better grades. However, no such research has been done in Kaloleni Sub-County in Kilifi County. This study therefore investigated learning strategies (metacognitive planning, monitoring and regulation) as predictors of academic achievement among form two students in public secondary schools.

3. Significance of the Study
The findings of this research may be of value to students, teachers and education policy makers. First, the findings of this study may give insight to the students on the use of effective learning strategies to enhance their academic performance. They may also get enlightened that seeking academic assistance from the knowledgeable persons is not a sign of weakness; but a strategy to learn more effectively. The findings of this study may also offer insights to the teachers to explore more effective instructional strategies to enhance students' learning strategies so as to improve their performance. The results of this study may give insights to education policy makers on how much secondary schools are successfully contributing to developing effective learning skills among students. Finally, the results of the current research may enhance the extant literature on the association between learning strategies and students' academic achievement.

4. Methodology
a. Research Design
A correlational research design was used. As Goodwin (2010) states, the design did not only allow the researcher to measure two or more characteristics of the same individual, but to also to work out the correlations of these characteristics. The information on the variables was collected from the participants during normal school day, thus there was no manipulation whosoever. Additionally, study of cause-effect was not possible, but only the correlations. The design established the connection among learning strategies academic achievement.

b. Sampling Techniques and Sample size
The researcher employed three sampling techniques; purposive, stratified and simple random sampling. Purposive sampling was used in selection of the County, Sub County and the form two classes. Since the schools existed in distinct categories stratified sampling was used to draw the schools from each stratum. The schools were stratified into 1 boy's boarding, 2 girl's boarding and 4 co-educational schools. Finally, in selection of students to participate in this study, simple random sampling was used.

The sample size for this study was arrived at by the Krejcie and Morgan's table of sample determination (Krejcie & Morgan, 1970). The table showed the population size and the sample size that can be drawn and no calculation is required. For this study the population size was 1975, from where we drew a sample of 320 participants (151 boys and 168 girls) as guided by Krejcie and Morgan's table of sample determination shown on appendix E. The proportionate stratified sampling was then be used to pick respondents from the three subcategories of schools to guarantee that sample size drawn from each category is proportional to relative size of that category in the population. This formula ($\frac{n1}{N} \, X \, n$) was used to compute the size of respondents per category where *n1* is the population size of the specific strata, *N* is the total population, and *n* is the sample size**.** Table 1 shows the sample size and sampling frame.

Table 1: Sample Size and Sampling Frame

Category Of School	Number of Schools in each Category	School Sample Size	Size of the Population per Category		Student's Sample Size	
			Boys	Girls	Boys	Girls
Boy's boarding	2	1	294	_____	48	_____
Girl's boarding	4	2	_____	514	____	83
Co-educational	16	4	642	525	104	85
Sub Totals			936	1039	151	168
Totals	22	7	1975		320	

Note. Researcher, 2020

c. Research Instruments

In this study questionnaires and a document analysis were used to collect data from the respondents. Specifically, Goal Orientation and Learning strategies Survey (GOALS-S) scale was adapted to assess learning strategies.

d. Data Collection

Upon obtaining the research permit, the research started the data collection process by first printing enough questionnaires and seeking appointments from the principals of selected schools. On the actual day of data collection, the instruments were administered by the researcher to students during normal class session. The filling of the instruments took about 20-25 minutes. The researcher also requested for the mark sheets from the respective class teachers to extract end of term mean grade score for every respondent. Then, the completed surveys were collected ready for the actual data analysis.

e. Data Analysis

After data collection, the data was coded and entered into computer for statistical analysis using SPSS. First, data was cleaned to check for any missing data, wrongly keyed, test for the assumptions that must be met for a particular test and also to run any transformation in case of violation of the assumptions. In description and analysis of data the descriptive inferential statistical procedures were used respectively.

5. Findings
5.1 Demographic Information of the Respondents

Students' demographic information that was collected include gender and age. Table 2 shows the gender of the students.

Table 2: Respondents Gender

	Frequency	Percent
Male	134	45.4
Female	161	54.6
Total	295	100.0

Table 2 shows that 134 respondents translating to 45.4% were male while 161 respondents representing 54.6% were female. The results indicate that the number of female respondents was slightly higher than the male respondents. On the age category of the respondents, the results were as shown in Table 3.

Table 3: Age Bracket of the Students

	Frequency	Percent
14-18	259	87.8
19-25	31	10.5
25 and Above	5	1.7
Total	295	100.0

Table 3 indicates that 259 students (87.8%) were aged between 14 and 18 years and 31 students representing 10.5% were aged 19-25 years. Only 5 students representing 1.7% were aged 25 years and above. The researcher also computed age and gender cross tabulation and the findings are presented in Table 4.

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Table 4: Age and Gender Cross Tabulation

		Gender				Total
		Male	%	Female	%	
Age	14-18	106	40.9	153	59.1	259
	19-25	24	77.4	7	22.6	31
	25 and Above	4	80	1	20	5
Total		134	45.4	161	54.6	295

As shown in Table 4, 106 male students (40.9%) and 153 female students (59.1%) were aged between 14 and 18 years. A total of 24 male students (77.4%) and 7 female students (22.6%) were aged 19-25 years. Those who were aged 25 years and above were 4 male students and one female student.

5.2 Relationship Between Metacognitive Planning and Academic Achievement
First objective of this study was to investigate the relationship between metacognitive planning and academic achievement. This section presents descriptive statistics of metacognitive planning scores, academic achievement scores, hypothesis testing and discussion of the results.

a. Descriptive Statistics of Metacognitive Planning
Table 5 presents the descriptive statistics of metacognitive planning scores.

Table 5: Metacognitive Planning Descriptive Statistics

Gender	*N*	Min	Max	Range	Mean	*SD*	*Sk*	*Kur*
Metacognitive Planning	295	9.00	28.00	19.00	20.44	2.94	-.66	.97

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis

The results indicate that the lowest score was 9 while the highest score was 28 with a range of 19. The mean score was 20.44 with a standard deviation of 2.94. Skewness and kurtosis coefficients indicate that the scores were near normal distribution. The researcher also examined metacognitive planning scores by gender and results are tabulated as shown in Table 6.

Table 6: Metacognitive Planning Descriptive Statistics by Gender

Gender	*N*	Min	Max	Mean	*SD*	*Sk*	*Kur*
Male	134	9.00	28.00	20.50	3.12	-.81	1.39
Female	161	11.00	26.00	20.39	2.78	-.50	0.43

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis

For male students the lowest score was 9 and the maximum score was 28. Mean score for male students was 20.5 (*SD* = 3.12). For female students, the lowest score was 11 while the highest score was 26. The mean score for female students was 20.39 with a standard deviation of 2.78. The study was conducted in three categories of schools namely; boy's boarding, girl's boarding

and co-educational schools. The description of metacognitive planning scores by the school category are presented in Table 7.

Table 7: Metacognitive Planning Descriptive Statistics by School Category

School Category	N	Min	Max	Mean	SD	Sk	Kur
Boys Boarding	41	9.00	28.00	20.51	3.78	-.78	1.01
Girls Boarding	80	14.00	26.00	20.41	2.85	-.29	-.35
Co-educational	174	11.00	26.00	19.02	2.76	-.71	1.21

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
Table 7 shows that the lowest score for students from boy's boarding schools was 9 while the highest score was 28. The mean score was 20.51 and a standard deviation of 3.78. The lowest score for students from girl's boarding schools was 14 while the highest score was 26. The mean score for students from this category of schools was 20.41 with a standard deviation of 2.85. For co-educational schools, the lowest score was 11 while the highest score was 26. The mean score was 19.02 with a standard deviation of 2.76. The results imply that students from boy's boarding schools had the highest mean score in metacognitive planning while students from co-educational schools scored the lowest mean in metacognitive planning.

b. Descriptive Statistics of Academic Achievement Scores
Academic achievement of the students was measured using end of term exam. The researcher explored the descriptive statistics of academic achievement raw scores and the results are tabulated in Table 8.

Table 8: Academic Performance Raw Scores

	N	Range	Min	Max	Mean	SD	Sk	Kur
Raw scores of academic achievements	295	75	5.00	80.00	44.54	13.62	-.32	-.32

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
Table 8 indicates that the mean of raw scores of academic achievements was 44.54 with a standard deviation of 13.62. The lowest academic achievement raw score was 5.00 while the highest score was 80. The skewness and kurtosis coefficients indicate that the distribution was nearly normal.
The descriptive statistics of standardized academic scores is presented in Table 9.

Table 9: Academic Achievement Standardized Scores

	N	Range	Min	Max	Mean	SD	Sk	Kur
Standardized scores of academic achievements	295	54.76	20.67	75.45	49.66	10.55	.50	-.18

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
The results from Table 9 indicates that the mean score was 49.66 (*SD*=10.55). The maximum score was 75.45 while the minimum score was 20.67 giving a range of 54.76. The skewness

coefficient was .50 and a kurtosis coefficient was -.18. This implies that the distribution was nearly normal. The researcher also categorized academic achievement scores by gender as presented in Table 10.

Table 10: Descriptive Statistics of Academic Achievement by Gender

Gender	*N*	Min	Max	Mean	*SD*	*Sk*	*Kur*
Male	134	20.67	75.45	51.68	10.37	-.02	.75
Female	161	31.36	55.03	43.95	6.76	.25	-1.33

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
The findings in Table 10 indicate that the mean score for male students was 51.68 with a standard deviation of 10.37. The lowest score was 20.67 whereas the highest score was 75.45. The mean score of female students was 43.95 with a standard deviation of 6.76. The maximum score for girls was 55.03 while the minimum score was 31.36. The findings indicate that male students perform slightly better than female students.
The researcher further analyzed the academic achievement scores by school category and the findings tabulated in Table 11.

Table 11: Descriptive Statistics of Academic Achievement by School Category

School Category	*N*	Min	Max	Mean	*SD*	*Sk*	*Kur*
Boys Boarding	41	32.12	72.62	47.64	3.39	-1.70	1.79
Girls Boarding	80	40.52	75.03	47.86	5.25	-.14	-1.46
Co-educational	174	20.67	75.45	45.87	11.59	.40	-.45

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
The results from Table 11 indicate the mean score for boys boarding was 47.64 (*SD*=3.39). The mean scores for girls boarding and co-educational schools was 47.86 (*SD*=5.25) and 45.87 (*SD*=11.59) respectively. In boy's boarding highest score was 72.62 while the lowest score was 32.12. The highest score for girl's boarding schools was 75.03 while the lowest score was 40.52. The maximum score for co-educational schools was 75.45 with a minimum score of 20.67. The findings indicate that girls boarding performed better followed by boys boarding. Co-educational schools had the lowest mean score.
The researcher further categorized academic achievement into levels as presented in Table 12.

Table 12: Levels of Academic Achievement

	Frequency	Percent
Low	80	27.1
Moderate	173	58.6
High	42	14.2
Total	295	100.0

Table 12 indicates that majority of the respondents had moderate scores in academic achievement. A total of 80 respondents translating to 27.1% had low scores while 42 respondents

translating to 14.2 had high scores in academic achievement. A total of 173 respondents translating to 58.6% had moderate scores in academic achievement.

c. Hypothesis Testing

In the first objective, the researcher aimed to find out the association between metacognitive planning and academic achievement. To find out if the two variables were significantly correlated, the following hypothesis was formulated.

$H0_1$: There is no significant relationship between metacognitive planning and academic achievement.

To test the hypothesis, collected data were analyzed using Pearson correlation and findings tabulated in Table 13.

Table 13: Correlation between Metacognitive Planning and Academic Achievement

		Metacognitive planning
	Pearson Correlation	.43**
Academic Achievement	Sig. (2-tailed)	.00
	N	295

The researcher hypothesized that there is no significant relationship between metacognitive planning and academic achievement. However, our results indicate the existence of a positive significant relationship between metacognitive planning and academic achievement r (295) =.43, $p <$. .05. Therefore, the null hypothesis was rejected. This implies the higher the metacognitive planning the higher the academic achievement and the lower the level of metacognitive planning the lower the level of academic achievement. This implies that the more the students embrace metacognitive planning in their studies, the more they are able to achieve academically and vice versa.

c. Discussion of the Results

The findings indicate that there exists a positive and significant relationship between metacognitive planning and academic achievement. This implies that the more a student engages in metacognitive planning the more likely they are to perform better in academics and vice versa. The findings are similar to the results by other researchers in the same field. Globally, research has been done to access the relationship between the learning strategy of metacognitive planning and academic achievement. Research by Altamira (2015) studied the effects of using metacognitive strategies among intermediate schools from Saudi Arabia. The study used a sample of 40 male students from grade one. The study found out that metacognitive planning strategy is common among students. The strategy is essential for acquiring knowledge. The study also established that metacognitive planning positively impacted on the student's academic achievement. Moreover, the study established that metacognitive planning strategy enables to improve in their academic achievement.

Similarly, Abdelrahman (2020) in his study examined the relationship between metacognitive awareness and academic achievement. The study revealed that metacognitive

planning plays an important role in learning. Students with high academic achievement scores were found to include metacognitive planning in their studies. Students with high levels of metacognitive planning performed better than students with low levels of metacognitive planning. Abdelrahman concluded that metacognitive planning significantly affects academic achievement.

Consistent with the findings of the current study are the findings of Lemke (2020). The study found a positive impact of metacognitive planning and academic achievement. Metacognitive planning enables students to recess themselves. Students with metacognitive planning are in a position to evaluate what they already know and what can help them succeed. Additionally, the study established that a student who embraces metacognitive planning performs higher in their academics as compared to students who do not.

Metacognitive planning has contributed to improved academic performance of students. Learners are able to plan theirselves on how they are going to achieve their goals. According to the theory used in this study, metacogntive planning is applicable in reading, writing, reasoning and memorising. Through metacognitive planning, students transfer their knowledge from one context to another.The low performance of students from Klifi county can be attributed to students lacking the idea of planning theirselves on how to achieve their goals.

Chepkieng (2020) in his study on metacognition found a positive significant relationship between metacognitive planning and academic performance. Chepkieng study was done among secondary school students from Nairobi County. There was no gender disparity in application of the learning strategies. The study denotes that the higher the level of metacognitive planning strategy the more the students performed better. The study recommends awareness of learning strategies as a factor that can contribute to academic performance. The low performance in Kilifi County can be attributed to ineffective learning strategies used by students.

5.3 Relationship Between Metacognitive Monitoring and Academic Achievement
In this section, descriptive statistics of metacognitive monitoring scores, hypothesis testing and discussion of the results are presented.

a. Descriptive Statistics of Metacognitive Monitoring
Scores on metacognitive monitoring were descriptively analyzed to get the mean, standard deviation, minimum score, maximum score and the range.
Table 14 shows the descriptive statistics of metacognitive monitoring.

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Table 14: Metacognitive Monitoring Descriptive Statistics

	N	Range	Min	Max	Mean	SD	Sk	Kur
Metacognitive monitoring	295	12	13	25	19.25	2.24	-0.26	-0.06

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
Table 14 indicates that the highest score in metacognitive monitoring was 25 while the lowest score was 13 with a range of 12. The mean score was 19.25. The kurtosis and skewness coefficients were -.06 and -.26 respectively suggesting that the distribution of the scores was approximately symmetric.
The researcher examined metacognitive monitoring by gender and the results are shown in Table 15.

Table 15: Metacognitive Monitoring Descriptive Statistics by Gender

Gender	N	Min	Max	Range	Mean	SD	Sk	Kur
Male	134	13	25	12	19.28	2.41	-0.42	0.18
Female	161	14	24	10	19.22	2.08	-0.05	-0.48

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
The results in Table 15 indicate that the highest score for male students was 25 and the lowest score was 13 giving a range of 12. The highest score for female students was 24 while the minimum score was 14 giving a range of 10. The mean score for male students were 19.28 (*SD* = 2.41) while the mean score for female students was 19.22(*SD*=2.08). The kurtosis and skewness coefficients for both male and female students indicate that the distribution of the scores was nearly normal. The findings indicate that male students' mean score for metacognitive monitoring was slightly higher than that of female students.
The schools that participated in this study were grouped into girls boarding, boys boarding and coeducational schools. Their results on metacognitive planning are presented in Table 16.

Table 16: Metacognitive Monitoring Descriptive Statistics by School Type

School Category	N	Min	Max	Range	Mean	SD	Sk	Kur
Boys Boarding	41	13	25	12	19.25	2.93	-.29	.00
Girls boarding	80	15	24	9	19.44	1.99	.06	-.46
Co-educational	174	14	24	10	18.85	2.15	-.22	-.48

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
The results from Table 16 indicate that the maximum score for respondents from boys boarding was 25 and the lowest score was 13 giving a range of 12. The mean score for metacognitive monitoring for students from this category was 19.25 (*SD*=2.93). The girls' boarding school highest score was 24 while the minimum score was 15 giving a range of 9. The mean score for girls' boarding schools was 19.44 with a standard deviation of 1.99. Coeducational schools had a maximum score of 24 and a minimum score of 14 giving a range of 10. The coeducational mean score for metacognitive monitoring was 18.85 (*SD*=2.15). The findings indicate that boys' boarding schools had the highest mean score of metacognitive monitoring in learning while co-educational schools recorded lowest mean score of metacognitive monitoring.

a. Hypothesis Testing

The researcher hypothesized that there is no significant relationship between metacognitive monitoring strategy to learning and academic achievement. The hypothesis was tested using Pearson correlation and the results were as shown in Table 17.

Table 17: Correlation Between Metacognitive Monitoring and Academic Achievement

		Metacognitive Monitoring
	Pearson Correlation	.42[**]
Academic Achievement	Sig. (2-tailed)	.00
	N	295

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis

The results in Table 17 indicate existence of a significant positive relationship between metacognitive monitoring strategy to learning and academic achievement, *r* (295) = .42, *p* <.05. Therefore, the null hypothesis was rejected implying that there is a positive and significant relationship between metacognitive monitoring and academic achievement. This suggests that the more a student applies metacognitive monitoring strategy in learning, the more they achieve academically and vice versa.

b. Discussion of the Results

The findings indicate a positive significant relationship between metacognitive monitoring and academic achievement. This implies that the more a student applies metacognitive monitoring strategy to learning the higher the academic scores. The results reveal consistency with other researchers' findings of a positive and significant relationship between metacognitive monitoring and academic achievement. Studies have aimed at finding the impact of metacognitive monitoring on academic achievement. In France, Wagener (2016) studied the relationship between metacognitive monitoring and academic achievement. The study found that metacognitive monitoring is an important predictor of academic achievement. The study revealed that metacognitive monitoring enables a student to acquire new skills and solve complex problems. Moreover, metacognitive monitoring enables students to transfer acquired knowledge from one situation to the other.

Aloqleh and Teh (2019) in their research demonstrated that students practicing metacognitive monitoring consistently achieves higher grades academically. In the study, students were studied for a full semester to identify whether they practiced metacognitive monitoring. They were then assessed on their application of metacognitive monitoring strategy and how it affected academic achievement. The results indicated that student's performance was related to the level of accuracy of practicing metacognitive monitoring. The students who consistently practiced metacognitive monitoring achieved better grades than those who did not.

Similarly, Samuel et al. (2021) studied the relationship between metacognition and academic achievement in chemistry among secondary school students in Nigeria. Consistent with the results of the current research, the study concluded that metacognitive monitoring is an

important predictor of chemistry performance. The study recommended that teachers ought to train students on metacognitive strategies to help them improve in their chemistry performance. On the other hand, students should practice metacognitive monitoring strategy in order to improve their skills in this area. Metacognitive monitoring enables students to be more involved in the learning process.

In Kenya, Ong'uti et al. (2019) carried out a study on metacognitive monitoring as a precursor to mathematics performance among form three students. The study used a sample of 1665 form three students. Upon analyzing data using Pearson's correlation, the study found the existence of a significant positive relationship between metacognitive monitoring and mathematics performance among the selected students. Students who incorporated the self-regulated learning strategy of metacognitive monitoring performed better than those students who rarely included monitoring in their studies. This was in line with the present study and therefore metacognitive monitoring can be enhanced among students in order to improve academic performance in Kilifi County.

Additionally, Chepkieng (2020) studied metacognition as a predictor of achieving good academic grades. The study established a positive significant relationship between metacognitive monitoring and academic achievement. The researchers recommended that students should be trained to practice metacognitive skills in order to get new learning skills. The study outlines that metacognitive monitoring enable student grasp enough content thereby impacting positively in their academic scores. Based on the results, the low performance in Kaloleni Sub County, may be attributed to low to moderate levels of metacognitive monitoring among a majority of the students. This makes students unable to adequately access themselves on learning progress towards attaining academic goals resulting to low performance in academics.

5.4 Relationship between Deep Approach to Learning and Academic Achievement
This section contains the descriptive statistics of metacognitive regulation, hypothesis testing and discussion of the results.
This section contains the descriptive statistics of metacognitive regulation, hypothesis testing and discussion of the results.

a. Metacognitive Regulation Descriptive Statistics
Metacognitive regulation scores were analyzed to get the mean, standard deviation, skewness coefficient, kurtosis coefficient, minimum and maximum scores. Table 18 presents the descriptive statistics of metacognitive regulation scores.

Table 18: Metacognitive Regulation Descriptive Statistics

	N	Min	Max	Mean	*SD*	*Sk*	*Kur*
Metacognitive Regulation	295	11	25	18.82	2.21	-0.30	.26

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis

Table 18 indicates that the highest score for metacognitive regulation was 25 and lowest score was 11. The mean of the scores was 18.82 (*SD* = 2.21). Coefficient of skewness was -.30 and kurtosis of .26 implying the distribution was approximately symmetric.

The scores were also explored based on gender and the results are presented in Table 19.

Table 19: Metacognitive Regulation Descriptive Statistics by Gender

Gender	N	Min	Max	Range	Mean	*SD*	*Sk*	*Kur*
Male	134	11	19	8	16.88	1.41	-1.34	.51
Female	161	19	25	6	20.43	1.22	0.86	0.81

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis

The results in Table 19 indicate that the lowest score of metacognitive regulation of male students was 11 and the highest score was 19 with a range of 8. The mean of the scores for male students was 16.88 (*SD*=1.41). For female students the mean of the scores was 20.43 with a standard deviation of 1.22. The lowest score was 19 while the highest score was 25 (range = 6). Findings indicate that female students employed metacognitive regulation in their studies more than male students.

The researcher further explored metacognitive regulation according to the types of school categories as presented in Table 20.

Table 20: Metacognitive Regulation Descriptive Statistics by School Category

School Category	N	Min	Max	Range	Mean	SD	*Sk*	*Kur*
Boys Boarding	41	11	16	5	18.58	1.20	-1.80	0.24
Girls boarding	80	20	25	5	21.21	1.11	.99	.96
Co-educational	174	16	21	5	15.17	1.22	.31	-.74

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis

The results showed that in boys' boarding schools the lowest score of metacognitive regulation was 11 while the maximum score was 16. The mean score for boys' boarding schools was 18.58. The lowest score for girls' boarding schools was 20 while the highest score was 25. The mean score was 21.21 (*SD*= 1.11). Students from co-educational schools had a maximum score of 21 and a minimum score of 16. The mean score of the students from this category of schools was 15.17 (*SD* = 1.22). From the findings, it is clear that students from girls boarding employed metacognitive regulation more than the students from the other categories of schools.

b. Hypothesis Testing

The researcher hypothesized that there is no significant relationship between metacognitive regulation and academic achievement. The hypothesis was tested using Pearson correlation and the results are as shown in Table 21.

Table 21: Hypothesis Testing

		Metacognitive Regulation
	Pearson Correlation	.46**
Academic Achievement	Sig. (2-tailed)	.00
	N	295

Note. Min- Minimum, max – maximum, SD- Standard deviation, Sk – Skewness, Kur- Kurtosis
It was hypothesized that there is no significant relationship between metacognitive regulation and academic achievement. However, it was established that there exists a positive significant relationship between metacognitive regulation and academic achievement, r (295) = .46, p = .00. The results suggest that a student with high level of metacognitive regulation performs better in academics than a student low level of metacognitive regulation.

c. Discussion of the Results

The results of this study indicate that metacognitive regulation has a positive and significant relationship with academic achievement. This is in support of other research work that have been done on metacognitive regulation. Stanton et al. (2015) found the existence of a positive significant relationship between metacognitive regulation and academic achievement. The study established that students who always use metacognitive regulation are in a position to select the most effective learning strategies that enhance academic achievement. Metacognitive regulation is part of self-regulated learning. Self-regulated students are in a position to understand the task lying ahead of them, identify areas of strengths and weaknesses in their studies. Through regular use of self-regulation strategies, a student is able to improve in learning and academic achievement.

Similarly, Crescenzi (2016) studied metacognitive regulation and its relationship with academic achievement. The participants in this study described their commitment towards achieving their academic goals. One of the participants reveals that she always spent more time reading the same concept so as to gain full understanding in order to get good academic results. Another participant indicated their metacognitive regulation as a feeling of pressure when time was up without achieving their academic goals. The students involved in the study came up with their own self-regulated strategies such as metacognitive regulation to enhance their academic achievement. This study illustrates that metacognitive regulation is positively related to academic achievement.

Consistent with our findings is the study by Anamudu et al. (2019) which found that metacognitive regulation positively impacts on a student's academic achievement. The study included both undergraduate and post graduate participants from Nigeria. The study confirmed

the growing emphasis on metacognitive strategies in an attempt to boost students' academic achievement. The study further indicated the higher scores in biology-based courses was common among students who always practiced metacognitive regulation.

Additionally, Chepkieng (2020) studied the relationship between metacognitive regulation and academic achievement. The research found similar results with our findings that metacognitive regulation significantly affects academic achievement. The study illustrated that metacognitive regulation consists of the components of strategizing, auditing and self-evaluation. The study established that good academic scores were evident among students who effectively manage what they are learning than students who did not. From the study, monitoring regulation involves a student's ability to effectively manage their time with more emphasis on finding time for learning and accomplishing academic tasks. Through this strategy enables students to achieve more in academics. In Kaloleni Sub County, Kilifi County, the low performance can be attributed to low to moderate level of practicing metacognitive regulation. Students are thus not in a position to direct themselves on planning and management of time towards achieving academic goals. Additionally, the low performance may be as a result of lack of awareness of the learning strategies.

5.7 Prediction of Academic Achievement from Learning Strategies
To develop the prediction equation of academic achievement from learning strategies the following hypothesis was advanced.
There is no significant prediction of academic achievement from learning strategies. The hypothesis was tested using multiple regression analysis.

Table 22: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.38ᵃ	.15	.13	9.35	1.83

Table 22 indicates that multiple regression coefficient was 0.38 suggesting that learning strategies moderately predict academic achievement. R square was 0.15 suggesting that 15% variance in academic achievement is predicted by learning strategies. Durbin Watson value was 1.83 which suggests that data met assumption of independence of observations. According to Sulaiman et al. (2019) assumption for independent errors ranges from 1.5-2.5. Hence our data did not violate the assumption for independent errors.

Table 23: ANOVA Summary Table

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
	Regression	558.45	5	111.69	9.87	.00ᵇ
1	Residual	25424.25	289	87.97		
	Total	25982.70	294			

The results indicate that the independent variables of metacognitive planning, metacognitive regulation, metacognitive monitoring, adaptive help seeking and expedient help seeking significantly predict academic achievement, $F(5,289) = 9.87$, $p = .00$.

Table 24: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	*T*	Sig.
	B	Std. Error	Beta		
(Constant)	38.91	5.89		5.61	.01
Monitoring	.72	.37	.64	2.21	.00
Planning	.25	.23	.13	1.42	.02
Regulating	.80	.11	.71	3.41	.01
Adaptive help seeking	.50	.10	.34	1.21	.00
Expedient help seeking	.68	.21	.44	1.14	.00

From Table 24, the prediction equation for academic achievement from goal orientation and learning strategies is;

$\hat{y} = 0.72M + 0.25P + 0.80R + 38.91$

Where M-Monitoring-Planning-Regulation, A-Adaptive help seeking -E-Expedient help seeking
It is evident that metacognitive regulation has highest predictive index for academic achievement. The second highest predictive index is for metacognitive monitoring followed by expedient help seeking and then adaptive help seeking. The least predictive index is for metacognitive planning. A unit change in all the predictor variables leads to a significant change in academic achievement.

Discussion of the Results
The findings indicate that metacognitive monitoring, metacognitive regulation, metacognitive planning, adaptive help seeking and expedient help seeking significantly predict academic achievement. This suggests that students with adequate skills on learning strategies attain good scores in academics. The findings are in line with the results of a number of studies conducted in this area. A study by Valdez (2013) reported similar findings of a positive predictive index of metacognitive monitoring on academic achievement. The study was done using a sample of American university students. The study aimed at measuring students' accuracy pertaining expected performance on a test. Statistical analysis results indicated that metacognitive monitoring has a significant predictive index on academic performance.

Another research by Teng and Wang (2021) established those metacognitive strategies significantly predict academic achievement. The study collected data from 664 university students. The study found that students who were learning foreign languages struggled a lot in writing. The study established that with the use of metacognitive strategies of learning, foreign language learning became easier and the students registered an improvement in performance. Students who employed metacognitive strategies enhanced their competence of the context and this improved a student's academic performance. Additionally, Hayat and Shatter (2019) outlines those metacognitive strategies positively predict academic achievement and hence the need to consider metacognitive strategies when guiding students on issues of academic performance and factors that affect it. A majority of the students involved in the present study reported moderate

and low levels of learning strategies. This may explain the below average academic achievement among a majority of the students in Kaloleni sub county.

Research by Cambridge International Education Teaching and Learning team (2019) on the implicattion of metacognition on academic achievement identified three metacognitive srtategies of monitoring, planning and regulation. The study further established that metacognitive strategies enhance academic achievement. The study concluded that the strategies significantly predict academic achievement. The researcher pointed out that metacognitice strategies enhance memory, attention and activation of prior knowledge to solve academic tasks. In another study, in Nairobi, Kenya, Ombasa et al. (2019) studied learning strategies among nursing student. Among the students involved in the study, 160 of them were help seekers. Such students sought help from lecturers and colleagues. Academic help seekers performed better results than students who did not seek help. The study furthermore indicated that some students didn't seek help as they felt help seeking is a sign of weakness.

6. Conclusions

This study aimed to establish how learning strategies predict academic achievement. Since the findings indicate a positive significant relationship between metacognitive planning and academic achievement, it implies that students who practiced metacognitive planning in their studies scored better in academics compared to students who did not practice metacognitive planning. Therefore, students need to be guided so that they can always use metacognitive planning for better academic achievement scores.

The study found that there was a significant correlation between metacognitive monitoring and academic performance. Students who always focused on assessing their progress of achieving academic goals were found to perform better than those who did not. Therefore, it is important for teachers to train the students to enhance their skills on metacognitive monitoring for better performance in academics. This will go a long way in addressing the below average performance in academics.

The third objective was to establish the relationship between metacognitive regulation and academic achievement. Students who regularly practice metacognitive regulation perform better in academics than students who do not regularly practice metacognitive regulation. To enhance academic achievement of students based on metacognitive regulation, teachers need to train and sensitize students to enhance their skills on metacognitive regulation.

When the independent variables were explored jointly using regression analysis, it was established that they explained 15 % variance in academic achievement. The results are useful with regard to the factors that predict academic achievement of students. Therefore, to enhance future academic performance of students, teachers and parents need to guide and mentor students on learning strategies to enhance academic achievement.

7. Recommendations
a. Practice Recommendations

Secondary school students should always strive to effectively use metacognitive learning strategies to enhance their academic achievement scores.

ii) Since the study established that there is a significant relationship between learning strategies and academic achievement, students should be guided to develop and adopt effective learning strategies to enhance academic achievement. The students should also be encouraged to seek help from teachers and fellow students on areas of learning difficulties in order to improve in academics.

iii) Curriculum designers and content creators should consider including learning content on learning strategies in the course content to create awareness on the importance of learning strategies in learning and academic achievement.

iv) School administrators and teachers should create learning environment that foster skills on effective learning strategies.

b. Recommendations for Further Research

i) The research was conducted among form two students from selected secondary schools in Kaloleni Sub County. To widen the scope and generalization of the results, this study should be replicated in other areas with samples of students from other levels of learning. This will help to conclusively address the issue of below average performance in secondary schools in Kenya.

ii) This study used quantitative research methodology only. The researcher recommends that a similar study be conducted using mixed research methodology to compare the results.

iii) Since the research established that learning strategies significantly predict academic achievement, further research should be conducted to establish the predictors of learning strategies. This will help to boost these constructs for better academic achievement among the students.

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