School Administration Support Systems for Educational Technology Adoption and Students' Academic Achievement in Secondary Schools in Kenya

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ABSTRACT

Adoption of technology in instruction requires the unconditional support of school administration. Certain mandatory pillars of support services must be in the right place for educational technology adoption by teachers to take place. Studies seem to suggest that technology adoption in schools has been impeded by the lack of support by school administrations. Such bottlenecks include the inability to purchase and maintain the required technology infrastructure, a lack of teacher motivation, the failure of schools to be adaptable to technological trends, and the inability to provide technical services. The purpose of this study was to find out the school administration support systems that enable the adoption of educational technology in secondary schools in Kakamega County, Kenya. A descriptive survey guided the research. From a population of 3305, a sample of 461 teachers, 138 heads of departments, 77 principals, and 67 technicians was obtained using stratified sampling techniques. Data was collected using a questionnaire, observation schedule, and interviews and analysed both qualitatively and quantitatively. Simple linear regression was used to analyse quantitative data. The findings revealed that schools seem not to provide sufficient technological support systems to allow for the adoption of educational technology, thereby negatively influencing academic achievement. Nevertheless, technological support systems had a significant influence on students' academic achievement ($t = 2.040$, $p < 0.05$). Therefore, the study recommends that schools put in place a technological support system that effectively enables the adoption of educational technology.

Keywords: Academic Achievement, Educational Technology, Technological Support Systems

I. INTRODUCTION

The 21st century has been characterised by technological explosion in all spheres of life, with critical changes in the workplace environment (UNESCO, 2011). However, the education sector has been slow (Wekesa, 2015) to adopt and integrate technology into curriculum and instruction. There is a need to educate learners in an environment similar to the workplace. This calls for the integration of technology into curriculum and instruction if 21st century tangible skills that include the ability to collaborate with others, interpersonal skills, creativity, digital citizenship, and problem-solving skills are to be achieved among learners (Miller, 2018). Moreover, today's learners are techno-savvy and are described as digital natives (Prensky, 2001), which provides the much-needed platform for the adoption of technology in classroom instruction. Technology, combined with a student-centered constructivist mode of learning, has the potential to provide students with higher-level cognitive and interpersonal skills (Inan, 2007). Schools should provide a conducive environment to enable the adoption of educational technology. However, schools seem not to provide the needed support for teachers to facilitate the adoption of technology. This is because most schools face financial constraints, which is a major setback to the technology adoption process (Makhanu, 2010). Costs such as duty and tax levied on technology products, training of teachers, hiring technical staff, storage, repair, maintenance, and updating of technology resources make it almost impossible for schools to consider adopting technology.

A study by Chan (2002) revealed that the Malaysian government implemented measures that included the enhancement of education and training programs, the provision of an environment conducive to the development of

ICT, and the provision of incentives for computerization and automation. Similarly, a case study undertaken in secondary schools in Graham's town in South Africa identified factors that enabled the adoption of educational technology. These included sufficient hardware, appropriate software, and affordable connectivity; sufficient technical support and training; policy-related issues; the vital contribution of principal leadership and champion teachers; and ongoing teacher professional development (Hodgkinson-Williams, 2007). This support from key stakeholders, in addition to the policies, norms, and guidelines established, promotes the effective adoption and use of technology in schools. Teaching staff must be enabled to acquire skills and experiment with technology tools to fulfil pedagogical requirements in the classroom. The induction of teachers into new technologies calls for continuous professional improvement and technical support and the establishment of special centres for lesson development (Bates, 2001). All these can be facilitated by the school administration.

Various studies point to low adoption of educational technology due to challenges that affect the process (Nchunge et al., 2012; Lau & Sim, 2008; Salehi & Salehi, 2012; Yilmaz, 2011). Despite the efforts by the Kenyan government to enable the adoption of technology in schools, the education sector seems to lag behind (GOK, 2006). In a 2014 report by the Kakamega County Education Task Force, it was reported that a lack of viable and requisite facilities for effective teaching and learning using technology could be a reason for the non-adoption of educational technology (Kakamega, 2014). The major question therefore was: What is the role of the school administration in supporting the adoption of educational technology among teachers of secondary schools in Kakamega County?

The study therefore sought to address the following objective: Determine school administration support systems for technology adoption and their influence on students' academic achievement and test the hypothesis: *school administration support systems for educational technology adoption have no influence on students' academic achievement*.

II. METHODOLOGY

The study adopted a descriptive survey design and was conducted in public secondary schools in Kakamega County. Stratified sampling was used to select 794 respondents for the study, which comprised 77 principals, 138 heads of department, 461 teachers, and 67 technical staff. Data was collected using a questionnaire, observation schedule, and interviews and analyzed both qualitatively and quantitatively. The validity of the questionnaires was established through face and content validity, while reliability was tested using the Cronbach alpha coefficient of internal consistency. A reliability quotient of 0.812, 0.799, and 0.807 for teachers, HoDs, and technicians was ascertained. This indicated a high level of reliability and internal consistency of the instruments (Fraenkel & Wallen, 2010). The data collected from the respondents was analyzed using SPSS, and the results were presented in table format.

III. RESULTS

Data collected were analyzed and presented in table format while the hypothesis was tested using simple linear regression. The results are presented in various sub-themes as per the study.

3.1 School Support for adoption of Educational Technology

Heads of departments were asked whether they received support from the school to facilitate teachers' adoption of educational technology. A questionnaire was administered, and analysis was done based on the schools' performance index. During analysis, the schools were categorised based on their performance index as below 4, between 4 and 8, and above 8. This was on a scale of 1 to 12, with 1 being the least and 12 being the highest. Their responses were run against mean academic achievement.

From the data in Table 1, across the school categories, the data indicates that the school administration supports the adoption of educational technology. Since 57 (41.3%) strongly agreed and 33 (23.9%) agreed with the statement, this gives a total of 90 (65.2%) HoDs. This implies that the general support provided by the administration could increase academic achievement amongst the students, given the availability of learning tools and resources.

Table 1

School Support Systems to Adoption of Educational Technology and Academic Achievement (n=138)

Academic achievement	Support for adoption of Educational Technology									
	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%
below 4	9	6.5	8	5.8	0	0.0	5	3.6	4	2.9
between 4 and 8	44	31.9	20	14.5	5	3.6	19	13.8	10	7.2
above 8	4	2.9	5	3.6	0	0.0	4	2.9	1	0.7
Total	**57**	**41.3**	**33**	**23.9**	**5**	**3.6**	**28**	**20.3**	**15**	**10.9**

Teachers were also asked whether they received support from the school to adopt educational technology. Their responses were based on academic achievement. From the data in Table 2, teachers are not giving a clear response to whether schools support the adoption of educational technology. This is seen from the responses, since 140 (30.4%) strongly agreed and 58 (12.6%) agreed with the statement. This gives a total of 198 (43%) teachers. On the other hand, 75 (16.3%) strongly disagreed and 143 (31.1%) disagreed with the statement, for a total of 218 (47.4%). HODs seem to agree that they get support from schools to facilitate the adoption of educational technology. Teachers were non-committal since their responses were not clearly disagreeing or agreeing (difference of 4.4%). Since teachers are the implementers of the curriculum, they were of the opinion that they were not getting adequate support to enable the adoption of educational technology resources.

Table 2

School Support for Adoption of Educational Technology (n=461)

Academic achievement	Support for adoption of Educational Technology									
	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%
Below 4	14	3.0	4	0.9	4	0.9	11	2.4	16	3.5
Between 4 and 8	98	21.3	47	10.2	30	6.5	105	22.8	46	10.0
Above 8	28	6.1	7	1.5	11	2.4	27	5.9	13	2.8
Total	**140**	**30.4**	**58**	**12.6**	**45**	**9.8**	**143**	**31.1**	**75**	**16.3**

The findings in Table 2 suggest that school administration seems not to be very keen on supporting the adoption of technology in classrooms. However, from the interview sessions, the principals were of the view that teachers are getting enough support to facilitate the adoption of educational technology resources. The principals argued that the heavy workload among teachers, combined with fear of the unknown, was the main issue hindering teachers from incorporating technology into instruction. School support for teachers is a prerequisite to adopting and using technology in teaching. This implies that if teachers are not supported to adopt technology resources, then they are not motivated to integrate technology into teaching.

3.2 Internet Subscription and Availability

The study sought to find out whether schools supported adoption of technology through availing internet and paying subscription services. Data was gathered from heads of departments and teachers, and the responses were as shown in tables 3 and 4, respectively. From the data in Table 3, only 7 (5.4%) of schools with a mean of above 8 always subscribed to the internet, and the internet was always available. Few schools (18, 13.0%) with an academic mean of above 8 rarely had internet access and sometimes subscribed to internet services. This implies that very few schools can afford the internet, and therefore the academic achievement of such schools is above average, while for those that do not have the internet, their performance is below average

Table 3

Internet Availability, Subscription, and Academic Achievement (n=138)

Internet Subscription	Academic achievement	Internet availability									
		Always		Often		Sometimes		Rarely		Never	
		f	%	f	%	f	%	f	%	f	%
Always	below 4	1	0.8	0	0.0	0	0.0	1	0.7	1	0.7
	between 4 and 8	4	3.1	1	0.8	1	0.7	1	0.7	0	0.0
	above 8	7	5.4	3	2.3	1	0.7	0	0.0	0	0.0
Often	below 4	0	0.0	0	0.0	1	0.7	1	0.7	3	2.2
	between 4 and 8	1	0.8	0	0.0	1	0.7	0	0.0	1	0.7
	above 8	4	3.1	2	1.5	1	0.7	0	0.0	0	0.0
Sometimes	below 4	0	0.0	0	0.0	1	0.7	0	0.0	1	0.7
	between 4 and 8	1	0.8	1	0.8	2	1.4	1	0.7	1	0.7
	above 8	2	1.5	0	0.0	8	5.8	18	13.0	12	8.7
Rarely	below 4	3	2.3	1	0.8	5	3.6	3	2.2	5	3.6
	between 4 and 8	5	3.8	2	1.5	1	0.7	0	0.0	0	0.0
	above 8	0	0.0	0	0.0	1	0.7	4	2.9	1	0.7
Never	below 4	2	1.5	3	2.3	3	2.2	6	4.3	3	2.2
	between 4 and 8	1	0.8	1	0.8	1	0.7	2	1.4	1	0.7
	above 8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

The information presented in Table 3 was sought from the teachers, and the data is shown in Table 4.

Table 4

Internet Availability and Academic Achievement (n=461)

Internet subscription	Academic achievement	Internet availability							
		Always		Often		Sometimes		Rarely	
		f	%	f	%	f	%	f	%
Always	below 4	2	0.4	3	0.7	4	0.9	5	1.1
Often		2	0.4	2	0.4	3	0.7	9	2.0
Sometimes		1	0.2	2	0.4	4	0.9	10	2.2
Rarely		1	0.2	4	0.9	10	2.2	24	5.2
Always	between 4 and 8	21	4.6	2	0.4	8	1.7	26	5.6
Often		8	1.7	6	1.3	9	2.0	17	3.7
Sometimes		4	0.9	5	1.1	21	4.6	41	8.9
Rarely		2	0.4	27	5.9	30	6.5	99	21.5
Always	above 8	3	0.7	5	1.1	1	0.2	3	0.7
Often		1	0.2	2	0.4	1	0.2	5	1.1
Sometimes		0	0.0	1	0.2	4	0.9	9	2.0
Rarely		0	0.0	0	0.0	1	0.2	13	2.8

According to the data in Table 4, only 99 (21.5%) schools whose academic mean ranged between 4 and 8 indicated that their schools rarely had internet and the subscription was rarely done. Based on the results, schools rarely had internet services, thus limiting their use in learning. Consequently, the academic achievement was average.

3.3 Training in technology use

The study sought to find out whether resource persons were made available to train teachers. A cross tabulation of the responses with the students' academic achievement was conducted. The responses from HoDs and teachers were as shown in tables 5 and 6 respectively.

Table 5
Availability of Resource Persons, Frequency of Training and Academic Achievement (n=138)

Resource Persons	Academic achievement	Frequency of training									
		Always		Often		Sometimes		Rarely		Never	
		f	%	f	%	f	%	f	%	f	%
Termly	below 4	0	0.0	1	0.7	2	1.4	23	16.7	6	4.3
	between 4 and 8	1	0.7	3	2.2	1	0.7	4	2.9	1	0.7
	above 8	3	2.2	5	3.6	1	0.7	2	1.4	4	2.9
Yearly	below 4	1	0.7	3	2.2	3	2.2	17	12.3	1	0.7
	between 4 and 8	2	1.4	8	5.8	12	8.7	6	4.3	0	0.0
	above 8	3	2.2	2	1.4	0	0.0	1	0.7	1	0.7
Never	below 4	4	2.9	2	1.4	2	1.4	6	4.3	4	2.9
	between 4 and 8	0	0.0	1	0.7	0	0.0	1	0.7	0	0.0
	above 8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

From the data in Table 5, it can be observed that 23 (16.7%) of HoDs in schools with an academic mean of below 4 rarely had in-service training but invited resource persons on a termly basis. It should be noted that having resource persons train teachers on technology use facilitates adoption and subsequent use of educational technology since teachers will be confident in their technology skills. Having skilled teachers adopt technology leads to learners' improvement in academic performance.

The teacher responses were cross-tabulated with the mean academic achievement of the schools, and the output was as indicated in Table 6.

Table 6
Availability of Resource Persons, Frequency of Training and Academic achievement (n=461)

Availability of Resource Persons											
Frequency of Training	Academic achievement	Always		Often		Sometime		Rarely		Never	
		f	%	f	%	f	%	f	%	f	%
Termly	below 4	1	0.2	0	0.0	0	0.0	6	1.3	23	5.0
	between 4 and 8	2	0.4	1	0.2	4	0.9	25	5.4	7	1.5
	above 8	8	1.7	4	0.9	2	0.4	5	1.1	0	0.0
Yearly	below 4	3	0.7	5	1.1	4	0.9	5	1.1	43	9.3
	between 4 and 8	16	3.5	13	2.8	6	1.3	36	7.8	18	3.9
	above 8	4	0.9	3	0.7	0	0.0	2	0.4	0	0.0
Never	below 4	18	3.9	18	3.9	7	1.5	47	10.2	61	13.2
	between 4 and 8	4	0.9	7	1.5	2	0.4	14	3.0	25	5.4
	above 8	2	0.4	1	0.2	0	0.0	8	1.7	1	0.2

The data in Table 6 indicates that so many teachers (43, 9.3%) and (47, 10.2%) cutting across academic achievement categories of schools reported that either they never or rarely invited resource persons with frequency of training being yearly or never at all. This seems to suggest that teachers are not sufficiently supported to adopt technology through training. During the interviews, school principals agreed that resource persons were rarely invited due to financial challenges and other underlying issues. Resource persons are helpful as they offer refresher courses to teachers due to the dynamic nature of technology.

3.4 Availability of technical staff, Conducting repair and Maintenance of educational technology resources in schools

The study sought to find out whether the schools have technical staff and conduct maintenance on available educational technology equipment and resources. This information was collected through the use of questionnaires for teachers and HoDs. The results were as shown in tables 7 and 8 for HoDs and teachers, respectively.

Table 7
Availability of Technicians, Repairs and Maintenance of Educational Resources and Academic Achievement (n=138)

Conduct repair & maintenance	Academic achievement	Availability of Technicians									
		Always		Often		Sometimes		Rarely		Never	
		f	%	f	%	f	%	f	%	f	%
Monthly	below 4	1	0.7	0	0.0	0	0.0	1	0.7	0	0.0
	between 4 and 8	9	6.5	2	1.4	0	0.0	4	2.9	3	2.2
	above 8	3	2.2	1	0.7	1	0.7	3	2.2	2	1.4
Termly	below 4	2	1.4	0	0	1	0.7	3	2.2	0	0
	between 4 and 8	9	6.5	0	0	4	2.9	10	7.2	4	2.9
	above 8	2	1.4	0	0	0	0	1	0.7	0	0
Yearly	below 4	4	2.9	0	0	0	0	2	1.4	2	1.4
	between 4 and 8	10	7.2	8	5.8	3	2.2	4	2.9	2	1.4
	above 8	2	1.4	2	1.4	0	0	2	1.4	1	0.7
Never	below 4	1	0.7	1	0.7	1	0.7	4	4.3	1	2.2
	between 4 and 8	5	13	3	4.3	2	2.2	6	8.7	4	3.6
	above 8	0	0	1	0.7	0	0	1	0.7	0	1.4

From table 7, it can be observed that the distribution of responses indicate that schools (10, 7.2%) rarely have technicians and undertake repairs and maintenance on termly basis. These imply that schools have put less emphasis on having technical staff and also maintaining educational technology resources through servicing them.
A cross tabulation from teachers' responses was run and the results were as presented in table 8.

Table 8
Availability of Technicians and Conducting Repairs and Maintenance of Educational Technology Resources (n=461)

Repair & Maintenance	Academic achievement	Availability Technicians									
		Always		Often		Sometimes		Rarely		Never	
		f	%	f	%	f	%	f	%	f	%
Monthly	Below 4	4	0.9	2	0.4	2	0.4	1	0.2	0	0.0
	Between 4 and 8	21	4.6	18	3.9	9	2.0	8	1.7	1	0.2
	Above 8	7	1.5	8	1.7	2	0.4	1	0.2	1	0.2
Termly	Below 4	4	0.9	5	1.1	4	0.9	2	0.4	1	0.2
	Between 4 and 8	35	7.6	37	8.0	19	4.1	16	3.5	14	3.0
	Above 8	10	2.2	16	3.5	5	1.1	4	0.9	0	0.0
Yearly	Below 4	5	1.1	3	0.7	1	0.2	1	0.2	1	0.2
	Between 4 and 8	18	3.9	23	5.0	12	2.6	9	2.0	7	1.5
	Above 8	7	1.5	4	0.9	3	0.7	2	0.4	0	0.0
Never	Below 4	3	0.7	5	1.1	2	0.4	2	0.4	1	0.2
	Between 4 and 8	25	5.4	19	4.1	16	3.5	11	2.4	8	1.7
	Above 8	5	1.1	5	1.1	4	0.9	1	0.2	1	0.2

Some teachers (35, 7.6%) seem to agree that technicians are available, and others (25, 5.4%) said repairs are never conducted. From interviews with principals, technicians are only hired in science areas and not for educational technology. Additionally, it seems the cost of conducting repairs and maintenance on technology was too high for schools to afford. The data with respect to performance was average, ranging between 4 and 8.

This implies that having technical staff and conducting repairs is an essential service that enables the adoption of educational technology, leading to better academic achievement among learners. This is because teachers spend less time trying to solve technical problems or hitches that might arise and concentrate on preparing learning content suitable for learners. This way, more attention and time are given to learners, which translates to better academic achievement.

3.5 Alternative power source

A cross tabulation of the responses from HoDs and teachers on the availability of an alternative power source was run against the academic achievement, the results were as shown on table 9.

Table 9

Alternative Power Source and Academic Achievement (n=599)

Academic achievement	Alternative Power Source							
	Yes				No			
	HoDs		Teacher		HoDs		Teachers	
	f	%	f	%	f	%	f	%
below 4	3	2.2	39	8.5	75	54.3	134	29.1
between 4 and 8	5	3.6	111	24.1	21	15.2	99	21.5
above 8	23	16.7	54	11.8	11	8	24	5.2

From the data in Table 9, 134 (29.1%) teachers and 75 (54.3%) HODs indicated that there was no alternative source of power in their schools. The school's academic achievement was below 4. This data seems to imply that having a constant power supply leads to efficient use of educational technology with limited learning interruption, which could contribute to better academic performance among learners.

3.6 Security of educational technology resources by school management

The study sought to find out the security offered to educational technology resources in schools. The responses from both HODs and teachers were cross tabulated with the academic achievement of students of the schools.

Table 10

Security of Educational Technology and Academic Achievement (n=599)

Type of security	Academic achievement	Security of educational technology equipment							
		Yes				No			
		HoDs		Teachers		HoDs		Teachers	
		f	%	f	%	f	%	f	%
Security Officers	Below 4	10	2.2	29	6.3	20	4.3	61	13.2
	Between 4 and 8	27	5.9	154	33.4	30	6.5	100	21.7
	Above 8	36	7.8	62	13.4	15	3.3	55	11.9
Computer Anti-viruses	Below 4	7	1.5	50	10.8	32	6.9	44	9.5
	Between 4 and 8	14	3.0	138	29.9	54	11.7	128	27.8
	Above 8	13	2.8	64	13.9	18	3.9	37	8.0
Computer Passwords	Below 4	18	3.9	62	13.4	18	3.9	59	12.8
	Between 4 and 8	29	6.3	165	35.8	17	3.7	109	23.6
	Above 8	43	9.3	39	8.5	13	2.8	27	5.9
Encryptions	Below 4	12	2.6	62	13.4	15	3.3	43	9.3
	Between 4 and 8	40	8.7	145	31.5	18	3.9	111	24.1
	Above 8	39	8.5	69	15.0	14	3.0	31	6.7
Metallic grills on technology rooms	Below 4	22	4.8	51	11.1	20	4.3	36	7.8
	Between 4 and 8	36	7.8	155	33.6	25	5.4	125	27.1
	Above 8	28	6.1	65	14.1	10	2.2	29	6.3

From the data in Table 10, (165, 35.8%) teachers and (54, 11.7%) HoDs agreed that the most preferred security for available technology was computer passwords and anti-viruses, respectively. Most schools seem to focus the security of technology equipment on the hardware. There's a need for schools to budget and fund security measures for both software and hardware if the technology resources in schools are to be protected and subsequently used for instruction.

Makhanu (2010), as cited in Mingaine (2013), argues that costs like duties and taxes levied on technology products have made it impossible for schools with limited resources in developing countries to adopt educational technology. Additional costs, such as security and maintenance, are a challenge in most schools. Such costs make schools reconsider adopting technology in instruction.

To find out whether school administration support systems for technology adoption had an influence on students' academic achievement in secondary schools, the following null hypothesis was tested at an alpha level of 0.05 using regression analysis.

Ho_2: School administration support systems for educational technology adoption has no influence students' academic achievement

The results of the analysis are displayed in tables. The model summary table 11 shows the number of the model and the proportion of variance in the dependent variable from the independent variables. This was done by running the school administration support system against student academic achievement.

Table 11

Model Summary for Teachers' Data

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.695[a]	.719	.777	.698	1.832

a. Predictors: (Constant), school administration support systems
b. Dependent Variable: Student academic achievement

Table 12 shows the source of the variance, Regression, Residual and Total.

Table 12: ANOVA for teachers' data

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.027	1	2.027	4.160	.042[b]
	Residual	223.661	459	.487		
	Total	225.688	460			

a. Dependent Variable: Student academic achievement
b. Predictors: (Constant), school administration support systems for educational adoption technology

Table 13 shows the values for the regression equation for predicting the dependent variable from the independent variable.

Table 13

Regression Coefficients for Teachers' Data

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.559	.206		7.569	.000		
	school administration support systems for educational adoption technology	.022	.011	.095	2.040	.042	.889	1.112

a. Dependent Variable: Student academic achievement

From the tables, the simple linear regression explains 71.9% of the variation in student academic achievement, and it is significantly useful in explaining student academic achievement, F (1, 459) = 0.460, p<0.05. With one-unit increase in school administration support systems for educational technology adoption, student academic achievement increases by .022, which was found to be a significant change, t= 2.040, p<0.05. Thus we reject the null hypothesis and conclude that school administration support systems for educational technology adoption has influence on students' academic achievement.

The same was sought to be found from HODs, and the results of the analysis are displayed in Tables 14–16. The model summary table 14 output displays the number of the model being displayed and the proportion of variance in the dependent and independent variables.

Table 14

Model Summary for HODs Data

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.546[a]	.592	.615	.627	1.908

a. Predictors: (Constant), school administration support systems for educational technology adoption

b. Dependent Variable: Students' academic achievement

Table 15 shows the source of the variance, Regression, Residual and Total. The Total variance is partitioned into the independent and independent variables.

Table 15

ANOVA for HODs Data

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.112	1	.112	.285	.024[b]
	Residual	53.424	136	.393		
	Total	53.536	137			

a. Dependent Variable: Students' academic achievement

b. Predictors: (Constant), school administration support systems for educational technology adoption

Table 16 shows the values for the regression equation for predicting the dependent and the independent variable.

Table 16

Regression Coefficients for HODs Data

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.761	.344		5.116	.000		
	school administration support systems for educational adoption technology	.005	.010	.046	.533	.024	0.927	1.079

a. Dependent Variable: Students' academic achievement

From the data, a simple linear regression was fitted, and the overall model explains 59.2% variation of student academic achievement, and it is significantly useful in explaining student academic achievement, F (1, 136) = 0.285, p< .05. With one-unit increase in school administration support systems for adoption of educational technology, student academic achievement increases by .005, which was found to be a significant change, t= 0.533, p < .05. Thus, we reject the null hypothesis and conclude that school administration support systems for educational adoption technology has influence on students' academic achievement.

The study also found out from technical staff whether school administration support system has influence on students' academic achievement. A linear regression analysis was carried out at 5% level of significance to test the null hypothesis*: school administration support systems has no influence on students' academic achievement in Kakamega County*. The results of the analysis are displayed in Table 17 – 19.

The model summary table 17 output, displays the number of the model being displayed and the proportion of variance in the dependent which can be predicted from the independent variables.

Table 17

Model summary for technical staff

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.126[a]	.616	.701	.570	1.012

a. Predictors: (Constant), school administration support system

b. Dependent Variable: Student academic achievement

Table 18 shows the source of the variance, regression, residual and total. The Total variance is partitioned into the independent and independent variables.

Table 18

ANOVA for technical staff

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.345	1	.345	1.062	.001[b]
	Residual	21.463	66	.325		
	Total	21.809	67			

a. Dependent Variable: Student academic achievement

b. Predictors: (Constant), school administration support system

Table 19 shows the values for the regression equation for predicting the dependent variable from the independent variable.

Table 19

Regression coefficients for technical staff

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.374	.496		4.788	.000		
	school administration support system for educational adoption technology	-.056	.054	-.126	-1.031	.001	.800	1.250

a. Dependent Variable: Student academic achievement

In Table 17- 19, a simple linear regression was fitted to explain student academic achievement based on school administration support systems. All the assumptions of regression analysis were met. The overall model explains 61.6% variation of student academic achievement, and it is significantly useful in explaining student academic achievement, $F(1, 66) = 1.062$, $p < .05$. With one-unit increase in school administration support systems, student academic achievement decreases by -.056, which was found to be a significant change, $t(66) = -1.031$, $p < .05$. Thus, we reject the null hypothesis and conclude that school administration support systems has a significant influence on students' academic achievement.

The study findings concur with observations made by Kinuthia (2009), who found that administrators play an important role in the use of computers in Kenyan classrooms. School management must be an integral part of the technology adoption process for successful technology integration to take place (Martin, 2015). In addition, Mumtaz (2000) stated that resistance to adoption of technology in the education sector is due to among other factors, lack of support from school management. Kamau (2014) found out that lack of support from school administrators led to poor uptake of technology by teachers. This in turn affected students' academic achievement.

Mingaine (2013) stated that the school administration must be involved in provision of quality programs offered in schools. This is because the world today demands a workforce that has technology skills as a means of increasing creativity and production. Futurelab (2010) observed that investing in technology kits does not guarantee its use or what impact it will have. The school administration and the stakeholders play a key role in offering financial support. They must avail the technology tools both to learners and teachers.

Teeroovengadum (2017) found that in order to positively and significantly affect the level of technology adoption in the teaching and learning process in secondary schools, the top management of the school must support the process. However, Balanskat et al. (2007), found that factors that prevent teachers from adopting and using technology are system-level barriers which include a traditional education system that is too rigid in terms of structure; assessment of learners; restrictive curricula and organizational structure. The study suggest that the school management can remove system barriers thereby facilitating adoption of technology by teachers. In addition, Yildirim (2007) quoted lack of motivation and absence of strong leadership as key causes of poor technology uptake. On the other hand, Slaouti and Barton (2007) reported that inaccessibility to technology, inadequate time and lack of mentors are the major hindrances to technology adoption among teachers.

Availability of technological resources is one of the effective ways for teachers to adopt technology in instruction (Usluel et al., 2008: Yildrim, 2007). The internet access rate among developing countries and especially in Africa is very low (Ngwacho, 2021). Stable, reliable and moderately priced internet access is a necessary condition for educational technology adoption and use (Bates 2001). Wheeler, (2006) and Balanskat et al, (2006) agree that lack of access to technology resources including hardware, broadband, updated and technical support is a barrier to technology

adoption in schools. The high expenses of setting up appropriate infrastructure for educational technology, its ongoing maintenances, and its wastage management makes schools with limited financial resources shy away from adopting educational technology in instruction. Study findings by Mothibi, (2015) indicate that technology has a significant positive impact on students' overall academic achievements. In view of this, until there is a basic, reliable and accessible infrastructure in place, educational technology is unlikely to be a practical choice for teachers. School administrations have an important role in ensuring the needed infrastructure is in place through lobbying the government, politicians, well-wishers, non-governmental organizations and the private sector.

Most teachers apply basic technology knowledge they received during in-service training (Sánchez-García et al, 2013). Higgins and Moseley (2011) reported that investment and planning for training teachers has been viewed as an additional cost rather than as an investment for adopting educational technology. The school administration finds having a resource person a costly venture thereby denying teachers refresher courses. In addition, "fear of failure" and "lack of technology knowledge" (Balanskat et al., 2007) are some of the reasons for teachers' lack of confidence for adopting and integrating technology into their teaching. British Educational Communications and Technology Agency (Becta, 2004) stated that many teachers do not consider themselves to be skilled in use of instructional technology. In effect, they feel anxious about using technology among a class of learners who perhaps know more about technology than they do. This calls for a means to improve teacher confidence through continuous training in educational technology.

IV. CONCLUSIONS & RECOMMENDATIONS

4.1 Conclusion

The findings of the study indicate that school administration support is key in enabling adoption of technology in schools. School administration support enables seamless adoption of technology for use by teachers who integrate the same in instructional processes. With technology being adopted in instruction, learners' academic achievement is improved. This way, school administrative support has influence on learner academic achievement since the adopted technology is put in use by teachers in instruction.

4.2 Recommendations

The study recommends schools to put in place more ways to support the adoption of educational technology. This can be through offering continuous professional development in technology facilitated by the school, continuous maintenance of available technology equipment, upgrading of technology resources and availing needed technical support for teachers.

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