

TEACHER'S MOTIVATION: CRITICAL INFLUENCE OF STUDENTS' CHOICE OF SCIENCE SUBJECTS IN SECONDARY SCHOOLS IN MURANG'A COUNTY, KENYA

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Abstract

The teacher factor is critical in influencing students to choose the Science disciplines. Despite teachers constantly encouraging the students to choose Science disciplines, students choosing these subjects are few in secondary schools. The study examined how teacher's factors influence students in choice of Science subjects in Murang'a County, Kenya. It was guided by objective; to determine the: influence of teacher motivation on students' choice of Science subjects. The study was premised on reinforcement theory of motivation. Descriptive research design was used for the study. The target population was 3400 comprising of 34 Science Head of Departments, 136 Science teachers and 3230 students in Murang'a County. Simple random sampling was used to choose 27 schools as a unit of sampling. From the selected schools, random sampling was employed to draw 65 teachers and 119 students. One HOD was selected through purposive sampling in each of the 27 selected schools. This yielded to a sample size of 211 respondents in the study. Questionnaires for students and science teachers, and interview guide for Science HODs were used as instruments to collect data. Piloting was conducted to determine the comprehensiveness of the instruments. Validity of the instruments was determined through expert judgment. Reliability of instruments was done using split-half technique. Quantitative data were analyzed using descriptive statistics such frequency and percentage with the help of Statistical Package for Social Sciences (SPSS). The data was then presented in bar graphs, pie chart and tables. Qualitative data was put into similar themes and presented through narration and verbatim quotations. The research revealed that teacher learner's interactions encouraged students to pursue science subjects. Positive reinforcement of learner's attitudes hence, they choose the science subjects this was supported by 64.3% of the teachers. Test evaluation feedback was found to influence learner's choice of science subjects this was supported by 66.4% of the students. Test results helped the students to know their strengths and weaknesses which greatly influenced student's choice of science subject.

Keywords: Teacher Motivation and Students' Choice of Science Subjects

BACKGROUND TO THE STUDY

Science is perceived generally as being vital globally both for monetary prosperity of countries and as a result of the requirement for scientifically and logically educated residents (Hagay and Baram, 2015). Science is subsequently a necessity worldwide due to the shortcomings encountered by countries. Some of these challenges comprise of global warming, hazards of explosions and nuclear war, diseases that are drug resistant, engineering and genetic experimentation impacts and ecological effect that comes with modern technology (Nugent, Wright, Shetty, Hodes, Lenz, Mahurkar and McCarthy, 2015). It is through technology in Science that solutions to most of the challenges can be met but this is not fully met due to limited number of experts venturing in the Science field.

Science as a device or tool of change and development, it enhances there is continuous development in technology, advancement in industrialization, health and promotion of national wealth (Hagay and Baram, 2015).

Matthews, (2017) highlights that Science subjects will always remain as the essential subjects over the years. In Kenya, the National Science, Technology and Innovation (STI) policy and strategy advocates for the need to mainstream Science in education sector (Bokova, 2012). This being in upper secondary where choice of subjects is done and recommended for Science subjects to be given a priority as teachers guide their students on choosing Science subjects such as: Biology, Physics or even Chemistry. Despite the teacher's efforts in guiding students to choose Science subjects, the number is still low. This is demonstrated by continuous decline of the number of students choosing Science subjects: in the year 2016-4007 students; year 2017- 3704; year 2018- 3419 and year 2019- 3230. Teachers advocate for Science subjects in their schools as far as choice of subjects is concerned by motivating and encouraging students to choose Science subjects like Physics, Biology and Chemistry (Sithole et al., 2017).

Regan and DeWitt, (2015) suggest that probably by making Science subjects compulsory can help avoid, fewer and fewer students choosing to continue to study it. It is of paramount significance for a study to be carried out to point out teacher's influence on students' choice in Science subjects with an aim to unravel the perennial mystery of low numbers showing interest in the field. According to Ferrare and Miller, (2020) choice patterns in Science subjects have been decreasing in every part of the world.

In U.S, as per the Department of Commerce, Science fields were required to develop by 17% somewhere in the range of 2008 and 2018, contrasted with simply 9.8 % development for non-Science fields in a similar time period (Mutambuki , 2014). However, without a deluge of graduates in these areas, the U.S. will not have enough specialists to fill those Science related positions and as a result, it will end up importing foreign Science experts. Over the course of the following decade alone, the U.S. is to deliver around 1 million more Science - certificate graduates than currently projected to fulfill the needs of the economy (Aina and Ayodele, 2018). This point to the fact that more students are needed to choose Science subject. The school management with the help of teachers are very significant when it comes to directing students to Science subjects. Once this is done, the society will trap the abilities and talents of its people. This study is very timely since it will provide insight on the role that teachers play in guiding and influencing students to choose Science subjects.

In Australia, during 2016 report, a public secondary school authority found an incredibly low degree of interest for partaking in Science related subjects in secondary school among center school students (Timms, Moyle, Weldon and Mitchell, 2018). However, most students especially girls seemed interested in entertainment, literature, arts and business (Hossain and Sakib, (2016). There is high possibility of high school academics linked to Science disciplines in Australia to be in risk incase enrollment in Science fields decline due to less interested students in Science. As a result, they will have a reduced number of students majoring in Science courses and the trend continues to having less experts in Science careers (Sithole, Chiyaka, McCarthy, Mupinga, Bucklein and Kibirige, 2017). Thus, this study looked into teachers influence on students in choosing Science subjects.

In Malaysia, Science subjects are highly considered as far as the Nation's needs are met in terms of having innovators and creative human capital for development (Shahali, Halim, Rasul, Osman and Zulkifeli, 2016). Siew, Amir and Chong, (2015) advocate that, teaching approach used by Science teachers have a great impact on the number of students who choose to continue pursuing Science subjects. They also found out that, when teachers are taken to Science in-service training to gain skills on effective, project-based and innovative methods to teach Science subjects, more students choose Science subjects. Nevertheless, Thomas, (2014) states that there is still a decline in the number of students enrolled in Science subjects in Malaysia which raises the question of what more can Science educators do to promote and help increase the number of students taking Science subjects. Hence, this study is viable in that it looked in to how educators in this case the Science teachers can work and influence more students to gain interest and choose Science subjects.

Tanzania has taken various activities to improve students' presentation and investment in Science and Mathematics. According to Misaki, Apiola and Gaiani, (2016), Tanzania has executed various projects in Science schooling. In Tanzania, the main goals of the policy guiding National Science and Technology culture are; to strengthen national Science and technology institutions by providing enough facilities and equipment, enhance women representation and participation in Science through providing a conducive environment for their innovation and to have a dominated Science culture in Tanzania (Smucker, 2015). Development prompts new items and cycles that support the economy. This development and Science education rely upon a strong information base in the Science areas (Semali and Mehta, 2012). It is clear that most positions of things to come will require a fundamental comprehension of Mathematics and Science hence, the need for this study.

According to Vuzo, (2018) despite of efforts done to improve Science and Technology, Tanzania has recorded a decline in students choosing Science subjects in high schools particularly those advancing their secondary education. Studies divulge that Science subjects are mostly taught using theoretical approach which is experiential than observational and experimental inclined approach. The teaching methodology used is more experiential, theoretical than observational and this has a negative effect in influencing the interest of learners to choose these Science subjects in their further studies (Sanga, Magesa, Chingonikaya and Kayunze, 2013). In the education sector in Tanzania, educators play a critical part in influencing students to take Science subjects in order to see more students get enrolled in Science subjects, but despite this, still there is a decline of the number of students choosing Science subjects.

Kenya like numerous different nations on the planet has been putting forth purposeful attempts towards creating and improving Science training such as funding Science and Engineering Fair projects, installation of internet in schools for research and introducing ICT learning in schools for research in Science subjects (Malinda, Mwanja and Maithya, 2017). Nevertheless, the percentage of Kenyan inhabitants qualified for Science jobs is stagnating (Ngetich, 2014). For instance, the automobile industry has deficit of engineers required in various departments (Azodo, 2016). According to Ngure, (2016) health sector has limited number of medical experts because students choosing Science subjects are few. In Kenyan education policy on Science, the policy states that every student in high schools must at least choose one Science related subject which shall be included in the National examination. However, despite the policy, students argue that sciences are difficult thus, are not willing to choose the sciences and mostly choose humanities. According to Hooker, (2017) teachers are trained on teaching quality of Science since 2017 by Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) on how to encourage and influence students to acquire and develop applicable core competencies like learning how to learn and digital literacy. On the other hand, many students struggle to decide which Science subject to choose when they are in form three and four and this has been an issue to many students which has contributed to diversified understanding among educational stakeholders and even among the students (Ngetich, 2014). According to Hasni and Potvin, (2015) the ministry of education has observed a reduction in the numbers of interested students in Science subjects which is a clear indicator that, despite the government's effort to raise the number of Science personnel or specialists in the country, it seems to be difficult to achieve it (Hooker, 2017). Hence, the current study looked into the aspect of how teachers mentor and motivate students to venture and choose Science subjects.

In Murang'a County, the circumstance is not totally different with regards to diminished number of students choosing Science subjects. Most students when it comes to choice of subjects, they choose humanities and a small number choose Science subjects. According to a study done by Gikonyo, (2017) from a report by CEMASTEAM most schools in Murang'a county have a school policy whereby Chemistry and Biology are made compulsory in addition to Mathematics while Physics subject is not compulsory and becomes unpopular among students especially girls as demonstrated in table 1.1.

Table1.1: Science Subject Choice in Murang'a County

Gender	Chemistry & Biology	Chemistry & Physics	& Chemistry, Biology & Physics
Boys	90%	52%	41%
Girls	99%	34%	32%

Over the years, the number of students taking science has been decreasing from 2016 to 2019 as shown below in Murang'a County.

Table: Gender

Years	Male	Female	Aggregate
2016	2,672	1,335	4,007
2017	2,647	1,057	3,704
2018	1,990	1,429	3,419
2019	1,794	1,436	3,230

Source: Ministry of Education and Technology, (2019)

The school principals have come up with the initiative of in-service training of Science teachers so that they can get pedagogical support based on how Science subjects should be taught in terms of teaching methodologies and test evaluation as well as the motivating aspect towards students. The school heads have been very supportive in Science and Engineering Fair projects to enable students become more innovative in the field of Science through coming up with projects that can help towards realization of vision 2030. Most schools now are equipped with qualified Science teachers and the school principals with the board of management in schools have been pushing for schools to build laboratories for more research and practical.

However, despite school management supporting science teachers to deliver on their mandate the anticipated ripple effect on their influence on increasing the number of students opting for science subject remains minimal. This current study delved on how the teachers influence students to venture into Science with a view to inform policy and practice in Kenya.

This particular study looked in to the influence teachers have when students are choosing their Science subjects- Physics, Chemistry and Biology based on teacher factors such as motivation, teaching pedagogy, test evaluation feedback as well as teacher mentorship on science subjects.

Here are some probabilities of compulsory science subjects in schools.

Probabilities of compulsory Science subjects in a school

Probabilities of compulsory Science subjects in a school	CHEM	BIO	PHY
CHEM	X	①	②
BIO	①	X	③
PHY	②	③	X
COMPULSORY ALL	①	②	③

However, some probabilities were not ruled out in this study based on choice of science subjects, whereby some schools made it compulsory for a particular science subject to be done by all students. In such a case, the researcher excluded such schools from the study before collecting the data.

LITERATURE REVIEW

Influence of Teacher Motivation on Students' Choice of Science Subjects

Motivation is a process of stimulating individuals to act towards achieving a goal. It stimulates the desires within an individual and hence, teachers can come up with ways of motivating students either through intrinsic or extrinsic motivation with a goal of having the student liking the subject and ending up choosing it. Teachers pay attention to retaining intrinsic motivation by encouraging and guiding students on how to improve on the Science disciplines. Students feel motivated when teachers pressure on them to work harder and give complements whenever an improvement is noted on Science subjects (Tessier, Sarrazin and Ntoumanis, 2010).

In Britain, Ardura and Perez, (2018) did a research on what motivates students to choose Chemistry and Physics subjects using a sample size of 1060 students. They found out that teacher's motivation to students on career path was a key contributing factor in terms of retaining more students in both subjects in future. Ardura and Perez, (2018) also found out that, despite teachers motivating students, there still existed a number of students not willing to take Physics and Chemistry. Therefore, the current study sampled 119 students, 65 Science teachers and 17 Science HODs, and the study was founded on teacher's motivation on students' choice of all Science subjects not only in Chemistry and Physics but also in Biology in order to strive and see if the scenario is the same.

In reference to Koballa and Glynn, (2013) on attitudinal and motivation they affirmed that students tend to perform well in subjects when motivation is maintained. They stated that continuous motivation of students enables them to work harder and yield good grades. Hence, this study informs the current study whereby teachers can enhance continuous motivation to their students and help them gain interest towards various subjects. More so, this study looked on the influence of teacher's motivation on Students' choice of Science subjects and not basically on the aspect of performance in Science subjects.

Grinis, (2017) did a study using case study method and found out that interest and motivation in students towards Science subjects had really declined specially in Asian nations like Japan and India due to lack of student motivation

by teachers and parents. The study found out that there was a reduction of choice of Science subjects by students. Therefore, the current study looked on how teacher's motivation can lender many students to choose Science subjects using descriptive research design and determine if the scenario in Kenya is different.

In reference to Zhang, Bobis and Cui, (2018) they did a study in China and looked into how Physics teachers motivate their students towards choice of Physics subject that is part of Science subjects. The researchers found out that, teacher's motivation in Physics classrooms was lacking and at times rare to be noted. As a result, this greatly contributed to the decline of students who selected Physics due to rare teacher's motivation in Physics. This study informs the current study whereby teachers are seen to be very influential whenever they offer motivation to students and this can be implemented in Kenyan schools to post positive results from students who are motivated by their teachers. Although, the scholars looked on teacher's motivation in Physics subjects which is part of Science, they did not look on the aspect of teacher's motivation in other Science subjects like Chemistry and Biology which this study will look in to.

Mariappan and Veloo, (2020) discussed that choice of Science subjects by girls is determined by the practicality of the skills learned in real life. However, extracurricular activities or support by the teachers motivate students to choose Science subjects. He also found out that Science teachers have negative reputation to students because of aggressiveness. Therefore, teacher behavior and personality play significant role in motivating students to choose Science subjects. It was found that negative emotions such as fear and dislike affect students' attitude towards particular teacher and subject. Moreover, use of derogatory and humiliating language lowers students' motivation thus, affecting their interests towards Science subjects. This study seems to inform the current study on various ways that teachers can use to motivate students.

Buday,Stake and Peterson, (2012) states that self-efficacy of the teachers influences the students on Science subjects. He argued that some teachers discourage students on Science subjects. Teachers were in frontlines in demotivating students on Science subjects thus, affecting students' Science self-efficacy. However, this study integrated teacher students' motivation that increased students' self-efficacy in choosing Science subjects.

According to a study done by Dettweiler, Ünlü, Lauterbach, Becker and Gschrey, (2015) using self-determination theory of motivation, intrinsic motivation is emphasized whereby teachers are to use word of encouragement to students as they teach and this helps students in making the right decision from their interest. This study found out that, students are motivated to take Science subject after they are made aware of the benefits of choosing these subjects by their teachers. Hence, the current study sought to find out how teacher student motivation about Science, influences their choice in Science subjects.

A case study by Ndalichako, (2014) in Tanzania indicates that there exist disparities during Science subject choice by students in different schools. Furthermore, this study shows that in ward secondary schools is where students mostly make unwise decisions during choice of Science subjects by not being guided by their ability and interest. Therefore, with the current study the researcher looked into how best teachers can get involved in creating awareness to students about Science and ways of motivating them to choose Science subjects.

When there is no motivation, students with high ability in Science do lack proper inspiration, numerous high Science-capacity students neglect to perceive their maximum capacity in Science in secondary school. Research shows that students' interest and inspiration toward Science subjects has declined particularly in western nations and more prosperous Asian countries (Thomas, 2014). According to Kiemer, Gröschner, Pehmer and Seidel, (2015) teacher-student discourse or interaction is perceived to be the central cause of significant decrease in students' interest and motivation in Science. This study informs the current study based on how teachers motivate students to choose Science subjects.

A study in Kenya by Gathaiga and Peninah, (2012) in Nyeri County which used form 2 students as respondents shows that, boys and girls are motivated to settle on decision of optional subjects basically by three factors; social, economic factors and individual factors. The current study sought to find out how teachers influence students in choosing Science subjects using form 3 students and found out some of the motivating factors of teachers to students in choice of Science subjects

Statement of the Research Problem

The background reviewed demonstrated that teachers have a significant influence in the way in which students choose Science subjects. The background further demonstrated that teacher motivation, teacher pedagogy, teacher test evaluation feedback and teacher mentorship on Science disciplines determines how students choose the Science subjects.

If all factors were held constant and if the teacher factors were fine, then the ideal situation is to have an increase in the number of students choosing the science subjects. However, this is not the case and the reality on the ground stands to be that the number of students selecting Science subjects is declining. This is manifested by the low number of students choosing Science subjects in Murang'a County as demonstrated in the following table.

Table on: Students Taking Science Subjects (Physics, Biology, Chemistry) in Murang'a County

Years	Male	Female	Aggregate
2016	2,672	1,335	4,007
2017	2,647	1,057	3,704
2018	1,990	1,429	3,419
2019	1,794	1,436	3,230

Source: Ministry of Education and Technology, (2019)

As a result of reduced number of students in Science, this lowers the chances of achieving the Sustainable Development Goal- nine (SDG-9) which enhances fostering technology and innovation, upgrading scientific research, promoting sustainable and inclusive industrialization, and building resilient infrastructure. As a result, it hinders the target for attaining vision 2030 in Kenya.

Hence, this study came in to help in determining ways of teachers enabling students get more interested in choosing science subjects. Therefore, the critical question at hand was, "What is the influence of teacher factors in the choice of Science subjects?"

Purpose and Objectives of the Study

The purpose of this descriptive study was to examine teacher factors that have an influence on students' choice of science subjects and determine why there has been a decrease of students choosing Science subjects from 2016 to 2019. As a result, this will help to establish ways of having more students choosing Science subjects with a view of informing education practices in Kenya.

Theoretical Framework

This study was guided by BF Skinner reinforcement theory of motivation. According to Skinner, (2016) a person's behavior is a function of its consequences. That is; positive consequences of behavior tend to make behavior be repeated by an individual whereas negative consequences of behavior tend not to be repeated by an individual.

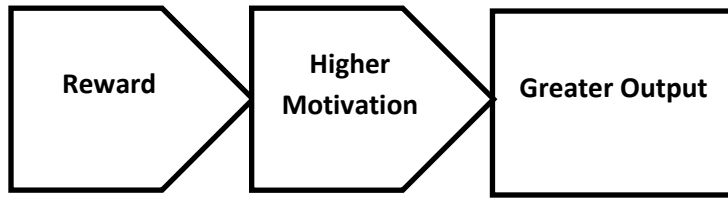


Figure: Premises behind Reward and Recognition

Source: Researcher's (2022)

The theory applied in the current study in that; teacher's motivation to students in terms of giving rewards and giving praises to the students is likely to motivate students to choose Science subjects and perform well. Thus, there is an increment in the student population taking Science subjects and this behavior is likely to recur in future.

Positive reinforcement in terms of teacher giving test evaluation feedback will make students intrinsically motivated thus, choosing Science subjects over the others. In that, when a teacher comments 'good' on student's performance in a test, that students will have the urge to do better next time and get 'very good' comment from the teacher. Those who may not have done well in the test, the teacher may use encouraging words such as 'you can make it', 'good trial' and 'work harder' to motivate the students to continue putting more effort in Science subjects. Once the students' performance improves in a Science subject, the students are likely to take the subject during the choice process with confidence that they can do better and achieve more in that subject.

The theory will also contribute in the current study in determining the influence of teacher's pedagogy on students' choice of Science subjects. In that, when teachers use good teaching methods like involving students in doing practical experiments and making maximum use of laboratories, students will be in a better position to master the Science subject and have confidence in pursuing it.

The reason being they will have been intrinsically motivated by them being in a position to exercise theory studied in class and putting it in to action and practice. When they get intrinsically motivated their interest in Science increases hence, increasing the number of students choosing Science subjects.

This theory contributes to an important role in the study in determining the influence that teachers have in mentoring students about Science on the basis of choice of Science subjects. When teachers mentor students about Science through mentorship programs, the students stand a position to make informed decisions and choices on the Science subjects to pursue, based on the information gathered during mentorship program. Mentorship gives the students a chance to self-evaluate themselves and make the right choice.

Therefore, reinforcement theory of motivation provides positive reinforcements as well as motivation to students and this increase the number of students choosing science subjects. Reinforcement theory contributes to cognitive development towards choice of Science subjects in that teachers employ continuous motivation to students to encourage them gain interest and choose science subjects. The theory guides teachers in using intrinsic motivation to students through positive feedback and words of encouragement in mentoring them to venture in the path of science.

RESEARCH METHODOLOGY

Research Design

This research employed descriptive research design in the context of both qualitative and quantitative methods which were utilized. The design was selected as it helped in gathering realities, information, feelings and decisions from the students and teachers in respect to the choice of Science subjects (Creswell and Clark, 2017). This design helped the study in determining the rate at which teacher's motivation, teacher's teaching pedagogy in Science subjects, teacher's mentorship to students and teacher's evaluation feedback influences students' choice of Science subjects. Descriptive

research design was appropriate for the study since it helped in identifying characteristics, frequency trends, correlations and categories of the variables without manipulating any variables (Mugenda and Mugenda, 2003).

Location of the Study

The study was carried out in Murang'a County that consist of public day secondary schools. It comprises of three climatic conditions sub-tropical climate, semi-arid conditions at the eastern part and equatorial climate at the central region. There has been a continued decline in the number of students choosing Science subjects from 2016 - (4,007), 2017 - (3,704), 2018 - (3,419) and 2019 - (3,230) in Murang'a County.

According to Walker, Mbari-Kirika and Miheso-O'Connor, (2016) there has been a nonstop radical drop in the number of students choosing Science subjects. This calls for need of a solution to the problem since in the mere future if the problem is not rectified, there will be minimal specialists in Science from Murang'a County which will have an implication to the economic development of the country. Hence, the researcher's need to do research on the problem and find ways in which teachers can be influential to students for them to choose Science subjects.

The research is relevant in Murang'a County since, it will help in having more students venturing in to Science field thus, an increase in the number of innovators to help grow the economy of the County.

Target Population

This study targeted form 3 students, Science teachers and Science HODs in public day secondary schools in Murang'a County. The target population was 3400 participants, consisting of 3230 form 3 students, 136 Science teachers and 34 Science HODs. Form three students were targeted because they had already selected their subjects and they had underlying reasons as to why they selected various Science subjects. On the other hand, Science teachers were targeted since they are directly involved in students' performance history in Science subjects and they stand a better position to guide students on the Science subject to choose. The Science HODs were also targeted since they have the specific knowledge and information about the Science subjects in their school. The target population is as presented in the following table.

Table: Summary of the Target Study Population

Category	Total number of target population
Form 3 students	3230
Science teachers	136
Science HODs	34
Total	3400

Research instruments

The pre-reading interview prompted participants' interests in the study. This facilitated the changes and modification of the questions for the improvement of the understanding and data gathering. Also, the researcher was in a position to enhance clarity of questions formulated for both interview guides and questionnaires.

Discussion of Research Results

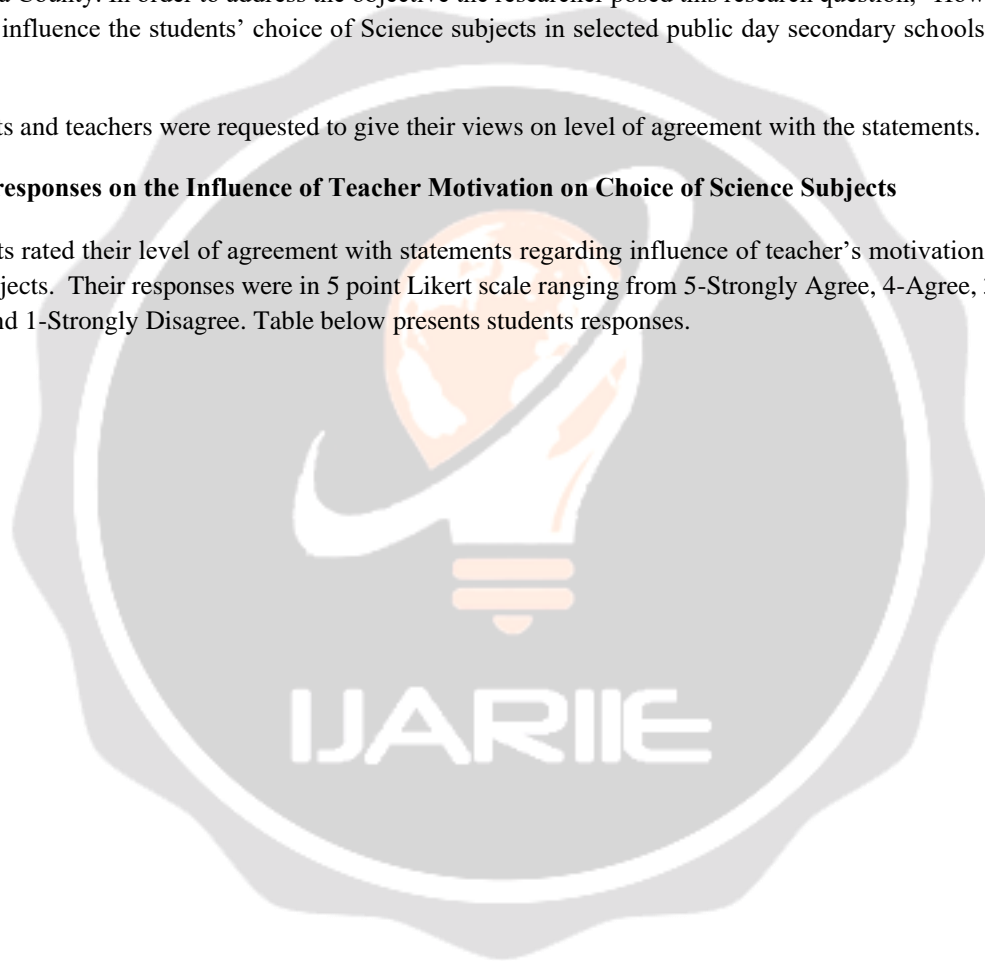
The Influence of Teacher Motivation to Students on Choice of Science Subjects

This objective of the study was to determine the influence of teacher motivation on student's choice of science subjects in Murang'a County. In order to address the objective the researcher posed this research question, "How does teacher motivation influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County?"

The students and teachers were requested to give their views on level of agreement with the statements.

Students' responses on the Influence of Teacher Motivation on Choice of Science Subjects

The students rated their level of agreement with statements regarding influence of teacher's motivation on choice of science subjects. Their responses were in 5 point Likert scale ranging from 5-Strongly Agree, 4-Agree, 3- Neutral, 2-Disagree and 1-Strongly Disagree. Table below presents students responses.



Statements	5		4		3		2		1	
	F	%	F	%	F	%	F	%	F	%
My biology teacher gave praises and comments in class that affected my attitude towards the choice of Biology subject	17	14.7	12	10.3	5	4.3	11	9.5	71	61.2
My biology teacher prompted me to continue pursuing Biology by rewarding me when I made an improvement on the subject.	19	16.4	10	8.6	12	10.3	6	5.2	69	59.5
My biology teacher interacted and engaged with us often during the lessons and this made me to select the subject.	23	19.8	10	8.6	9	7.8	6	5.2	68	58.9
My chemistry teacher praises and comments affected my attitude towards the choice of science subjects I chose	44	37.9	23	19.8	13	11.2	12	10.3	24	20.7
My chemistry teacher prompted me to continue pursuing Biology by rewarding me when I made an improvement on the subject.	41	35.3	26	22.4	20	17.2	5	4.3	24	20.7
My chemistry teacher interacted and engaged with us often during the lessons and this made me to select the subject.	42	36.2	30	25.9	11	9.5	6	5.2	27	23.3
My physics teacher praises and comments affected my attitude towards the choice of science subjects I chose	34	29.3	22	19.0	5	4.3	10	8.6	45	38.8
My Physics teacher prompted me to continue pursuing Biology by rewarding me when I made an improvement on the subject.	28	24.1	24	20.7	14	12.1	7	6.0	43	37.1
My physics teacher interacted and engaged with us often during the lessons and this made me to select the subject.	48	41.4	21	18.1	5	4.3	8	6.9	34	29.3

Table: Students' responses on the Influence of Teacher Motivation on Choice of Science Subject

The table shows that majority of the students 82(70.7%) disagreed that biology teacher gave praises and comments that affected students attitude towards choice of biology subject, only 29(25%) strongly agreed that teachers praises influenced their choice of biology subject while only 5(4.3%) had neutral views. Majority of the students 75(64.7%) disagreed that biology teacher prompted them to continue pursuing biology by rewarding them to improve in the subject, 29(25%) of the respondents agreed that biology teacher prompted them to continue pursuing biology by receiving rewards from their teachers while only 12(10.3%) had neutral views . These findings confirm that most of the biology teachers do not use rewards to attract learners in selecting their subject however a good number of teachers rewarded students in order for them to continue pursuing the biology subjects. Teachers who were neutral indicated that learners may choose subject of choice with or without rewards from their sub teachers. These finding concurs with Baranek (1996) that main goal should be to have the learners interest is at the center of their learning not a reward. Learners should be intrinsically motivated to choose the subject they love without the influence of rewards or gifts.

Majority of the students 74(64.1%) of the students disagreed that biology teacher interacted and engaged with them often during the lessons and this made them to select the subject, 33(28.4%) agreed that biology teacher interaction and engagement during the lessons influenced them to choose biology subject. Majority of the respondents 67(57.7%) agreed that chemistry teacher's praises prompted them to continue pursuing chemistry by rewarding them when they made an improvement of the subject, while 36(31%) disagreed that chemistry teachers praises had affected their attitude towards choice of science subjects they chose while only 13(11.2%) of the students were neutral. Grounded on the findings it is evident that chemistry teacher praises and rewards influenced the students to select the chemistry subject and this can be used to explain the big number of student's choice of the chemistry subject.

Majority of the students 67(57.7%) agreed that chemistry teacher prompted them to continue pursuing chemistry subject by rewarding them when they made improvement on the subject while the minorities 29(25%) disagreed with the statement that chemistry teacher prompted them to continue pursuing chemistry subject by rewarding them when they made improvement on the subject. Majority of the students 72(62.1%) agreed that chemistry teacher interaction and engagement with the student during the lessons that made them select the subject, 33(28.5%) disagreed that chemistry teacher interaction and engagement during the lessons influenced them to select the subject while only 11(9.5%) had neutral response.

Majority of the student 56(48.3%) were in agreement that physics teachers praises and comments affected their attitude towards choosing the subject while 55(47.4%) of the students disagreed. Majority of the students 52(44.8%) were in agreement that physics teacher prompted them to continue pursuing physics by rewarding them when they improved on the subject while 50(43.1%) of the students disagreed that physics teacher prompted them to continue pursuing physics by rewarding them when they improved on the subject while the minorities 14(12.1%) of the students had a neutral response.

Finally majority of the respondents 69(59.5%) indicated that physics teacher interaction and engagements during the lessons made them to select the subject, 42(36.2%) of the students disagreed that physics teacher interaction and engagements during the lessons made them to select the subject while 5(4.3%) had neutral views. Based on the findings it is clear that physics teachers' interactions and engagement with students influenced them to choose physics subject. The finding, further points out that reduction of interactions between the teachers and students tends to affect students choice of science subject.

These findings concurs Warku and Alemu (2020) that teacher of physics interactions and engagements during the lesson influences the learner decision in selecting physics subject.

Teachers' responses on the Influence of Teacher Motivation on Choice of the Science Subjects

In order to further understand the teacher's responses on the influence of teacher motivation on choice of science subject the teachers were asked to show their agreement in 5 point Likert scale ranging from 5-Strongly Agree, 4-Agree, 3- Neutral, 2-Disagree and 1-Strongly Disagree. Their responses are presented in Table 4.6.

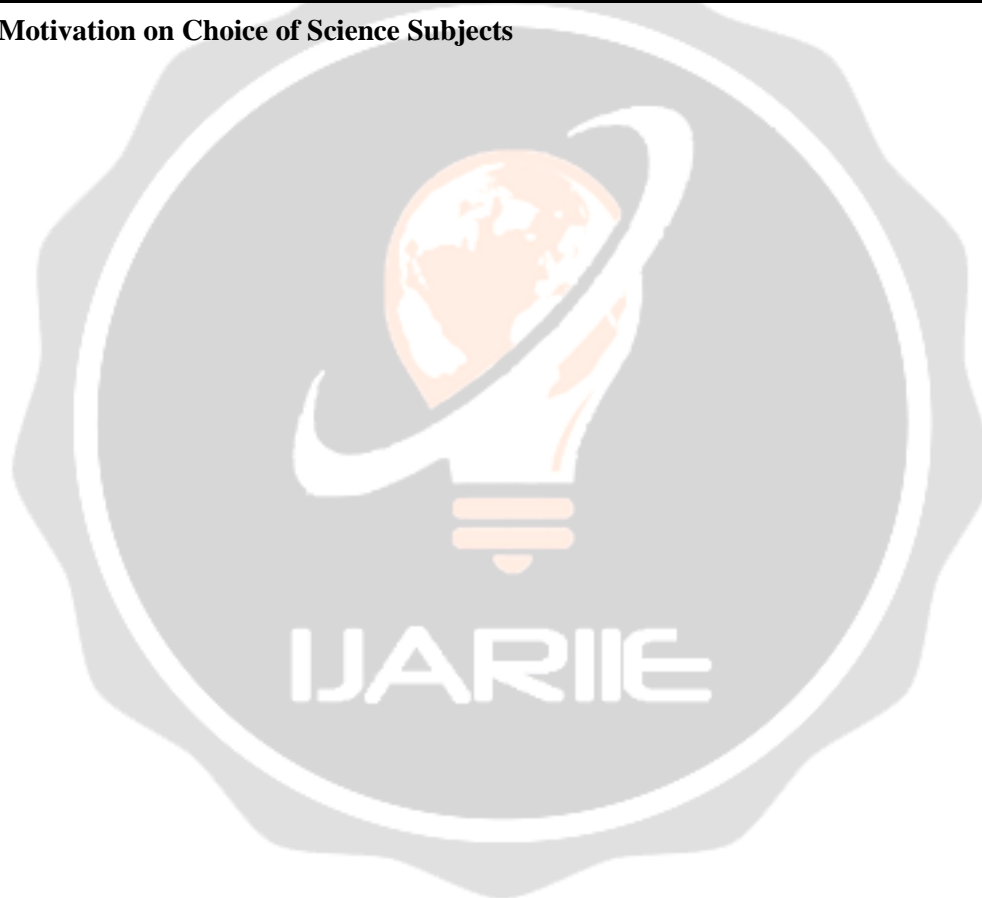


Statements	5		4		3		2		1	
	F	%	F	%	F	%	F	%	F	%
Being a Chemistry teacher, my remarks in terms of praises that I give students as a way of motivation, have an impact on student's choice of science subjects	28	40.0	20	28.6	7	10.0	5	7.1	10	14.3
Being a Biology teacher, my remarks in terms of praises that I give students as a way of motivation, have an impact on student's choice of science subjects	28	40.0	12	17.1	0	0.0	0	0.0	30	42.9
Being a Physics teacher, my remarks in terms of praises that I give students as a way of motivation, have an impact on student's choice of science subjects	27	38.6	2	2.9	2	2.9	2	2.9	37	52.9
As a Biology teacher, I do recognize the student's effort through rewards and this makes them have a positive attitude towards choosing the subject	16	22.9	4	5.7	3	4.3	4	5.7	43	61.4
As a Physics teacher, I do recognize the student's effort through rewards and this makes them have a positive attitude towards choosing the subject	17	24.3	9	12.9	14	20.0	4	5.7	26	37.1
As a Chemistry teacher, I do recognize the student's effort through rewards and this makes them have a positive attitude towards choosing the subject	22	31.4	23	32.9	11	15.7	6	8.6	8	11.4
As a Physics teacher, I frequently interact with my students when teaching and this helps them gain confidence in the subject ending up choosing it	21	30.0	4	5.7	12	17.1	5	7.1	28	40.0
As a Chemistry teacher, I frequently interact with my students when teaching and this helps them gain confidence in the subject ending up choosing it	33	47.1	22	31.4	4	5.7	4	5.7	7	10.0

As a Biology teacher, I frequently interact with my students when teaching and this helps them gain confidence in the subject ending up choosing it	3	52.9	16	22.9	1	1.4	0	0.0	16	22.9
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Table4.1:
Teachers' responses on the

Influence of Teacher Motivation on Choice of Science Subjects



The table shows that majority of the chemistry teachers 48(68.6%) were in agreement that their remarks and praises motivated and influenced students to choose science subject, only 15 (21.4%) disagreed that their remarks praises and motivation influenced students choice of subject while the minorities 7(10%) had neutral views. Majority of the biology teachers 40(57.1%) agreed that their remarks in terms of praises that they give to students motivated them on choice of science subjects, while the minorities 30(42.9%) disagreed that their remarks, in terms of praises that they give students as a way of motivation have an impact on students choice of science subjects. Majority of teachers 39(55.8%) disagreed with the statement that their remarks in terms of praises they gave to students as a way of motivation had impact on students choice of science subject while the minorities 29(41.5%) agreed that their remarks in terms of praises motivated students choice of science subject while only 2(2.9) of the teachers had neutral views.

Majority of the biology teachers 47(67.1%) disagreed that they do recognize the students effort through rewards and this makes them to have a positive attitude towards choosing the subject, 20(28.6%) of the biology teachers agreed that they do recognize the students efforts through rewards which makes them to have positive attitude towards the subjects. Majority 30(42.8%) of the teachers disagreed that as physics teachers, they do recognize students efforts through rewards and this makes them to have a positive attitude towards choosing the subject while the minorities 26(37.8%) of the teachers agreed that they recognize students efforts through rewards which influences students choice of subject. Majority of the teachers 45(64.3%) indicated that as chemistry they recognize students efforts through rewards and this makes learners have positive attitudes towards choosing the subject while, 14(20%) disagreed that recognizing students efforts through rewards makes them to have positive attitude towards choosing the subject.

Majority of the teachers 33(47.1%) disagreed with the statement that as a physics teacher, they frequently interact with their students while teaching which helped them to gain confidence of the subject hence ended up choosing the subject while the minorities 25(35.7%) agreed that as a physics teacher, they interact with the students while teaching which helps the students gain confidence in the subject and ends up choosing the subject. Majority of the chemistry teachers 55(78.5%) agreed that as chemistry teachers they frequently interact with their students when teaching which helps the students gain confidence with the subject ending up choosing it while the minorities 11(15.7%) disagreed that as chemistry teacher they frequently interact with their students when teaching which influenced the students to choose the subject. More than half 53(75.8%) were in agreement that as biology teachers they frequently interact with the students when teaching which helps them gain confidence in the subject hence ends up choosing the subject. 16(22.9%) disagreed that as biology teachers they frequently interact with the students when teaching which helps them gain confidence in the subject hence ends up choosing the subject while the minorities only 1(1.4%) had neutral responses. One of the head of science department added that;

“Science teachers’ motivation to students has greatly influenced students to love science subjects and select them. When learners improve in chemistry and they receive some positive reinforcement from the teacher this motivates the students to choose that subject. Students who receive negative reinforcement from some science teachers tend to run away from those subjects.

My teachers motivate learners by rewarding them when they perform well and praising them before other students which have greatly influenced the learners to choose the science subjects wisely.”

Another head of science department added that;

“Together with the school management we encourage our science teachers to motivate learners to take science subjects by reinforcing good behavior. In the recent past very few students used to select physics subject in this school. Together with my teachers we decided to attract more learners by motivating them and rewarding good performances. Learners who perform very well in midterm exams are given rewards while those who score good grades in the end of term exams are taken for an academic trip to Mombasa. This has encouraged and motivated most of the students to take the physics subject.”

The above finding agrees with Zhang, Bobis and Cui (2018) that science teachers motivate learners to choose chemistry, physics and biology by rewarding students when they achieve good scores. Teachers' praise and remarks to students, to a great extent influence the students to choose the science subject. The research finding reveals that teacher motivation to students influence choices of the science subjects in Murang'a County.

Conclusions of the Study

The Influence of Teacher Motivation on Choice of Science Subjects

The study pointed out that teacher motivation influenced student's choice of science subject. The study revealed that teacher's praises influenced the number of students who choose biology subjects. About 67(57.7%) of the students agreed that chemistry teachers praises and encouragements prompted them to continue pursuing chemistry. Rewards and teachers praises were found to change learner's attitudes hence they ended up choosing the science subject.

The study revealed that teachers frequent interaction with the students when teaching enable the students gain confidence and end up choosing the sciences. This was supported by biology and physics teachers. As per the findings, it is clear that teacher motivation to students influenced choice of science subjects by the students.

Recommendations of the Study

Recommendations of the Study

Based on the findings the researcher made the following recommendations:

- i. The head of science department should ensure that science teachers motivate students in choosing the science subjects by organizing in-service training on contemporary methods to guide the learners in subject selection.
- ii. The head of department should also collaborate with the school management and school stakeholders to make resources like finances available to award students who perform well in science subjects.

Suggestions for Further Studies

Based on the findings this study suggests the following researches:

- i. This research should be replicated in the entire Kenya so that its benefits can be enjoyed by all the students towards realization of vision 2030 which advocates for Science Innovations.
- ii. This research was carried out in Murang'a county replication can be done in other counties in Kenya.

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