

## **Influence of Teachers' Attitudes on Integration of Computer Technology in Teaching of Mathematics Nakuru Town East and West Sub-Counties, Kenya**

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**Abstract:** Computer Technology integration in teaching is expected to promote academic achievement. The e-schools initiative in secondary schools by the Government of Kenya has been in existence since 2006 with the aim of improving performance through teaching methodologies. The purpose of the study was to establish the influence of teachers' attitudes on integration of computer technology in teaching of Mathematics Nakuru Town East and West Sub-Counties, Kenya. A Correlation design was used. The study population was 25 public secondary schools, 60 mathematics teachers, 25 principals and 1 County Quality Assurance and Standard Officer (CQASO). A sample of 10 SMASE trained mathematics teachers and 10 Principals were selected by purposive sampling technique and one CQASO. Questionnaires, Computer integration Lesson observational schedule and interview schedule were the main research instruments. The finding showed that there exist a strong positive relationship between Teachers Attitude with Integration of Computer Technology ( $r=0.818^{**}$ ;  $p<0.05$ ). Based on the findings, Teachers Attitude influences up to 81.8%(positive variation) in integration of computer technology in teaching of mathematics suggesting that positive attitude is desirable if integration is to be realized. It was noted that mathematics teachers rarely integrate Computer Technology in teaching due to the fact that they lack interest and majority have negative attitude towards the integration. The study recommends that teachers should maintain a positive attitude towards integration of computer technology in teaching of mathematics to accelerate its implementation.

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### **I. Introduction**

Integration of Computer Technology in teaching has been shown to result to better educational outcomes. According to<sup>1</sup> advanced tools are necessary as they help students learn by supporting computation and by giving abstract ideas a more perceptible form and Computer Technology applications are the right substantial form for secondary school. Computer Technology can support learning when appropriately integrated with teaching techniques, curriculum, and assessments<sup>2</sup>.

Research done in other countries had found that Computer Technology integration in teaching was very little in mathematics classroom and that inadequacy of Computer Technology resources, negative attitude of teachers' and teachers' level of experience are the main factors that influence integration of Computer Technology into teaching process<sup>3</sup>. This created a need for more research on those factors and several others which have not been identified that affect the performances in mathematics.

According to<sup>4</sup> factors such as educational level, age, gender, educational competence with the computer for educational purpose and attitude towards computers can influence the integration of computer technology. In this research, we discuss three factors that influence integrations of Computer Technology in teaching mathematics focusing on improving performance in mathematics by making abstract concepts easier for students.

In Kenya Certificate of Secondary Education, Mathematics performance has consistently been low among students at the secondary school level when compared to other subjects for example; in the year 2011 and 2012 Mathematics mean score was 3.040 and 3.222 respectively. Research showed that teaching quality could be improved by helping teachers to have more experience and be effective in teaching<sup>5,6</sup>. In the year 2012 Computers for Schools Kenya (CFSK) reported to have installed 18,000 computers in over 600 schools with 20 computers per school. The ICT Trust Fund had provided 200 schools with 20 computers each. The NEPAD e-schools project provided 6 schools with 20 computers each. The Rural School Project had provided 4500

computers to a number of unidentified schools. Overall, the analysis indicated that 15,450 computers had been disbursed to 1300 secondary schools out of 4000 schools.

In developed countries, Computer integration in teaching is greatly advanced while there is a lag in African countries. Findings from research show that the extent of Computer technology integration in teaching activities is very low. This poses a question on the factors that influence the integration of Computer Technology in teaching.

### Objectives of the Study

1. Establish influence of teachers' attitudes on integration of computer technology in teaching of Mathematics Nakuru Town East and West Sub-Counties, Kenya.

## II. Material And Methods

This study employed a correlation research design where many variables were analyzed in a single study and it dealt with the relationship between the independent and dependent variables. The study population consisted of 25 principals, 60 mathematics teachers and 1 CQASO from 25 public secondary schools in Nakuru Town East and West sub-counties. The study used purposive sampling to select 10 principals, 10 SMASE trained mathematic teachers based on schools which have integrated computer technology and have at least one teacher who had trained with SMASE. The researcher used purposive sampling.

Research instruments that were used to collect data were questionnaires, lesson observation schedule and interview schedule. To ensure the validity of the instruments, the researcher availed the instruments to experts on the topic who checked on the language, comprehensiveness of contents, relevance and length of the items. The researcher made adjustments in response to the comments made by the experts. Reliability of the questionnaire was established through test retest method and then accepted at Pearson value of 0.7 and above at alpha of 0.05. All the variables returned a coefficient above 0.7 indicating that they were reliable. The overall Pearson r value is 0.835 indicating that the question was reliable.

## III. Result

### 3.1 Individual Teachers' Attitude and Computer Technology integration

An analysis was conducted to examine the extent to which teachers' attitude affect integration of Computer Technology in teaching of mathematics. The total score on each item was obtained and dividing by the total frequency of respondents scored on that item. The finding is illustrated in Table 1.

**Table 1:** Teachers' Attitude towards Computer Technology Integration

Statement	SA (4)	A (3)	D (2)	SD (1)	Total Score	Mean Score
	F	F	F	F		
I have self-doubts, lack of interest or knowledge about computers	0	3	3	4	19.00	1.90
Integration of Computer Technology assist in understanding mathematics	0	2	6	2	20.00	2.00
I love the integration of Computer Technology in Teaching mathematics as it Promotes interactive classroom learning	0	3	3	4	19.00	1.90
Computer technology integration is good for private studies and not teaching	1	1	4	4	19.00	1.90
I enjoy attending refresher course on ICT	0	3	3	4	19.00	1.90
Computers enable my students to understand mathematics	1	2	4	3	21.00	2.10
I feel integration Computer Technology requires a lot of time	0	3	3	4	19.00	1.90
Students lack release time to learn how to use computers or internet to source for information	0	2	5	3	19.00	1.90
I am always willing to integrating computer Technology in	0	3	3	4	19.00	1.90
Use of Computer in teaching is tedious	0	3	4	3	20.00	2.00
I enjoy integration of Computer technology in teaching Mathematics	0	6	4	0	26.00	2.60
<b>Mean Frequency</b>						<b>2.2</b>

The finding from Table 1 shows the frequency mean of Teachers Attitude on each item towards Computer Technology integration was 2.2 indicating that teachers disagree that computer Technology enhance their teaching, also the findings revealed that 3 teachers agree that they have self-doubts, lack of interest or knowledge about computers. Other 2 teachers affirm that integration of Computer Technology assist in understanding mathematics while 8 teachers gave a contrary opinion. In addition only 3 teachers reported that they love integration of Computer Technology in teaching mathematics as it promotes interactive classroom learning. This view was consistent with 2 teachers who declared that Computer Technology integration is good for private studies and not teaching. On the other hand, it was unclear why 7 teachers disagreed that they

enjoyed attending refresher course on computer technology integration and that Computers Technology enable students to understand mathematics.

Other 3 respondents felt that integration Computer Technology requires a lot of time and 2 teachers reported that student's lack release time to learn how to integrate Computer Technology or internet to source for information. It was noted that 3 teachers are always willing to integrating computer technology in teaching. Similarly 6 teachers reported that they enjoy integration of Computer Technology in teaching Mathematics while only 3 teachers reported that use of Computer in teaching is tedious.

### 3.2 Relationship between Teachers Attitude and Computer Technology Integration

Correlation analysis was conducted to determine the existence and significance of the relationship between teachers' attitude and Integration of Computer Technology in Teaching Mathematics. Pearson correlation was used to estimate the nature of relationship that existed between the two variables of the study. Table 2 shows results of correlation analysis.

**Table 2:** Correlations between Teachers' Attitude and Integration of Computer Technology in Teaching Mathematics

	Integration of Computer Technology	Teachers Attitude
Integration of Computer Technology	Pearson Correlation Sig. (2-tailed) N	1 0.818** .004 10

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

It was observed from the analyzed data that there exist a positive and statistically significant relationship between Teachers Attitude and Integration of Computer Technology in Teaching of Mathematics ( $r=0.818^{**}$ ;  $p<0.05$ ).

### 3.3. Influence of Teachers Attitude on Computer Technology Integration

Regression analysis was conducted to determine the influence of Teachers' Attitude on Integration of Computer Technology in Teaching Mathematics and the results shows that the Adjusted R Square value is 0.335. This means that 33.5% of the variation in Integration of Computer Technology in Teaching Mathematics can be explained by Teachers Attitude.

## IV. Discussion

The finding from Table 1 shows the frequency mean of Teachers Attitude towards Computer Technology integration was 1.792 indicating that teachers strongly disagree that computer Technology enhance their teaching, although few teachers agree that they have self-doubts, lack of interest or knowledge about computers and affirm that integration of Computer Technology assist in understanding mathematics it is observed that majority of teachers gave a contrary opinion. The findings shows clearly that majority of the teachers have negative attitude towards integration of computer technology in teaching and concurs with <sup>7,8</sup> who said that experiences with technology integration highlight the teacher attitudes toward technology and technology integration seriously affected the success of professional development programs.

According to <sup>9</sup> self-efficacy beliefs determined how people felt, thought, motivated them and behaved. Efficacy involved one's own attitude or thinking about his or her ability and connected to motivation. People's thought and attitudes influence their actions and motivate them to attempt or restrain from certain behavior <sup>10</sup>. With regard to teacher effectiveness, teachers' attitudes about their teaching abilities would affect their teaching behavior <sup>11</sup>. Also the findings were strengthened more by both the principals' and CQASO views who aver that their mathematics teachers rarely integrate Computer Technology in teaching mathematics and the reasons given by the majority are that: they lack interest and majority have negative attitude towards the integration. On the other hand the findings disagree with <sup>11</sup> who found that overall attitudes towards in integration of computers were very positive.

The result of Correlation analysis indicates there exist a positive and statistically significant relationship between Teachers Attitude and Integration of Computer Technology in Teaching of Mathematic( $r=0.818^{**}$ ;  $p<0.05$ ). This infers that as teachers develops a positive attitude towards computer based learning, integration will be enhanced. It can be argued that teachers' enhanced interest and knowledge on computers, attending refresher course on Computer technology and their willingness to integrate Computer Technology in teaching will significantly enhance integration of computer technology in teaching. This finding disagrees with <sup>12</sup> in their study of teachers' integration of computers to teach mathematics, found that overall attitudes towards in integration of computers were very positive, although many of them had limited experience with computers Technologies.

## V. Conclusion

Based on the findings, Teachers Attitude influences up to 81.8%(positive variation) in integration of computer technology in teaching of mathematics suggesting that positive attitude is desirable if integration is to be realized. It was noted that mathematics teachers rarely integrate Computer Technology in teaching due to the fact that they lack interest and majority have negative attitude towards the integration

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