

**AN ASSESSMENT OF INFLUENCE OF STUDENTS' ATTITUDE ON
IMPLEMENTATION OF SCIENCE CURRICULUM IN PUBLIC SECONDARY
SCHOOLS IN WAJIR COUNTY, KENYA**

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Abstract

Students' performance in science subjects in secondary schools in Kenya is raising concern amongst education stakeholders. It has remained to be poorly performed despite the intensive guidance and counselling programs, remedial teaching and provision of learning materials by the government. Other factors may have contributed to this poor achievement either directly or indirectly but students' attitude on implementation of science curriculum remain to become one of central element to consider. Thus, the purpose of the study was to investigate the influence of students' attitude on implementation of science curriculum in public secondary schools in Wajir County. The study was guided by the attitudinal and curriculum implementation theories. The study used mixed methods approach and concurrent triangulation research design in which quantitative and qualitative data were collected at the same time and with equal weight. The target population was 1000 comprising of 18 principals, 60 science subject teachers and 922 students. The study established that students' motivational influence implementation of science curriculum in public secondary schools. Thus, the study recommends that teachers and other education stakeholders should encourage and motivate students to take part in science symposiums, seminars and other workshops as a way of improving their desire to perform well at school. The Ministry of Education, Science and Technology should develop a policy aimed at encouraging students to develop positive attitude towards science subjects.

Keywords: science curriculum, Attitude, Motivation

1. Introduction

At the school level, science subjects holds the pivotal position amongst other subjects and a learner's grasp and command of science subjects may prove a precursor for improving performance in other subjects. Howard, Perry and Lindsay (2001) also accredited the sovereignty of science subjects when they outlined that today all fields of knowledge are reliant on science subjects. Researchers like Kifer and Robitaille (2008) and Nisbert and Warrant (2000) shared a related opinion about science subjects, as being basic to the study of the physical sciences and engineering of all kinds. Science subjects are increasingly used in medicine and in biological sciences, in geography and economics, in business and management studies. It is necessary to the operation of industry and commerce both in the office and workshop.

Despite this fact, implementation of science curriculum amongst secondary school students has been dismal and has been of a concern to many education stakeholders worldwide. Broussard and Garrison (2004) stipulate that for teaching and learning of science to be exciting and encouraging, there has to be motivation on the part of both the student and the teacher so as to ensure the advance of positive attitude and subsequently determined academic achievement.

Secondary school students' performance in science subjects has been on the decline. Such paltry performance has been attributed to many challenges ranging from poor teaching approaches, lack of infrastructural development and negative students' attitude. For example, a report by Ministry of Education (2013) indicated that Wajir County had 12,956 KCSE candidates and the number of candidates who scored a grade of C+ and above in science subjects were 2047 (15.80%) whereas those who scored a grade of D+ to C were 2436 (18.80%). Those who scored a grade of D to E were 8473 (65.40%). Such dismal performance has also been attributed to lack of parental involvement, lack of adherence to science subjects curriculum and lack of enough trained teachers among others, which the parents and the government have tried to address. Efforts to mitigate these problems have not yielded much and have failed to register remarkable progress. This is due to the fact that studies have not been conceptualized within the framework of students' attitude reflected through students' motivating attitude and perception and how these variables influence secondary school student's implementation of science curriculum. It was against this background that the study was being undertaken.

2. Objective of the Study

The objective of this study was to investigate the influence of students' motivation on implementation of science curriculum amongst secondary schools in Wajir County;

3. Research Methodology

The study applied concurrent triangulation research design. This is a single-phase design in which quantitative and qualitative data collects at the same time and with equal weight (Creswell, 2009). The researcher then merged the two data sets by bringing the separate results together in the interpretation. The target population was 1000 comprising of 18 principals, 60 science subject teachers and 922 students. Stratified sampling was applied to create 6 different strata based on the number of sub-counties in Wajir County. From each sub-county, purposive sampling was used to select one principal and 3 science subjects' teachers considering school which has had low Stratified sampling was applied to create 6 different strata based on the number of sub-counties in Wajir County. From each sub-county, purposive sampling was used to

select one principal and 3 science subjects' teachers considering school which has had low implementation of science curriculum. From each zone, and 29 students were selected using systematic sampling to eliminate biasness?

Questionnaires were used to collect data from students whereas interview schedules were used to collect data from principals and science subjects' teachers and Documentary Analysis Guide used to give existing records and documents on performance and academic progress in science subjects. The researcher obtained an introductory letter from The School of Postgraduate Studies of Mount Kenya University and Authorization Letter and research permit from National Commission. Data analysis began by identifying common themes from the respondents' description of their experiences. Qualitative data was analyzed thematically along the study objective and presented in narrative forms whereas the quantitative data was analyzed descriptively using frequencies, percentages, mean and standard deviation and inferentially using ANOVA Test Analysis using Statistical Packages for Social Science (SPSS Version 23).

4.0 Results and Discussion

The section he provides the data analysis results and discussions categorized under the sub headings: demographic characteristics of the respondents and how students' motivational attitude influence implementation of science curriculum.

4.1 Demographic Characteristics

The data collection instruments elicited information of demographics of the respondents.

These included; gender and level of education.

The results on the gender respondents' indicate that majority (80.0%) of the sampled principals were male and 20.0% female. Three-quarters (75.0%) of the sampled teachers were male whereas female teachers constituted a quarter (25.0%).

The data records majority (80.0%) of the sampled principals were male with 20.0% being female. Three-quarters (75.0%) of the sampled teachers were male whereas female teachers constituted a quarter (25.0%). In the same vein, 69.8% of the sampled students were male with female students constituting 30.2%. These results affirmed the fact that there was gender disparity at all levels of the study and that the influence of students' attitudes on implementation of science curriculum. The research instruments also elicited information on the level of education of principals and teachers and the results indicated that 40.0% of the sampled principals had Diplomas, 40.0% had Bachelors' Degrees whereas a paltry 20.0% had postgraduate qualifications at the same time, majority (62.5%) of the sampled teachers had Diplomas, a quarter (25.0%) had Bachelors' degrees whereas a paltry 12.5% had postgraduate qualifications. This information reveals that the principals and teachers had met the minimum qualification to be teachers and were expected to be competent to understand how students' attitudes influence implementation of secondary science curriculum.

4.2 Students' Motivation and Implementation of Science Curriculum

The study sought to establish how students' motivational attitude influence implementation of science curriculum.

4.2.1 Descriptive Findings on the Influence of Students' Motivation on Implementation of Science Curriculum.

Descriptive data was collected from students, organized and summarized into specific thoughts and results are indicated in Table 1,

Table 1: Students' Views on Influence of Implementation of Science Curriculum

Test Items	Rating				
	SA	A	U	D	SD
	%	%	%	%	%
Students' motivation enhances implementation of science curriculum	75.0	11.5	4.5	7.5	1.5
Students who are persistent in science subjects' teaching always motivate me to perform well in Science subjects	65.0	10.5	3.0	11.5	10.0
Inspiring students motivate students to work hard in Science subjects	75.0	10.5	2.5	9.0	3.5
Assignments are not marked nor returned in time	88.5	2.5	1.5	4.5	3.0
Teachers rarely reward students' performance in science subjects	65.5	11.5	4.0	13.0	6.0
Students miss lessons which has not improved their performance in science subjects	70.0	15.5	4.5	7.0	3.5

Table 1 reveals that three-quarters (75.0%) of the sampled teachers strongly agreed with the view that students' motivation enhances implementation of science curriculum as did 11.5% who agreed. However, only a paltry 4.5% of the sampled teachers were undecided, 7.5% of the teachers disagreed whereas 1.5% of the teachers strongly disagreed. These findings corroborate the assertions of Hung (2008) believes that suitable school learning is unlikely to take place in the absence of adequate motivation to study. The study further revealed that, with students' motivating attitude, students were able to break the cycle of poor implementation of science curriculum amongst students. These findings also lend weight to the findings of a study conducted in Australia in which Way and Relic (2003) found that students' motivating attitude towards science subjects teaching and students' achievement is one of the key contributors towards explaining the variance in students' cognitive realization.

Way and Relic (2003) further asserted that to enhance self-esteem of learners, which will in turn improve attitude of such students, it is recommended that varying activities, which has been designed to have science subjects difficulties ranging from easy to very hard, should be used. At least each student no matter their ability level should be able to

answer some questions correctly. This would go a long way to motivate such students towards further learning. These findings affirm the fact that with constant motivation from their science subjects' students, they were able to register impressive grades in science subjects test scores. These research studies affirm the fact that students' motivating attitude plays a significant role in arousing students' interest in science subjects. The study also found out that majority (65.0%) of the teachers strongly agreed with the view that students who are persistent in science subjects' teaching always motivate me to perform well in science subjects. At the same time, 10.5% of the sampled teachers agreed. However, 3.0% of the teachers were undecided, 11.5% the teachers disagreed whereas 10.0% of the sampled teachers strongly disagreed. These findings lend credence to the findings of a longitudinal study conducted in China amongst 111 secondary school students about persistence and resilience in science subjects' performance in which Hung (2008) revealed that students' motivating attitude is a significant aspect of effective learning and that motivation is a basic element for such learning. Hung (2008) believes that satisfactory school learning is unlikely to take place in the absence of sufficient motivation to learn. These findings thus affirm the fact that, with students' motivating attitude, students were able to break the cycle of poor implementation of science curriculum amongst students.

The study also revealed that three-quarters (75.0%) of the teachers strongly agreed with the view that inspiring students motivate students to work hard in Science subjects. On the same breath, 10.5% of the teachers agreed. However, 2.5% of the teachers were undecided, 9.0% of the teachers disagreed whereas 3.5% of the sampled the teachers strongly disagreed. These findings are consistent with the assertions of Tell (2003) that students' motivation influences students' implementation of science curriculum. In the effort to improve students' cognition and affective outcomes in science subjects and school learning, educational psychologists and science subjects educators, have continued to search for variables that could be manipulated in favor of academic gains. Of all the personal and psychological variables that have attracted researchers in this area of educational achievement, motivation seems to be gaining more popularity and leading other variables.

Majority (88.5%) of the sampled teachers strongly agreed with the view that assignments are not marked nor returned in time. A paltry 2.5% of the sampled teachers agreed. At the same time, 1.5% of the sampled teachers were undecided, 4.5% of the teachers disagreed whereas 3.0% of the sampled principals teachers strongly disagreed. On the same breath, majority (65.5%) of the teachers strongly agreed with the view that teachers rarely reward students' performance in science subjects. At the same time, 4.0% of the sampled teachers were undecided, 13.0% of the teachers disagreed whereas 6.0% of the sampled teachers strongly disagreed. Majority (70.0%) of the teachers strongly agreed with the view that students miss lessons which has not improved their performance in science subjects. At the same time, 4.5% of the sampled teachers were undecided, 7.0% of the teachers disagreed whereas 3.5% of the sampled teachers strongly disagreed. These findings corroborate the assertions of Way and Relic (2003) further asserted that to enhance self-esteem of learners, which will in turn improve attitude of such students, it is recommended that varying activities, which has been designed to contain science subjects problems ranging from easy to very challenging, should be used. At least each

student no matter their ability level should be able to answer some questions correctly. This would go a long way to motivate such students towards further learning.

4.2.2 Inferential Findings on the Influence of Students' Motivation on Implementation of Science Curriculum

To verify the possibility of difference between students' motivation and implementation of science curriculum, data was collected on students' motivation and students' science performance in internal, joint and KCSE examinations and the results are shown in Table 2,

Table 2: Results of Students' Motivational Attitude and Performance in Science Subjects

Aspects of Students' Motivation (Mean score, Marks)	Students' Performance in Science Subjects		
	Internal Exams	Joint Exams	KCSE
Students who do not feel encouraged to undertake science subjects	200	199	178
Students who are not inspired to undertake sciences	210	211	201
Students who are persistent	246	241	255

The results on Table 2 indicate that students who do not feel encouraged, inspired or are not persistent register low grades in science subjects in internal, joint and KCSE examinations. These results further lend credence to the assertions of Tell (2003) that students' motivation influences students' implementation of science curriculum. In the effort to improve students' cognition and affective outcomes in science subjects and school learning, educational psychologists and science subjects educators, have continued to search for variables that could be manipulated in favor of academic gains. These results were subjected to ANOVA and results were as indicated in Table 3:

Table 3: ANOVA Analysis of the Difference between Means of Students' Performance in Internal Exams, Joint Exams and KCSE

	Sum of Squares	Df	Mean Square	F	Sig
Between People	9280.188	3	3093.396		
Within People					
Between Items	149973.188	3	49991.063	108.178	.000
Residual	4159.063	9	462.118		
Total	154132.250	12	12844.354		
Total	163412.438	15	10894.163		

Grand Mean = 174.19

From the ANOVA Statistics in Table 3, the processed data, which is the population parameters, had a significance level of 0.000 which shows that the data is ideal for making a conclusion on the population's parameter as the value of significance (p-value of 0.000) is less than 5%, that is, $p\text{-value}=0.000<0.05$. It also indicates that the results are From the ANOVA Statistics in Table 8, the processed data, which is the population parameters, had a significance level of 0.000 which shows that the data is ideal for making a conclusion on the population's parameter as the value of significance (p-value of 0.000) is less than 5%, that is, $p\text{-value}=0.000<0.05$. It also indicates that the results are statistically significant and that there is significant difference between students' motivation and means of their performance in internal, joint and KCSE examinations. These results were consistent with the findings of a study conducted by Tell (2003) which generated a p-value of $0.037<0.05$. Thus, these findings point to the fact that students' motivation influences students' implementation of science curriculum.

In the effort to improve students' cognition and affective outcomes in science subjects and school learning, educational psychologists and science subjects educators, have continued to search for variables that could be manipulated in favor of academic gains.

4.2.3 Thematic Analysis of Qualitative Findings on the Influence of Students' Motivation on Implementation of Science Curriculum

Principals and teachers were interviewed who responded in favor of the fact that students' motivation enhances implementation of science curriculum. Just like in quantitative findings, these views further corroborate the views expressed by Hung (2008) that satisfactory school learning is unlikely to take place in the absence of sufficient motivation to learn. The study further revealed that, with students' motivating attitude, students were able to break the cycle of poor implementation of science curriculum amongst students. In the same vein, these views also lend credence to the qualitative findings of a study conducted in Australia in which Way and Relic (2003) found that students' motivating attitude towards science subjects teaching and students' achievement is one of the major contributors towards explaining the variance in students' cognitive achievement. Hence, these views also attest to the fact that with constant motivation from their science subjects' students, they were able to register impressive grades in science subjects test scores. That is, students' motivating attitude plays a significant role in arousing students' interest in science subjects. One interview remarked, "*Students who are persistent in science subjects' teaching always motivate me to perform well in science subjects*". These views are also consistent with the qualitative findings of a longitudinal study conducted in China amongst 111 secondary school students about persistence and resilience in science subjects' performance in which Hung (2008) revealed that students' motivating attitude is an important aspect of effective learning and that motivation is a necessary ingredient for such learning.

Hung (2008) believes that satisfactory school learning is unlikely to take place in the absence of sufficient motivation to learn. These views thus affirm the fact that, with students' motivating attitude, students were able to break the cycle of poor implementation of science curriculum amongst students. The interviewees also responded in favor of the view that inspiring students motivate them to work hard in science subjects. Likewise, these views are consistent with the viewpoints held by Tell

(2003) that students' motivation influences students' implementation of science curriculum. In the effort to improve students' cognition and affective outcomes in science subjects and school learning, educational psychologists and science subjects educators, have continued to search for variables that could be manipulated in favor of academic gains. Of all the personal and psychological variables that have attracted researchers in this area of educational achievement, motivation seems to be gaining more popularity and leading other variables. The interviewees also indicated that students' assignments are not marked nor returned in time and that students miss lessons which has not improved their performance in science subjects. These views corroborate the views expressed by Way and Relic (2003) further asserted that to enhance self-esteem of learners, which will in turn improve attitude of such students, it is recommended that varying events, which has been designed to contain science subjects problems ranging from easy to very difficult, should be used.

4.2.4 Mixing of Research Findings on the Influence of Students' Motivation on

Implementation of Science Curriculum

From the mixed findings, it is evident that students' motivational attitude influence implementation of science curriculum. That is, students' motivation, inspiration and marking of students' assignments enhance implementation of science curriculum and students' performance in science subjects. Mixed findings thus point to the fact that satisfactory school learning is unlikely to take place in the absence of sufficient motivation to learn.

That is, with students' motivating attitude, students were able to break the cycle of poor implementation of science curriculum amongst students. Besides, students' motivating attitude towards science subjects teaching and students' achievement is one of the major contributors towards explaining the variance in students' cognitive achievement. In other words, with constant motivation from their science subjects' students, they were able to register impressive grades in science subjects test scores. That is, students' motivating attitude plays a significant role in arousing students' interest in science subjects. Mixed findings affirm the fact that students' motivating attitude is an important aspect of effective learning and that motivation is a necessary ingredient for such learning and students are able to break the cycle of poor implementation of science curriculum amongst students.

Mixed findings further point to the fact that students' motivation influences students' implementation of science curriculum. In the effort to improve students' cognition and affective outcomes in science subjects and school learning, educational psychologists and science subjects educators, have continued to search for variables that could be manipulated in favor of academic gains. Of all the personal and psychological variables that have attracted researchers in this area of educational achievement, motivation seems to be gaining more popularity and leading other variables.

5. Recommendations

- i. Teachers and other education stakeholders should encourage and motivate students to take part in science symposiums, seminars and other workshops as a way of improving their desire to perform well at school.
- ii. Students should be encouraged to develop willingness to undertake their science assignments, homework and a desire to do their corrections.
- iii. Students should be encouraged to work hard in science subjects as a precursor to good career in medicine and other medical courses.
- iv. The Ministry of Education, Science and Technology should develop a policy aimed encouraging students to develop positive attitude towards science subjects.

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