TEACHER'S INFLUENCE ON STUDENTS' CHOICE OF SCIENCE SUBJECTS IN SELECTED PUBLIC DAY SECONDARY SCHOOLS IN MURANG'A COUNTY, KENYA

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS OF EDUCATION (EDUCATIONAL ADMINISTRATION) IN THE SCHOOL OF EDUCATION AND LIFELONG LEARNING OF KENYATTA UNIVERSITY

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DECLARATION

I **Zipporah Wahu Gatuiku** declare that this research thesis is my original work and has not been presented in any other university/institution for consideration of any certification. This research thesis has been complemented by referenced sources duly acknowledged. Where data, text or tables have been borrowed from other sources, including the internet, all have been specifically accredited and references cited using current APA style that is in accordance with anti-plagiarism regulations.

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Supervisors' Declaration

We confirm that this research thesis was carried out by the candidate under our supervision as University Supervisors.

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DEDICATION

I dedicate my educational research work to the Almighty God for giving me the will, ability, grace, strength and good health towards completing this study research. I also dedicate it to my loving mother-Lydiah Wangechi Gatuiku, my husband- Moses Mwangi, Remy Osteen my son and my siblings- Kennedy, Robert and Diana for their inspiration, prayers and support in seeing me reach this educational level.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

CEMASTEA:		Centre for Mathematics, Science and Technology Education Africa
EEIs	**:**	Extended Experimental Investigations
ERTs	**:**	Extended Response Tasks
GCC	**:**	Gulf Cooperation Council
HODs	**:**	Head of Departments
KICD	**:**	Kenya Institute of Curriculum Development
NACOSTI	**:**	National Commission of Science Technology and Innovation
STI	**:**	Science, Technology and Innovation
TSC	**:**	Teachers Service Commission

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 four objectives, namely, to determine the: influence of teacher motivation on students' choice of Science subjects; influence of teacher pedagogy on students' choice of Science subjects; influence of teacher test evaluation feedback on students' choice of Science subjects; and influence of teacher mentorship about Science on students' choice of Science subjects in Murang'a County, Kenya. 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 was 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 interactions, praises and rewards encouraged students to pursue science subjects. Hence, they choose the science subjects which was supported by 64.3% of the teachers. Utilization of theory and practical lessons was found to motivate the learners to select the science subject and this was supported by 57.1 % of the teachers. Test evaluation feedback was found to influence learner's choice of science subjects and 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. Teacher mentorship to students was found to influence student's choice of science subject. The study concluded that, recognition of students' efforts through rewards, use of theory and practical enabled students to have a better understanding of subject content, frequent administration of tests was found to improve students' knowledge and confidence in the subject. Teacher mentorship in terms of involving students in career talks, Kenya Science and Engineering Fair and even science mentorship programs all made students to have an interest towards choosing the science subject. The study recommended that the schools should organize regular science talks for the students, the KICD should ensure that the Competency Based Education (CBE) curriculum is well versed on pedagogical content delivery and the school stakeholders should encourage learners to participate in Kenya Science and Engineering Fair to enlighten them. This study may be significant to science teachers in guiding students when selecting science subjects.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter covers the background to the study, problem statement, purpose of the study, objectives of the study, research questions, significance of the study, limitations of the study, delimitations of the study, assumptions of the study, theoretical framework, conceptual framework and finally operational definition of key terms.

1.2 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, Baram and Tsabari, 2015). There can never be an overstatement of the relevance of science education in the growth of a nation. Worldwide, science like Biology, Chemistry and Physics has formed the cornerstone in terms of technological advancement, innovation and economic development. 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.

This pattern has brought about the concern of education stakeholders on the different factors that contribute to subjects that students choose at the secondary school level. One of the factors, which though not widely discussed and examined, is crucial, is

what teachers do to form academic preferences in students. Knowledge is not only inherited in teachers but teachers also act as a guide, a role model and a mentor to students in their education life. They can make or break the choices students will make regarding their academic future mainly in terms of their attitude, the style in which they teach, their encouragement or rather encouragement, and their expectations. The teachers are especially significant in the context of science education because the STEM disciplines are perceived to be quite difficult and rigorous. The motivation to study these areas usually needs good support systems and educationists are the best people to offer the support.

Several studies on a local level as well as international level have revealed that the factors of teachers play a large part in shaping up the academic decisions made by the students. These are the enthusiasm of the teacher towards the subject, content mastery of the subject, pedagogical strategies used, the teaching and other learning resources and capability in relating content to real life situations. Moreover, the character of relations between the teacher and student, the lack or presence of a mentorship, and the educative support given of teachers may stimulate or prevent the further studies in science among students.

Also, the stereotypes that teachers have about the abilities of the students can unwillingly affect the self-vision of the learners and their decisions. When educators talk about the high expectations and display confidence in abilities of students, the chances are that these students will respond well and take a challenge of trying more difficult subjects. Conversely, when instructors further stereotypes -such as the assumption that only the more gifted students will be able to excel at science- students can internalize such attitudes and choose new subjects that are seen as less challenging. In other schools, girls are discouraged in a more subtle manner to stick to

females' stereotypes leaving out sciences because of the perceptions that people have had over the years about gender roles. This practice can either confront such stereotypes or strengthen them on the part of teachers.

Another key factor of influence is mentorship by the science teachers. Actively mentoring the students on career decisions, science club, science fairs, suggesting science careers of interest, and connecting students to professionals in some science careers would allow the demystification of the science topics and confidence among the students to participate. Mentorship programs give students a chance to learn about science outside the classroom and the chance to imagine themselves as scientists, doctors, engineers, or research scientists in the future. In the absence of such mentorship access, however, students are not likely to be interested in continuing their interest in science beyond the mandatory levels.

Science as a device or tool of change and development, enhances there is continuous development in technology, advancement in industrialization, health and promotion of national wealth (Hagay and Baram, 2015). Matthews, (2014) highlights that Science subjects will always remain as the essential subjects over the years.

In U.S, Little interest among students in the study of science subjects is increasingly becoming an issue of concern among educationists, policymakers, and scholars all over the United States Odden, Marin and Rudolph, 2021. Such a trend is a major setback to the development of countries especially in this knowledge-based global economy that is gradually revolving around science, technology, engineering and mathematics (STEM) skills. The U.S. government and other stakeholders in education have enacted a wide range of programs to solve the problem, which includes STEM outreach, reforming curriculum and spending on science educations infrastructure (Pareja, Schunn, Bernstein and McKenney, 2018). But among the many factors that

can determine how students interact with science subjects, the role of teachers is one such important aspect that has not been fully exploited particularly in public day secondary schools where other academic support systems are not available to the student (Osborne and Pimentel, 2022).

The teaching and learning process involves teachers at the center and as much as their impact on academic choices of students cannot be overemphasized. In U.S, according to Spangle, Ghalei and Corbett, (2021) science teachers are not only the givers of content knowledge, but also play a role in being a model, mentor and career advisor. The attitude, teaching technique, scientific interest of the teacher and the level of classroom environment can personally influence the students towards science subject. Yu and Alibakhshi (2025) indicated that passion and competence exhibited by the teachers in teaching science are more likely to make students adopt a favorable attitude towards the teaching content in science. On the contrary, poor attitude or the interest of teachers may act as a barrier of encouragement among the students, despite their potential or preliminary interest, in science subjects.

In U.S, day secondary schools in general, and especially the under-resourced communities served by most public day secondary schools, the power of the teacher is greater (Jones and Burrell, 2022). As compared to the boarding schools or the private schools where there might be a more enhanced academic environment or involved parents, the students in the day schools may tend to lean on the teachers to give them academic advice. In U.S, the instructional staff in such environments also often serves as the most consistent provider of the academic support and knowledge regarding professional prospect (Ajayi, Mitchell, Nelson, Fish, Peissig, Causadias and Syed, 2021). Thus, their influence on subject selection by the students cannot be underestimated, especially in the fields where even societal beliefs, seemingly

complex nature, and the inability to immediately apply acquired knowledge might discourage students not to enrol in it.

According to Ahmadi, Noetel, Parker, Ryan, Ntoumanis, Reeve and Lonsdale (2023) there exist a few reasons why the teacher influences the choices of students. The first is the professionalism and the expertise of the teacher in his or her matter. The comparison between the two can and will be discussed. Teachers who are clearly confident in what they know and understand normally can teach in a better way and is able to motivate students in a better way. Second is how a teacher is approachable and can mentor. Being accessible to inquiries and aiding students in their cognitive progress, forwarded by the teachers, helps build a favourable classroom environment, which provokes curiosity and risk-taking. Third, they should use teaching methods that find their way into the heart, like involving students in practical experiments, group activities and real-life examples that would make learning science subjects more attractive. Secondly, the same bias and expectations can be displayed not only by the students but also by teachers, which leads to a teacher subtly influencing the students that they encourage on the path of science in many cases depending on gender, race, or perceived prowess.

The other important aspect of teacher influence is gender issues. In U.S, the national programs on encouraging gender equality in STEM do not exclude the implicit discouragement of women students to study science subjects. According to According to Kuchynka, Eaton and Rivera, (2022) teachers who knowingly or unknowingly emphasize gender stereotypes would not encourage girls to gain confidence in science and gender sensitive and encouraging teachers could certainly take center stage in encouraging girls to pursue science courses. This is of concern especially in the case

of secondary day schools, the society at large may already be doing that to restrict academic ambition in girls.

In addition, teaching and mentorship relationship between the students and the teachers has become an important factor in the subject choice. By establishing mentoring relationships with their students--discussing their future career goals, assisting in academic planning, and discussing the real-life applications of science--teachers help create a better-informed and more motivated student body. Such mentorship is not always present in the underfunded public school and sees a necessity in purposeful policy and training actions that are meant to prepare educators to fulfil this role adequately.

According to Hughes, Corrigan, Grove, Andersen and Wong, (2022) when introducing changes in STEM education in the U.S., it is necessary to regard teachers as the key factor in determining the path of students academically. Although curriculum design, availability of resource material and standardized testing are topics of focus in U.S, the human aspect, i.e. the teacher, seems to be a critical component as to whether students choose into a science track.

As per the Department of Commerce in United States, 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 (Celepcikay and Tarim, 2015). 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 & 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. There has been a growing concern of the reduction in the numbers of students taking science related courses in senior secondary years. Although the national policy and programs take initiatives in order to enhance Science, Technology, Engineering and Mathematics (STEM) education, a significant number of students in the public day secondary school are not taking core science subjects including Physics, Chemistry and Biology in Australia. The trend has led to increased focus on the different factors that affected the choice of subject, especially the fact that teachers are considered important stakeholders in academic and career progression among the students in guiding and influencing students to choose Science subjects.

In Australia, there has been a growing concern of the reduction in the numbers of students taking science related courses in senior secondary years (Sciberras and Fernando, 2022)). Although the national policy and programs take initiatives in order to enhance Science, Technology, Engineering and Mathematics (STEM) education, a significant number of students in the public day secondary school are not taking core science subjects including Physics, Chemistry and Biology in Australia Ross, Galaudage, Clark, Lowson, Battisti, Adam and Sweaney, 2023). The trend has led to increased focus on the different factors that affected the choice of subject, especially the fact that teachers are considered important stakeholders in academic and career progression among the students.

Tytler and Ferguson, (2023) did a study in Ausralia and found out that poor teacher attitudes and/or ineffective instructional practices or personal estrangement which leads to lack of interest by the students as well as their low confidence in achievement in science.

The role of the teacher is even more crucial in the context of Australia where there exist the Australian public day secondary schools in which the students are usually released out of their schools at the end of the school day and that also are not able to afford the extra academic assistances outside school. These schools serve best in terms of broad scope because they accommodate socio-economically disadvantaged students, rural student communities, and culturally diverse students. In these environments, teachers get not only to teach academic material; they also provide mentorship, serve as a role model, and are occasionally the only accordant source of academic support. Their influence over the choice of subjects taken by the student is thus at once only a pedagogical and a relational and emotional investment.

Previous research in Australia by See, Munthe, Ross, Hitt and Soufi, (2022) established that one of the factors that can make learners choose or reject certain subjects is teachers. The variables that have been associated with student subject choice include the approachability of the teacher, whether the teacher is genuinely interested in whether students succeed, how challenging concepts are explained and to what extent the teacher encourages students. In the case of science subjects in general which could be seen as challenging or a talent, considerable teacher encouragement is seen as forming positive student attitudes and diminishing feelings of anxiety or self-doubt.

In addition, the differences between boys and girls' enrolment in science subjects remain an issue in Australia Kirkham and Chapman, (2022). The roles that teachers take can prove to be critical in strengthening gender stereotypes or breaking down such stereotypes with the help of the students in viewing with whom the science subjects can belong. Teachers can encourage female students to be independent of social constructs and give them the confidence to tackle science subjects the same way they can motivate boys to learn the value of life sciences or any other course that is not necessarily related to their gender. Therefore, the influence of teachers on shaping the academic choice of students gives a clue to interventions that may focus on the individual or the teacher, on training or policy with an aim of improving the rates of engagement in science.

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, 2012). 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). Struggles to practice socio-

economic development have strategically led nations like Malaysia to enhance science, technology, engineering, and mathematics (STEM) education at different levels. Regardless of these attempts, the decreasing enrolment in science subjects among secondary school learners has become a worrying trend in most areas in Malaysia and more so in government day secondary schools. The issue of underrepresentation of students in science-related fields has provoked some critical questions regarding the factors that contribute to the choices of the subjects. Amongst these, the role of teacher has come out to be one of the most important and potentially remarkable forces in determining the academic trajectory of students.

Within the context of those working within the Malaysian education system, secondary school teachers frequently find themselves in the role of guiding a student as they move through the transition between lower secondary and upper secondary education, at which point they must begin planning out a combination of subjects studied which will ultimately determine their future careers. Physics, Chemistry, Biology, and Additional Mathematics course are regarded as important subjects as far as entering any field in tertiary education that requires science and technology is concerned.

Within the Malaysian setting, various policies/programs, as STEM Education Policy and Malaysia Education Blueprint (2013-2025), have been initiated in line with expanding the involvement of students in science. Although these initiatives have been in place, public day secondary schools that take much of the students of varying socio-economic classes have relatively had less uptake with respect to science subjects when compared with boarding or private schools. The reason could be in the daily experience of the classroom and teacher-student interaction in these schools. The interest and desire to study science might be significantly impacted by access to

science teachers, their quality, the level of interest to the subject, the potential to put the given scientific knowledge into context, and the roles of teachers that transform into mentors (Fernandez, 2010).

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.

In Tanzania, the government has been keen on developing science and technology as witnessed by a number of government policy frameworks including the Tanzania Development Vision 2025 that has pegged science and technology as one of the major tools in industrialization and nation building (Msami and Wangwe, 2016). Notwithstanding all these, the enrollment and performance in the sciences disciplines in the secondary school students, especially in the public day secondary school, is low. One such important aspect that remains underrepresented in the research is the influence that teachers have on the preferences of students in studying a subject.

Lower secondary to upper secondary education is a turning point in the life of the Tanzanian students because; general lower secondary (forms I-II) learners shift to

specialized subject selection at upper secondary sections (forms III-IV). By this point the scholar is usually expected to make a choice of subjects in relation to the academic achievements, the interest and the career opportunities in the future life. Nevertheless, the students are mostly taught how to choose their choices by their teachers, or rather they are pressured. It has been shown that teachers have the role of experts, mentors and academic role models and that their values, teaching practices and expectations can greatly influence their level of motivation and choices to undertake science subjects.

The teaching of science classes (Physics, Chemistry, and Biology) in most Tanzanian school within the public day secondary schools has been viewed in a blanket fashion as being hard, dry and requiring rigor almost always without the resources (requiring continuous working, extra reading materials and laboratory access) which are often minimal.

Studies done in different regions in sub-Saharan Africa, such as Tanzania, have discovered that students often mention teacher motivation, feedback, and classroom processes as vital in declaring their preferences when it comes to picking their subjects of preference Lange and Lange, 2016). As an example, the learners will feel more motivated to learn science in case the teachers employ practical demonstration, apply concepts in the real-life situation, and exhibit excitement in the classroom. Also, teacher career guidance is an influential factor in perception of science in Tanzania where most of the public schools in Tanzania have low institutional capacity to deal with formal career guidance programs; hence, advice given to the students by teachers on future career options is important. Students are more informed when teachers are informed and supportive hence when in need they tend to learn the value

of science in different careers such as medicine, engineering, environmental sciences, and information technology.

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.

In Kenya, the vision 2030 development blueprint in Kenya has defined the science and technology as among the main pillars on which economic change is going to be developed. Therefore, national initiatives aimed at urging young people to take sciences at the higher school are important. Nevertheless, many students still avoid taking science in the public day secondary schools leading to large proportions of students who major in arts and humanities. The role of the teacher is one of the critical factors, which contribute to this trend. It is common to consider teachers as the nearest and the most stable adult in the academic lives of students. In most of the Kenyan government day secondary schools, the educationists do not restrict themselves to teaching only, as the teachers provide guidance, counseling, and educate the students with moulding of academic orientation. Their impact, whether in the way they teach, in the classroom or direction in career can make a lot of difference in the student choice of subject.

The Kenya Competency-Based Education (CBE) policies appreciate the importance of career guide and mentorship at high school level. In most of the day schools that are publicly run, given the limited resources and large population of the students, huge workloads and the number of students in a classroom, a teacher can only provide a basic level of individual mentorship. It is most especially problematic in science education in which there must be a consistent guidance, practical exposure as well as positive reinforcement in order to support student interest. Moreover, day schools in the country may not be as prestigious and well-endowed as the national or boarding

schools which puts a lot of burden on the teachers to engage and mentor the learners with minimal outside help.

In Kenya, subject choice by students is further complicated by gender stereotypes and expectations by the society. The female students, especially, do not take many science subjects and related career opportunities in STEM. Implicit and explicit cues made by teachers have the potential of either contradicting these stereotypes or reinforcing them. Science teacher who is keen on encouraging female involvement and introduces examples on gender-neutral success stories in the field of science may address a transformative role. Thus, it is important to determine how the teachers can shape the choices of the students when it comes to choosing the science subjects, particularly in the public day secondary schools where available guidance services might be sparse.

The National Science, Technology and Innovation (STI) policy and strategy in Kenya 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, 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.

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, Mwania 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 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. Murang a County is a rural county that is majorly agricultural with many public day secondary schools facing the challenge of insufficient resources to maximize the potential of the students, large student-teacher ratios and poor choice of laboratory equipment. Such limitations may impact on the teaching as well as the learning of sciences subjects. Moreover, disadvantaged students are hardly exposed to science careers or role models, which reduces their interest in science even more. Thus, the teachers as a factor also take the center stage in exposing the students to the opportunities that relate to science, and in building the curiosity surrounding the areas.

Nevertheless, according to the coordinated reports and the initial surveys in Murang a County indicate that in most instances, students make these crucial decisions with a lot of minimalism (Ruuri, 2014). In a few instances, topics are selected by the students due to perceived difficulty, peer pressure or weakness instead of knowing interest or career goals. Lack of proper teacher guidance in making these choices can result in underrepresentation in the science streams that would extend the Science pipeline in the country. It is against this background that this paper tries to examine how teachers determine the students to take or shun science subjects in some of the

public day secondary schools in Murang a County. More so, it aims at exploring the level to which teachers determine the choice of students majoring in science subjects in the identified public day secondary schools within Murang a County. The results of the analysis will seek to offer some policy-informative insights that can be used to train teachers and strategize at the school levels to ensure more engagement in science education. Finally, equipping a greater proportion of students in state day schools with good foundations in science would serve the purpose of better educated people in the country, and one that would help increase the ability of the nation to achieve its development objectives. It seeks to examine the level of teacher participation in the choice of subjects, methods employed by teacher to encourage students to pursue science.

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 CEMASTEA 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.

Table 1.1: 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 2019 to 2023 as shown below in Murang'a County.

Table 1.2: Gender

Years	Male	Female	Aggregate
2019	2672	1335	4007
2020	2647	1057	3704
2021	1990	1436	3426
2022	1794	1429	3223
2023	1690	1410	3100

Source: Ministry of Education and Technology, (2023)

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.

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 as illustrated in table 1.3. In such a case, the researcher excluded such schools from the study before collecting the data.

Table 1.3: Some probabilities of compulsory science subjects in schools

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

1.3 Statement of the Problem

This study was timely as far as Science subjects are concerned since it will enable students to expedite the use of the Science teachers in improving their performance. The study will enable teachers to make some adjustment in the teaching pedagogy, mentorship of the students and ways of motivating students for them to be prioritize and gain more interest in choosing the science subjects. More so, apart from teacher's influence, students also have a say on the choice of science subject driven by their abilities, interest and career projections aside from teachers' influence towards the choice of Science subjects.

Although the government has done so much to ensure that science subjects are promoted in Kenya, there is evidently a drop in the number of students who take the science subjects in the four year schools especially in Murang'a County. This drop is a risk to the dreams of the Nation to grow to be a middle income, industrial country with the vision of Kenya vision 2030. Physics, Chemistry and Biology science

subjects are vital in the career paths of the medical, engineering and technological fields but still many learners are evading them. It is unknown as to why this trend is happening and it is an issue of concern to educators and policymakers among other stakeholders.

The teacher is one of the vital factors that are suspected to determine the preferences of the subjects taken by the students. Educators are important in developing the academic interests and attitudes of the students; this is because the teachers will influence the behavior of the student via the teaching procedures, motivation, knowledge of the subject taught, method of communication, and the characteristic interaction between them and the students. Nevertheless, in Murang'a County, not much study has been conducted on how these teacher-based factors directly influence the students to choose or to forego science subjects. The aim of this study is to examine how much influence teachers have in their students who get to choose science subjects in a few of the area selected public day secondary schools in Murang'a County so that measures can be put in place. This is to make sure that more students take science subjects and this will lead to more students passing or succeeding in their studies. This was manifested by the low number of students choosing Science subjects in Murang'a County as demonstrated in Table 1.4.

Table 1.4: Students Taking Science Subjects (Physics, Biology, Chemistry) in Murang'a County

Years	Male	Female	Aggregate
2019	2672	1335	4007
2020	2647	1057	3704
2021	1990	1436	3426
2022	1794	1429	3223
2023	1690	1410	3100

Source: Ministry of Education and Technology, (2023)

As a result of reduced number of students in Science, this lowers the chances of having more experts in the science field to help in fostering technology and innovation, upgrading scientific research, promoting sustainable and inclusive industrialization, and building resilient infrastructure.

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?”

1.4 Purpose 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 in Murang’a County, Kenya.

1.5 Objectives of the Study

1. Determine the influence of teacher-student motivation on students’ choice of Science subjects in selected public day secondary schools in Murang’a County, Kenya;
2. Determine the influence of teachers’ pedagogy on students’ choice of Science subjects in selected public day secondary schools in Murang’a County, Kenya;
3. Determine the influence of teachers’ test evaluation feedback on students’ choice of Science subjects in selected public day secondary schools in Murang’a County, Kenya and;
4. Determine the influence of teacher-student mentorship on students’ choice of Science subjects in selected public day secondary schools in Murang’a County, Kenya.

1.6 Research Questions

1. What is the influence of teacher-student motivation on students' choice of Science subjects in selected public day secondary schools in Murang'a County?
2. How does teacher's pedagogy influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya?
3. How does teacher test evaluation feedback influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya?
4. How does teacher-student mentorship to students on Science influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya?

1.7 Significance of the Study

1.7.1 Ministry of Education

The study may be of importance to the stakeholders involved in policy making process when it comes to making and implementing educational policies to sensitize teachers on Science. The Ministry of Education, Science and Technology may benefit in coming up with policy guides to Teacher Training Institutes (TTI) based on training Science teachers on pedagogy and how to go about orienting and guiding students on choice of Science subjects. The study may contribute to advanced scholastic information in the sector of education which might be utilized by different scientists as reference in future.

1.7.2 Kenya Institute of Curriculum Development

Kenya Institute of Curriculum Development (KICD) may significantly benefit from the study by ensuring that the Competency Based Education (CBE) curriculum is well versed on pedagogical content delivery. It may also have more stakeholders especially

when implementing policies regarding Science subjects due to increment of experts in the field.

1.7.3 Industries

Industries and institutions in Murang'a County may consequently have glimpses of hope from increased number of students choosing Science subjects. Science subjects are widely applicable in the industry thus; such students will improve productivity in the market.

1.7.4 Students

Students may benefit from the study because it will prepare them for future careers through guidance from teacher mentorship thus, filling the gap that exists in the market because Science subjects have a wide gap that have not yet been identified.

Students in secondary school may be of main target in implementing a research, upon its approval by the ministry. Since students have social network with their alumni in high schools, such students may act as ambassadors in encouraging students to have positive reputation on Science subjects thus, increasing number of students choosing Science subjects. More so, the alumni may guide students based on their ability on which science to pursue for their future career aspirations.

1.7.5 Teachers

More so, the study may benefit the teachers on getting more students pursuing Science subjects in their schools by improving on their teaching pedagogy, ways of motivating their students, best ways of mentoring students during choice process and also knowing how best to give test evaluation feedback to students and encourage them to continue with Science subjects.

1.8 Limitations and Delimitations of the Study

1.8.1 Limitations of the Study

Limitations of the study were as follows;

i. Ambiguity was anticipated in the framing design of the questions.

ii. Sample biasness was anticipated.

iii. Social ethics such as privacy of the participants was anticipated to be a concern.

iv. Self-selection bias arose when choosing teachers to participate in the study.

v. The sampling size was anticipated to present challenge on providing true reflection of the findings.

1.8.2 Delimitations of the Study

The study had the following delimitations;

i. Find the teacher's influence on students' choice of Science subjects in Murang'a County, Kenya for the selected public day secondary schools. Therefore, the teachers highlighted challenges they face when students are choosing Science subjects such as teacher's pedagogy, motivation aspect, teacher's test evaluation feedback and teacher mentorship. Nevertheless, the study did not look in to other influences like parental influence and peer influence in choice of Science subjects.

ii. The research was done in public day secondary schools and hence, the study was not carried out in private day secondary schools and boarding schools as well.

iii. The study did seek to determine the influence of teacher's motivation, teacher's pedagogy, teacher's test evaluation feedback and teacher mentorship on students' choice of Science subjects. This information provided relevant baseline for motivating students thus, encouraging them to choose Science subjects. This study did not look into other teacher factors that influence

student's choice of other subjects such as humanities apart from Science subjects.

iv. The study also failed to venture in to looking on students' factors such as their interest and ability in science which could also have some contribution when it comes to making a choice of science subjects.

v. Furthermore, the study targeted the Science teachers in schools since they stand a better position to give opinions, direction and guidance to students on matters related to choice of Science subjects. However, the study did not involve other stakeholders within the school due to them not being directly involved with students' performance trend in Science field.

1.9 Assumptions of the Study

The assumption of the study is that:

i. The respondents created time for the researcher in providing their views about Science subject choice

ii. There were few students taking Science subjects in Murang'a county

iii. There were specific teacher factors that influence choice of Science subjects

1.10 Theoretical Framework

This study was supported by the Reinforcement Theory of Motivation by B.F. Skinner, the set of behavioral theories that suggest that the behaviors of the people are determined and retained by their outcomes. When positive reinforcement is given in an educational situation, the behavior has a greater chance of being repeated or what we can call reinforcement of behavior. The student is more likely to repeat behavior of choosing a subject when science subjects are recommended to do after the positive reinforcement.

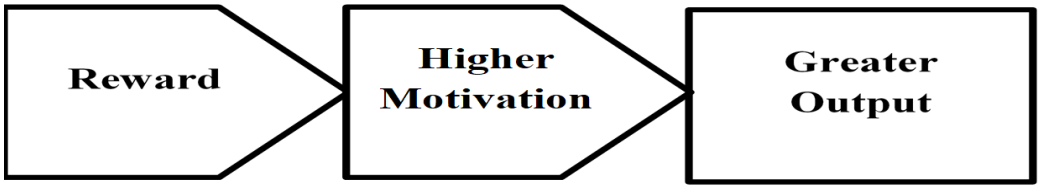


Figure 1.1: Premises behind Reward and Recognition
Source: Researcher's (2023)

Concerning the reinforcement theory, as a role model, when a teacher shows his/her interest and enthusiasm in science subject and displays a passion towards science, he/she can reinforce positively among students to choose science subject. More than that, the interesting, effective, and student-oriented approaches to instruction may stimulate the further interest of the students in science. It can encourage the students to take the science subjects in case teachers motivate them at the right moment by providing students with the needed feedback and encouragement when they make efforts or perform actions that have relevance to science using praises or comments. It is teacher student communication that can create a supportive relationship that helps build confidence and interest of students in the field of science.

The theory developed by Skinner explains how the actions of teachers can be used, as a form of reinforcement, to facilitate and maintain the level of interest held by students in the field of science. The possibility to be rewarded (externally or internally) by their engagement in science will make the students more inclined to selecting the science subjects. In their case, on the contrary, they may become de-motivated when they are punished or ignored.

There is need to fulfil ones internal needs. The theory was 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 both extrinsically with rewards and intrinsically with praises and comments in class making them 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. Such feedback from teachers is likely to guide the students on their ability in a certain subject and make informed decision in making a choice on the science to pursue. 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 contribute 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. Students are able to have external focus through observation of their teachers whereby they see them as role models and thus, the need to associate with them. 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 as well as classroom engagements. Mentorship gives the students a chance to self-evaluate themselves and make the right choice.

Therefore, positive reinforcements as well as motivation to students would lead to an increase in 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 choice of science subject by students could be guided by this theory whereby students are driven by their desire to achieve their career aspirations. 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. According to this theoretical framework, the behavior which involves the choice of science subjects can be attributed to the principles of reinforcement which was formulated by Skinner. The teacher as the key protagonist of the reinforcement process can either support or negatively affect the uptake of the science subjects in their methods of engagement, interactions and in motivating them.

1.11 Conceptual Framework

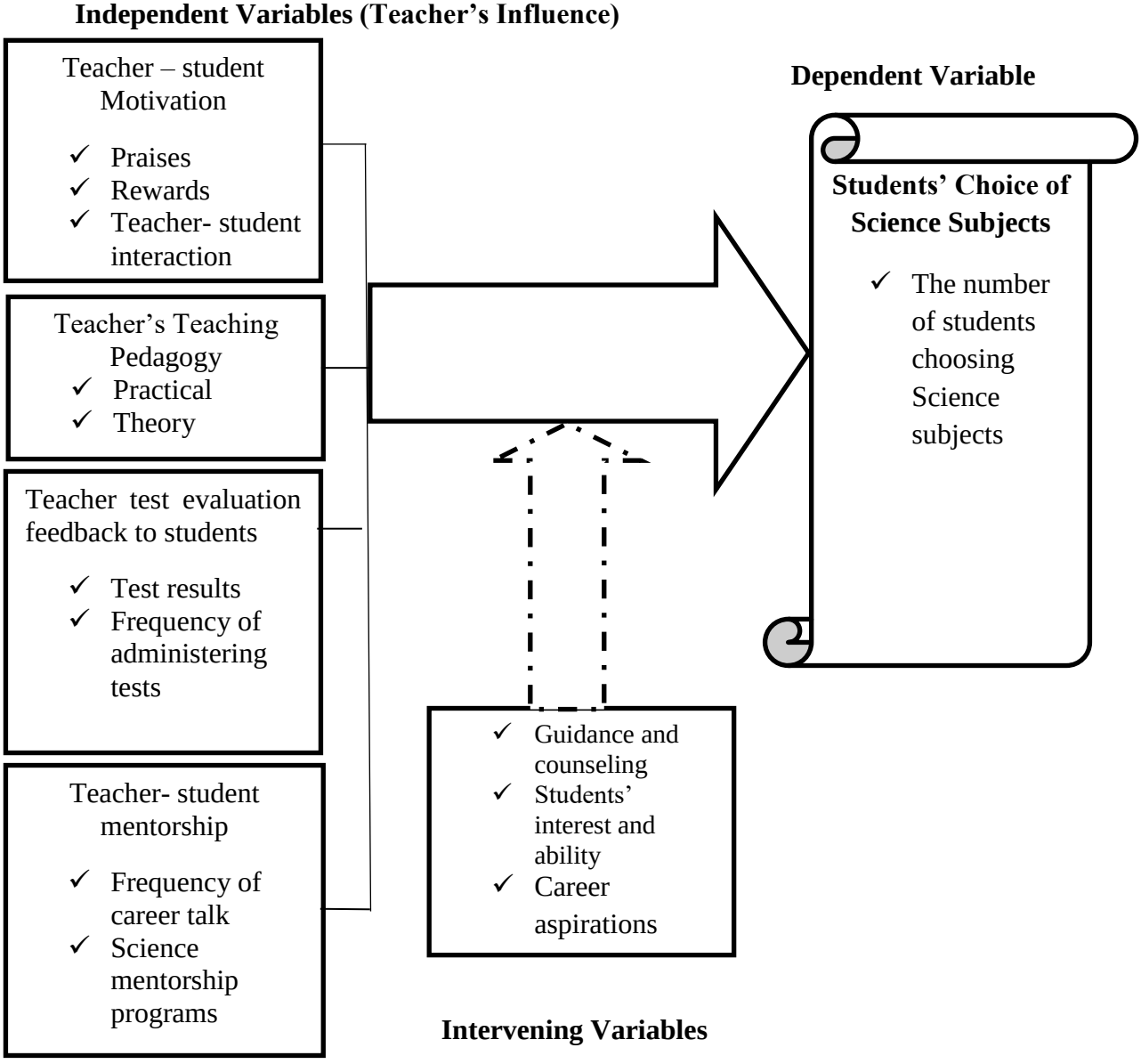


Figure 1.2: Conceptual Framework

Source: Researcher's (2023)

The above conceptual framework presents the interrelationship between variables. This conceptual model explains the effect of teacher related factors in the decision made by the students to take the subjects of science. It involves the independent variables (teacher factors), the intervening variables (Guidance and counseling, Students' interest and ability, Career aspirations) and a dependent variable (Students' Choice of Science Subjects).

Independent variable - teacher factors is thought to establish an academic environment that may be favorable or unfavorable towards the student taking science subjects. The intervening variables either mediate (act between the relationship), or moderate (act on the relationship) teacher factors and the choice of the subjects of students. To make this effective, the availability and effectiveness of career counseling and academic advising, the students should be intrinsically motivated, show self-efficacy and academic strength in science and most of all, they should have some long-term goals and ways on how science subjects fit their future career plans. The dependent variable - Students Choice of Science Subjects plays a role in ensuring that students make a decision to take science related subjects at secondary or post primary level (e.g. Physics, Chemistry, and Biology).

Independent variables of this study include the teacher-student motivation whereby students get motivated to pursue Science subjects when their teachers keep on praising them and rewarding them for any improvement noted in performance of science subjects. Increased teacher-student interactions in classroom motivate students and hence, increasing their understanding of the subject. As a result, this will attract them in choosing the Science subjects. Teacher's teaching pedagogy such as practical and theory application in experiments help students in understanding the subject concept in terms of theory which in return will increase students choosing Science subjects.

Teacher-student test evaluation feedback help students develop a certain attitude from the feedback they get from teachers depending on the frequency at which tests are administered to them and test results they get. If the feedback is encouraging for continued tests administered to them and the test results are positive, students will be willing to choose the science subject. Teacher mentorship to students through

conducting career talks frequently that are related to Science field to give them a better understanding of science related careers which they can aspire to pursue. Moreover, through using Science mentorship programs like Science and Engineering Fair assist students to see the need of Science in the community which influence them to choose Science subjects.

Intervening variables on the other hand will break the relationship between independent variable and dependent variables, such as: Career aspirations, students' interest and ability. Some student may be aspiring to be in business field which will lead them to dropping Science subject, so the career aspirations may influence the relationship. Schools hold guidance and counseling sessions by inviting professionals in the sector of counseling where students interact with counselors in different careers which might influence students to picking a different path which will cause a decrease in number of students choosing Science subjects.

The dependent variable of this study is students' choice of Science subjects which is dependents on or influenced by the independent variables. Success of the dependent variable will be determined by the independent variables and the intervening variables. Science subjects' choice is expected to increase after implementing the research in, Murang'a County.

1.12 Operational Definition of Key Terms

Science subjects: This is branch of knowledge studied in a school for example; Biology, Physics and Chemistry.

Subject choices: Refers to an outlined list of subjects provided by the school where students choose the subject of their interest and pursue it.

Teacher's Influence: Refers to the way a teacher makes students choose a Science subject or not choose it.

Teacher Pedagogy: Refers to the approaches that a teacher employs when teaching to ensure that he/she meets the needs and interests of individual student in order to have an understanding of what is being taught.

Teacher Motivation: Refers to the ability of a teacher to stimulate students' interest in a subject and enable them develop an interest in it.

Reinforcement: Refers to the ability to strengthen or increase a behaviour pattern.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The purpose of this chapter is to review literature related to the study. The literature review is explored in the following thematic areas: the influence of teacher-student motivation to students; influence of teacher's teaching pedagogy; influence of teacher test evaluation feedback and influence of teacher-student mentorship to students. Finally, the study summarized the literature and teased out the specific gaps that the study wanted to fill.

2.1 Influence of Teacher-Student 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 them to work harder and give complements whenever an improvement is noted on Science subjects (Tessier, Sarrazin and Ntoumanis, 2010).

There has been an immense academic concern due to the chronic low participation rate of students in science courses, especially in poor countries (Lyons, 2006). Apart from other socio-cultural and institutional forces that shape subjects choice among the students, the motivational relationships between teachers and students have been present as significant factors to determine the academic preferences among students

(Salami, 2008). The literature review identifies the current studies on the influence of teacher-student motivation on decisions made by students to choose science subjects. It discusses the theories of motivation, influence of the teachers, the character of student interaction and the gaps left by previous researches.

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 will be founded on teacher's motivation on students' choice of all Science subjects not only in Chemistry and Physics but also in other Science subjects like Biology and Mathematics 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 will look 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 has 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 will look 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.

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.

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, Biology and Mathematics which this study will look in to.

There are other factors affecting students' choice of subjects such as peer pressure and family background which also contributes to students' choice in subjects but studies indicate that the influence of the teacher can either support or overrule such external influences (Ahmed, Ejaz, Siddique and Sadaf 2022). An example is a student whose background is not science oriented yet she could end up studying science subjects provided that the teacher is constantly motivating and encouraging the student.

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. Further, a study by (Korpershoek, Canrinus, Fokkens-Bruinsma and De Boer 2020) indicates that the

impact of teacher support on the motivation is more than direct as it moderates the correlation between self-efficacy and subject choice. In other words, when students are made to feel encouraged by their educators, they hold more belief in the vicinity with regards to their abilities when it comes to choosing science. However, this study will integrate teacher- students' motivation that will increase 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. From a study by Gagné and Deci (2014) in their Self-Determination Theory (SDT), they outlined motivation in education into two broad groups, extrinsic and intrinsic motivation. This theory holds that people tend to become involved in activities, including choosing subjects in science, when they get their psychological needs of autonomy, competence, and relatedness satisfied. The study found out that these motivational factors can be improved or weakened by teachers as major contributors in the learning environment of students. By feeling that they belong and have autonomy teachers can encourage the realization of intrinsic motivation, which is more lasting and connected to increased perseverance in academic endeavors (Merdiaty and Sulistiasih, 2024).

More so, Eccles and Wigfield (2002) offer the Expectancy-Value Theory lens that can be very helpful when evaluating the student choice. This theory tries to indicate that the choices taken by students are determined by how they expect to do and the level

of value attached to a subject. The part of the teacher in the establishment of expectancy and value could not be over emphasized. Those teachers who have confidence in their students and explain the role of science in everyday life may play a key role in determining the attitude of students and future subject choice Kelley, Knowles, Holland and Han, 2020). This current study was supported by the Reinforcement Theory of Motivation by B.F. Skinner that suggest that the behaviors of the people are determined and retained by their outcomes. In relation to the study, the student is more likely to repeat behavior of choosing a subject when science subjects are recommended to be done after the positive reinforcement. Hence, the current study seeks to find out how teacher student motivation about Science influences their choice in Science subjects.

According to Olatoye, Ojeyinka and Ogunleke, (2022) in Nigeria secondary schools, revealed that students were prone to choosing science subjects more when their teachers applied motivational promotion techniques like carrying out of real life and practical experiments and encouraging them. In the same line of thinking, a positive relationship between the motivational behaviors of teachers with career aspirations to pursue careers in science among students was also seen by Adeyemo and Jegede, (2023). A positive learning environment in science presupposed the involvement of teachers who had the enthusiasm and adopted multi-strategies of teaching and developed rapport with students (Constantinou, Tsivitanidou and Rybska, 2018).

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 will try to find out how best teachers can get involved in creating awareness to students about Science and ways of motivating them 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 seeks to find out how teachers influence students in choosing Science subjects using form 3 students and find out which are some of the motivating factors of teachers to students in choice of Science subjects. Even after having a strong literature supporting the fact that teacher-student motivation is vital there are loopholes.

2.2 Influence of Teacher's Pedagogy on Students' Choice of Science Subjects

According to Freire, (2018) pedagogy refers to the practice and method of teaching that entails; Science, art and teaching profession. The innovations in pedagogy include inquiry-based learning, cooperative learning, technology use, and real-world applications, which promote engagement on the part of students (Gillies, 2023). According to Baram Tsabari and Osborne (2015), the interest in the study of science decreases because of the adverse experiences in science classrooms, which usually come as a result of unengaging, inflexible teaching styles. An extensively resonating study by Hattie (2016) and Darling-Hammond and Hyler, (2020) gave evidence that students tend to have a longer-term interest in science when facing the teaching methods that allow students to be engaged, inclusive, and student-centered such as exposure to practical as well as use of technology in learning.

The purposes behind students' preference of a specific subject entailed the motivation from significant others, responsibility and support given by the subject teachers, the availability of teachers and their teaching methodologies, and importance of the subject to their day-to-day experiences (Ndalichako, 2014). Hence, this study informs the current study in terms of teachers using different teaching methodologies to enable students have a clear understanding of the Science subjects and this makes them create an interest in students to choose a particular Science subject.

According to Kudenko and Gras-Velázquez, (2016), Euro barometer study about European reports, it was discovered there is complex reasons of students not having an interest in choosing Science subjects such as the mode of teaching used by Science teachers and the attitude students develop towards Science subjects. According to Freeman, Eddy, McDonough, Smith, Okoroafor, Jordt and Wenderoth, (2014) they support that in Science discipline, teachers should make use of laboratories for experiments to enhance practicality and flexibility. This draws many students to like the Sciences when they get exposed to reality of what they are taught and it is put into practice through experiments in laboratories. According to Kelley and Knowles, (2016) teachers ought to choose the best teaching technique that will bring about connection between the concepts in Science and applications in the real world.

In U.S, Herro and Quigley, (2017) carried out research on teacher's teaching methodologies in Science field and found out that, when teachers worked out on student centered pedagogy in Science the number of students choosing Science subjects increased. The study sampled the students only in collecting data. Hence, the current study will take samples from both teachers and students to give the expected type of pedagogy which arouse students to choose Science subjects and at the same time, the study will be carried out in Kenya.

In relation to Hudson, English, Dawes, King and Baker, (2015) trainers' educational information practices might be connected to students' results in terms of attitudes, skill development, values, understanding and knowledge for Science subjects. More so, according to Connell, Donovan and Chambers, (2016), as far as Science subjects are concerned, student-centered teaching methodology is very crucial for the subjects to be well understood by the students for better results. Teachers are important Human Resources that a country can check upon to shape and support its young personalities (Pineda-Báez, Bauman and Andrews, (2019).

Bahcivan, and Cobern, (2016) advocate for teachers to acquire more pedagogical knowledge of Science teaching since it enables a teacher to integrate inquiry pedagogy, Science pedagogy and Science content when teaching variety of topics to students and in making instructional decisions for teaching. In a National Research Council, Donovan and Bransford, (2005) emphasizes from cognitive studies that best knowledge transfer occurs when the knowledge being applied by the teacher is seen by students in various different situations. Hence, this could also be applied in acquisition of teaching methodologies in Science subjects. When a teacher acquires knowledge in inquiry instruction, one becomes capable of implementing and relating it to different situation where inquiry has been encountered in classroom environment (Schuster, Cobern, Adams, Undreiu and Pleasants, 2018). Teaching methodologies have been described to have a great impact on students' interest in a particular subject since it is based more on the ability of the teacher to deliver, being understood by students and having the students apply the acquired knowledge and skills to the real world. Thus, the study observers that teachers are to use the correct measures in teaching methodologies they apply in Science subjects and this is by making the

Sciences more practical than theoretical. There is allocation of more time on practical and less time on theory work.

Chiyaka, Kibirige, Sithole, McCarthy and Mupinga, (2017) advocates that, teacher's professional development is very critical in helping teachers gain new skills of teaching Science subjects that will help improve students' interest in choosing Science. The concept is that teachers can use improved skills of teaching to improve the mode of teaching and help students understand the subjects better. The current study will look in to pedagogies that teachers can use to influence students to choose Science subjects.

Schott, van Roekel and Tummers, (2020) stated that teaching methods by the teachers on Science subjects determine the outcome of choice process. The scholars also found that students were more motivated by teachers using variety of teaching methods. It creates diversity and prevents boredom to students hence; they have autonomy of which subjects to choose depending on the teacher. This informs this study where teachers use good methodologies of teaching like carrying out practical and influence students to choose Science subjects during choice process.

In relation to Hudson, English, Dawes, King and Baker, (2015) they discovered that trainers' educational information practices might be connected to students' results in terms of attitudes, skill development, values, understanding and knowledge for Science subjects. However, there is need to also look on how teacher's teaching methodologies influences students' choice of Science subjects.

Chiyaka, Kibirige, Sithole, McCarthy and Mupinga, (2017) advocates that, teacher's professional development is critical and found out that, it helps teachers gain new skills of teaching subjects which help in improving the performance of students. The

current study will look into how specific teacher pedagogy will influence students' choice of Science subjects.

A nation may have the best curriculum, teaching aid as well as the infrastructure in the schools but it all depends on the teacher to make a difference in the teaching of any subject. In Kenya, through the Teachers Service Commission (TSC) Act, there is push to ensure that there is in-service training of teachers for them to be equipped with pedagogical skills and knowledge that will determine their ability to deliver content to students and make them understand. This study will look into how best teachers can employ pedagogical skills in engaging learners with more practical than theories to give them a real picture of whatever they are learning in order to influence their choice of Science subjects.

A study conducted by Moore and Smith, (2014) indicated that teachers are required to have unique student-directed pedagogy. Teachers have experience to influence their students on Science instructions. Teachers reported the problems associated with Science subjects such as pedagogy problems, structural challenges and students concerns towards Science education. It was found that Science education could be achieved when integrated by peer collaboration, quality curriculum and effective professional development of the teachers. Therefore, teachers facilitate student-led process and guide them in examining challenges in all angles through logical manner and as a result, students are likely to choose science subjects based on their understanding of a subject. Although a considerable amount of researches posit the connection between pedagogy and choice of science subjects, some gaps still exist. Numerous studies are mostly related to the cognitive domain, and less weight is given to the affective and motivational one (Madan, 2017).

2.3 Influence of Teacher's Test Evaluation Feedback on students' Choice of Science Subjects

According to Stone and Heen, (2015) test evaluation feedback refers to the response given to an individual in order to create awareness of where they belong or stand. Many academic and psycho social variables influence the choice of science, among them the feedback of teachers on the performance of students being important (Lamb, Annetta, Vallett, Firestone, Schmitter-Edgecombe, Walker and Hoston, 2018). Feedback on the test, especially in science education, does not just cover numerical results, but also gives the comments, suggestions, and interpretative directions that either positive or negative motivate students to cover the subject Pei and Wu 2019). The way, the tone, and the time of this feedback can greatly affect the academic self-concept of students, motivation and their future subject choices especially in science (Stone and Heen, 2015).

Teachers administer tests to students frequently and give their responses in form of advice to students depending on their performance. The result of this feedback helps students to know their ability in a subject and through this, they can be in a position to make decision on whether to choose a subject or not. Evidence found in the field of educational psychology highlights that feedback can be considered as one of the most influential factors in terms of student attainment and motivation (Hattie & Timperley, 2007). In the science classroom, feedback influence helps students to gain a comprehension of a complex idea, correct misconceptions, and develop a growth mindset--all traits of successful learners in science disciplines.

A case study by Ndalichako, (2014) in Tanzania on teacher's evaluation feedback shown that students were highly influenced by individual factors like personal ability in relation to teacher's evaluation feedback during subject choice in various schools.

The study informed the current study in that, students feel comfortable to choose a subject which they have clarity on their potential from the feedback they get from teachers. Therefore, teacher's evaluation feedback is very crucial in determining once potential as a student in a given subject. Hence, the current study will be carried out in Kenya to determine how teacher's evaluation feedback influences students' choice of Science subjects in Kenyan context.

Floden, (2017) states that students tend to evaluate their teachers through the feedback they get from them. This study affirmed that teachers test evaluation feedback can have a great impact on students' attitude towards a subject which enables them to have confidence in pursuing it. According to Kaivanpanah, Alavi and Sepehrinia, (2015) they found out that student develop a certain attitude from the feedback they get from teachers. The current study will discuss nature of feedback which will arouse student interest in the choice of the subjects in accordance with the test evaluation feedback they are given by teachers. The study will also cover a variable such as teaching methodology which was not in this past study.

More so, Han,Yalvac, Capraro and Capraro, (2015) on teacher's evaluation feedback to students found out that, students' response was positive in terms of performance once feedback was administered and led to good student performance and liking of the subject. Han, (2015) found out that when teachers gave comments and awarded marks from a test, students became more aware of their weak points and were ready to rectify thus, performing better when another test was administered to them. The current study seeks to find out the influence that teacher test evaluation feedback will have on student's choice of Science subjects and not only on performance aspect.

2.4 Influence of Teacher-Student Mentorship on Students' Choice of Science Subjects

Mentorship revolves around giving guidance based on the experience one has in a certain field. In this case, the teacher acts as a mentor who is to be emulated by students depending on the experiences or knowledge, he/ she has in a given area. In an educational institution, teachers act as role models or mentors to students by sharing their experiences with an aim of becoming an eye opener to students. Mentorship helps students in making informed decisions in their studies that later on has an impact on their future. There are several triggers to this trend, however, teacher-student mentorship has come out as a determinant point. This literature review discussed the impact of teacher as mentor to guide the students to choose science subjects.

The role of the teacher is to not only help the students in terms of academic knowledge but also in making career choices. Crisp and Cruz (2009) present that good mentorship involves psychosocial support, role modeling, academic as well as career guidance, which play a paramount role in developing the aspirations of students. The aspect of mentorship is especially effective at decisive moments like choice of subjects in secondary school. Science subjects that are perceived to be difficult and abstract subjects should be encouraged, constantly supported and given positive encouragement, all qualities that are common in the presence of good mentorships. Science can be demystified as well by means of an enthusiastic teacher that takes steps to encourage students in pursuing scientific thinking and inquiry and make the matter simpler and more attractive (Aschbacher, Li and Roth, 2010). Also, the nature of relations between teachers and students is pivotal. Investigations have observed that students with positive and continued interaction with the science teachers will be

more prone to claiming an affection of growing appreciation towards science topics (DeWitt, Osborne, Archer, Dillon, Willis and Wong, 2013).Such relationships do not always revolve around academic training, but can span into specialty advice, career planning and even emotional support, which is a component of effective mentorship.

Teachers in Science classrooms invest time to find and recruit mentors for their classrooms because it will likely have a positive impact on student perception of Science disciplines. In reference to Blickenstaff, (2005) high school females have a more positive perception of Science disciplines after their mentorship experience. However, their interest in Science careers do not change giving a reason as to why the practice of integrating mentors into the classroom will not be the sole solution to increasing female high school students' interest and perception of Science disciplines. He also found out that Female students do not see enough Science role models outside of their textbooks and classroom, so by integrating female Science mentors into the classroom adds a role model that girls can tap into. This increases their confidence about and perception that Science as a career is attainable. The same can probably be said about cultural minorities in the urban centers; their motivation and interest in Science may be improved if mentors representing their cultural background were present in the classroom. This lender the researcher to find out how best teachers can mentor students to choose Science subjects.

Research proposes role models who address the variety of the populace to be significant, especially for separating generalizations (Edwards and Lampert, 2014). This is especially significant in Science fields where girls are underrepresented in Science vocations. Teacher-student mentorship is a determinant factor in the selection of science subjects by students. Mentors can foster fundamental changes in how students think and choose science, and how willing they are to do it Scogin and

Stuessy, 2015). Such that, they could determine the ability of the students to think about science in positive ways and be willing to do so through psychological support, pedagogical innovation, role modeling, and socio-emotional engagement.

Staff at Gulf Cooperation Council (GCC) chooses to utilize peer tutoring at the school to give a positive good example to the students, particularly the girls (El-Saharty, Kheyfets, Herbst and Ajwad, 2020). The interest of a guide in classes likewise empowers best practice from the instructor and supports students to do Extended Experimental Investigations (EEIs) or Extended Response Tasks (ERTs).

The expected advantages of peer tutoring are several (for all parties involved). Female peer tutors specifically, is effective in changing girls' view of Science and subsequently raising their goals concerning future studies in Science fields (McDonald, 2011). Other advantages entail giving a genuine connection to Science for the students (Karcher, Nakkula and Harris, 2005) giving educational assistance to the teacher (McDonald and Abd-El-Khalick, 2017) and enhancing the class experience for the mentor (Barnett, 2008).

According to a study done by Stroet, Opdenakker and Minnaer, (2015) on teacher-student mentorship they found out that poor teacher- student mentorship is perceived to be the central cause of significant decrease in students' interest and motivation in subjects. Therefore, the current study will determine the influence that teacher's mentorship to students about Science have on students' choice of Science subjects.

Instructors try to figure out how to commit a lot of their opportunity to scholarly work, educators convey elevated requirements, show express showing abilities and backing. Instructors are presented to proficient advancement projects to renew content information and the powerful instructional Sciences important to actualize Science

(Drew, 2011). Students and instructors build up the natural motivation to learn with the goal of affecting social change (Weimer and Gonzalez-DeHass, (2012). Having the pace of financial, and innovative change, students need a protected spot of figuring out how to get past the progress. Instructors, meeting up to share new instructive thoughts and assets are to help make positive results. A culture committed to learning would need to give assets to help individuals to remember genuine instructive undertakings with the persistent development and improvement (Senge, Cambron-McCabe, Lucas, Smith and Dutton, 2012).

2.5 Summary of the Gaps of Knowledge that the Study Intends to Fill

The Reviewed literature pointed out that students' choice of Science subjects is in both developed and developing nations. It was noted that students' choice of Science subject is highly influenced by teacher's motivation, teacher's teaching pedagogy, teacher's mentorship to students on Science subjects and teacher's test evaluation feedback in Science subjects.

Review of related literature identified the following gaps of knowledge that this study filled. First, Ardura and Perez, (2018) carried out a study in Britain to examine what motivates students to choose chemistry and physics subjects. This study was carried out in Britain and they have a different education policy with Kenya, meaning its finding cannot be fully applicable in Kenyan context.

Second, Grinis, (2017) carried out a study in Asia on factors influencing students' interest on Science subjects. This study used a case study research design. However, the study used a descriptive research design.

Third, Zhang, Bobis and Cui, (2018) did a study in China and looked into how physics teachers motivate their students towards choice of physics subject. The current study did not only examine how physics teacher influence students in choosing physics subject but the whole Science subjects.

Fourth, Herro and Quigley, (2017), carried out research on teacher's teaching pedagogy in Science field and only sampled students. The current study involved students, Science HODs and the Science teachers.

Fifth, a research conducted by Buday, Stake and Peterson, (2012) showed that students' perception on Science careers had significance interests in students. Students associated such subjects with complexities. However, after motivation, students were able to develop interests in choosing Science subjects. The study found that the relationship between students and teachers influenced the Science subject choice. Positive relationship of teachers with students led to more students choosing Science subjects. Students' motivation through positive reinforcement such as rewards to students had positive results on students' Science subject choice. This study determined whether the outcome results of studies done in other countries fit or are different in the Kenyan context.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter presents the procedures and techniques that the researcher used in carrying out the research. It focuses on: the research design, Study variables, the location of the study, target population and sampling techniques. This chapter also focuses on sample size, research instruments, pilot study, validity and reliability of the instruments, data collection techniques, data analysis procedures, logistical and ethical considerations.

3.2 Research Design and Study Variables

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 influence of the teachers based on teacher's motivation, teacher's teaching pedagogy in Science subjects, teacher's mentorship to students and teacher's evaluation feedback on students' choice of Science subjects. The study sought descriptive statistics since it wanted to stay within the sampled data and more so, there were no predictions and inferences about a larger population for inferential statistics to apply. The design also facilitated comparisons based on quantitative insights and helped in communicating complex data concisely making informed decisions based on quantitative insights.

Descriptive research design was appropriate for the study since it helped in identifying, summarizing and describing the main characteristics of the dataset,

frequency trends, and categories of the variables without manipulating any variables (Mugenda and Mugenda, 2003).

The independent variables of the study were teacher motivation, teacher's pedagogy, teacher test evaluation feedback of students and teacher mentorship to students. The dependent variable was student's choice of science subjects.

3.3 Location of the Study

The study was carried out in Murang'a County on 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. The county has good accessibility of road networks and more so, the study previously had not been carried out within the vicinity of Murang'a County. There has been a continued decline in the number of students choosing Science subjects from 2019 - (4,007), 2020 - (3,704), 2021 - (3,426) and 2022 - (3,223) and 2013- (3100) 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 county. Hence, the researcher's need to do research on the problem and find ways in which teachers could 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.

3.4 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 34Science 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 table 3.1.

Table 3.1: Summary of the Target Study Population

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

Source: Researcher, 2021

3.5 Sampling Techniques and Sample Size

3.5.1 Sampling Techniques

The researcher chose a portion of the population in the research area which represented the whole population. In this case the researcher chose 30 schools through simple random sampling based on basis of having populations that corresponds with the research concerns and characteristics. This helped in saving time and at the same time it was cost effective. Head of departments in Science subjects was interviewed per school out of the 30 schools selected. 30 HODs in Science were selected through

purposive sampling since they were the key informants in that; they had the specific knowledge and information about the Science subject in their school.

The Science teachers were selected through simple random sampling that helps in calculation of sampling error. This also helped in avoiding biasness and giving each and every participant equal chance of being selected. Hence, the researcher used lottery technique by having the names of respondent science teachers in folded papers with serial numbers that were later mixed up carefully. Later on, the respondents picked one paper and waited for the researcher to mention the winning serial numbers for those who were to be involved in the study.

The researcher then carried the second exercise of choosing respondent students by using simple random sampling using random number table whereby, a table with random numbers was used to determine the individuals who were to be included in the study. The students were given numbers and the researcher ranked digits in three different groups in the table calling out the numbers found in the selected range of numbers for two groups. The researcher then chose the students having the digits in the selected two groups. Form 3 students were selected since they had already selected the subjects and were in a position to clarify some of the factors that drove them to choosing certain subjects. Simple random sampling technique was selected because it gives all the respondents in the population an equal opportunity of being selected. Form 3 students were most preferred because they had just chosen their science subjects to pursue and were well versed with the reasons why they had just dropped a certain subject and not the other when choosing their subjects. Nevertheless, majority of schools allow students to choose subjects in form three, first term because they can assess their performance based on particular subjects.

3.5.2 Sample Size

To find the sample size, the Yamane Taro, formula will be employed, to enable reach to conclusions and inferences having done generalization of the entire population which the sample was gotten from (Okon, 2015). This formula was used to choose the sample size for students, Science teachers and HODs in the study.

$$n = \frac{N}{1+N(e^2)}$$

Where n is the required sample size.

N is the total population of teachers and students in Kahuro Sub-county, Murang'a County.

e^2 is the marginal error that is 0.09

The sample size of Science teachers, Science HODs and students is represented in the table.

Table 3.2: Sampling Frame

Categories	Target Population (N)	Percentage of (N)	Sample Size (n)	Percentage of sample size
Science HODs	41	100%	30	73.2%
Science Teachers	136	100%	93	68.2%
Students	3230	100%	119	3.7%
Grand Total	3407		242	

Source: Researcher, 2021

3.6 Research Instruments

The study used questionnaires and interview guides as the research instruments. According to Arafat, Chowd, Qusarand Hafez, (2016) questionnaires were the best preference in this study since they save time in terms of gathering data from a huge group of respondents within a short timeframe. More so, questionnaires drive away the fear of respondents as they give information needed by the researcher.

In accordance to Bell, Fahmy and Gordon, (2016) interview schedule on the other hand was used since it helped the researcher to get precise and direct feedback from respondents within the allocated time. The research instruments were administered whereby the interview schedule was administered to Science HODs whereas two different questionnaires were administered to Science teachers and students. Hence, interviews and questionnaires were used in getting primary data from the participants.

3.6.1 Questionnaires for Science Teachers and Students on Teacher's Influence on Students' Choice of Science Subjects

The two different questionnaires were administered to form 3 students and Science teachers respectively. They contained both closed-ended and open-ended questions. The two different questionnaires were divided in two parts. Section A addressing the demographic data and section B addressing the four objectives. The questionnaire is advantageous since it can easily be administered to students and teachers; it is cost effective, familiar, saves time and enables the researcher to gather feedback from objective replies (Orodho, 2009). It also has the positive side of making it possible to gauge the responses of numerous respondents to a restricted set of questions consequently, facilitating comparison and factual accumulation of the information (Creswell and Clark, 2017).

3.6.2 Interview Guide for Science HODs on Teacher's Influence on Students' Choice of Science Subjects

An interview guide was used to conduct face-to-face interview with the teachers. The interview guide was divided in to two sections. Section A- Introductory to general information and Section B- addressing the four objectives. This is to the fact that interview guide has the capacity to acquire detailed data as it permits more pont by point inquiries to be asked (Creswell and Clark, 2017). Interview also has the benefit

of getting high number of responses, has the opportunity to clarify any ambiguity, it is not time consuming and a follow up can be made in case of incomplete answer (Orodho, Nzabalirwa, Odundo, Waweru and Ndayambaje, 2016). The interview guide had probing questions covering all the objectives of the study.

3.7 Validity and Reliability of Instruments

3.7.1 Validity of Research Instruments

Orodho, (2005) observes that, validity determines whether the research instrument truly measures how truthful the research results are or what it was intended to measure. It also enhances credibility of the research. Qualitative validity was enhanced through use of naturalistic approaches such as interviews. Quantitative validity was enhanced through the use of statistical methods such as Pearson Moment Correlation, content validity.

Face validity was used as a measure of interest-construct especially for qualitative research design through counterchecking of the instruments to ensure they measured what they were intended to measure. Questionnaire addressed self-esteem questions that fit respondents. The questionnaire items were constructed in consideration of the requirement of each objective of the study. Face validity was used as validity in quantitative data because the sample size selected was large. Large data provided thematic measures of the objectives.

On the other hand, several experts in education management were utilized in establishing the content validity of the research instruments used. Their comments were used to improve the validity of the research tools. According to Cohen, (2003) for qualitative data, validity was addressed through honesty, depth, repeated observations, taking longer time in the field to make more observations, use of

research technicians, scope and richness of the data collected, the respondents involved, the extent and the objectivity and triangulation of the researcher. The credibility of the qualitative data was based on the recording the respondent's experience and perceptions.

3.7.2 Reliability of Research Instruments

Kombo and Tromp, (2006) defined reliability as a measure of how consistent the results from a test are. The instruments were divided into two equal halves taking the odd against the even numbered items. The researcher used the technique of equivalent halves to determine the reliability of the instruments. The scores of the halves were then correlated using the split half measure of reliability. Pearson Product Moment Correlation Coefficient was calculated between the scores that was obtained for each person on the odd and even items. A correlation coefficient of 0.78 was obtained. According to Weir, (2005) coefficient of 0.7 and more is a fair index of reliability.

3.7.3 Pilot Study

According to Mugenda and Mugenda, (2003), it is important to pre-test the instruments to guarantee that the questions are unmistakably stated in order to determine the time used in responding to the items and to determine whether it can be understood by the respondents. Procedures used in pre-testing the interview schedules and questionnaire were the same from those that were used when collecting data. A pilot study was conducted in 3 public day secondary schools in Murang'a County since they have the same characteristics as the research area. 65Science teachers, 27 Science HODs and 119 form 3 students were selected with an aim of identifying ambiguities in the feasibility of the study techniques; the instruments' concepts and instruments as well as the wording.

The pilot study was conducted in the following ways. First, it involved pre-reading questionnaires and carrying out orientation to ensure it fitted the participants. Second, thinking-aloud training was done to assess methodology. Third, reading task was done whereby, some of participants were selected to participate in reading and thinking-aloud tasks. Induced questionnaire was provided to provide their demographic information. 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.

3.8 Data Collection Procedures

The researcher obtained a letter of introduction from Kenyatta University Post Graduate School which enabled the researcher to apply for a research permit from the Ministry of Education Science and Technology. This research comprised of both secondary and primary data. Earlier before embarking on the data collection, the researcher approached the specific institutions to be sampled by sending an introduction letter to school managers to request for permission and made booking appointments to collect data from the schools as well as booked in advance to have an appointment. The researcher also prepared the instruments in advance and made recognizance visits to schools.

During actual field sampling, the researcher enhanced punctuality in all appointments booked and presented the research permits to the school mangers to be allowed to carry out the study within the school. For interview, the researcher booked an appointment with the Science HODs to conduct the interview. The researcher also self-administered the questionnaires to form 3 students and Science teachers to be filled at their own time.

The completed tools by respondents was collected and handled carefully to enhance accuracy in data analysis after the field study. The researcher assured respondents of confidentiality of information collected by not exposing their identity, not sharing information to outsiders and only using the information for education purpose.

3.8.1 Questionnaires and Interviews Checklist Return Rate

This research was conducted in 30 public secondary schools in Murang'a County. The researcher issued questionnaires to 93 teachers and 119 Students. Moreover, all the head of science departments from the 30 secondary schools were interviewed. The questionnaire return rate of the study is shown in Table 3.3.

Table 3.3: Questionnaire Return Rate

Designation	**Questionnaire Administered**	**Questionnaire Returned**	**Percentage %**
Head of Science Departments	30	30	73.2
Teachers	93	70	75.3
Students	119	116	97.5
Total	242	216	89.3

Table 3.3 shows, that 70(75.3%) of the teachers and 116(97.5%) of the students returned duly filled questionnaires. The high questionnaire return rate may be attributed to researcher's self-administration of the research instruments and good rapport created between the respondents and the investigator. Additionally, the researcher interviewed 30(73.2%) of the science head of department in Murang'a county.

According to Oso and Onen (2009) questionnaire return rate of 60% is deemed adequate for data analysis. Mugenda and Mugenda (2018) points out that a questionnaire return rate of 60% is satisfactory while 80% and above is absolute

satisfactory. The general questionnaire return rate for this research was 89.3% which was considered adequate for data analysis.

3.9 Data Analysis

This study yielded both qualitative and quantitative data. Quantitative data was analyzed using descriptive statistics such as frequency counts and percentages with the help of Statistical Package for Social Sciences (SPSS version 25) and later presented in to bar graph, pie chart and tables. SPSS version 25 helped in summarizing and processing large information, and it was easy to apply with a high degree of accuracy. Consequently, the influence was determined by the responses given by the respondents which were used to make conclusions on the teachers influence on students' choice of Science subjects.

When it came to qualitative data, responses were first coded by organizing them into similar themes before tallying all similar responses. Qualitatively, data from interviews and some from the questionnaires was scrutinized by coming up with the themes and categories, relationships and conclusions aligning with the objectives of the study. Empirical generalizations were developed from the data by categorizing the data thematically. Qualitative data was thematically analyzed and presented in narrative form using words, statements of voice and narratives.

Table 3.4: Summary of Data Analysis Process

Objectives	Type of Data	Statistical Technique	Data Presentation
1. Determine how teacher motivation influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya	Qualitative data Quantitative data	Thematically Descriptive statistics	Content Narration Bar graph, pie chart and tables
2. Determine how teacher's pedagogy influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya	Quantitative data Qualitative data	Descriptive statistics Thematically	Bar graph, pie chart and tables Content Narration
3. Determine how teacher test evaluation feedback influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya	Qualitative data Quantitative data	Thematically Descriptive statistics	Content Narration Bar graph, pie chart and tables
4. Determine how teacher mentorship on Science influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya	Qualitative data Quantitative data	Thematically Descriptive statistics	Content Narration Bar graph, pie chart and tables

Source: Researcher's (2021)

3.10 Logistical Considerations

This study was conducted with utmost honesty and professionalism as the researcher obtained all the necessary research authorizations from the relevant authorities before embarking on the actual research. This included permission from Murang'a County Director of Education, County Commissioner, County Governor, an introductory letter from Kenyatta University Graduate School. A research permit was obtained

from the National Commission of Science Technology and Innovation (NACOSTI), and other relevant authorities to visit respective institutions.

3.11 Ethical Considerations

The researcher did seek the consent of the respondents before administering the research instruments. The researcher assured the respondents of utmost confidentiality. The researcher did seek consent from the respondents before administering the data collection instruments. Respondents were assured that the information they gave was to be treated with utmost confidentiality and was to be used for academic purposes only. Participants had freedom from coercion, extreme harm as well as freedom of flow of information. Instructions, guidelines and confidential clause were captured at the top of every data collection tool in bold as shown in **Appendix B/C/D.** Participation in the research was voluntary hence; participants could withdraw from the research without any risks involved. An informed consent form in **Appendix G** was used to seek informed consent. During data analysis, participants were assigned numerical numbers to safeguard their identity. Regarding ethical issues in data analysis, the researcher enhanced integrity in presentation of data by avoiding sharing of information, avoiding biasness, using pseudo names without using the respondent's real name and only using the analyzed data for education purpose only. The researcher also recognized and cited any source of information for the data collected to avoid plagiarism.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents data analysis, interpretation and discussions of research findings per the research objectives. The purpose of this research was to examine how teacher's factors influenced students in choice of science subjects in Murang'a County, Kenya. The study findings are presented as per the following four research objectives, namely;

i. Determine how teacher motivation to students influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya,
ii. Determine how teacher's pedagogy influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya,
iii. Determine how teacher test evaluation feedback influence the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya and;
iv. Determine how teacher mentorship to students on Science influences the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya.

4.2 The Influence of Teacher-Student Motivation to Students on Choice of Science Subjects

The first objective of the study was to determine the influence of teacher motivation to students on student's choice of science subjects in Murang'a County. The students and teachers were requested to give their views on level of agreement with the statements.

4.2.1 Students' responses on the Influence of Teacher-Student 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 on students. Their responses were in 5 point Likert scale ranging from 5-Strongly Agree, 4-Agree, 3- Neutral, 2-Disagree and 1-Strongly Disagree. Table 4.1 presents students responses.

Table 4.1: Students' responses on the Influence of Teacher Motivation on Choice of Science Subjects

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 interest 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 Physics 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 4.1 shows that majority of the students 82(70.7%) disagreed that biology teacher gave praises and comments that affected students interest 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 subject teachers. These finding concurs with Baranek (1996) that main goal should be to have the learners' interest 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 in 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 pointed out that reduction of interactions between the teachers and students tends to affect students' choice of science subjects. These findings concurs Warku and Alemu (2020) that teachers of physics interactions and engagements during the lesson influences the learner decision in selecting physics subject. To support these findings, one of the head of Science department remarked that;

> Science teachers' motivation to students has greatly influenced students to love science subjects and choose them. When learners improve in Science 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. (HoD 01, Murang'a Sec School, May 2022)

It was clear that teachers had a great influence on students choosing science subjects based on how they motivated the students either intrinsically or extrinsically. From the findings, most students became more interested in a Science subject when they got to interact and engage more with the friendly teachers who were approachable and always encouraged them to put more effort in science.

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

In order to further understand the teacher's responses on the influence of teacher motivation on students' 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 4.2.

Table 4.2: Teachers' responses on the Influence of Teacher Motivation on Choice of Science Subjects

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	37	52.9	16	22.9	1	1.4	0	0.0	16	22.9

Table 4.2 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, only15 (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 to make 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 in chemistry they recognize students' efforts through rewards such as revision books, exercise books and snacks

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 physics teachers, 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.

Another Science Head of Department continued highlighting that;

> 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. More so, the rewards such as revision books act as a motivation to other students in form two to choose those science subjects most awarded. (HoD 02, Murang'a Sec School, May 2022)

In support of the findings, it was stated by one of the HODs in Science that;

> We normally give rewards such as exercise books to students who show an improvement in Sciences. However, this has not attracted more students to Science since it is done at times based on the availability of financial resources. Our hands at times become tied even when we want to reward the science students and there is nothing much we can do. (HoD 03, Murang'a Sec School, May 2022)

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. (HoD 04, Murang'a Sec School, June 2022)

The above findings agree 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' praises and remarks to students, to a great extent influence the students to choose the science subject while the manner of motivation given through rewards did not have a greater influence to students probably due to the availability of revision materials given as rewards in school. The research finding reveals that teacher motivation to students influence choices of the science subjects in Murang'a County.

4.3 The Influence of Teacher's Pedagogy on Students' Choice of Science Subject

The second objective of the study was to find out the influence of teacher's pedagogy on students' choice of science subjects in Murang'a County. The students and teachers were requested to give their opinions.

4.3.1 Students' Responses on influence of teacher's pedagogy on student's choice of science subject.

The students' responses on the influence of teacher's pedagogy on students' choice of science subject are presented in a scale of 1 to 4 (Where 4- Not at all, 3- Sometimes, 2- Usually, 1- Always).

Table 4.3: Students Responses on influence of teacher's pedagogy on student's choice of science subject

Statement	1		2		3		4	
	F	%	F	%	F	%	F	%
My Biology teacher always summarized what he/she taught at the end of lessons and always posed some questions relating to the taught topic which enabled me to master the content.	32	27.6	7	6.0	6	5.2	71	61.2
My biology teacher conducted many practical lessons and this boosted my interest in Biology	24	20.7	7	6.0	12	10.3	73	62.9
My chemistry teacher always summarized what he/she taught at the end of lessons and always posed some questions relating to the taught topic which enabled me to master the content.	60	51.7	25	21.6	13	11.2	18	15.5
My chemistry teacher conducted many practical lessons and this boosted my interest in chemistry	35	30.2	28	24.1	21	18.1	32	27.6
My physics teacher always summarized what he/she taught at the end of lessons and always posed some questions relating to the taught topic which enabled me to master the content.	53	45.7	19	16.4	8	6.9	36	31.0
My Physics teacher conducted many practical lessons and this boosted my interest in Biology	37	31.9	15	12.9	14	12.1	50	43.1

As shown in Table 4.3, majority of the students 71(61.2%) pointed their biology teachers neither summarized the lessons nor posed some questions relating to topic taught, only 32(27.6%) indicated that biology teacher always summarized lessons and posed questions which motivated the students in choosing the biology subject. Majority of the students 73(62.9%) responded that biology teacher conducted many practical's but never boosted their interest in biology while 24(20.7%) responded that biology teacher always conducted many practical that boosted their interest in biology while 7(6.0%) pointed out sometimes biology teacher conducted many practical that boosted their interest in biology. These findings revealed that even when the biology teachers conducted numerous practical's this never influenced students in selection of the biology subject. This is a clear indication that apart from conducting regular practical's there were other numerous factors like career aspirations and individual interests that influence learners in selecting biology subjects.

Majority of the students 60(51.7%) indicated that chemistry teacher always summarized lessons and posed questions that motived students in choosing the subject, 25(21.6%) of the students indicated that chemistry teacher usually summarize the lessons which motivated them to choose the subject, 18(15.5%) of the students indicated that the chemistry teacher never summarized what he taught while the minorities 13(11.2%) indicated that chemistry teachers sometimes summarized lessons and posed some questions which motivated them to choosing the subject. On chemistry practical lessons conducted, majority of the students 35(30.2%) indicated that the teacher conducted many practical lessons which boosted their interest in chemistry, While 21(18.1%) pointed out chemistry teacher sometimes conducted many practical lessons that boosted their interest in chemistry.

Majority of the students 53(45.7%) pointed that physics teachers always summarized the lessons and posed some questions related to the taught topic which motivated them to choose the subject. Only 36(31%) of the respondents indicated that the physics teacher summarized lessons which motivated students in choosing the subject, about 19(16.4%) indicated that physics teachers usually summarize the lessons and always posed questions relating to topic taught which motivated them in choosing the subject while 8(6.9%) of the students agreed that physics teachers summarized lessons always, which influenced them in choosing the subject. These findings were supported by one of the Head of science department who stated that;

> We encourage our teachers to use heuristic and expository teaching methods to ensure learners get key concepts in science. Science practical lessons are important in inspiring learners to pursue the sciences. In our school, we have well stocked physics, chemistry and physics labs where teachers demonstrate the practical to the learners. Exposer of learners to numerous practical in form two has influenced them to select Biology subject. (HOD 05, Murang'a Sec School, June 2022)

The above findings were in agreement with Schott, van Roekel and Tummers (2020) that use of mixed teaching methodologies influenced students to choose science subjects. Exposure of students to many biology practical lessons motivated learners to choose the subject they were exposed to laboratory sessions many times.

4.3.2 Teacher's responses on the Influence of Teacher's Pedagogy on Students' choice of science subject

The teachers were requested to show their agreement with the statement of influence of teacher pedagogy on student's choice of science subjects. Their responses were presented in a 5 Points Likert scale ranging from 5-Strongly Agree, 4-Agree, 3-Neutral, 2-Disagree and 1-Strongly Disagree. Table4.8 shows teachers' responses.

Table 4.4: **Teacher's responses on the Influence of teacher's pedagogy on students' choice of science subject**

Statement	5		4		3		2		1	
	F	%	F	%	F	%	F	%	F	%
Being a Chemistry teacher, I make use of practical lessons to make students understand the concept being taught thus, they end up choosing the subject	18	25.7	23	32.9	14	20.0	7	10.0	8	11.4
Being a Biology teacher, I make use of practical lessons to make students understand the concept being taught thus, they end up choosing the subject	34	48.6	4	5.7	3	4.3	0	0.0	29	41.4
Being a Physics teacher, I make use of practical lessons to make students understand the concept being taught thus, they end up choosing the subject	22	31.4	9	12.9	4	5.7	11	15.7	24	34.3
Being a Biology teacher, I make use of theory when teaching to make students understand the concept being taught thus, they end up choosing the subject	33	47.1	7	10.0	4	5.7	6	8.6	20	28.6
Being a Chemistry teacher, I make use of theory when teaching to make students understand the concept being taught thus, they end up choosing the subject	19	27.1	22	31.4	20	28.6	3	4.3	6	8.6
Being a Physics teacher, I make use of theory when teaching to make students understand the concept being taught thus, they end up choosing the subject	32	45.7	3	4.3	4	5.7	9	12.9	22	31.4
As a Chemistry teacher, when I use both theory and practical lessons to teach, students understand the concept being taught and end up choosing the subject	19	27.1	18	25.7	12	17.1	12	17.1	9	12.9
As a Biology teacher, when I use both theory and practical lessons to teach, students understand the concept being taught and end up choosing the subject	21	30.0	15	21.4	9	12.9	11	15.7	14	20.0
As a Physics teacher, when I use both theory and practical lessons to teach, students understand the concept being taught and end up choosing the subject	17	24.3	8	11.4	7	10.0	16	22.9	22	31.4

Table 4.4 shows that majority of the teachers 41(58.9%) were in agreement that being a chemistry teacher, they make use of practical lessons to make students understand the concept being taught thus, they end up choosing the subject. 15(21.4%) of the teachers disagreed that they make use of practical lessons to make students understand concept being taught hence, they choose chemistry while only14 (20%) of the teacher were neutral. Majority of the biology teachers 38(54.3%) were in agreement that they make use of practical lessons to make students understand the concepts being taught and end up choosing the subject. Only 29(41.4%) who were not in agreement that they make use of practical to influence students choose the subject while 3(4.3%) had neutral views. Majority of the physics teachers 35(50%) disagreed that they make use of practical lessons to make students understand concept hence, choose the subject while 31(44.3%) indicated that they use practical lessons to make students understands physics concepts thus, end up choosing the subject.

Majority of the teachers 40(57.1%) pointed out that they make use of biology theory teaching to make students understand concepts being taught hence, they choose the subject while 26(37.2%) of the teachers disagreed with the use of biology theory classes to make students choose the subject. Majority of the chemistry teachers 41(58.5%) indicated that they utilize theory lessons when teaching to make students understand concepts being taught while only 9(12.9%) of the chemistry teachers disagreed. Half of the teachers 35(50%) indicated that they make use of theory when teaching to make students understand concepts being taught thus, they end up choosing the subject, only 31(44.3%) of the teachers disagreed on the use of physics theory lessons to make students choose physics while a minority of the teachers 4(5.7%) had neutral views.

A majority of the chemistry teachers 37(52.8%) indicted that they make use of both theory and practical lessons to teach learners to understands concepts being taught hence, they choose the subject. About 21(30%) of the respondents disagreed with the use of theory and practical lessons to influence students in choosing chemistry subject while the minorities 12(17.1%) had neutral views.

More than half of the teachers agreed that use of theory and practical in teaching biology influences students in selecting the subject while only 25(35.7%) of teachers disagreed with use of practical and theory lessons to make students understand concepts hence, choose the subject. A majority of the teachers 38(54.3%) disagreed with the use of theory and practical lessons to teach students and influence them in selecting the subject, about 25(35.7%) agreed that use of theory and practical lessons to teach students enabled them understand physics concepts taught which made them end up choosing the subject while a few teachers 7(10%) had neutral views.

Teacher's method of content delivery in the science subject had great influence on the number of students who could select biology, chemistry and physics. The finding further confirms the revelations by Kimotho (2020) science practicals are vital to student's choice of science subject. They are inseparable and essential part of knowledge acquisition which tends to influence students choices when selecting a particular subject. Utilization of laboratory practical's and theory sessions is expected to have influence on the students choice of science subject but the study reveals that this might not be the case to all the students. The preference of subject choice varies from one student to the other depending on various factors like career aspirations, market demand, peers and parents' influence.

More so, another head of science department remarked that;

> When teachers integrate technology in practical lessons, students get more curious to undertake the practical on their own once they watch a certain concept projected online by a teacher and imitate what they saw. This method of teaching attracts the interest of students in Sciences and thus, should be emulated despite the limited resources in the day secondary schools. (HOD 06, Murang'a Sec School, June 2022)

From the findings, it became clear that more students would be more interested in choosing science subjects if only the teachers did integrate technology in their lessons be it in class or in the laboratory.

4.4 The Influence of Teacher Test Evaluation Feedback on Students' Choice of Science Subjects

In the third objective of the study the researcher sought to establish the influence of teacher test evaluation feedback on student's choice of science subjects.

4.4.1 Students' responses on the Influence of Teacher Test Evaluation Feedback on Students' Choice of Science Subjects

The students and teachers were asked to give their level of agreements with the statements. Their responses were presented in a 5 Points Likert scale ranging from 5-Strongly Agree, 4-Agree, 3-Neutral, 2-Disagree and 1-Strongly Disagree. Student's responses are presented in Table 4.5.

Table 4.5*:* Learners' responses on the influence of teacher test evaluation feedback on students' choice of science subjects

Statement	5		4		3		2		1	
	F	%	F	%	F	%	F	%	F	%
My biology teacher's comments on test results had an impact on my choice of science subject	26	22.4	9	7.8	3	2.6	3	2.6	75	64.7
My biology teacher administered tests frequently that improved my knowledge in the subject and this sparked my interest in making a choice of selecting the subject.	26	22.4	8	6.9	7	6.0	4	3.4	71	61.2
My chemistry teacher comments on test results had an impact on my choice of science subject	41	35.3	27	23.3	18	15.5	11	9.5	19	16.4
My chemistry teacher administered tests frequently that improved my knowledge in the subject and this sparked my interest in making a choice of selecting the subject.	42	36.2	28	24.1	15	12.9	9	7.8	22	19.0
My physics teacher comments on test results had an impact on my choice of science subject	41	35.3	20	17.2	14	12.1	3	2.6	38	32.8
My Physics teacher administered tests frequently that improved my knowledge in the subject and this sparked my interest in making a choice of selecting the subject.	47	40.5	24	20.7	7	6.0	3	2.6	35	30.2

Table 4.5 shows that majority of the students 78(67.3%) disagreed with the statement that biology teacher comments on results had an impact on their choice of the science subject, only 35(30.2%) agreed that teachers comments on tests results had an impact on their choice of science subject while the minorities 3(2.6%) had neutral views. Majority of the students 75(64.6%) disagreed with the statement that their biology teachers had administered tests frequently that improved their knowledge in the subject and sparked interest of choosing the subject while 34(29.3%) of the students pointed out that biology teacher had administered tests frequently which improved their knowledge in the subject hence this made them to improve their performances hence, chose the subject.

A majority of the students 68(58.6%) were in agreement that their chemistry teachers' comments on tests results had an impact on their choice of science subject. 30(25.9%) of the students disagreed while 18(15.5%) had neutral views. More than half of the students 70(60.3%) were in agreement that chemistry teacher administered tests frequently that improved their knowledge in the subject and this sparked their interests in making a choice of selecting the subject, only 31(26.8%) of the students disagreed while 15(12.9%) had neutral views.

More than half of the students 61(52.5%) were in agreement that physics teachers' comments on tests results had an impact on the students choice of science subjects. 41(35.4%) disagreed while only 14(12.1%) had neutral views. More than half of the students 71(61.2%) were in agreement that their physics teachers administered tests frequently that improved their knowledge in the subject and this sparked their interests in making choice of selecting the subject. Only 38 (32.8%) disagreed with administration of tests sparkling their interest in physics while 7(6%) had neutral views.

These findings were supported by one of the Science HODs who highlighted that;

> Most students get more interest in Sciences once exposed to practical lessons in the laboratory. Due to insufficient resources in labs, this has led to students sharing the available apparatus during practical lessons and some instances, teachers are forced to conduct the practical themselves to students due to insufficient apparatus. If only the labs were well equipped, probably, this would build interest and attract more students into choosing Sciences. (HOD 07, Murang'a Sec School, July 2022)

From the research revelations it is evident that teacher's comments on student's examination results had numerous effects on the student choice of the science subject. The finding confirms Han and Xu, (2019) that teacher feedback in examination influenced students decision in making choices in education. Positive examination feedback encouraged the students to love the science subject while negative feedback discouraged some students from selecting the science subject.

4.4.2 Teachers' responses on the Influence of Teacher Test Evaluation Feedback on Students' choice of Science Subjects

To understand the influence of teacher test evaluation feedback on students' choice of science subjects, the teachers were requested to show their level of agreement in a Likert Scale. The teachers' views are presented in Figure 4.1.

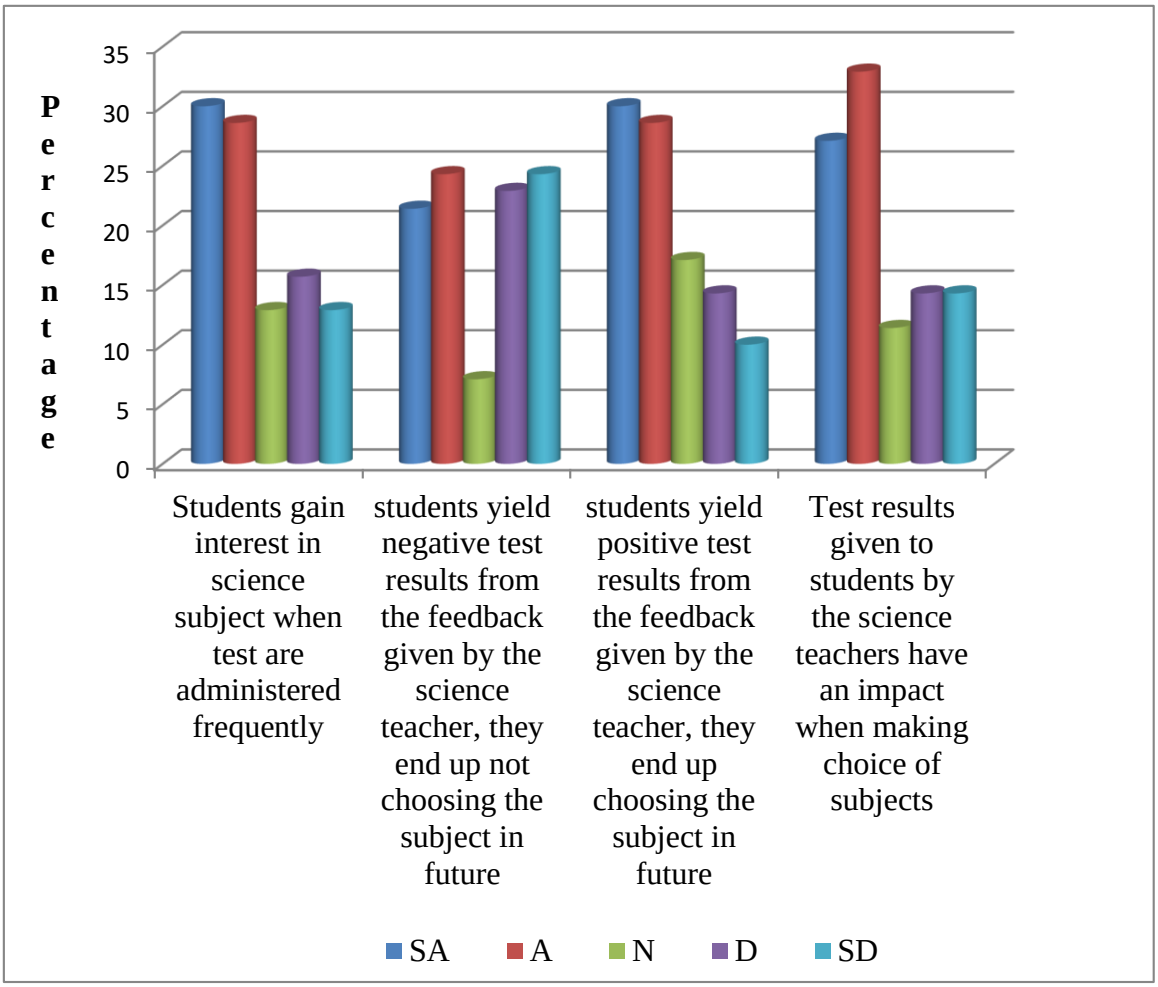


Figure 4.1: Teachers' responses on the influence of teacher test evaluation feedback on students' choice of science subjects.

Figure 4.1 shows that majority of teachers 41(58.6%) were in agreement that students gain interest of science subject when tests are administered frequently, only 20(28.6%) disagreed while only 9(12.9%) had neutral views. Majority of the teachers 33(47.2%) disagreed with the statement that students yield negative tests results from the feedback given by the science teacher they end up not choosing the subject in future. Only 32(45.7%) of the teachers agreed that when students yield negative tests results from the feedback given by the science teacher they end up not choosing the subject in future while 5(7.1%) had neutral views. These findings are providing clear

basis that the feedback given to learners tend to influence their choice of science subject they settle on pursuing.

Majority of the teachers 41(58.6%) were in agreement that students yield positive test results from the feedback given by the science teacher, they end up choosing the subject in future. Only 17(24.3%) of the teachers disagreed that students yield positive test results from the feedback given by the science teacher, they end up choosing the subject in future while the minorities 12(17.1%) had neutral opinion. Majority of the respondents 42(60%) were in agreement that test results given to students by the science teachers have an impact when making choice of subjects. Only 10(28.6%) agreed with the statement while 8(11.4%) had neutral views.

One of the head of department agreed with the findings that;

> Regular administration of examination to student has a great effect on the number of students who take science subjects. As a head of department, I encourage my teachers to give and discuss examination outcome with the students. This has been found to motivate learners to love the science subjects and select them. Feedback is also good to guide students to know their weaknesses in science subjects. Once they identify their weaknesses they work on them and select the science subject. (HoD 08, Murang'a Sec School, July 2022)

Another Head of department supported the finding by stating that;

> When learners are given feedback often by their subject teachers they get encouraged to select the science subject. I encourage my teachers to give random assessments to students. Once the teacher marks the exams they sit down and discuss the outcomes with the students. We have realized that assessment feedbacks encourage weak students to love subjects that are feared hence, end up choosing them. (HoD 09, Murang'a Sec School, July 2022)

One HoD agreed to the findings that;

> We frequently administer tests and give feedback to our students in order to expese them to different questions that are examined in Sciences and build confidence in them for science subjects. This feedback seems to have been yielding good results when it comes to students understanding their potential and weaknesses to improve on a certain area of interest in Science. Our teachers give positive feedback to students that boost their interest in that science subject and they end up choosing it. (HoD 010, Murang'a Sec School, July 2022)

These findings agreed with Ndalichako, (2014) revelations that learners are motivated to choose subjects that are easy to understand. Students always choose subjects that teachers give comments and positive reinforcement in exams. Based on these findings from the research, it is evident that evaluation feedback had a great influence on students' choice of science subjects. Feedback was found to steer learners to love science subjects, teacher's comments on subject was also found to encourage majority of the students who ended up choosing the subject.

4.5 The Influence of Teacher-Student Mentorship to Students' Choice of Science Subjects

The fourth objective of the research was to determine how teacher mentorship to students on Science influences the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya.

4.5.1 Students' responses on the influence of Teacher mentorship to students about science on choice of science subjects

Using 5 points Likert scale ranging from 5-Strongly Agree, 4-Agree, 3- Neutral, 2-Disagree and 1-Strongly Disagree, the students were requested to show their level of agreement on the influence of teacher mentorship to students about science on choice of science subjects. Table 4.6 shows students responses.

Table 4.6: Learners' responses on the influence of teacher mentorship on student's choice of science subjects

Statement	5		4		3		2		1	
	F	%	F	%	F	%	F	%	F	%
My biology teacher took us for Science Engineering fair workshops that made me gain more interest in choosing the subject	23	19.8	5	4.3	10	8.6	78	67.2		
My biology teacher invited science motivational speakers more frequently and through their mentorship, I made a decision of choosing the subject	20	17.2	9	7.8	12	10.3	75	64.7		
My chemistry teacher took us for Science Engineering fair workshops that made me gain more interest in choosing the subject	35	30.2	19	16.4	28	24.1	34	29.3		
My chemistry teacher invited science motivational speakers more frequently and through their mentorship, I made a decision of choosing the subject	42	36.2	19	16.4	21	18.1	34	29.3		
My physics teacher took us for Science Engineering fair workshops that made me gain more interest in choosing the subject	33	28.4	19	16.4	16	13.8	48	41.4		
My Physics teacher invited science motivational speakers more frequently and through their mentorship, I made a decision of choosing the subject	43	37.1	19	16.4	4	3.4	50	43.1		

Based on the finding presented in Table 4.6 majority of the students 88(75.8%) disagreed with the statement that biology teacher took them for science congress that made them gain more interest in choosing the subject while the minorities 28(24.1%) were in agreement with the statement. Majority of the students 87(75%) disagreed that biology teacher invited science motivational speakers more frequently and through their mentorships they made decisions of choosing the subject while the minorities 29(25%) agreed.

Majority of the students 62(53.4%) were in disagreement that chemistry teacher took them for science congresses that made them gain more interest in choosing the subject while the minority of the students 54(46.6%) agreed with the statement. Majority of the students 61(52.6%) agreed with the statement that chemistry teacher invited science motivational speakers more frequently and through their mentorship they made decision of choosing the subject while the minorities of the student 55(47.4%) disagreed with students.

Majority of the students 64(55.2%) disagreed with the statement that physics teacher took them to science congress that made them gain interest in choosing the subject while the minorities 52(44.8%) agreed that their physics teachers took them for science congress that made them gain more interest in choosing the subject. Majority of the students 62(53.6%) were in agreement with the statement that physics teacher invited science motivational speakers more frequently and through their mentorship which made them choose the subject while minorities disagreed with the statement.

One of the head of science department added that:

> Every term we invite motivation speakers and Kenya National Examination Examiners in all the science subjects. They motivate, encourage and change students' attitudes towards the science subjects. Over the years female students in this school feared physics but after we started the mentorship program the number of female students choosing physics has increased immensely. We also encourage teachers to mentor and encourage students to select science subject. (HoD 011, Murang'a Sec school, July 2022)

Based on the findings it is evident that student who participates in science congress tend to choose the subject that they have scientific project in. Invitation of Science subject examiners as motivation speakers had a great impact on the number of students choice of subject even through there were a number of students who were not influenced by science congress to pursue the science subject(Okumu,2013).

4.5.2 Teachers' responses on the influence of Teacher-Student mentorship on student's choice of science subjects

The teachers were requested to share their level of agreement with the statements on influence of teacher mentorship on students' choice of science subject. Table 4.7 shows teachers' responses.

Table 4.7: Teachers' responses on the influence of teacher mentorship on student's choice of science subjects

Statement	5		4		3		2		1	
	F	%	F	%	F	%	F	%	F	%
Science motivational speakers have an impact on students when it comes to choosing of the Science subjects	22	31.4	42	60.0	0	0.0	0	0.0	6	8.6
Students who participate in Science Engineering fair workshops end up choosing Biology	11	15.7	15	21.4	10	14.3	17	24.3	17	24.3
Students who participate in Science Engineering fair workshops end up choosing Chemistry	18	25.7	22	31.4	13	18.6	10	14.3	7	10.0
Students who get involved in Science fair mostly choose Physics	21	30.0	6	8.6	14	20.0	13	18.6	16	22.9
Having Science mentorship programs administered in school, increases the students' number choosing Physics subject.	13	18.6	16	22.9	14	20.0	13	18.6	14	20.0
Having Science mentorship programs administered in school, increases the students' number choosing Chemistry subject.	15	21.4	8	11.4	4	5.7	22	31.4	21	30.0
Having Science mentorship programs administered in school, increases the students' number choosing Biology subject.	16	22.9	17	24.3	13	18.6	13	18.6	11	15.7
The number of students who choose Physics increases when teachers administer Physics related career talks to them.	18	25.7	16	22.9	4	5.7	13	18.6	19	27.1
The number of students who choose Chemistry increases when teachers administer Chemistry related career talks to them.	16	22.9	21	30.0	11	15.7	9	12.9	13	18.6
The number of students who choose Biology increases when teachers administer Biology related career talks to them.	16	22.9	16	22.9	11	15.7	13	18.6	14	20.0

Table 4.7 shows that, Majority of the teachers 64(91.4%) were in agreement that Science motivational speakers have an impact on students when it comes to choosing of the Science subjects while the minorities 6(8.6%) of the teachers disagreed. Majority of the teachers 34(48.6%) disagreed that students who participate in science congress end up choosing biology, Only 26(37.1%) agreed that students who participate in science congress end up choosing biology while 10(14.3%) of teachers had a neutral opinion. Majority of teachers 40(57.1%) were in agreement that students who participate in science congress end up choosing chemistry, only17 (24.3%) disagreed that students who participated in science congress end up choosing chemistry while 13(18.6%) had neutral opinion. Majority of the teachers 29(41.5%) disagreed that students who get involved in science congress mostly choose physics while 14(20%) of the teachers had a neutral opinion.

Majority of the teachers 29(41.5%) were in agreement that having Science mentorship programs administered in schools increases the number of students choosing physics, about 27(38.6%) of the teachers disagreed with the statement as 14(20%) had neutral views. Majority of the teachers 43(61.4%) disagreed that having science mentorship programs administered in school increases the number of students choosing chemistry subject, only 23(32.8%) of the teachers disagreed while 4(5.7%) had neutral opinions. More than half 33(47.2%) of teachers were in agreement that having science mentorship programs administered in schools increased number of students choosing biology subject, only 24(34.3%) and the minorities 13(18.6%) had neutral opinion.

Majority of the teachers 34(48.6%) were in agreement that the number of students who choose physics increases when teacher administer physics related career talks, 32(45.7%) of the teacher disagreed while 4(5.7%) had neutral opinion. Majority of the

teachers 37(52.9%) were in agreement that the number of students who choose chemistry increases when teacher administer chemistry related career talks to them, only 22(31.5%) of the teachers disagreed while 11(15.7%) of the teacher had a neutral opinion. Majority of the teachers were in agreement 32(45.8%) that the number of students who choose biology increases when teachers administer biology related career talks to them, only 27(38.6%) of the teachers disagreed while 11(15.7%) of the teachers had neutral opinion.

Another head of science department highlighted that:

> Our students in form two attend Kenyatta University annual career week talks before they choose their science subjects. The career week at Kenyatta University has gradually changed students' attitudes and perceptions towards the science subjects. As a result some students have been encouraged to select subjects based on the courses they purpose to pursue. (HoD 012, Murang'a Sec school, July 2022)

The HoD supported the finding by remarking that;

> We noted that students become fond of their teachers and therefore do not take them seriously when being mentored. Therefore, as a department we decided to use external resources to mentor our students into science field. We started by inviting other schools for science fairs to showcase their knowledge in science innovation and at times we took them in Kenyatta University during Career week for mentorship. Since we started it, this really built a lot of interest in students on Science subjects. (HoD 013, Murang'a Sec school, July 2022)

This research revealed that academic talks by mentors have changed students' attitude towards science subjects. Teachers seemed not to be more influential to other external influences when it came to motivating students due to students being used to their teachers in school as compared to external mentors in other institutions such as Kenyatta University. Learners who participated in science congress were found to be more motivated to choose science subject.

These findings differ with Stroet, Opdenakker and Minnaer (2015) student mentorship by teachers is the central cause of significant decrease in students' interest and motivation in science subjects. This research pointed out that teacher's mentorship increased the number of students who selected the science subject. Based on these finding it was evident that teacher student mentorship influenced students to select science subjects in Murang'a County.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, findings of the study, conclusions made from the study, recommendations and suggestions for future study. The purpose of this study was to examine how teacher's factors influence students in choice of Science subjects in Murang'a County, Kenya.

5.2 Summary of the Main Research Findings

This section provides a summary of the research findings based on the research objectives. The summary of the general objective revealed that teachers influence students' choice of science subjects in secondary schools in Murang'a County. The summary of the specific research objectives are made as per the following research objectives; to determine how teacher motivation to students influence the students' choice of Science subjects, to determine how teacher's pedagogy influence the students' choice of Science subjects, determine how teacher test evaluation feedback influence the students' choice of Science subjects and to determine how teacher mentorship influences the students' choice of Science subjects in selected public day secondary schools in Murang'a County, Kenya.

5.2.1 The Influence of Teacher Motivation on Choice of Science Subjects

The study pointed out that teacher motivation influenced student's choice of science subjects. The study revealed that teacher's praises influenced the number of students who choose Biology subject. 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 attitude hence, they ended up choosing the science subjects.

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.

5.2.2 The influence of Teachers Pedagogy on Students' Choice of science Subject

Majority of the students indicated that chemistry teachers always summarized lessons and posed questions, this motivated the students to choose the subject. The researcher established that the number of science practical lessons conducted motivated some students' interest in the science subjects.

Teachers indicated that the utilization of theory lessons when teaching made students to understand the concept taught thus, they ended up choosing the science subjects. Utilization of both practical and theory lessons to teach, learners end up choosing the subject. This research finding shows that teachers' pedagogy influenced students' choice of science subjects. Many students had been motivated by the subject teacher pedagogy to select the science subject.

5.2.3 The Influence of Teacher Test Evaluation Feedback on Students' Choice of Science Subjects

The researcher further sought to establish the influence of teacher test evaluation feedback on students' choice of science subjects. The investigator established that teacher comments on tests results had an impact on the student's choice of a subject. This was supported by majority of the chemistry students who indicated they had been motivated by the teacher's comments. The research revealed that frequent administration of examinations to students influenced learners to choose the science

subject. The researcher established that students who did yield negative results from the feedback given by their science teachers, made them not to select the science subjects.

The research exposed that students who yield positive results from the feedback given by the science teacher, end up choosing the science subject. The test results given to the students by the science teachers were found to have an influence on the students when making choice of science subjects. An increased number of students selecting physics subject was as a results of teacher tests evaluation on students' choice of the science subject.

5.2.4 The Influence of Teacher-student Mentorship on Students' Choice of Science Subjects

The researcher further sought to establish the influence of teacher mentorship to students' choice of science subject. Chemistry teachers were found to invite science motivational speakers more frequently and through their mentorship talks, many students were found to make decision of choosing the subjects. Students who got involved in Kenya Science and Engineering Fair ended up choosing physics and chemistry subject.

Science mentorship programs administered in schools were found to increase the number of students choosing biology subject. It was also found that the number of students choosing chemistry increased when teachers administered chemistry related career talks. Most of the schools head of science department were found to invite motivation speakers who played a big role in changing students' attitude towards science subjects. This research revealed that teacher mentorship influenced students to choose science subjects in Murang'a County.

5.3 Conclusions of Study

Based on the findings of the study the following conclusions were made:

i. Firstly, teacher-student motivation influenced the choice of science subject among the students. Praises and comments, given to students in class by the teachers motivated learners to continue pursuing the science subjects. Recognition of students' efforts through rewards made them to have an interest towards choosing the subject.

ii. Secondly, based on the findings the teacher's pedagogy was found to influence students' choice of science subjects. Science practical lessons boosted students' interest in science subjects. Use of theory and practical enabled students to have a better understanding of subject content and was also found to influence students' interests in science subjects.

iii. Thirdly, the third objective of study pointed out that teacher test evaluation feedback to the students influenced students' choice of science subjects. Frequent administration of tests was found to improve students' knowledge and confidence in the subject and this parked students' interests in making a choice of choosing the science subject.

iv. Finally, based on the findings the study concluded that teacher mentorship to students influenced them on the choice of science subjects. Teacher mentorship in terms of involving students in career talks, Kenya Science and Engineering Fair and even science mentorship programs, influenced learners to choose the science subjects.

5.4 Recommendations of the Study

5.4.1 Recommendations

Based on the findings the researcher made the following recommendations for practice:

i. There is need to facilitate teachers with finances to cater for motivational aspect of rewards to students. The head of science department should ensure that science teachers motivate students in choosing the science subjects by organizing teacher in-service training on contemporary methods to guide the learners in subject selection. 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.

ii. As a result of insufficient laboratory resources, the school management should ensure school laboratories are well stocked in order to ensure that learners are exposed to science practical lessons. The head of science department should organize with the school board of management to retool teachers on utilization of expository and heuristic teaching methods to influence students' choice of science subject.

iii. Most schools fail to administer tests due to insufficient funds to cater for that. The School management should facilitate the process of science tests administration to all the learners by coming up with a schedule. The feedback should be discussed to guide and encourage students pursue the science subjects.

iv. Students who are not enlightened on career opportunities tend to get confused when making a decision on sciences to choose. Thus, educational policy makers should ensure that all the learning institutions organize regular career talks for the form twos before they choose the science subjects.

v. The KICD should ensure that the Competency Based Education (CBE) curriculum is well versed on pedagogical content delivery. This is to ensure that students are well equipped with pedagogical content knowledge in subjects.

vi. Some teachers are not enlightened on how to guide students on choosing science subjects. Teacher's service commission should organize regular seminar programs for the teachers to be trained on how to mentor and guide the learners in choosing the science subjects.

vii. The school stakeholders should encourage learners to participate in Kenya Science and Engineering Fair to enlighten them. This is to enable the learners to know their strengths in science subjects. This is by participating in Kenya Science and Engineering Fair.

5.4.2 Recommendations for Further Study

Based on the findings in chapter four 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. Challenges faced by the teachers in guiding students in choice of science subjects in public secondary schools.

iii. The rationale of having more male students than female students venturing in to Science field in secondary schools.

iv. Relationship between laboratory resources and choice of science subjects in public secondary schools.

v. Challenges encountered by students in making a choice in science subjects in public secondary schools.

REFERENCES

Adeyemo, D. A., & Jegede, D. J. (2023). Sociopsychological determinants of career maturity among secondary school students in Osogbo, Osun State, Nigeria. Journal of Psychological Perspective, 5(1), 9-16.

Ahmadi, A., Noetel, M., Parker, P., Ryan, R. M., Ntoumanis, N., Reeve, J., ... & Lonsdale, C. (2023). A classification system for teachers' motivational behaviors recommended in self-determination theory interventions. Journal of Educational Psychology, 115(8), 1158.

Ahmed, W., Ejaz, M., Siddique, M., & Sadaf, S. (2022). Financial Factors Affecting Major Subject Choice. International Journal of Business and Economic Affairs, 7(3), 29-38.

Aina, J. K., &Ayodele, M. O. (2018). The Decline in Science Students' Enrolment in Nigerian Colleges of Education: Causes and Remedies. *International Journal of Education and Practice, 6*(4), 167-178.

Ajayi, A. A., Mitchell, L. L., Nelson, S. C., Fish, J., Peissig, L. H., Causadias, J. M., & Syed, M. (2021). Person–environment fit and retention of racially minoritized college students: recommendations for faculty, support staff, and administrators. Education Sciences, 11(6), 271.

Arafat, S. Y., Chowd, H. R., Qusar, M. S., & Hafez, M. A. (2016). Cross cultural adaptation & psychometric validation of research instruments: A methodological review. *Journal of Behavioral Health, 5*(3), 129-136.

Ardura, D., & Pérez-Bitrián, A. (2018). The effect of motivation on the choice of chemistry in secondary schools: adaptation and validation of the Science Motivation Questionnaire II to Spanish students. *Chemistry Education Research and Practice, 19*(3), 905-918.

Aschbacher, P. R., Li, E., & Roth, E. J. (2010). Is science me? High school students' identities, participation and aspirations in science, engineering, and medicine. Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching, 47(5), 564-582.

Azodo, A. P. (2016). Attitude of engineering students towards engineering drawing: A case study. *Int. J. Res. Studies in Edu*, *6*(1), 71-84.

Bahcivan, E., &Cobern, W. W. (2016).Investigating coherence among Turkish elementary Science teacher's teaching belief sySciences, pedagogical content knowledge and practice.Australian Journal of Teacher Education (Online), 41(10), 63.

Baram-Tsabari, A., & Osborne, J. (2015). Bridging science education and science communication research. Journal of Research in Science Teaching, 52(2), 135-144.

Bell, K., Fahmy, E., & Gordon, D. (2016). Quantitative conversations: the importance of developing rapport in standardised interviewing. *Quality & quantity*, *50*(1), 193-212.

Blickenstaff, J. C. (2005). Women and Science careers: Leaky pipeline or gender filter? Gender and Education.

Bokova, I. R. I. N. A. (2012). An integrated policy approach in Science, technology, and innovation for sustainable development: a UNESCO idea in action. *The Global Innovation Index*, 143-148.

Buday, S. K., Stake, J. E., & Peterson, Z. D. (2012). Gender and the choice of a Science career: The impact of social support and possible selves. *Sex roles*, *66*(3-4), 197-209.

Chiyaka, E. T., Kibirige, J., Sithole, A., McCarthy, P., &Mupinga, D. M. (2017). Comparative analysis of participation of teachers of SCIENCE and non-SCIENCE subjects in professional development. *Journal of Education and Training Studies*, *5*(9), 18-26.

Cohen, I. L. (2003).Criterion-related validity of the PDD Behavior Inventory. *Journal of Autism and developmental Disorders*, *33*(1), 47-53.

Connell, G. L., Donovan, D. A., & Chambers, T. G. (2016). Increasing the use of student-centered pedagogies from moderate to high improves student learning and attitudes about biology. CBE—Life Sciences Education, 15(1), ar3.

Constantinou, C. P., Tsivitanidou, O. E., & Rybska, E. (2018). What is inquiry-based science teaching and learning?. In Professional development for inquiry-based science teaching and learning (pp. 1-23). Cham: Springer International Publishing.

Corcoran, T. B., Mosher, F. A., &Rogat, A. (2009).Learning progressions in Science: An evidence-based approach to reform.

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage publications.

Crisp, G., & Cruz, I. (2009). Mentoring college students: A critical review of the literature between 1990 and 2007. Research in higher education, 50(6), 525-545.

Darling-Hammond, L., & Hyler, M. E. (2020). Preparing educators for the time of COVID… and beyond. European Journal of Teacher Education, 43(4), 457-465.

Dass, P. (2015). Teaching SCIENCE effectively with the learning cycle approach. K-12 SCIENCE Education, 1(1), 5-12.

Dettweiler, U., Ünlü, A., Lauterbach, G., Becker, C., &Gschrey, B. (2015).Investigating the motivational behavior of pupils during outdoor Science teaching within self-determination theory. *Frontiers in psychology*, *6*, 125.

DeWitt, J., Osborne, J., Archer, L., Dillon, J., Willis, B., & Wong, B. (2013). Young children's aspirations in science: The unequivocal, the uncertain and the unthinkable. International journal of science education, 35(6), 1037-1063.

Drew, D. E. (2011). *SCIENCE the tide: Reforming Science, technology, engineering, and math education in America*. JHU Press.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. Annual review of psychology, 53(1), 109-132.

Edwards, J. A., &Lampert, M. D. (Eds.). (2014). Talking data: Transcription and coding in discourse research. Psychology Press.

El-Saharty, S., Kheyfets, I., Herbst, C., & Ajwad, M. I. (2020). Fostering human capital in the Gulf Cooperation Council countries. World Bank Publications.

Fernandez, J. L. (2010). An Exploratory Study of Factors Influencing the Decision of Students to Study at University Sains Malaysia. Kajian Malaysia: Journal of Malaysian Studies, 28(2).

Ferrare, J. J., & Miller, J. M. (2020).Making sense of persistence in scientific purgatory: A multi-institutional analysis of instructors in introductory Science, technology, engineering, and mathematics (SCIENCE) courses. *The Journal of Higher Education*, *91*(1), 113-138.

Flodén, J. (2017). The impact of student feedback on teaching in higher education. *Assessment & Evaluation in Higher Education*, *42*(7), 1054-1068.

Forawi, S. (2018, August).Science, Technology, Engineering and Mathematics (SCIENCE) Education: Meaningful Learning Contexts and Frameworks. In *2018 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE)* (pp. 1-4). IEEE.

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., &Wenderoth, M. P. (2014). Active learning increases student performance in Science, engineering, and mathematics. Proceedings of the National Academy of Sciences, 111(23), 8410-8415.

Freire, P. (2018). *Pedagogy of the oppressed*.Bloomsbury publishing USA.

Gagné, M., & Deci, E. L. (2014). The history of self-determination theory in psychology and management. The Oxford handbook of work engagement, motivation, and self-determination theory, 1-9.

Gathaiga, Peninah. N. (2012). *Factors influencing form two boys and girls choice of KCSE subjects in Kiene division, Nyeri North District, Kenya* Doctoral dissertation, University of Nairobi, Kenya

Gikonyo, K. G. (2017). Teacher's information Communication Technology Competence In Classroom Instruction In Day Secondary Schools In Murang'a County, Kenya.

Gillies, R. M. (2023). Using cooperative learning to enhance students' learning and engagement during inquiry-based science. Education Sciences, 13(12), 1242.

Grinis, R. (2017). Quantization of time-like energy for wave maps into spheres. *Communications in Mathematical Physics*, *352*(2), 641-702.

Hagay, G., &Baram-Tsabari, A. (2015). A strategy for incorporating students' interests into the high-school Science classroom. *Journal of Research in Science Teaching*, *52*(7), 949-978.

Hammond, C. D. (2016). Internationalization, nationalism, and global competitiveness: a comparison of approaches to higher education in China and Japan. Asia Pacific Education Review, 17(4), 555-566.

Han, S., Yalvac, B., Capraro, M. M., &Capraro, R. M. (2015). In-service Teacher's Implementation and Understanding of SCIENCE Project Based Learning. *Eurasia Journal of Mathematics, Science& Technology Education*, *11*(1).

Hanson, G. H., & Slaughter, M. J. (2016).High-skilled immigration and the rise of SCIENCE occupations in US employment (No. w22623).National Bureau of Economic Research.

Hattie, J. O. N. H. (2016). Know thy impact. On Formative assessment: Readings from educational leadership (EL Essentials), 36.

Hattie, J., & Timperley, H. (2007). The power of feedback. Review of educational research, 77(1), 81-112.

Herro, D., & Quigley, C. (2017).Exploring teacher's perceptions of STEAM teaching through professional development: implications for teacher educators. *Professional Development in Education*, *43*(3), 416-438.

Hooker, M. (2017). *A Study on the Implementation of the" Strengthening Innovation and Practice in Secondary Education Initiative" for the Preparation of Science, Technology, English and Mathematics (SCIENCE) Teachers in Kenya to Integrate Information and Communication Technology (ICT) in Teaching and Learning* (Doctoral dissertation, Queen's University Belfast).

Hossain, S., & Sakib, M. N. (2016). The impact of social media marketing on university students' brand loyalty. *International Journal of Marketing and Business Communication*, *5*(3), 1-7.

Hudson, P., English, L., Dawes, L., King, D., & Baker, S. (2015). Exploring links between pedagogical knowledge practices and student outcomes in SCIENCE education for primary schools. *Australian Journal of Teacher Education (Online)*, *40*(6), 134.

Hughes, B. S., Corrigan, M. W., Grove, D., Andersen, S. B., & Wong, J. T. (2022). Integrating arts with STEM and leading with STEAM to increase science learning with equity for emerging bilingual learners in the United States. International Journal of STEM Education, 9(1), 58.

Jones, T. R., & Burrell, S. (2022). Present in class yet absent in science: The individual and societal impact of inequitable science instruction and challenge to improve science instruction. Science education, 106(5), 1032-1053.

Kaivanpanah, S., Alavi, S. M., &Sepehrinia, S. (2015). Preferences for interactional feedback: differences between learners and teachers. *The Language Learning Journal*, *43*(1), 74-93.

Karcher, M. J., Nakkula, M. J., & Harris, J. (2005). Developmental mentoring match characteristics: Correspondence between mentors' and mentees' assessments of relationship quality. Journal of Primary Prevention, 26(2), 93-110.

Kelley, T. R., & Knowles, J. G. (2016).A conceptual framework for integrated SCIENCE education.International Journal of SCIENCE Education, 3(1), 11.

Kelley, T. R., Knowles, J. G., Holland, J. D., & Han, J. (2020). Increasing high school teachers self-efficacy for integrated STEM instruction through a collaborative community of practice. International journal of STEM education, 7(1), 14.

Kennedy, B. K., Berger, S. L., Brunet, A., Campisi, J., Cuervo, A. M., Epel, E. S., ... &Rando, T. A. (2014). GeroScience: linking aging to chronic disease. Cell, 159(4), 709-713.

Kiemer, K., Gröschner, A., Pehmer, A. K., & Seidel, T. (2015). Effects of a classroom discourse intervention on teacher's practice and students' motivation to learn mathematics and Science. Learning and instruction, 35, 94-103.

Kirkham, J., & Chapman, E. (2022). Gender, achievement level and sociocultural factors in the mathematics course choices of Year 10 students in Western Australia. The Australian Educational Researcher, 49(1), 97-114.

KoballaJr, T. R., & Glynn, S. M. (2013). Attitudinal and motivational constructs in Science learning. In *Handbook of research on Science education* (pp. 89-116).Routledge.

Korpershoek, H., Canrinus, E. T., Fokkens-Bruinsma, M., & De Boer, H. (2020). The relationships between school belonging and students' motivational, social-emotional, behavioural, and academic outcomes in secondary education: A meta-analytic review. Research papers in education, 35(6), 641-680.

Kuchynka, S. L., Eaton, A., & Rivera, L. M. (2022). Understanding and addressing gender-based inequities in STEM: Research synthesis and recommendations for US K-12 education. Social issues and policy review, 16(1), 252-288.

Kudenko, I., & Gras-Velázquez, À. (2016). The future of European SCIENCE workforce: What secondary school pupils of Europe think about SCIENCE industry and careers.In Insights from Research in Science Teaching and Learning (pp. 223-236).Springer, Cham.

Kuenzi, J. J. (2008). CRS report for congress: Science, technology, engineering, and mathematics (SCIENCE) education: background, federal policy, and legislative action. In Library of Congress, Washington, DC.

Lamb, R., Annetta, L., Vallett, D., Firestone, J., Schmitter-Edgecombe, M., Walker, H., ... & Hoston, D. (2018). Psychosocial factors impacting STEM career selection. The Journal of Educational Research, 111(4), 446-458.

Lange, S., & Lange, S. (2016). Achieving Teaching Quality in Sub-Saharan Africa. Springer Fachmedien Wiesbaden.

Lyons, T. (2006). Different countries, same science classes: Students' experiences of school science in their own words. International journal of science education, 28(6), 591-613.

Madan, C. R. (2017). Motivated cognition: Effects of reward, emotion, and other motivational factors across a variety of cognitive domains. Collabra: Psychology, 3(1), 24.

Malinda, H., Mwania, J., &Maithya, R. (2017).Strategies for Fostering Character Development Education by Teachers in Kenyan Schools. *African Educational Research Journal*, *5*(1), 64-74.

Mariappan, U., &Veloo, A. (2020) Assessment of Practical Skills in Accounting Subjects among Matriculation Students.

Matthews, M. R. (2017). Reconceptualizing the nature of Science for Science education.

Mbwesa, K. J. (2008). *Introduction to management research.*A student Handbook. Nairobi: Basic Modem Management Consultants.

McDONALD, C. V. (2016). SCIENCE Education: A review of the contribution of the disciplines of Science, technology, engineering and mathematics. Science Education International, 27(4), 530-569.

McDonald, C. V., &Abd-El-Khalick, F. (2017).Where to from here? Implications and future directions for research on representations of nature of Science in school Science textbooks. In Representations of Nature of Science in School Science Textbooks (pp. 215-231).Routledge.

Merdiaty, N., & Sulistiasih, S. (2024). Empowering Learning: The Mediating Role of Teachers in Enhancing Students' Intrinsic Motivation. Al-Ishlah: Jurnal Pendidikan, 16(4), 5163-5172.

Misaki, E., Apiola, M., &Gaiani, S. (2016). Technology for small scale farmers in Tanzania: a design Science research approach. *The Electronic Journal of Information SySciences in Developing Countries*, *74*(1), 1-15.

Moore, T. J., & Smith, K. A. (2014).Advancing the state of the art of SCIENCE integration. *Journal of SCIENCE Education: Innovations and Research*, *15*(1), 5.

Msami, J., & Wangwe, S. (2016). Industrial development in Tanzania. Manufacturing Transformation, 155.

Mugenda, O. M., &Mugenda, M. AG (2003). Research Methods: Quantitative and Qualitative Approaches, Nairobi: African Centre Technology Studies press (ACTS). Nager, A., & Atkinson, R. D. (2016).The case for improving US computer Science education.Available at SSRN 3066335.

Mutambuki, J. M. (2014). Integrating nanotechnology into the undergraduate chemistry curriculum: The impact on students' affective domain.

Ndalichako, J. L. (2014). Students' Subject Choice in Secondary Schools in Tanzania: A Matter of Students' Ability and Interests or Forced Circumstances? *Open Journal of Social Sciences*, *2*(08), 49.

Ngetich, J. K. (2014). Factors influencing girls' low enrolment and poor performance in physics: The Case of Secondary Schools in Nandi South District, Kenya. *Unpublished University of Kenyatta, M. Sc. Thesis*.

Ngure, L. N. (2016). *Influence of selected factors on help-seeking Behaviour among public secondary school students: a comparative study of Nyeri and Nairobi counties, Kenya* (Doctoral dissertation, Egerton University).

Nugent, B. M., Wright, C. L., Shetty, A. C., Hodes, G. E., Lenz, K. M., Mahurkar, A., ... & McCarthy, M. M. (2015). Brain feminization requires active repression of masculinization via DNA methylation. *Nature neuroScience*, *18*(5), 690.

Odden, T. O. B., Marin, A., & Rudolph, J. L. (2021). How has Science Education changed over the last 100 years? An analysis using natural language processing. Science Education, 105(4), 653-680.

Okon, G. B. (2015). Social Media Use by the Two Dominant Political Parties in Rivers State: Their Techniques, Applications and Followership. *Review of communication and media studies*, 132-142.

Olatoye, A. O., Ojeyinka, G. A., & Ogunleke, M. O. (2022). Business education in Nigeria: Challenges and way forward for national development. KWASU Journal of the Business of Education, 3(1), 75-80.

Orodho, A. &Kombo,D. (2005). *Research Methods.*Nairobi: Nairobi: Masola Publishers

Orodho, A. J. (2005). Techniques of writing research proposals and reports in Educational and Social Sciences, Nairobi: kaneja HP Enterprises

Orodho, J. A. (2009). Elements of education and social Science research (2nd Ed.). Kenezja Publisher, Maseno Kenya.

Orodho, J. A., Nzabalirwa, W., Odundo, P., Waweru, P. N., &Ndayambaje, I. (2016). Quantitative and qualitative research methods: A step by step guide to scholarly excellence. *Kanezja Publishers and Enterprises, Nairobi*.

Osborne, J., & Pimentel, D. (2022). Science, misinformation, and the role of education. Science, 378(6617), 246-248.

Pareja Roblin, N., Schunn, C., Bernstein, D., & McKenney, S. (2018). Exploring shifts in the characteristics of US government-funded science curriculum materials and their (unintended) consequences. Studies in Science Education, 54(1), 1-39.

Pei, L., & Wu, H. (2019). Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Medical education online*, *24*(1), 1666538.

Pineda-Báez, C., Bauman, C., & Andrews, D. (2019). Empowering teacher leadership: a cross-country study. International Journal of Leadership in Education, 1-27.

Rau, M. A. (2017). Conditions for the effectiveness of multiple visual representations in enhancing SCIENCE learning. Educational Psychology Review, 29(4), 717-761.

Regan, E., & DeWitt, J. (2015). Attitudes, interest and factors influencing SCIENCE enrolment behaviour: An overview of relevant literature. In *Understanding student participation and choice in Science and technology education* (pp. 63-88).Springer, Dordrecht.

Ross, K., Galaudage, S., Clark, T., Lowson, N., Battisti, A., Adam, H., ... & Sweaney, N. (2023). Invisible women: Gender representation in high school science courses across Australia. Australian Journal of Education.

Rozek, C. S., Svoboda, R. C., Harackiewicz, J. M., Hulleman, C. S., & Hyde, J. S. (2017). Utility-value intervention with parents increases students' SCIENCE preparation and career pursuit. Proceedings of the National Academy of Sciences, 114(5), 909-914.

Ruuri, E. K. (2014). Participation of mentally retarded

Ryan, R. M., &Deci, E. L. (2016). Facilitating and hindering motivation, learning, and well-being in schools: Research and observations from self-determination theory. *Handbook of motivation at school*, *96*.

Salami, S. O. (2008). Roles of personality, vocational interests, academic achievement and socio-cultural factors in educational aspirations of secondary school adolescents in southwestern Nigeria. Career Development International, 13(7), 630-647.

Sanders, M. (2009). Integrative SCIENCE education: primer. The Technology Teacher, 68(4), 20-26.

Sanga, C., Magesa, M., Chingonikaya, E., &Kayunze, K. (2013). Can e-learning promote participation of female students in SCIENCE disciplines in higher learning institutions of Tanzania? *International Journal of Education and Development using ICT*, *9*(3).

Schott, C., van Roekel, H., &Tummers, L. (2020).Teacher leadership: A syScienceatic review, methodological quality assessment and conceptual framework. Educational Research Review, 100352.

Schuster, D., Cobern, W. W., Adams, B. A., Undreiu, A., & Pleasants, B. (2018).Learning of core disciplinary ideas: Efficacy comparison of two contrasting modes of Science instruction. Research in Science Education, 48(2), 389-435.

Sciberras, E., & Fernando, J. W. (2022). Climate change-related worry among Australian adolescents: an eight-year longitudinal study. Child and adolescent mental health, 27(1), 22-29.

Scogin, S. C., & Stuessy, C. L. (2015). Encouraging greater student inquiry engagement in science through motivational support by online scientist-mentors. Science Education, 99(2), 312-349.

See, B. H., Munthe, E., Ross, S. A., Hitt, L., & El Soufi, N. (2022). Who becomes a teacher and why?. Review of Education, 10(3), e3377.

Semali, L. M., & Mehta, K. (2012).Science education in Tanzania: Challenges and policy responses. *International Journal of Educational Research*, *53*, 225-239.

Senge, P. M., Cambron-McCabe, N., Lucas, T., Smith, B., & Dutton, J. (2012). Schools that learn (updated and revised): A fifth discipline fieldbook for educators, parents, and everyone who cares about education. Currency.

Shahali, E. H. M., Halim, L., Rasul, M. S., Osman, K., & Zulkifeli, M. A. (2016). STEM learning through engineering design: Impact on middle secondary students' interest towards STEM. *EURASIA Journal of Mathematics, Science and Technology Education*, *13*(5), 1189-1211.

Sithole, A., Chiyaka, E. T., McCarthy, P., Mupinga, D. M., Bucklein, B. K., &Kibirige, J. (2017). Student Attraction, Persistence and Retention in SCIENCE Programs: Successes and Continuing Challenges. *Higher Education Studies*, *7*(1), 46-59.

Skinner, B. F. (2016). *The technology of teaching*.BF Skinner Foundation.

Smucker, T. A., Wisner, B., Mascarenhas, A., Munishi, P., Wangui, E. E., Sinha, G., ...& Lovell, E. (2015). Differentiated livelihoods, local institutions, and the adaptation imperative: Assessing climate change adaptation policy in Tanzania. *Geoforum*, *59*, 39-50.

Spangle, J. M., Ghalei, H., & Corbett, A. H. (2021). Practical advice for mentoring and supporting faculty colleagues in STEM fields: Views from mentor and mentee perspectives. Journal of Biological Chemistry, 297(3).

Stone, D., &Heen, S. (2015). *Thanks for the feedback: the Science and art of receiving feedback well (even when it is off base, unfair, poorly delivered, and frankly, you're not in the mood)* (Vol. 36, No. 10). Penguin.

Stroet, K., Opdenakker, M. C., &Minnaert, A. (2015). What motivates early adolescents for school? A longitudinal analysis of associations between observed teaching and motivation. *Contemporary Educational Psychology*, *42*, 129-140.

Subotnik, R. F., Tai, R. H., Rickoff, R., &Almarode, J. (2009). Specialized public high schools of Science, mathematics, and technology and the SCIENCE pipeline: What do we know now and what will we know in 5 years?. *Roeper Review*, *32*(1), 7-16.

Tessier, D., Sarrazin, P., &Ntoumanis, N. (2010). The effect of an intervention to improve newly qualified teacher's interpersonal style, students motivation and psychological need satisfaction in sport-based physical education. Contemporary Educational Psychology, 35(4), 242-253.

Thomas, T. A. (2014). Elementary teacher's receptivity to integrated Science, technology, engineering, and mathematics (SCIENCE) education in the elementary grades (Doctoral dissertation).

Timms, M. J., Moyle, K., Weldon, P. R., & Mitchell, P. (2018). Challenges in SCIENCE learning in Australian schools: Literature and policy review.

Tromp, L. A. D., &Kombo, K. D. (2006). Proposal and thesis writing. *An Introduction, University Education Book service University Press version) Industrial and labor relations review*, *55*, 3-21.

Tytler, R., & Ferguson, J. P. (2023). Student attitudes, identity, and aspirations toward science. In Handbook of research on science education (pp. 158-192). Routledge.

Vuzo, M. (2018). Towards achieving the Sustainable Development Goals: Revisiting language of instruction in Tanzanian secondary schools. *International Review of Education*, *64*(6), 803-822.

Walker, B. N., Mbari-Kirika, I., &Miheso-O'Connor, M. (2016). *The Mwangaza Project: A Comprehensive Report on the Nationwide Baseline Survey of Technology Skills for Learners with Vision Impairment in Kenya*. Georgia Institute of Technology.

Webster, C. M., Iannucci, A. L., & Romney, A. K. (2002).Consensus analysis for the measurement and validation of personality traits. *Field Methods*, *14*(1), 46-64.

Weir, J. P. (2005).Quantifying test-retest reliability using the intraclass correlation coefficient and the SEM. *The Journal of Strength & Conditioning Research*, *19*(1), 231-240.

Wells, J. G. (2019). SCIENCE education: The potential of technology education. Council on Technology and Engineering Teacher Education.

Willems, P. P., &Gonzalez-DeHass, A. R. (2012). School-Community Partnerships: Using Authentic Contexts to Academically Motivate Students. School Community Journal, 22(2), 9-30.

Yu, J., & Alibakhshi, G. (2025). Modeling the relationships among physical education teachers' technological pedagogical content knowledge, technology integration self-efficacy, employability, and the mediating role of job passion. Scientific Reports, 15(1), 25999.

Zhang, D., Bobis, J., Wu, X., & Cui, Y. (2018).The effects of an autonomy-supportive teaching intervention on Chinese physics students and their teacher. *Research in Science Education*, 1-27.

APPENDICES

Appendix A: Introductory Letter

Dear Respondent,

I am Zipporah Wahu Gatuiku, a postgraduate student pursing Masters of Education (Educational Management) student at Kenyatta University. I am carrying out a research on "**Teacher's influence on students' choice of Science subjects in secondary schools in Murang'a County, Kenya**," for partial fulfillment of the requirements for the award of master's degree.

I kindly request you to take part as a respondent in this study research and be honest as you give your responses. The information gathered will be handled with confidentiality and your identity will be safeguarded.

Thank you.

Yours sincerely,

Z.W.G

Zipporah Wahu Gatuiku.

Appendix B: Questionnaire for Students

Dear Respondent,

I am a postgraduate student in Kenyatta University doing a study on '**Teacher's influence on students' choice of Science subjects in secondary schools**.' The aim of this study area is to determine the influence a teacher has on students' choice of Science subjects.

It is therefore my humble request that you take your time to fill in the questionnaire. The responses gathered will be handled with utmost confidentiality and will ONLY be used for academic purpose. This will be towards fulfillment of my research Thesis. Your involvement in this study is voluntary and on the questionnaire, do not write your name.

SECTION A: DEMOGRAPHIC DATA

(*Kindly tick in the space provided as you respond to the questions*)

1. What is your gender?
   a) Male [ ]
   b) Female [ ]
2. What is your age?
   a) 14 – 15 years [ ]
   b) 16 - 17 years [ ]
   c) 18 years and above [ ]
3. Which combination of science subjects did you choose?
   a) Physics/ Biology [ ]
   b) Physics/ Chemistry [ ]
   c) Biology/ Chemistry [ ]

SECTION B: THE INFLUENCE OF TEACHER MOTIVATION ON CHOICE OF SCIENCE SUBJECTS

This section is to determine how the teacher motivation factor influences student choice of science subject.

4. Please, indicate by a tick the extent to which you agree with the following statements (Where 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1- Strongly Agree).

	STATEMENTS	**1**	**2**	**3**	**4**	**5**
1.	My biology teacher gave praises and comments in class that affected my attitude towards the choice of Biology subject					
2.	My biology teacher prompted me to continue pursuing Biology by rewarding me when I made an improvement on the subject.					
3.	My biology teacher interacted and engaged with us often during the lessons and this made me to select the subject.					
4.	My chemistry teacher praises and comments affected my attitude towards the choice of science subjects I chose					
5.	My chemistry teacher prompted me to continue pursuing Biology by rewarding me when I made an improvement on the subject.					
6.	My chemistry teacher interacted and engaged with us often during the lessons and this made me to select the subject.					
7.	My physics teacher praises and comments affected my attitude towards the choice of science subjects I chose					
8.	My Physics teacher prompted me to continue pursuing Biology by rewarding me when I made an improvement on the subject.					
9.	My physics teacher interacted and engaged with us often during the lessons and this made me to select the subject.					

SECTION C: THE INFLUENCE OF TEACHER'S PEDAGOGY ON STUDENTS' CHOICE OF SCIENCE SUBJECT

The purpose of this section is to establish the influence of teacher pedagogy on student choice of science subjects.

5. Please, indicate by a tick how do you agree with the following statement. (Where 4- Not at all, 3- Sometimes, 2- Usually, 1- Always).

	STATEMENTS	**1**	**2**	**3**	**4**
1.	My Biology teacher always summarized what he/she taught at the end of lessons and always posed some questions relating to the taught topic which motivated me in choosing the subject.				
2.	My biology teacher conducted many practical lessons and this boosted my interest in Biology				
3.	My chemistry teacher always summarized what he/she taught at the end of lessons and always posed some questions relating to the taught topic which motivated me in choosing the subject.				
4.	My chemistry teacher conducted many practical lessons and this boosted my interest in Biology				
5.	My physics teacher always summarized what he/she taught at the end of lessons and always posed some questions relating to the taught topic which motivated me in choosing the subject.				
6.	My Physics teacher conducted many practical lessons and this boosted my interest in Biology				

SECTION D: THE INFLUENCE OF TEACHER TEST EVALUATION FEEDBACK ON CHOICE OF SCIENCE SUBJECTS

The section is to determine the teacher's test evaluation feedback and its influence on students' choice of science subjects.

Please, indicate by a tick how do you agree with the following statements (Where 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1- Strongly Agree).

	STATEMENTS	1	2	3	4	5
1.	My biology teacher's comments on test results had an impact on my choice of science subject					
2.	My biology teacher administered tests frequently that improved my knowledge in the subject and this sparked my interest in making a choice of selecting the subject.					
3.	My chemistry teacher comments on test results had an impact on my choice of science subject					
4.	My chemistry teacher administered tests frequently that improved my knowledge in the subject and this sparked my interest in making a choice of selecting the subject.					
5.	My physics teacher comments on test results had an impact on my choice of science subject					
6.	My Physics teacher administered tests frequently that improved my knowledge in the subject and this sparked my interest in making a choice of selecting the subject.					

SECTION E: THE INFLUENCE OF TEACHER MENTORSHIP TO STUDENTS ABOUT SCIENCE ON CHOICE OF SCIENCE SUBJECTS

This section will determine how career talks and programs on mentorship affect students' choice of Science subjects.

7. Please, indicate by a tick how do you agree with the following statement. (Where 4- Not at all, 3- Sometimes, 2- Usually, 1- Always).

	STATEMENTS	1	2	3	4
1.	My biology teacher took us for Science and Engineering Fair that made me gain more interest in choosing the subject				
2.	My biology teacher invited science motivational speakers more frequently and through their mentorship, I made a decision of choosing the subject				
3.	My chemistry teacher took us for Science and Engineering Fair that made me gain more interest in choosing the subject				
4.	My chemistry teacher invited science motivational speakers more frequently and through their mentorship, I made a decision of choosing the subject				
5.	My physics teacher took us for Science and Engineering Fair that made me gain more interest in choosing the subject				
6.	My Physics teacher invited science motivational speakers more frequently and through their mentorship, I made a decision of choosing the subject				

SECTION F: STUDENTS' CHOICE OF SCIENCE SUBJECTS

This section is to determine influence of teachers on the number of students choosing Science subjects.

8. Please, indicate by a tick how do you agree with the following statements. (Where

5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1- Strongly Agree).

Statements		**1**	**2**	**3**	**4**	**5**
1.	Teacher's motivation contributed to me choosing Biology					
2.	Teacher's motivation contributed to me choosing Physics					
3.	Teacher's motivation contributed to me choosing Chemistry					
4.	Teacher's teaching pedagogy contributed to me choosing Physics					
5.	Teacher's teaching pedagogy contributed to me choosing Chemistry					
6.	Teacher's teaching pedagogy contributed to me choosing Biology					
7.	Teacher's Mentorship to students on science had an impact on me choosing Physics					
8.	Teacher's Mentorship to students on science had an impact on me choosing Biology					
9.	Teacher's Mentorship to students on science had an impact on me choosing Chemistry					
10.	Teacher's Test evaluation feedback had an impact on me choosing Physics					
11.	Teacher's Test evaluation feedback had an impact on me choosing Biology					
12.	Teacher's Test evaluation feedback had an impact on me choosing Chemistry					

Thank you for your cooperation

Appendix C: Questionnaire for Teachers

Dear Respondent,

I am a postgraduate student in Kenyatta University doing a study on '**Teacher's influence on students' choice of Science subjects in secondary schools**.' The aim of this study area is to determine the influence a teacher has on students' choice of Science subjects.

It is therefore my humble request that you take your time to fill in the questionnaire. The responses gathered will be handled with utmost confidentiality and will ONLY be used for academic purpose. This will be towards fulfillment of my research Thesis. Your involvement in this study is voluntary and on the questionnaire, do not write your name.

SECTION A: DEMOGRAPHIC DATA

(Kindly tick in the space provided and responds to the questions)

1. How old are you? ……

   25- 30 [ ] 30-40 [ ]

   40-50 [ ] 50-65 [ ]

2. Which gender are you? Male [ ] Female [ ]

3. As a Science teacher, which specific Science subject(s) do you teach?

   a) Physics [ ] Chemistry [ ]

   b) Biology [ ]

4. Since you started teaching Science discipline(s) and based on the number of years, what is your experience?

   a) 1-5 years [ ] 5-10 years [ ]

   b) 10-15 years [ ] 15 years and above [ ]

SECTION B: THE INFLUENCE OF TEACHER MOTIVATION ON STUDENTS' CHOICE OF SCIENCE SUBJECTS

This section is to determine teacher's motivation in terms of praises, interactions and rewards on students' choice of Science subjects.

	Statements	**1**	**2**	**3**	**4**	**5**
1.	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					
2.	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					
3.	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					
4.	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					
5.	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					
6.	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					
7.	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					
8.	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					
9.	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					

5. Please, indicate by a tick how do you agree with the following statements. (Where 5-StronglyDisagree, 4Disagree, 3- Neutral, 2- Agree, 1- Strongly Agree).

SECTION C: THE INFLUENCE OF TEACHER'S PEDAGOGY ON STUDENTS' CHOICE OF SCIENCE SUBJECT

This section is to determine the influence of teacher's pedagogy on students' choice of science subjects

6. Please, indicate by a tick how do you agree with the following statements. (Where 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1- Strongly Agree).

Statements		**1**	**2**	**3**	**4**	**5**
1.	Being a Chemistry teacher, I make use of practical lessons to make students understand the concept being taught thus, they end up choosing the subject					
2.	Being a Biology teacher, I make use of practical lessons to make students understand the concept being taught thus, they end up choosing the subject					
3.	Being a Physics teacher, I make use of practical lessons to make students understand the concept being taught thus, they end up choosing the subject					
4.	Being a Biology teacher, I make use of theory when teaching to make students understand the concept being taught thus, they end up choosing the subject					
5.	Being a Chemistry teacher, I make use of theory when teaching to make students understand the concept being taught thus, they end up choosing the subject					
6.	Being a Physics teacher, I make use of theory when teaching to make students understand the concept being taught thus, they end up choosing the subject					
7.	As a Chemistry teacher, when I use both theory and practical lessons to teach, students understand the concept being taught and end up choosing the subject					
8.	As a Biology teacher, when I use both theory and practical lessons to teach, students understand the concept being taught and end up choosing the subject					
9.	As a Physics teacher, when I use both theory and practical lessons to teach, students understand the concept being taught and end up choosing the subject					

SECTION D: THE INFLUENCE OF TEACHER TEST EVALUATION FEEDBACK ON STUDENTS' CHOICE OF SCIENCE SUBJECTS

7. This section determines teacher's test evaluation feedback on students' choice of Science subjects

Please, indicate by a tick how do you agree with the following statements. (Where 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1- Strongly Agree).

Statements		**1**	**2**	**3**	**4**	**5**
1.	When I administer tests frequently to students, they gain interest in Biology and choose to pursue it					
2.	When students yield negative test results from the feedback given by the science teacher, they end up not choosing the subject in future					
3.	When students yield positive test results from the feedback given by the science teacher, they end up choosing the subject in future					
4.	Test results given to students by the science teachers have an impact when making choice of subjects					

Based on the frequency of administering tests, how does it affect students' choice of Biology, physics or Chemistry?

a) Positively
b) Negatively

Explain your answer……

……

SECTION E: THE INFLUENCE OF TEACHER MENTORSHIP TO STUDENTS ABOUT SCIENCE ON CHOICE OF SCIENCE SUBJECTS

8. This section will seek to determine the influence of teacher's mentorship on students' choice of science subjects.

Please, indicate by a tick how do you agree with the following statements. (Where 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1- Strongly Agree).

Statements		**1**	**2**	**3**	**4**	**5**
1.	Science motivational speakers have an impact on students when it comes to choosing of the Science subjects					
2.	Students who participate in Science and Engineering Fair end up choosing Biology					
3.	Students who participate in Science and Engineering Fair end up choosing Chemistry					
4.	Students who get involved in Science and Engineering Fair mostly choose Physics					
5.	Having Science mentorship programs administered in school, increases the students' number choosing Physics subject.					
6.	Having Science mentorship programs administered in school, increases the students' number choosing Chemistry subject.					
7.	Having Science mentorship programs administered in school, increases the students' number choosing Biology subject.					
8.	The number of students who choose Physics increases when teachers administer Physics related career talks to them.					
9.	The number of students who choose Chemistry increases when teachers administer Chemistry related career talks to them.					
10.	The number of students who choose Biology increases when teachers administer Biology related career talks to them.					

11. How many students chose this year?

a) Biology.....

b) Physics……

c) Chemistry……

SECTION F: STUDENTS' CHOICE OF SCIENCE SUBJECTS

9. This section is to determine influence of teachers on the number of students choosing Science subjects.

Please, indicate by a tick how do you agree with the following statements. (Where 5- Strongly Disagree, 4- Disagree, 3- Neutral, 2- Agree, 1- Strongly Agree).

Statements		**1**	**2**	**3**	**4**	**5**
1.	Teacher's motivation affects the number of students choosing Biology					
2.	Teacher's motivation affects the number of students choosing Physics					
3.	Teacher's motivation affects the number of students choosing Chemistry					
4.	Teacher's teaching pedagogy affects the number of students choosing Physics					
5.	Teacher's teaching pedagogy affects the number of students choosing Chemistry					
6.	Teacher's teaching pedagogy affects the number of students choosing Biology					
7.	Teacher's Mentorship to students on science have an impact on the number of students' choosing Physics					
8.	Teacher's Mentorship to students on science have an impact on the number of students' choosing Biology					
9.	Teacher's Mentorship to students on science have an impact on the number of students' choosing Chemistry					
10.	Teacher's Test evaluation feedback have an impact on the number of students choosing Chemistry					
11.	Teacher's Test evaluation feedback have an impact on the number of students choosing Biology					
12.	Teacher's Test evaluation feedback have an impact on the number of students choosing Physics					

Appendix D: Interview Guide for Head of Departments in Science Subjects

Dear Respondent,

I am a postgraduate student in Kenyatta University doing a study on '**Teacher's influence on students' choice of Science subjects in secondary schools**.' The aim of this study area is to determine the influence a teacher has on students' choice of Science subjects.

It is therefore my humble request that you take your time to answer the questions honestly. The responses gathered will be handled with utmost confidentiality and will ONLY be used for academic purpose. This will be towards fulfillment of my research Thesis. Your involvement in this study is voluntary and during the interview, do not mention your name.

SECTION A: AN INTRODUCTORY SECTION TO GENERAL INFORMATION OF HEAD OF DEPARTMENT IN SCIENCE SUBJECTS

1. For how long have you gained experience in the Science teaching profession? *[Probe on number of years in teaching profession]*
2. What is your area of specialization, qualification level of your specialization and age? [*Probe on age brackets, Science subjects, level of education]*
3. How is your teaching experience in Science? [*Probe on performance* in *Science subjects and outcomes…?]*

SECTION B: QUESTIONS ON THE FOUR OBJECTIVES OF THE STUDY FOR THE INTERVIEW

Objectives	Research Questions	Probing Question
1. To determine how teacher-student motivation influences the students' choice of Science subjects	Do you give any rewards to students who show an improvement on science subjects?	*If yes, how does it affect students' choice of science subjects?*
	Do you commend students for performing well in science subjects?	*If yes, which implication does it have on students' choice of science subjects?*
	Based on the time allocated for teacher interaction with students in class, Does it affect students' choice of science subjects?	*It could be through interactions between teachers and students in class?*
2. To determine how teacher's pedagogy influences the students' choice of Science subjects	Does your school have enough lab resources for science subjects to cater for each student during practical lessons?	*If Yes/No, how does this affect students' choice of Science subjects?*
	Do your science teachers apply teaching aids when teaching?	*If yes, what type of teaching aid do the use and does it have any impact on mastery of concept by students thus leading to students' choice of science subjects*
	Between theory and practical, which teaching pedagogy have more influence on students' choice of science subjects?	*In relation to teacher centered and learner centered*
3. To determine how teacher test evaluation feedback influence the students' choice of Science subjects	How often do you test students in science subjects?	*Based on frequency of administering tests*
	After how long do you give the results to students	*Based on timelines for submission of result feedback*
	Based on the frequency of administering tests, does it have an influence on students' choice of science subjects?	*Based on the interest of the students*
4. To determine how teacher-student mentorship on Science influence the students' choice of Science subjects	Before students get to choose Science subjects, do you offer mentorship to them? Why, How, and When	*Explain if it does have an effect on students' choice of science subjects?*
	Do your Science teachers conduct career talks with students?	*Do your Science teachers conduct career talks with students?*
	Do you organize mentorship programs like science and Engineering Fair /symposium?	*If yes, does this affect students' interest towards choosing science subjects?*
	How often do you have career talks with students on science?	*Do career talks affect the students' choice of science subjects?*

Appendix E: Pseudonyms

S/No	Pseudonyms	Gender	Location	Date
01.	HoD 01	Male	Murang'a County	May, 2022
02.	HoD 02	Female	Murang'a County	May, 2022
03.	HoD 03	Male	Murang'a County	May, 2022
04.	HoD 04	Male	Murang'a County	June, 2022
05.	HoD 05	Male	Murang'a County	June, 2022
06.	HoD 06	Female	Murang'a County	June, 2022
07.	HoD 07	Male	Murang'a County	July, 2022
08.	HoD 08	Male	Murang'a County	July, 2022
09.	HoD 09	Male	Murang'a County	July, 2022
10.	HoD 010	Male	Murang'a County	July, 2022
11.	HoD 011	Female	Murang'a County	July, 2022
12.	HoD 012	Female	Murang'a County	July, 2022
13.	HoD 013	Female	Murang'a County	July, 2022

Appendix F: Research Budget

	Budget Item	Amount	Sub Total
1.	**Proposal Writing**		
	Typing, photocopy, printing and binding	KES 50,000.00	
	Total Proposal Writing		**KES 50,000.00**
2.	**Conducting Research:**		
	Data collection (Foolscaps, Pencils, File, Exercise book, Foolscaps, Meals, Travel Expenses)	KES 20,000.00	
	Total Direct Expenses		**KES 20,000.00**
3.	**Data Analysis:**		
	Foolscaps, Pens, Pencils, Travel expenses	KES 5,000.00	
	Data Analysis Expenses		**KES 5,000.00**
4.	**Research Publication: Journal publication, Research typing and binding**		**KES 28,000.00**
	Total Expenses		**KES 103,000.00**
	Miscellaneous 10%		**KES 10,000.00**
	TOTAL GROSS		**KES 113,000.00**

Appendix G: Informed Consent Form

My Name is Zipporah Wahu Gatuiku. I am a Masters student from Kenyatta University. I am conducting a study on `` Teacher's influence on students' choice of Science subjects in Murang'a County Kenya.'' The information will be used for academic purpose only.

Your cooperation in this study exercise will necessitate that I pose you a few inquiries. You reserve the privilege to deny participation in this study. Kindly bear in mind that your cooperation and support in the study is intentional. You may pose inquiries identified with the study when you need to. You may decline to give feedback to any inquiries and you may stop an interview at some point. You may likewise quit being involved in the study at any given time with no consequences.

The interview may add up to approximately half an hour to the time before you receive your routine services. The interviews will be conducted in a private setting while the questionnaire will be filled in natural setting within the school. Your name will not be recorded on the questionnaire. Everything will be kept private.

If you have any questions you may contact Dr. Hellen Kiende (**0711216832**), Dr. Francis Kirimi (**0720970158**) or the Kenyatta University Ethical Review Committee Secretariat on chairman.kuerc@ku.ac.ke

The above information regarding my participants in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that I will still get the same care and service whether I decide to leave the study or not and my decision will not change the care and service I will receive from the school today.

Code of Participant

.....

Signature or thumb print Date

I, the undersigned, I have explained to the volunteer in a language he/she understands, the procedures to be followed in the study and the risks and benefits involved.

…… ……

Zipporah Wahu Gatuiku Date

Appendix H: Approval Letter of Research Proposal from Graduate School

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

FROM: Dean, Graduate School **DATE:** 3rd November, 2021

TO: **Ms. Zipporah Wahu Gatuiku**
C/o Department of Educ. Management, Policy & Curriculum Studies

REF: E55/27397/2018

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

This is to inform you that Graduate School Board, at its meeting on **29th September, 2021**, approved your Research Proposal for the M.Ed. Degree entitled, **"Teacher's Influence on Students' Choice of Science Subjects in Selected Public Day Secondary Schools in Murang'a County, Kenya."**

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking and Progress Report Forms per semester. The Forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

ANNBELL MWANIKI
FOR: DEAN, GRADUATE SCHOOL

CC. Chairman, Educational Management, Policy & Curriculum Studies Department

Supervisors:

1. Dr. Hellen K. Guantai
   C/o Educ. Management, Policy & Curriculum Studies Dept.
   Kenyatta University

2. Dr. Francis Kirimi
   C/o Educational Foundations Department
   Kenyatta University

Appendix I: Research Authorization Letter

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: E55/27397/2018

DATE: 3rd November, 2021

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. ZIPPORAH WAHU GATUIKU – REG. NO. E55/27397/18

I write to introduce Ms. Zipporah Wahu Gatuiku who is a Postgraduate Student of this University. She is registered for M.Ed. degree programme in the Department of Educational Management, Policy & Curriculum Studies.

Ms. Gatuiku intends to conduct research for a M.Ed. thesis Proposal entitled, "Teacher's Influence on Students' Choice of Science Subjects in Selected Public Day Secondary Schools in Murang'a County, Kenya."

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

Appendix J: Authorization by Director of Education Murang'a County

REPUBLIC OF KENYA
MINISTRY OF EDUCATION
State Department of Early Learning and Basic Education

Email: cdemuranga@gmail.com
Telephone: 060 2030227
When replying please quote

COUNTY DIRECTOR OF EDUCATION
P.O BOX 118 – 10200
MURANG'A

REF: MGA/CTY/EDU/RESEARCH/GEN/64/VOL.III/69 6th June, 2022

Zipporah Wahu Gatuiku
REG. NO.E55/27397/18
C/o Department of Education Management,
Policy & Curriculum Studies
Kenyatta University

RE: RESEARCH AUTHORIZATION

The County Education office is in receipt of your request letter dated 6th June 2022, and authority from NACOSTI Ref No.948198 and license number NACOSTI/P/21/14753 dated 2/12/2021 to carry out research on ***'Teachers influence on students' choice of Science Subjects in Selected Public Day Secondary Schools in Murang'a County, Kenya'.***

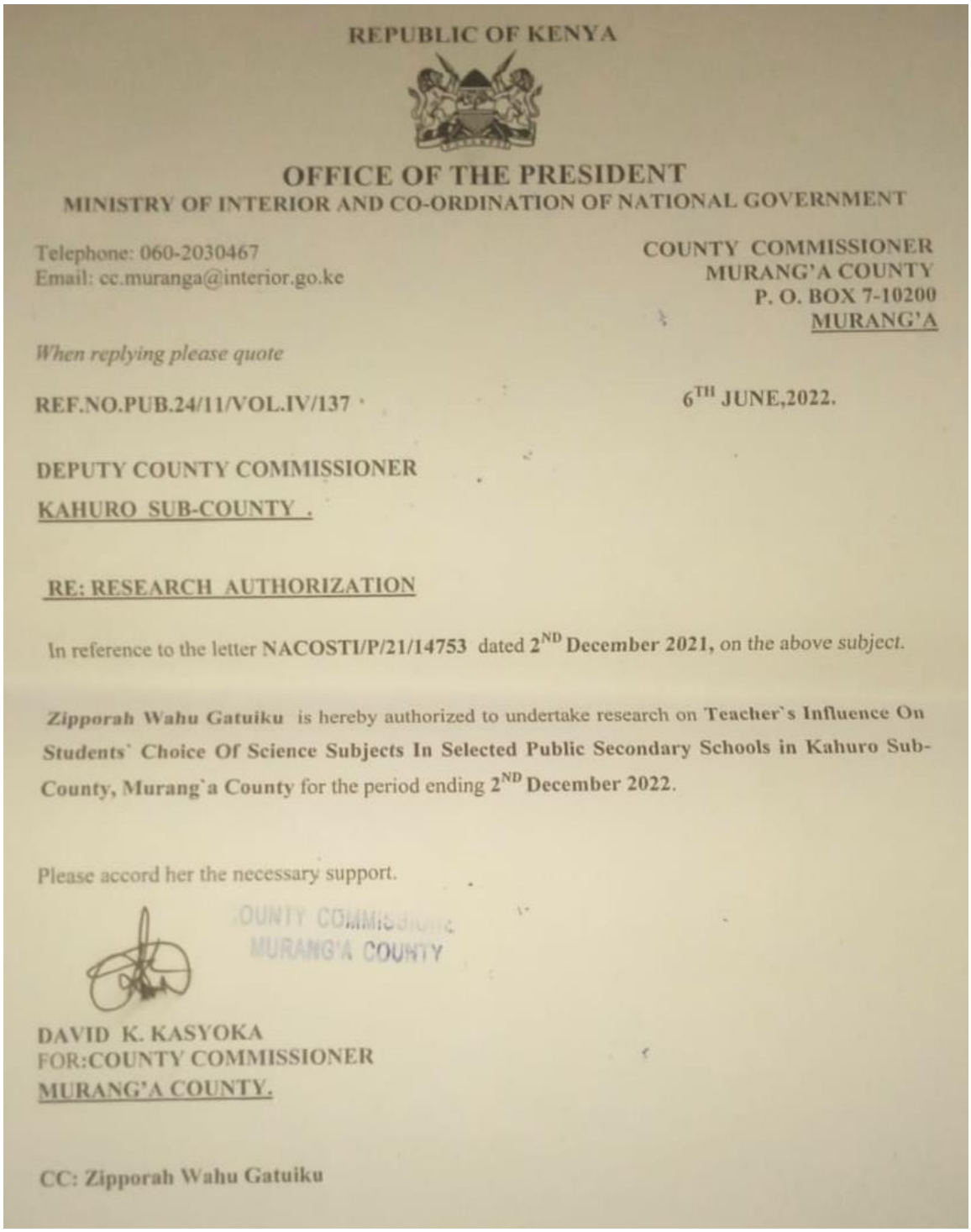
Permission is hereby granted to carry out research in **Murang'a County** for a period ending, **2nd December, 2022**

You are kindly advised to deposit a copy of the final research report to this office.

COUNTY DIRECTOR OF EDUCATION MURANG'A 06 JUN 2022 BOX 118-10200 MURANG'A

Anne Kiilu
County Director of Education
MURANG'A

Appendix K: Authorization by County Commissioner Murang'a County



REPUBLIC OF KENYA

OFFICE OF THE PRESIDENT

MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT

Telephone: 060-2030467
Email: cc.muranga@interior.go.ke

COUNTY COMMISSIONER
MURANG'A COUNTY
P. O. BOX 7-10200
MURANG'A

When replying please quote

REF.NO.PUB.24/11/VOL.IV/137

6TH JUNE,2022.

DEPUTY COUNTY COMMISSIONER
KAHURO SUB-COUNTY .

RE: RESEARCH AUTHORIZATION

In reference to the letter **NACOSTI/P/21/14753** dated **2ND December 2021,** on the above subject.

Zipporah Wahu Gatuiku is hereby authorized to undertake research on **Teacher`s Influence On Students` Choice Of Science Subjects In Selected Public Secondary Schools in Kahuro Sub-County, Murang`a County** for the period ending **2ND December 2022**.

Please accord her the necessary support.

COUNTY COMMISSIONER
MURANG'A COUNTY

DAVID K. KASYOKA
FOR:COUNTY COMMISSIONER
MURANG'A COUNTY.

CC: Zipporah Wahu Gatuiku

Appendix L: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 948198

Date of Issue: 02/December/2021

RESEARCH LICENSE

This is to Certify that Miss.. ZIPPORAH WAHU GATUIKU of Kenyatta University, has been licensed to conduct research in Muranga on the topic: TEACHER'S INFLUENCE ON STUDENTS' CHOICE OF SCIENCE SUBJECTS IN SELECTED PUBLIC DAY SECONDARY SCHOOLS IN MURANG'A COUNTY, KENYA for the period ending : 02/December/2022.

License No: NACOSTI/P/21/14753

948198

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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