European Journal of Education Studies
ISSN: 2501 - 1111
ISSN-L: 2501 - 1111
Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.244169 Volume 3 | Issue 1 | 2017

ANALYSING THE EFFECT OF TEACHING/LEARNING RESOURCES ON STUDENTS' ACADEMIC ACHIEVEMENT IN PUBLIC SECONDARY SCHOOLS, HAMISI SUB-COUNTY, KENYA

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Abstract:
Excellent secondary school academic achievement in Kenya is received with jubilation as this forms the beginning of lucrative careers studied at universities or colleges by students. Students failing to achieve academically well in secondary school tend to miss out in post-secondary institutions and become relegated to less lucrative jobs. This study attempted to address the perennial problem of academic achievement in secondary schools that leads to students receding in test scores. It was geared at specifically analyzing factors contributing to academic achievement in secondary schools in Hamisi sub-county, Vihiga-Kenya. The study was guided by the following objective: To establish the impact of teaching and learning resources to students' academic achievement in secondary schools in Hamisi Sub-county, Vihiga – Kenya. The study employed descriptive survey research design. The target population was 4,298 consisting of 41 Principals, 428 teachers, 3826 students, 1 DEO and 2 AEOs. Simple random sampling was used to select the teachers, students and the AEO. Purposive sampling technique was used to select the DEO. The sample size was 525 respondents consisting of 12 principals, 128 teachers, 383 students, one DEO and one AEO. Data collection tools used was structured and unstructured questionnaires, interview schedules and document analysis. Instrument validity was done through content validity whereas the test and re-test technique was used to test the reliability of the tools comparing with a Pearson Correlation Coefficient of 0.5. Quantitative data analysis was done using descriptive statistics and the data was presented using frequency counts, means and percentages with the aid of the SPSS Version 16.0. Qualitative data analysis was done thematically hence results of data analysis were presented in form of

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frequency distribution tables, bar/line graphs, and pie charts. The study established that students receded academically at the secondary schooling level as a result of factors related to Teaching and Learning Resources (TLR). It was recommended that the Government should roll out a fund to facilitate TLR production apart from encouraging the teachers to be innovative in production of these resources and that secondary schools should make achievement targets in respect to student entry behavior and work to augment this. These researchers hope that findings of this research will be vital for both Hamisi sub-county Education Office and the Ministry of Education Science and Technology in achieving the integral national goals of education which will transform the students into competitive global citizens.

Keywords: teaching/learning, resources, academic, achievement, receding test score, innovative, career

1. Background of the Study

The success of teaching and learning has been linked to availability of resources and that to support poorly performing schools, educational authorities must increase student levels and competencies by use of these resources for students to be ready for National Assessments (UNESCO, 2015). This can be done through instructional material development and allocation of resources. Resources ranging from textbooks to library books to websites, a variety of resources are available to help teachers meet the needs and pique the interest of their learners. TLR have been put into three categories of: material resources, physical facilities and human resources, (Akungu, 2014). This study focused on material resources (books, charts, computers, projectors, chemicals etc.) and physical facilities (libraries and laboratories) only. The Teaching/Learning resources may be in form of text, audio or audio-visual. MOE (2011) outlines several instructional materials such as the chalkboard, books and periodicals, wall sheets, charts, maps, atlases and globes, media such as specimens – both living and preserved artifacts, models and puzzles. Aduwa-Ogiegbaen et al. (2005) highlight resources such as; audio tape recorders, video tape recorders, slide projectors, opaque projectors, over-head projectors, still pictures, programmed instruction, filmstrips and graphs most of which are used in computer-aided teaching and learning.

MOE (2012) recognizes how important these resources are to students' academic achievement. It was noted in this report (MOE, 2012) that overcrowded classrooms due to increased enrollments had led to a strain to the resources thus compromising educational quality.

Investigations carried out by several researchers such as: Abdo and Semela (2010) in Ethiopia; Jotia and Matlale (2011) in Botswana and Dahar and Faize (2011) remained committal to the immense advantage the Teaching/Learning resources have to the teaching/learning process. They underscored the importance of instructional resources in the effective delivery of content to students by teachers in secondary/primary schools for the purpose of bettering their academic achievement. Their view was that these resources made teaching and learning easier thus upping students' academic outcomes. Wasanga and Kyala (2007) laud this fact by noting that there is a positive correlation between the availability of textbooks and students' learning outcomes. The consequence of not using these resources, as summed up by the researcher, led to students with good grades from primary school level receding in academic achievement in secondary school resulting to academic underachievement.

2. Statement of the Problem

A survey of student academic achievement on 4, 265 students in 13 randomly selected secondary schools in Hamisi sub-county reveal that 63.7 % of the students had had an entry mark of at least a C+ or 273 marks and above in KCPE in the period of 2011 – 2014. Out of the same number of students, only 38.0 % got the same grade (C+) and above in KCSE (Primary data on sample schools, 2015). This is in stark contrast to an important statement put forward by Staffolani and Bratti (2002), as cited by Ali Shoukat (2013) in his study of Pakistan's Islamia University sub-campus, on the anticipation of high performance for high student achievers upon moving to higher level of learning notably: *The measurements of students' previous educational outcomes are the most important indicators of student future achievement…*

This implies that a student scoring high grades in KCPE for instance is expected to do better at secondary school level. This is because the secondary school is expected to augment all the abilities of the students so that the students achieve higher performance (ibid). The researcher, in this vein, wondered what could have been the cause of this receding academic achievement.

3. Purpose of the Study

The main purpose of this study was to analyze impact of Teaching/Learning Resources to students' academic achievement in public secondary schools in Hamisi Sub-county, Vihiga County - Kenya with specific attention on high performing students in primary school (KCPE) who could not return a higher grade in secondary school (KCSE). Such

students tend to miss out on university admissions thus jeopardizing their competitiveness for better careers in future.

4. Research Objective

This study was guided by the following objective: To analyze the impact of Teaching/Learning Resources to students' academic achievement in secondary schools in Hamisi Sub-county.

5. Research Question

This study sought to answer the following question:
What is the impact of Teaching/ Learning Resources to students' academic achievement in public secondary schools in Hamisi Sub-county?

6. Research Design

This study adopted a descriptive survey research design. Kombo and Tromp (2000) cite Kerlinger who paid credence to the use of this research design. They inform that a descriptive study not only restrict itself to fact findings but also aid in generation of knowledge and solutions to pertinent problems. The studies involve classification, analysis, comparison and interpretation of data collected.

The descriptive survey design was preferred as it is used to explain the existing status of the two variables. Descriptive research permits the explanation of phenomena as they naturally transpire and without intervention from the researcher. Both qualitative and quantitative data will be sought and manipulated accordingly.

These researchers were in favour of this design in view of the fact that data to be collected included: respondents' opinions among other issues which, according to Orodho and Kombo (2002) can easily be collected and manipulated using the design in question.

6.1 Target Population

This study targeted 41 public secondary schools within the sub-county which had been presenting candidates for the KCSE examination for the past four years (2011-2014). In addition, a total of 3,826 students (both boys and girls), 41 Principals, one DEO and two AEO's in Hamisi sub-county also participated in the study. The summary is as in the table below. In total, the research targeted 4,298 persons.

Table 1: Target Population (N = 4,298)

Divisions	Schools	Principals	Teachers	Students	DEO	AEO
Tiriki West	24	24	251	2581		1
Tiriki East	17	17	177	1245		1
Totals	**41**	**41**	**428**	**3826**	**1**	**2**

Source: DEO's Office, 2015.

6.2 Sample Size and Sampling Procedures

The researcher used simple random sampling to select 12 public secondary schools, 12 Principals, 128 teachers and 383 former secondary school students (years 2011-2014). The use of simple random sampling was applied because it gives each member of a population an equal chance of being selected (Kombo and Tromp, 2000). It also allows for the generalization of the yielded data and subsequent findings to the entire population. Stratified random sampling was used to classify public secondary schools into two divisions i.e. Tiriki West and Tiriki East. These homogeneous sub-groups so created allowed for proportional representation of the population sub-groups (Kombo and Tromp, 2000).

Purposive sampling procedure was used to select one District Education Officer (DEO). One Area Education Officer (AEO) was selected using simple random sampling. Naisuma's (2000) Coefficient of variation was used to select sample size of public secondary schools, teachers and students .The sample size of between 20%-30% is same as that proposed by Best and Khan (2003). Such sample size is ideal in providence of reliable data when selected randomly. Therefore, in this study, the schools, Principals and teachers was selected using the figure recommended above. For the students, Kombo and Tromp (2000) recommendation of a 10% - 30% sample size was used. Thus:

Table 2: Sample size (n = 525)

Divisions	Schools	Principals	Teachers	Students	DEO	AEO
Tiriki West	7	7	75	258	1	1
Tiriki East	5	5	53	125		1
Totals	**12**	**12**	**128**	**383**	**1**	**1**

Source: DEO's Office (2015)

6.3 Data Collection Tools

The researcher used questionnaires, interviews and document analysis.

6.4 Validity and Reliability of Instruments

As Wiersma (1995) puts it, content validity is used to establish representation of the items with respect to the objective of the study. Content validity, in this study's tools, was arrived at by having expert knowledge input from lecturers from Mount Kenya University, Masinde Muliro University of Science and Technology and Egerton University. Test and retest technique was used to achieve reliability of the tools.

6.5 Data Collection and Analysis

The researcher prepared the questionnaires for teachers, principals and students. The questionnaires had three sections. Section one dealt with demographic data of the respondents including gender and age while the second section had queries related to teaching and learning resources. Data analysis was done using descriptive statistics hence Quantitative data was presented using frequency counts, means and percentages with the aid of the SPSS Version 16.0. Qualitative data was analyzed thematically hence results of data analysis were presented in form of frequency distribution tables, bar graphs, and pie charts

7. Findings and Discussion

7.1 Demographic Data

7.1.1 Gender of Respondents

The number of male teachers exceeded that of females' in that 67(55.4%) represented males while 54(44.6%) were females. As regards principals, 3 (25.0%) were females while 9 (75.0%) were males. Regarding students, males stood higher at 182(58.4%) while the female student number was 129(41.6%). Both the DEO and the AEO were male. Table 3 shows the gender distribution of the respondents who took part in the study.

Table 3: Gender of respondents

Category of respondents	Total number	Male	Female
Principals	12	9 (75.0%)	3 (25.0%)
Teachers	121	67 (54.5%)	54 (44.6%)
Students	311	182 (58.4%)	129 (41.6%)
DEO	1	1 (100%)	0 (0.0%)
AEO	1 (100%)	1 (100%)	0 (0.0%)

Source: Fieldwork (2016)

The higher number of males as shown in the table and figures above could suggest that there were more males among the target population than females. The finding is true to

what World Bank (1998) report on overall status of women in Africa. Women's participation in national educational systems is biased due to the socio-cultural and economic environments. Women are seen to be inferior and even the political environment does not favour them. They lag behind almost in all aspects, education notwithstanding. It is largely assumed that educating women would make them too independent thus make them deviate from their roles such as looking after the children, their husbands and the homestead (World Bank, 1998).

7.1.2 Age of Respondents

Regarding the age of respondents, table 4 below shows the age of principals, teachers, the DEO and the AEO while the next one, table 5, shows the ages of the students who took part in this study.

See tables 4 and 5 below.

Table 4: Age of Respondents – Principals, Teachers, DEO and AEO

Category of Respondents	**Age brackets**				
	30 or below	**30 - 39**	**40 - 49**	**50 or above**	**Total**
Principals	0 (0.0%)	3 (25%)	5 (41.7%)	4 (33.3%)	12 (100%)
Teachers	38 (31.4%)	47 (38.9%)	31(25.6%)	5(4.1%)	121 (100%)
DEO	-	-	1 (100%)	-	-
AEO	-	-	1 (100%)	-	-

Source: Fieldwork (2016)

Table 5: Age of Respondents – Students

Age Bracket	**15 – 17**	**18 – 19**	**20 – 21**	**Above 21**	**Total**
No. of students	24 (7.7%)	190 (61.1%)	61 (19.6%)	36 (11.6%)	311 (100%)

Source: Fieldwork (2016)

As indicated in the tables above, this study established that none of the principals was aged below 30 years. Most principals, 5(41.7%) were aged 40 – 49 years while 3(25%) principals had their age lying within bracket 30 – 39 years. The largest number was 5 (41.7%) whose age fell between 40 – 49 years while 4(33.3%) principals had their ages at 50 or above. Considering this age brackets, it was worthwhile noting that all the principals were mature individuals whose median age revolved around 40 - 49 years.

Studies carried out on age and decision-making suggest that adults (persons above 26 years) have developed varied and sophisticated ways to contrast the elements that affect a decision (Maria et al., 2007). This could be the result of past exposure and experiences. Having the highest number (41.7%) of principals within the age bracket of 40 – 49, the researcher opined that these principals were better placed to lead the

schools in Hamisi sub-county well. On the side of teachers, 38 (31.4%) were aged 30 years and below. A total of 47(38.9%) had ages between 30 – 40 years, 31 (25.6%) had ages between 40 – 49 years. 5(4.1%) teachers were aged above 50 years. For students, 24(7.7%) were aged between 15 – 17 years. A total of 190 (61.1%) were between 18 – 19 years of age with a total of 61 or (19.6%) falling in the 20 – 21 age bracket. Finally, 36 students, 11.6%, were above 21 years of age at the time they did their KCSE. Both the DEO and the AEO had their ages between 40 – 49 years.

7.2 Availability of Teaching and Learning Resources

The following data were captured from the schools on the status of the teaching and learning resources in schools in Hamisi Sub-county for the period 2011 – 2014.

The first research objective and question sought to analyze the effect of Teaching/Learning Resources to students' academic achievement in public secondary schools in Hamisi Sub-county. The collected and analyzed data revealed that secondary schools in this sub-county were endowed differently with instructional resources. See the findings tabulated in table 6 and also shown in Figure 1 graphically.

Table 6: Principals Responses on Teaching/Learning Resources

	AVAILABILITY/ ACCESSIBILITY			
	YES		NO	
	Number	%	Number	%
School Library and Library services	5	41.7	7	58.3
Laboratories (For all science subjects)	3	25.0	9	75.0
Equipment (Computers, medical kits…)	4	33.3	8	66.7
Course and Exercise books	8	66.7	4	33.3
ICT (Internet / Intranet connection)	1	8.3	11	91.7

Sources: Fieldwork (2016)

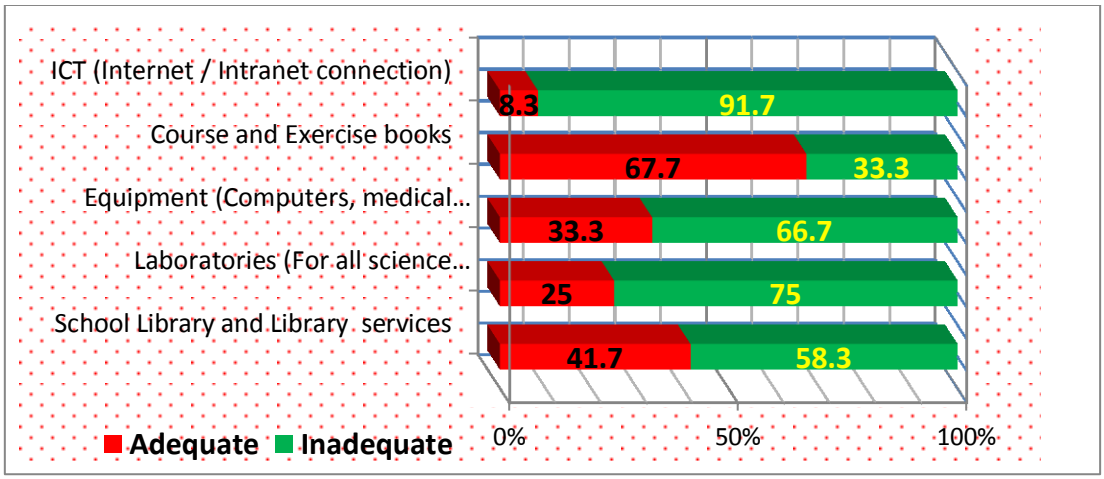

Figure 1: Principals' Reponses to on Teaching/Learning Resources

Sources: Fieldwork (2016)

These data indicated schools in Hamisi sub-county were ill-equipped with instructional resources (Teaching /Learning aids) and facilities. Data in table 6 was analyzed vis-à-vis that in table 7 below. Most principals 9(75.0%) indicated that laboratories for all science subjects were not in their schools. This was supported by 92(76.0%) of the teachers (see table 7 hereunder). The other 29(24.0%) of the teachers indicated that schools had enough laboratories. As regards the library and library services, a similar problem was seen with 7(58.3%) of the principals lamenting lack of same. Most teachers also seemed to agree with the principals in that 78(64.5%) of them said that this facility and services were missing in their schools. Only 1(8.3%) school had ICT (Internet / Intranet connection) and infrastructure. This meant that a majority of the schools at 11 or 91.7% lacked ICT.

Equipment such as computers and medical/ fast aid kits were present in only 33.3% of the schools. Schools were however well equipped with course and other reference books as evidenced by 8(66.7%) of principals and 68(56.2%) of the teachers agreeing that books were available and accessible. Data was also collected from teachers on this very aspect of availability of teaching/learning resources (instructional resources).

The teachers' responses on the aspect were as indicated in table 7 below. The values discussed in the preceding paragraph, as mentioned, are indicated in the table. The same data was also presented graphically in Figure 2 for a clearer view.

Table 7: Teachers' Responses on Teaching/Learning Resources

Teaching/Learning Resources	**AVAILABILITY/ ACCESSIBILITY**			
	YES		**NO**	
	Number	**%**	**Number**	**%**
School Library and Library services	43	35.5	78	64.5
Laboratories (For all science subjects)	29	24.0	92	76.0
Equipment (Computers, medical kits…)	39	32.2	82	67.8
Course and Exercise other Reference books	68	56.2	53	43.8
ICT (Internet / Intranet connection)	11	9.1	110	90.9

Source: Fieldwork (2016)

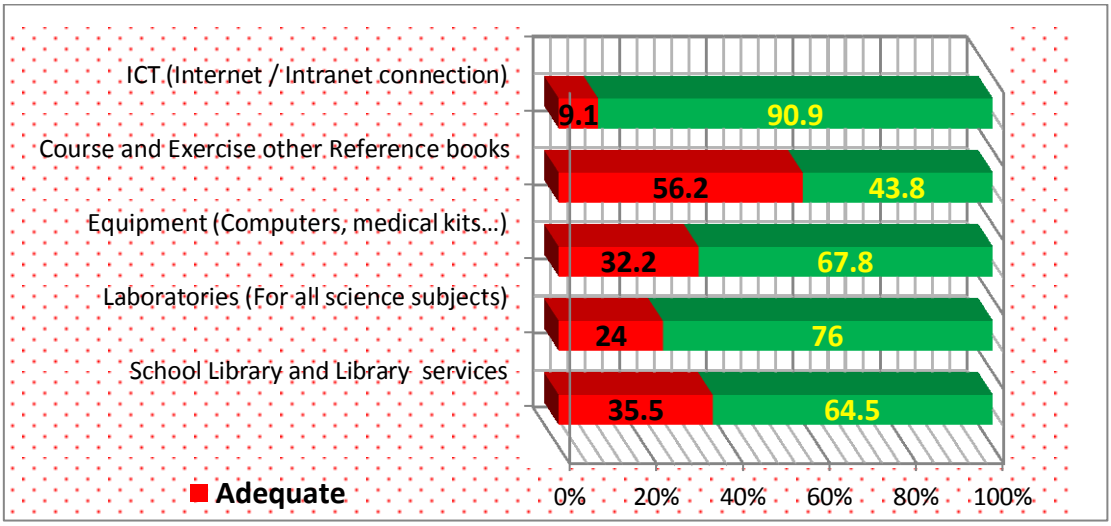

Figure 2: Teachers' Responses on Teaching/Learning Resources

Sources: Fieldwork (2016)

Students gave their take on the availability of these resources and facilities. Through questionnaires, the students gave data that were summarized in table 8 below and also presented in figure 3 graphically.

Table 8: Students' responses on Teaching/Learning Resources

Teaching/Learning Resources	AVAILABILITY/ ACCESSIBILITY			
	YES		NO	
	Number	%	Number	%
School Library and Library services	84	27.0	227	73.0
Laboratories (For all science subjects)	135	43.4	176	56.6
Equipment (Computers, medical kits…)	55	17.7	256	82.3
Course and Exercise books	212	68.2	99	31.8
ICT (Internet / Intranet connection)	16	5.1	295	94.9

Source: Fieldwork (2016)

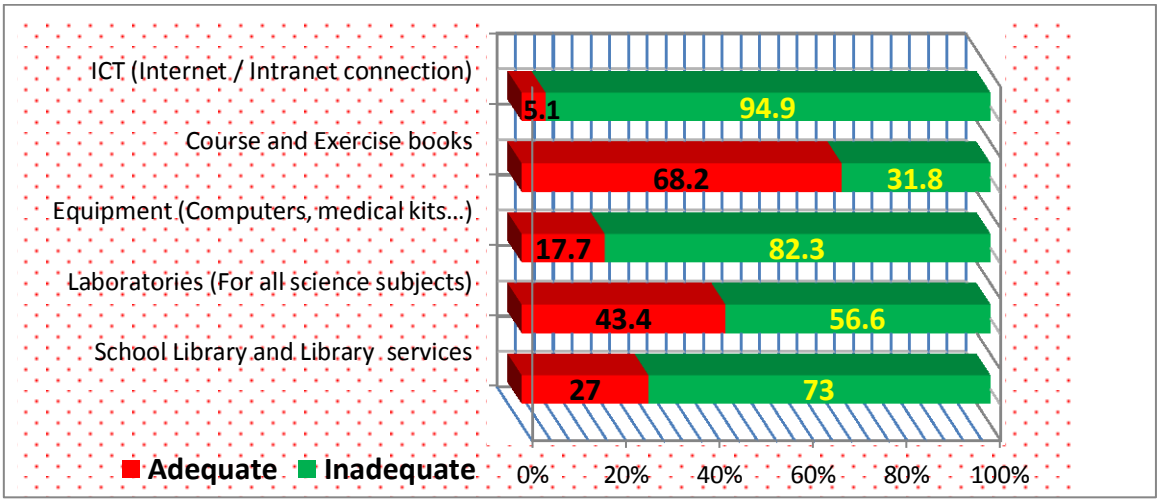

Figure 3: Students' Responses on Teaching/Learning Resources

Sources: Fieldwork (2016)

Table 8 above shows data on availability of teaching and learning resources supplied by student respondents. If the data were compared to that from principals and teachers as presented above, one should notice great similarities. In other words, most students generally agreed that secondary schools in Hamisi sub-county had limited resources such as: laboratories (135 students or 43.4% agreed to have had them in their schools), ICT (with only 16 or 5.1% agreeing), school library and library services (only 84 students/27.0% said these were available). Most schools seemed to have course and Exercise books as indicated by 73.0% (227) of the students agreeing that to the availability and accessibility of the books**.**

It should be noted (as outlined in earlier) that the success of teaching and learning has been linked to availability of resources and that to support poorly performing schools, educational authorities must increase student levels and competencies by use of these resources for students to be ready for National Assessments (UNESCO, 2015). However, with the immense importance of a school library in any educational institution, the curious case of 7(58.3%) of the principals and 78(64.5%) of the teachers lamenting lack of libraries in their schools remained intriguing. Students were denied this important facility and service and this affected their academic achievement negatively. Paradoxically, some schools had turned classrooms into laboratories which worse still housed the three science subjects albeit the minute space. Lack of Information Communication and Technology (ICT) infrastructure, specifically internet and/or intranet connectivity, in schools hindered teaching and learning through the web.

The interviews carried out on the Principals revealed that 5(41.7%) of the schools had library structures but did not have enough reading materials. 4(33.3%) postulated that libraries in their schools had been converted from former classrooms and thus their location did not provide conducive reading environment for the limited books in these very libraries. Asked about the availability of reference books and materials e.g. atlases, charts and dictionaries, a large percentage 10(83.3%) agreed that these were fairly stocked but yet to reach the required student-book ratio.

It became evident that school libraries in these schools were lacking in quality going by what Hannele et al. (2002) highlighted as the objectives of a school library in a school in an article titled *A Good School Library*. The objectives so mentioned are: Creating an aesthetically pleasing as well as practical learning environment, provide access to sources of varied, current and useful information for both pupils and teachers and thirdly to encourage reading for pleasure. A high number, 11(91.7%), of the schools did not have computers for use in computer-aided teaching and learning. The few that were present were meant for office use only. Only 1(8.3%) had a computer lab in which

students could do their studies. There were no projectors in any of the schools for computer-aided teaching as conceptualized in the National ICT Strategy for Education and Training, (MOE, 2006). Both the DEO and AEO were asked to elucidate the status of teaching and learning resources in the schools and their role in bringing into place these resources. They were categorical that during their school visits, they discovered that these resources were inadequate while some were in dilapidated state in many of the schools but they always encouraged improvisation or procurement of the same.

Regarding laboratories, 3(25%) of the interviewed principals said that schools had well-furnished and separate laboratories for all the three science subjects (Biology, Physics and Chemistry). As affirmed by the principals for these schools, students and teachers had ample time during lessons on top of having enough resources. This, as per the principals, led to high academic achievement of their students in these subjects. With two-in-one laboratories, 7(58.3%) schools implied that two science subjects were housed under one room. This was seen to cause despicable trauma to learning by students especially when two different classes were to use the facility at the same time. One principal was quoted as saying:

> *"It becomes entirely difficult when students are to learn how to pay attention to their Chemistry teacher when the Biology teacher is busy on the other side of the room teaching. At times, either of the lessons is postponed but may not be taught at the later scheduled date or time."*

In the same vein, 2(16.7%) of the schools had converted what initially were classrooms into laboratories which in themselves remained ill-equipped. As observed, there was a serious deficiency of the teaching learning resources in schools in Hamisi sub-county. This impacted negatively to the students' academic achievement with only a few students who were lucky to have these resources in their schools benefiting.

8. Summary of the Major Findings

The study found out that there were challenges in schools as regard the TLR resources, 7(58.3%) of the principals, 227(73.0%) of the students and 78(64.5%) of the teachers said that library facilities and services were missing in their schools. Principals, through interviews, revealed that 5(41.7%) of the schools had library structures but did not have enough reading materials. A further 4(33.3%) postulated that libraries in their schools had been converted from former classrooms and thus their location did not provide conducive reading environment. Both the DEO and AEO said that during their school

visits, they discovered that TLR resources were inadequate while some were in dilapidated state in many of the schools. They could only encourage teachers to improvise or procure the same.

Most principals at 9(75.0%) indicated that their schools lacked laboratories for all science-related subjects. This was supported by 92(76.0%) of the teachers with a relatively larger number of students, 176(56.6%), also saying that their schools did not have laboratories. During interviews with the principals, 7(58.3%) said that they had two-in-one laboratories implying that two science subjects were housed under one room. Only 3(25%) of the interviewed principals said that schools had well-furnished and separate laboratories for all the three science subjects (Biology, Physics and Chemistry).

As regards the next aspect under TLR and facilities, only 1(8.3%) school had ICT (Internet/Intranet connection/computers) infrastructure. This finding is based on interviews carried out on principals. Only a meager 16 or 5.1% of the students agreed that ICT infrastructure was available in their schools while 256(82.3%) of the students did indicate that their schools lacked ICT infrastructure to aid teaching and learning. There appeared to be positivity as regards course and other reference books in schools. This was so as evidenced by 8(66.7%) of principals and 68 (56.2%) of the teachers agreeing that course books were available and accessible. Many students, precisely 212 (68.2%), agreed that course and exercise books were available and accessible. This, the researcher observed was as a results of government capitation in which monies are allocated to purchase textbooks and other stationery. It is reference books and materials for example atlases, charts and dictionaries that seemed missing. Most principals interviewed, 10(83.3%), agreed that these were fairly stocked but yet to reach the required student-book ratio.

9. Conclusions

1. Students' academic achievement in public secondary schools in Hamisi sub-county is very low. That these secondary schools do not add value to many of the students who get admitted there from primary school. Put simply, students get admitted with high grades but fail to replicate these grades at the secondary schools' KCSE examination.
2. It was found out that teaching and learning resources were not sufficient in schools. Notably, books and reference materials and computers were inadequate in these schools. Laboratories and library structures were present in most schools but they remained ill-equipped. Some libraries had been converted from

previous classrooms. Many schools did not have separate laboratories for the three science subjects.

10. Recommendations

1. The government should create and roll out a fund specifically for teaching/learning resource production through the Sub-County Education Offices and ensure these officers participate in availing these resources to schools.
2. Secondary schools should be encouraged to make academic achievement targets in respect to students' entry behaviour so that the schools and students always work to augment these previous test scores. This will solve the problem of academic underachievement.

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