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**PERCEIVED CAUSES OF STUDENTS' LOW ENROLMENT IN PHYSICS IN CO-EDUCATIONAL DAY
SECONDARY SCHOOLS IN MERU SOUTH SUBCOUNTY, KENYA**

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How to cite:

Usinde, O.N. (2021). Perceived causes of students' low enrolment in physics in co-educational day secondary schools in Meru South subcounty, Kenya. *In: Isutsa, (E.d). D.K. Proceedings of the 7th International Research Conference held in Chuka University from 3rd-4th Dec, 2020 Chuka, Kenya p.347-357*

ABSTRACT

Physics is an important science domain that enables learners to develop analytical skills necessary for problem solving in technical fields. Physics content is relevant to all learners irrespective of the careers in which they become established since it provides information and skills that propel ingenuity. However there is a global decline in enrolment and graduation rate in Physics at all levels. This study sought to establish the causes of low students' enrolment in Physics in secondary schools in Meru south subcounty. The objective of the study was to establish students' and teachers' perceptions on causes of low students' enrolment in Physics. The study adopted a descriptive survey design. The sample consisted of 10 co-educational day secondary schools obtained through simple random sampling. The research instruments consisted of two questionnaires (A and B). The questionnaires consisted of 15 items on selected factors that could likely cause students' low enrolment and students / teachers perceptions on the state of students' enrolment rated on a likert scale. The pearson product moment coefficient was performed to ascertain the reliability of the questionnaire. A reliability of 0.74 was obtained and the questionnaires adapted. Collected data was analysed using SPSS software version 22. Descriptive statistics and Correlation analysis (pearson product moment correlation coefficient) were used to establish the nature and magnitude of association between study variables. Correlation test was done at 0.05 level of significance. The study established that some topics in the form two syllabus were too abstract to the students while teachers expressed difficulty in explaining certain concepts. The study revealed a strong positive correlation between school factors and students' enrolment in Physics. The study recommended training more female teachers in the field of science and inservicing of teachers on the abstract topics was recommended. Further, complex topics in form two to be moved to the form three syllabus to allow learners to mature.

Keywords: Physics, Students enrolment, Coeducational school, Perception.

INTRODUCTION

Background Information

Physics is an area of science that deals with the study of matter and laws that govern nature. Its study enables learners to develop analytical skills necessary for problem solving in various situations they encounter in life (Adeoye, 2010). Physics content is relevant to all learners irrespective of the careers they find themselves later in life. In the United States of America (USA), Monroe, O'kuma and Hein(2005) discussed the introduction of different alternatives of physics subject based on the student's future career. This alternatives include physics for the poets and physics for presidents. This move was towards motivating more learners to study physics despite its abstractness. Mbamara and Eya (2015) in Nigeria expressed concern over the declining of many students from pursuing physics at secondary level. They pointed out that the effect of abandoning physics triggers consequences such as stalling technological advancement, leading to inadequate number of physics teachers for the present and the future generations, proliferation of the arts subjects and excessive demands for admissions and jobs in those areas, while such demands in the area of physics remains low and sometimes totally lacking.

There is a decline in enrolment and graduation rate in physics at all levels in many countries including United states of America (USA), United Kingdom (UK) and Netherlands (Osborne et.al 2003). A study in Australia by Lyons

(2005) found out that many students regard junior high school science as irrelevant, uninteresting and difficult leaving them with few intrinsic reasons for enrolling in senior school physics courses. In Nigeria, West Africa Examinations Council (2014) reported that percentage of students studying physics was less than 50% of total number of candidates for over 80% of schools in Nigeria although percentage failure in physics was less than for Biology and Chemistry. Studies in Kenya have shown that fewer numbers of students are opting to study physics beyond form two level (Nderitu 2007). In 2016 KNEC examinations only 149,782 candidates sat the Physics exam out of a total of 570,278 candidates. This proportion represents 26.26% compared to 509,822 candidates that sat biology exam representing 89.4% (Daily Nation 8 May 2019). At the University 187 degree programmes require at least a C+ in Physics. During placement of students in Universities in 2019, 107 programmes failed to attract students. Some of these courses are physics related courses. The university managers warn that in the near future, important courses that are core to the country's development will be scrapped for lack of learners. Some programmes at the universities have not attracted students due to poor subject performance and students shunning

them (Daily Nation 8 may 2019). Low enrolment or zero enrolment in this courses will affect the contribution of science in national development and the achievement of vision 2030 and sustainable development goals(SGDs).

Most courses studied at the universities in Kenya require that a student should have done physics in the Kenya National Examinations Council (KNEC) examinations. For some courses Physics is taken in place of Mathematics where the student has not performed well in mathematics for a course that requires a good pass in Mathematics, Joint Admissions Board (JAB 2011). In secondary schools in Kenya Chemistry is compulsory. Students either choose between biology and physics or study both depending on the school. Table 1 below shows enrolment in physics against total candidature in form three in a sample of 10 mixed day schools meru south subcounty over the last five years.

Table 1. Total candidature and student enrolment in physics between 2015 and 2019

Year	Total candidature	Physics
2015	680	214
2016	689	191
2017	691	180
2018	700	167
2019	728	154

Data revealed a slowly increasing total enrolment in form three within the sampled schools from 680 in 2015 to 728 in 2019. However, the students' enrolment in physics has been dropping systematically from 214 to 154 within the same period. Existing studies have revealed some causes of students' enrolment in physics. Considine and Zappala (2007) in Australia, Akanbi, (2010) and Aina&Adedo(2013) in Nigeria, Mekonnen (2014) in Ethiopia and Centre for mathematics, science and Technology Education in Africa (2015) exposed several causes of enrolment in physics. The causes identified relate to the school, home and learner. According to Centre for Mathematics, Science and Technology Education in Africa (2015) students were not given opportunities to select the subjects they wanted.

The subjects were taken depending on what principals and career masters/mistresses referred to as school policies. In many schools chemistry and biology are compulsory. In some schools where the three sciences are accepted biology and physics are blocked such that they are taught at the same time. In some of the schools the navigation away from the physics subject is pegged on career requirements where by school heads reason that there are more careers related to chemistry and biology than physics. In other schools in Africa, laboratory equipment and materials have been cited as reasons for few students in physics (Nderitu 2007). Some teachers discourage students by advising them to study more friendly subjects like the humanities instead of spending time on a complicated subject like physics (CEMASTE, 2015). As school policy in some secondary schools students who are challenged in mathematics are not allowed to study physics. For this reason most schools in which students have low entry levels have very small numbers of students pursuing physics (Aina and Adedo, 2013). Curriculum expectations on students are too high and too demanding for the learners. CEMASTE 2015 discussed that the learners raised concern over the abstractness of the physics content in secondary schools. This study will attempt to identify the challenging areas in the physics form two syllabus in Kenya.

The home environment plays a crucial role in shaping academic orientation. Home related factors include the physical facilities like a study room or space, lighting in the night and psychological stability. In the United states of America and the United Kingdom learning continues even at home since lessons have been computerized. Learners can watch lessons that are animated on television screens. Therefore learning does not stop in school. In the African context some learners may be over engaged in home chores after school. For the period they are out of school they get detached from school work implying inability to complete school assignments (UNESCO 2015).

While at home learners engage more in household chores, playing, chatting and visiting friends. Most homes lack role models from whom students can check themselves against (Omar 2017, Muhonja 2012). Parents have convictions about what their children should become and have an influence on what subjects to study (Omar 2017). There are prestigious professions such as law and medicine which are fronted to the learners by parents. This pressure is likely to influence the learner's choice on whether to study physics (CEMASTE 2015). The study seeks to establish if parental participation contributes to students enrolment in physics in Meru south subcounty. Considine and Zappala (2007) in Australia and Mekonnen (2014) in Ethiopia, identified some learner factors that affect learners attitudes towards science in general. These factors were categorized under gender, personality traits

curriculum variables and teacher characteristics. Lack of confidence in the knowledge a learner processes may affect his/her level of activity in the classroom which results into passiveness and lack of interest in a subject. Girls activity and interest in science activities has been observed to be lower than that of boys when other factors are held constant (Akanbi,2010). Learners backgrounds play a key role in the learners readiness to pursue a course or subject. Ministry of Education Science and Technology (2007) and Munene (2007) established that students from urban backgrounds have significantly better academic orientations and interests than their counterparts from rural and remote backgrounds. According to Aina and Adedo (2013) learner's interest and motivation causes learners to make the choices they make during subject selection. As a result of interaction with peers a learner may develop interest in a subject of study. Past performances may have an effect on how learners perceive a subject. If others have not performed in the past then "we" may as well fail in future (Orodho 1996, Okpala 1988). Persistent low performance in a subject may lead to a low attitude in the subject hence lowering the academic learning time in that subject resulting into low performance and eventually no drive in the learner to study the subject (Nderitu, 2007).

Statement of the Problem

We live in a world that is increasingly dependant on Physics since technological advances are being fueled by discoveries and applications of physics knowledge. Unfortunately the number of students getting interested in studying physics is going down. The continuous low enrolment in physics is affecting the contribution of science in national development and the achievement of vision 2030 and sustainable development goals. This study addresses the gap in Meru South Subcounty by exposing the perceptions of teachers and students on causes of low students' enrolment in Physics. The information gathered will be useful in proposing possible mitigations against the declining rate of students' enrolment in Physics.

Purpose of the Study

The purpose of the study was to find out the perceived causes of students' low enrolment in physics among secondary schools in Meru south sub county.

Objective of the Study

To determine if selected factors cause students' low enrolment in Physics in day co-educational secondary schools in Meru South subcounty

Research Questions

- i. Do school related factors cause students' low enrolment in physics in day secondary schools in Meru South?
- ii. Do home related factors cause low students enrolment in physics in day secondary schools in Meru South?
- iii. Do learner related factors cause low students enrolment in Physics in day secondary schools in Meru South?

METHODOLOGY

Research Design

The study adopted a descriptive survey research design. The design was suitable to this study since it allowed collection of data necessary for establishing causes of low enrolment by physics students. The study was carried out in Meru South subcounty located in Tharaka Nithi county of Kenya. This subcounty has many coeducational day secondary schools which are accessible. There is reasonable distribution of qualified teachers in the schools so under a normal circumstances it is expected that physics subject is taught in all the schools. The county consists of 37 day secondary schools. The study was done on 220 form three students and 10 teachers in a sample consisting of 10 coeducational schools obtained by simple random sampling. Two questionnaires were used in data collection. Questionnaire A containing items on students' perceptions on causes of students enrolment in physics was used to collect data from the students while questionnaire B on teachers perceptions on causes of students' enrolment in physics was used to collect data from teachers. Collected data was analysed using SPSS software version 22. Descriptive analysis such as mean, standard deviation, frequencies and percentages were extracted. Correlation analysis (pearson product moment correlation coefficient) was undertaken to establish the nature and magnitude of association between study variables.

RESULTS AND DISCUSSIONS

The results obtained are represented on frequency tables and discussed in the succeeding sub Sections

Gender of the student respondents

Results on the gender of the student respondents are represented in Table 2.

Table 2: Gender of the student respondent

	Frequency	Percent	Valid Percent
Male	106	52.0	52.0
Female	98	48.0	48.0
Total	204	100.0	100.0

Male and female students who responded were 106 and 98 corresponding to 52% and 48% respectively. This clearly shows that male students were more than female students but each gender was adequately represented.

Students' Year of Birth.

The age of an individual determines how the individual perceives a situation. The results on the year of birth are as shown in Table 3.

Table 3: Year of birth of the student respondent

	Frequency	Percent	Valid Percent
1994	1	0.5	0.5
1995	2	1.0	1.0
1996	3	1.5	1.5
1998	9	4.4	4.4
1999	20	9.8	9.8
2000	52	25.5	25.5
2001	50	24.5	24.5
2002	47	23.0	23.0
2003	16	7.8	7.8
2004	4	2.0	2.0
Total	204	100.0	100.0

Majority of the students were born in the year 2000 (52) with a percentage of 25.5 followed by 2001 (50) with a percentage of 24.5 and 2002 (47) with a percentage of 23.0 and the least being born in the year 1994 (1) with a percentage of 0.5. Thus majority of respondents were between 17 and 19 which is within the required level of maturation for the form three syllabus.

Gender of the Teacher Respondents

Students perceptions on a subject may be influenced by gender of the teacher.

Results on the gender of the teacher respondent are presented in Table 4.

Table 4: Gender of the teacher respondent

	Frequency	Percent	Valid Percent
Male	7	70.0	70.0
Female	3	30.0	30.0
Total	10	100.0	100.0

70% of the respondents were male teachers (7) and 30% were female teachers (3) showing that there is disparity among the teachers in terms of gender.

Teachers' Experience in Years

Teacher's performance improves with the period of service of the teacher. The study sought to find out more about teacher's experience. Table 5 shows the number of years of experience of the teacher respondents.

From a total of ten teachers 5 teachers had more than 5 years of experience, with the longest serving teacher having 25 years of experience. The remaining 5 had less than 10 years of experience. This represents almost even representation of teachers of physics in terms of experience.

Table 5: Teachers' Experience in Years

	Frequency	Percent	Valid Percent
1	1	10.0	10.0
2	1	10.0	10.0
3	1	10.0	10.0
4	1	10.0	10.0
6	1	10.0	10.0
10	1	10.0	10.0
16	1	10.0	10.0
17	1	10.0	10.0
20	1	10.0	10.0
25	1	10.0	10.0
Total	10	100.0	100.0

Students' Perceptions on School Related Causes of Low Enrolment in Physics

Some causes of students perceptions are related to the school practices and policies. The study sought to find out more about school related causes of students' low enrolment in physics. The data on table 6 shows the students perceptions on school related causes of low enrolment in Physics.

Table 6: Students' perceptions on school related causes

	SA F	%	A F	%	U F	%	D F	%	SD F	%	Total F/%
Many students in the school do not study physics therefore I have not selected it	34	16.7	9	4.4	10	4.9	50	24.5	101	49.5	204/100
Previous students have not been performing well therefore I fear to fail	34	16.7	18	8.8	23	11.3	63	30.9	66	32.4	204/100
Physics content is not friendly hence no need to strain	59	28.9	34	16.7	13	6.4	47	23.0	51	25.0	204/100
Other teachers discourage us from studying physics	23	11.3	15	7.4	14	6.9	64	31.4	88	43.1	204/100
My physics teacher is committed to help me understand physics	68	33.3	58	28.4	15	7.4	26	12.7	37	18.1	204/100

Majority of student (49.5%) strongly disagreed that they did not choose to study physics at form three because many students in their school did not study physics compared to 16.7% who strongly agreed. A reasonable percentage (63.3) of the students indicated that they did not fear to study physics because previous students have not been performing well in physics. Almost half of the student respondents (45.6%) admitted that physics content is abstract and unfriendly therefore they strained. Most of the students (74.5%) disagreed that there teachers discourage them from studying physics compared to 34.3% who agreed. A bigger proportion of respondents (61.7%) indicated that their teachers were committed to helping them understand physics while 30.8% reported that their teachers were not committed. From this discussion most students did not select physics based on its abstractness which concurs with CEMASTE (2015).

Teachers' Perceptions on School Related Causes of Low Students' Enrolment in Physics

The study sought to explore the teachers' perceptions on school related causes of low students enrolment in physics. Table 7 shows the responses of teachers towards school related causes of low students' enrolment in Physics

Table 7: Teachers' perception on school related causes

	SA		A		U		D		SD		Total
	F	%	F	%	F	%	F	%	F	%	F/%
Students influence each other not to study physics	3	30	4	40.0	0	0.0	2	20.0	1	10.0	10/100
Previous students have not been performing well therefore I fear to fail	4	40.0	0	0.0	0	0.0	2	20.0	0	0	10/100
Physics content is not friendly hence no need to strain	1	10.0	4	40.0	0	0.0	2	20.0	3	30.0	10/100
Other teachers discourage students from studying physics	2	20.0	3	30.0	0	0.0	3	30.0	2	20.0	10/100
Teacher of physics are not committed to helping students understand physics	1	10.0	1	10.0	0	0.0	3	30.0	5	50.0	10/100

A large percentage of teachers (70) pointed at the fact that most students do not select physics as a result of influence from other students contradicting the students' view on the same. A reasonable proportion of teachers (40%) indicated that students opt not to study physics for fear of failing since their predecessors have not been performing well. The teachers were in agreement with the students that the physics content is abstract as indicated by (50%) of the teachers. Half of the teachers indicated that teachers of physics are committed to helping the students understand physics which was in support of the students' perception.

Students' Perception on Home Related Causes of Low Students Enrolment in Physics.

The study sought to find out students' perception on home related causes of low students' enrolment in physics. Results on student's perception on home related causes are as presented in table 8.

Table 8: Student's perception on home related causes

	SA		A		U		D		SD		Total
	F	%	F	%	F	%	F	%	F	%	F/%
Environment at home helps me to study physics	34	16.7	41	20.1	22	10.8	53	26.0	54	26.5	204/100
My parents/guardians encourage me to study physics	27	13.2	32	15.7	25	12.3	59	28.9	61	29.9	204/100
I interact with senior people who perform well in physics	36	17.6	47	23.0	29	14.2	42	20.6	50	24.5	204/100
I have support materials at home to enable me study physics	36	17.6	39	19.1	17	8.3	52	25.5	60	29.4	204/100
My parents have determined a career for me which requires	24	11.8	21	10.3	18	8.8	44	21.6	97	47.5	204/100

physics

More than half of the respondents (52.5%) revealed that home environment did not help them to study physics

compared to 36.8% who found home environment supportive towards studying physics. Only 28.9% of respondents agreed that parents and guardians at home encourage them to study physics compared to 58.8% who reported no

encouragement. Majority of students (45.1%) did not interact with senior members of their families who have performed well in physics. More than half of the respondents (54.9) have no support materials at their homes to enable them study physics. Majority of students (69.1%) indicated that their parents have not determined a career for them that requires physics. This discussion is pointing at the home environments for majority of students not being supportive of students studying physics. This could be contributing to the decline in the number of students selecting physics as a choice subject. This finding agrees with Omar 2017, Muhonja 2012 and UNESCO (2015)

Teachers' Perception on Home Related Causes of Students' Low enrolment in Physics

Teachers encounter students from different home backgrounds. The study sought to find out teachers perceptions on home related causes of low students' enrolment in physics. The results obtained on teachers' perception on home related causes are as shown in table 9.

Table 9: Teachers' perception on home related causes

	SA		A		U		D		SD		Total F/%
	F	%	F	%	F	%	F	%	F	%	
Environment at home helps students to study physics	1	10.0	3	30.0	4	40.0	2	20.0	0	0.0	10/100
Parents/guardians encourage students to study physics	1	10.0	4	40.0	3	30.0	2	20.0	0	0.0	10/100
Students interact with senior members in their families who perform well in physics	2	20.0	3	30.0	2	20.0	3	30.0	0	0.0	10/100
Students have support materials at home to enable them study physics	0	0.0	1	10.0	3	30.0	2	20.0	4	40.0	10/100
Parents have determined a career for students which <u>requires physics</u>	1	10.0	3	30.0	2	20.0	3	30.0	1	10.0	10/100

Only (20%) of the teachers agreed that home environment helps students to study therefore reinforcing students' perception on the same. A similar percentage of teachers also disagreed that parents and guardians encourage learners to study physics while 30% of teachers perceived that students interact with senior people who have performed well in physics. Majority of teachers (60%) indicated that students have support materials from home. Therefore parents provide some amount of support to their children towards studying physics.

Students Perception on Learner related Causes of Students Low Enrolment in Physics

Students may influence one another when making subject choices. The study sought to investigate learner related causes on students' low enrolment in physics. Results on students perception on learner related causes of students low enrolment in physics are represented on table 10.

Almost one third (28.4%) of students expressed strongly that they do not have a liking for physics when studying it compared to 19.6% that expressed a liking for physics. Majority of students (56.3%) did not dislike physics as a result of its likeness to mathematics. Only 19.6% of students aspire to study a physics related course compared to 36.8% who are strongly not looking forward to studying physics related courses. A reasonable proportion of 49.1 % did not link the study of physics to relevant information required in life. In addition 30.4% of students strongly expressed strain while studying physics. Averagly students do not attach an interest in studying physics. This findings confirm

Teachers Perception on Learner Related Causes of Students' Low Enrolment in Physics

Table 11 shows the results for teachers perception on learner related causes of low students' enrolment.

Table 10: Students' perception on learner related causes

	SA		A		U		D		SD		Total F/%
	F	%	F	%	F	%	F	%	F	%	
I feel like am doing what I want to do while learning physics	40	19.6	35	17.2	25	12.3	46	22.5	58	28.4	204/100
I fear physics because it is like mathematics	40	19.6	39	19.1	10	4.9	48	23.5	67	32.8	204/100
I aspire to study a physics related course after KCSE	36	17.6	22	10.8	30	14.7	41	20.1	75	36.8	204/100
Learning physics informs me about life	31	15.2	54	26.5	19	9.3	45	22.1	55	27.0	204/100
I strain while studying physics	62	30.4	36	17.6	16	7.8	38	18.6	52	25.5	204/100

Table 11: Teacher's perception on learner related causes

	SA		A		U		D		SD		Total F/%
	F	%	F	%	F	%	F	%	F	%	
Students feel like they are doing what they want to do while learning physics	1	10.0	7	70.0	0	0.0	2	20.0	0	0.0	10/100
Students fear physics because it is like mathematics	4	40.0	5	50.0	0	0.0	1	10.0	0	0.0	10/100
Students aspire to study a physics related course after KCSE	2	20.0	4	40.0	3	30.0	1	10.0	0	0.0	10/100
Students appreciate that learning physics informs them about life	2	20.0	3	30.0	0	0.0	4	40.0	1	10.0	10/100
Students strain while studying physics	2	20.0	5	50.0	2	20.0	0	0.0	1	10.0	10/100

A large percentage of teachers (70%) perceived that students feel like they are doing what they want to do while studying physics conflicting the perception by students (19.6%). Almost all teachers (90%) perceived students' fear of physics to be associated with nature of physics being like that of mathematics unlike students who were on the contrary. Thus teachers' perception on the nature of physics is different from that of the students.

Half of the teacher respondents (50%) indicated that students appreciate the physics content. This is stronger than the students' perception (41.7%) on the same. The finding implies that physics content is relevant and useful to the students however, there is strain by students while studying physics as perceived by 70% of teachers which confirms the strong students' perception discussed earlier. Therefore many students opted not to study physics due to the strain experienced while studying physics this concurs with Aina & Adedo (2013), Nderitu (2007), Orodho (1996) and Okpala (1988).

Students Perception Concerning the state of Students'Enrolment in in Physics.

The study sought to find out students' perceptions on what they feel about the level of students' enrolment in physics. Table 12 shows the results of students perception concerning the state of students enrolment in physics in their school.

Table 12: Student's perception on enrolment in Physics in their school

	SA		A		U		D		SD		Total F/%
	F	%	F	%	F	%	F	%	F	%	
Students enrolment in physics is at the required standard	30	14.7	37	18.1	21	10.3	56	27.5	60	29.4	204/100
More students are getting interested in studying physics as a choice subject	35	17.2	43	21.1	18	8.8	46	22.5	62	30.4	204/100
Many students prefer biology to physics when choosing the science subjects	102	50.0	60	29.4	13	6.4	13	6.4	16	7.8	204/100

The data shows that 29.4% of the students strongly disagreed with the fact that student's enrolment in physics is at the required standard. Only 14.7% strongly agreed, 18.1% agreed, 10.3% were undecided and 27.5% disagreed. On the account that more students are getting interested in studying physics as a choice subject, 30.4% of the students strongly disagreed, 17.2% strongly agreed, 21.1% agreed, 8.8% were undecided, and 22.5% disagreed. However, 50% of the students strongly agreed with the fact that many students prefer biology to physics when choosing the science subjects. Generally students are not satisfied with the state of students' enrolment in their schools.

Teachers Perception on the state of Students Enrolment in Physics.

The study sought to establish the teachers' perceptions on their evaluation of students' enrolment in physics in their schools. Table 13 shows results for teachers perception on state of students' enrolment in physics

Table 13: Teacher's perception observation on physics enrolment

	SA		A		U		D		SD		Total F/%
	F	%	F	%	F	%	F	%	F	%	
Students enrolment in physics is at the required standard	0	0.0	1	10.0	0	0.0	5	50.0	4	40.0	10/100
More students are getting interested in studying physics as a choice subject	0	0.0	5	50.0	1	10.0	1	10.0	3	30.0	10/100
Many students prefer biology to physics when choosing the science subjects	4	40.0	5	50.0	1	10.0	0	0.0	0	0.0	10/100

Half teacher representation (50.0%) disagreed with the fact that student's enrolment in physics is at the required standard. None strongly agreed, 10% agreed, 0% were undecided and 40.0% also strongly disagreed. This is however almost similar to what students alluded concerning enrolment and standard required. On the account that more students are getting interested in studying physics as a choice subject, 50.0% of the teachers agreed, 30.0% strongly disagreed, 10.0% were undecided and the same percentage also disagreed. However, 40.0% of the teachers strongly agreed and 50.0% agreed with the fact that many students prefer biology to physics when choosing the science subjects. This implies that more students prefer to study Biology than Physics.

Students Perceptions on Most Difficult Topics in Form Two Physics Syllabus

Based on the general opinion on the order of five most difficult topics in physics, the students' perception showed that the topic on hook's law was the most difficult followed by fluid flow, reflection at a curved surfaces, magnetic effect of force, equilibrium and centre of gravity and measurement II. On the other hand, majority of teachers also pointed out that reflection at curved surfaces and hook's law were the most difficult topics. Regarding the other causes of low physics enrolment, the students pointed out that poor attitude towards physics and the physics teachers were the major causes. Others pointed out that inadequate number of trained physics teachers makes it hard for them to enroll for physics classes. However, teachers had a feeling that the introduction of very difficult topics to Form 1 and 2 syllabus resulted to low enrolment in physics by the students. In addition, teachers also pointed out that majority of students have negative attitude towards the subject and the fact that there are insufficient trained teachers of physics.

Correlation Test

This section entails the test of strength of relationship between independent variables and dependent variables. The analysis was carried out and findings presented in Table 14.

Table 14: Correlation test of variables

Variables		School related causes	Learner related causes	Home related causes	Students subject preference
School related causes	Pearson Correlation	1	0.299	0.304	0.570
Learner related causes	Pearson Correlation	0.299	1	0.630	-0.034
Home related causes	Pearson Correlation	0.304	0.630	1	0.156
Students subject preference	Pearson Correlation	0.570	-0.034	0.156	1

*. Correlation is significant at the 0.05 level (2-tailed).

The correlation between each variable and itself is 1. There is a weak positive correlation between school related causes and learner related causes (0.299) and school related causes and home related causes (0.304). However, there is an averagely positive correlation between school related causes and student's subject preference of 0.570. Learner related causes and home related causes had a pearson correlation of 0.630, implying that they were highly correlated. However, student's subject preference and learner related causes had a strong negative correlation of 0.034 and the correlation between home related causes and student's subject preference was 0.156, implying a weak positive correlation amongst them. Low students enrolment in physics is caused more by school related causes rather than home related and learner related.

CONCLUSION

The purpose of the study was to find out the students perceptions on the causes of low students' enrolment in Physics in co-educational day schools in Meru South subcounty. The study found out that

- Learners shy from studying physics due to its complex nature and mathematical nature
- Students find content on magnetic effect of electric current, reflection at curved surfaces, waves, sound and hook's law to be complex.
- Some teachers experience difficulties while teaching the topics on waves, magnetic effect, measurements 2

RECOMMENDATIONS

- A deliberate attempt to be made by the curriculum developers to create other options of Physics that are relevant to their future careers.
- The Kenya Institute of Curriculum Development (KICD) to make the Physics curriculum more learner friendly by looking keenly at the suggested areas of difficulty. Complex topics such as waves, sound, magnetic effect of electric current, measurements 2 and reflection at curved surfaces to be moved to form three syllabus.
- There is need for in servicing of teachers of physics on the main problem topic areas in physics which include waves, sound, magnetic effect of electric current and measurements 2 and reflection at curved surfaces.

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