

EFFECT OF E-COLLABORATION SYSTEM IN TEACHING AND LEARNING ON CBC LEARNERS' PERFORMANCE IN PUBLIC PRIMARY SCHOOLS IN KILIFI COUNTY

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ABSTRACT

The basic purpose of education is to progress holistically a well- balanced and responsive individual who can bring improvement and change one- self and society today. According to past studies, there has been no significant association between e- collaboration and learners' performance in Public schools in Kenya. Therefore, this study seeks to fill this knowledge gap. The general objective of the study is to determine the effect of e- collaboration system in teaching methodology in improving CBC learners' performance in Public Schools in Kilifi County. This paper sought to assess the effect of e-collaboration on teaching methodology in the performance. This means that the study will be guided by two independent variables, a moderating variable and a dependent variable. The outcome of this study will develop literature on matters concerning e-collaboration in matters pertaining teaching methodology and the CBC curriculum especially during the post COVID-19 era. The study will also provide new insights to the Ministry of Education and policy makers in formulating better polices on teaching methodology. Two theories formed well-founded grounds significant for this study: Social Constructivist Theory and Traditional Pedagogy Theory. This study

will used descriptive research design and will focus on the total population of 85 public primary schools in Kilifi County. Sampling was be done using simple random sampling and convenience sampling which was used to get a sample size of 30% of the population giving a total of 26 Public primary schools form Kilifi County to be part of this study. A structured questionnaire was the main data collecting tool. Data was classified and analyzed by regression analysis by use of Statistical Package for Social Sciences (SPSS), (version 22.0). Descriptive and inferential statistics were also used. The effect of the moderating effect of School management and leadership on e-collaboration in teaching and learning was also applied.

Key Words: E-Collaboration, Competency Based Curriculum, Teaching, Learning, Performance

INTRODUCTION

Education is essential for the improvement of any society and is seen as a path to nurturing dogmatic and communal awareness as well as advancing the level of manpower. Education is a fundamental human right. Professional (learning) communities is a key concept, consisting of the entire school or even teachers from other schools (Birenbaum, Kimron, & Shilton, 2011). It can then be shared amongst communities of practice (Gajda & Koliba, 2008;

Rone, 2009). Brouwer, Brekelmans, Nieuwenhuis and Simons (2011) moreover reasoned that such networks progresses through time.

In the local context, the Kenyan education sector has continued to experience patterns of transformation. This change has also materialized in the whole world at large as a precondition to education, which is the principle for quality learning. Kenya vision 2030 visualizes to offer worldwide modest quality education, training and research to the citizens (Kenya, Vision 2030). A collaborative work setting appears to be the custom for each setup (Decuyper, Dochy, & Van den Bossche, 2010; Edmondson, 2013). CBC is a curriculum reform that recently has gained popularity in African countries.

An Overview of Competence Based Curriculum in Kenya

A competency-based curriculum is a programme that highlights what learners actually do and not primarily concentrating on what they are projected to know. CBC aims at enabling learners to 'learn to learn' and make available self-regulated learning competencies and greater sovereignty in learning (Wessehnik et al. 2010).

The structure is streamlined to the Constitution of Kenya and Vision 2030 which define the ambitions of the economy. The basic Education Curriculum Framework is based on pillars anchored on ideals and reinforced by theoretical approaches (KICD, 2017). Such a curriculum should hence be adaptive to learners and cater for their needs as well as of their teachers and the whole society. The developers of the CBC curriculum viewed that after the learning period, the learner achieve these competencies e.g critical thinking, digital literacy citizenship, communiqué and collaboration and self-efficacy. For this to happen, well-informed, logical, professional teachers with enhanced skills and confident in a variety of modern pedagogical tools such as teaching, facilitating, and mentoring be developed and supported (KICD, 2017).

Today, networking in a mutual manner is believed to be critical for the success of the CBC (Bryne, Downey & Souza, 2012) and Kenya is no exception. Today, collaboration between groups of workers geographically-dispersed is quickly attractive creativity and innovation (Zhang & Lowry (2018). The current LMS system is designed to facilitate learners' acquisition of skills and attitudes. This is because the key aspect of CBC is to offer real-life skills for learners and this has been a challenge to the Public primary schools teachers in Kenya (Kenya Vision 2030). In addition, the Covid-19 pandemic brought in a new dynamic of a new normal which led to the need for more and more people embracing the use of the e-teaching. Although much effort has been made by the Kenya Government, especially the concerns of the Big 4 Agenda which stipulates that each child has a right to basic quality education. There is need for more e-collaboration methods in which teachers would learn to share their content and ideas to improve learners' performance.

Finally, to achieve the vision of Technical University of Mombasa focus on solving societal problems through scientific research, a collaborative culture should be incorporated in

teaching and learning within the society so as to build support and explore as a team. Although a few studies have been done offering diverse perspectives on e-collaboration and learners performance, there does still not exist an e-learning collaboration system for use by among teachers in public primary schools. Hence, this study endeavored to fill the knowledge gap to find out ways in which teachers could use e-collaboration to exchange knowledge about teaching in order to improve CBC learners' performance in Public primary schools in Kenya.

Theoretical Review

To simplify understanding of e-collaboration in teaching and learning in Public Schools in Kilifi County the researcher presented a theoretical framework. Ochola and Le Roux (2010) postulates that it generates the experience allows a reader to make clear understanding of the link between variables.

Social Constructivist Theory

The social constructivist theory is founded on the belief that persons aggressively build knowledge and understanding a of one's world is a dynamic, mind-engaging process (Vygotsky, 1978). The proponent states that knowledge is created and that individuals learn from each another. This theory is significant to the study as it shows how a learning management system. The teacher as the learning leader, directs and gives advice. This theory shows a good foundation of theoretical knowledge, this kind of learning entails settings that support teacher collaboration. This theory inspires collective problem solving and knowledge sharing (Wilkinson, et al., 2010). Therefore, this study aims at finding out the link between e-collaboration of teachers in enhancing learners' performance in Public schools in Kenya.

The significance of this theory to the study is believed that if teachers have access to up to date information, they will create better models that will foster an association between content and their learners. In addition to motivating educators to improve their own performance, this report found that e- collaboration efforts will contribute to an all-inclusive and easily manageable infrastructure for both the teachers and their learners (Unser, 2017).

Traditional Pedagogy Theory

According to Morandi (2006) the teacher has authority over learners to follow his/her directives and build knowledge. A good teaching method takes into consideration discrete variables mostly the learning methods. Nevertheless, the cognitivist model has a significant limitation as it is not sufficient to ensure learning. Teachers assess and update their practices by using e-collaboration to learn to by networking with their colleagues (Askill-Williams, Murray-Harvey, & Lawson, 2007).

The theory is significant to this study as it presents the key ideas from the traditional pedagogy that have an influence on the learning management system. Therefore, a central place is allocated to teachers, with the essential tools to involve learners in the various activities (Morandi, 2006).

Conceptual Framework

A conceptual framework shows the link between various variables and supports the study models (Creswell, 2013). The diagram represents teaching content and instructional methods as variables to measure teaching methodology (independent variables) and learners' performance (dependent variable) as well as school Management/Leadership (moderating variable) as shown in Figure 2.1:

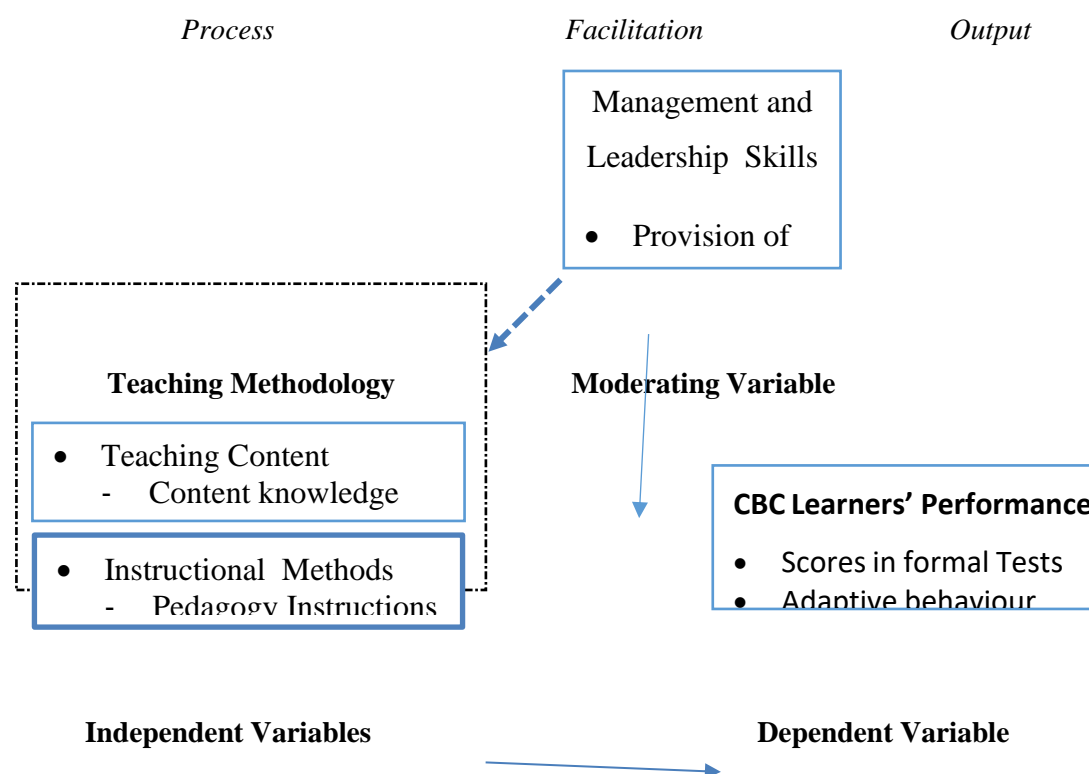


Figure 1: Conceptual Framework

Teaching Content

Likisa (2018) asserts CBC will provide an opportunity for learners to interact with the changing world of work and improvement in society. E-collaboration helps learners to appreciate and perform various activities as stated in the efforts to deliver content to learners (Fullan, 2020). This heightens attainment, managing, illustration, access, organization, changing, and safeguarding of digital content intended at enhancing learners'

performance in public primary schools(Kim, 2015). Schools and other educational institutions that enhance students' knowledge today. (Ghavifekr, Afshari & Amla Salleh, 2012). Teaching content was measured by content knowledge of the CBC teachers. This would provide vibrant and practical teaching-learning environment (Arnseth & Hatlevik, 2012). Using technology in instruction immensely contributes in real learning (Jamieson-Procter et al., 2013). System approaches are predominantly suitable for resolving design challenges at the curriculum level (Jamieson-Procter et al., 2013). According to this study educators are able to better link content to real life experience through the use of technology (Unser, 2017). To provide a competency-based curriculum, it is significant for learners to understand and apply, and can execute knowledge, skills, and abilities sought after by the industry(Kim, 2015).

H01: There is a positive and significant relationships between e-collaboration in teaching content and CBC learners' in Primary Schools.performance

Instructional Methods

Instructional methods was measured by Pedagogy Instructions. The ways and means in which teachers deliver their content in classrooms, hence integration of competency based curriculum is emergent as essential today. In addition, for e-collaboration to be operational in CBC today, it is imperative for teachers to be cognizant of the evolving skill sets of other teachers and understand that new knowledge should be integrated into the comprehensive academic CBC curriculum(Kim, 2015) This is because Incorporating instructional methods in digital versions is significant in strengthening learners' ability to comprehend content acquired. (Bunns, 2014)

According to Lassnigg (2017) CBC demands for modifications for the level for single lessons, which are normally taught by a single teacher and incorporates teams of teachers are from within or out of the school (Lassnigg, 2017). This enables the content of various subjects to be aligned with other competencies of the course.

E-collaboration would be of great significance to aid the improvement of primary teachers' professions as well as adapting to new instructional methods(Runhaar et al. 2013; Vangrieken et al. 2017). This is why Vangrieken et al (2017) asserts these instructional methods that lead to competency development are practical-oriented and should be relatively close to the actual tasks as possible. When teachers use e-collaborations to share instructional methods, it enhances sound articulations of competencies that inform and guide CBC learners accordingly(Kim, 2015).

H02: There is a positive and significant relationships between e-collaboration in instructional methods and CBC learners' performance in Primary Schools,.

Pedagogy content

CBC Learners' Performance

Scores in formal tests and adaptive behaviour

Planning the CBC by enhancing learners' performance is known for advocating cohesive cross-curricular approach where competencies are imparted by linking different disciplines (Tiana, Moya, & Luengo 2011). Many teachers support ways mainly teacher-teacher communication impacted student performance by increasing better learning methods. Türel and Johnson (2012) asserts that technical hitches are a key obstacle for teachers. For example schools in Netherland and United Kingdom have recognized the importance of e-collaboration to support teaching and learning (Yang & Wang, 2012). Due to the Unpredicted changes in the learning environs globally and the unanticipated lockdown of schools in Kenya, switching from face-to-face to online teaching called for applicable ways and means to enhance learners' performance. As has been observed across all primary schools in Kilifi County and the entire country. Teachers report that the introduction of e-collaboration systems encourages teaching, learning and the achievement of acceptable values (Drayton, Falk, Hobbs, Hammerman & Stroud, 2010). Hence, students will benefit in progressing their performance generally. Using math, as a basis for the study, researchers noted that students will be better able in solving advanced problem solving methods after the intervention of the e-collaboration with other teachers to share information.

H03: There is a positive and significant relationships between the moderating effect of management and leadership skills of e-collaboration in teaching methodology and CBC learners' performance in Primary Schools.

Study Methodology

This research adopts descriptive research design so as to answer what, where, when and how questions (Nassaji & Hossein,2015). This design is useful in portraying the relationship between the variables of a study using data collection techniques. A target population is the overall group of items or essentials of concern focused by a researcher (Kothari & Gaurav, 2014). The target population for this study was be 85 Public Primary Schools from Kilifi county. A sample of the respondents will be selected from Kilifi North, Kilifi South, Kaloleni, Ganze, Malindi, Magarini and Rabai Sub-counties in Kilifi County. Hence only the sampled Public schools will participate in this study. A sampling frame means the source material which a sample is drawn (Punch 2013). The study will seek the sampling frame from the Ministry of Education offices Kilifi County. The researcher will be issued with a list of all public schools in Kilifi County. The head teachers of the 85 public primary schools within Kilifi County will provided a list of all the CBC teachers and their phone numbers. Saunders et al. (2012) asserts that a sample is a set of respondents as a representative of a targeted population. This allows enough adequate time to collect data. This study will involve one

school from each of the seven constituencies in Kilifi County. There is a total of 86 public schools in Kilifi County. The study will use Mugenda and Mugenda (2008) asserts that the smaller the population, the larger the sampling measure required and for populations below 1,000 a ratio of 30% is worthwhile to ascertain representativeness of the sample.

$$n = 30\% * N$$

n = sample size N = population

Therefore, $30\% * 86$ (total no. of Public Schools in Kilifi county)

$$n = 25.8 \neq 26$$

Hence out of the 86 public schools only 26 public primary schools will participate in this study. Out of the 26 public primary schools two teachers will be involved in this study. The teachers will be selected through random sampling. Convenience sampling happens when data is collected from participants who are readily available to participant in the study (Saunders et al., 2012). Therefore, a total of 52 CBC teachers participated in this study. The study adopts this method to ensure that the targeted population is adequately represented in the study. This made the data collected to be more reliable, representative and accurate.

Data collection was done through questionnaires. This helps to provide answers to hypothetical inquiries and evaluate results (Kothari & Garg 2014). There will be classification of the data collected from both primary and secondary data. The study used self-administered questionnaires for data collection from CBC teachers concerning e-collaboration for teachers as shown on Appendix 1. Structured questionnaires with closed ended questions was used to gather information on study variables from the institutions. In order to quantify data, the questionnaire will consist of close ended questions measured on a Likert scale of 1-5 (Kothari & Gaurav, 2014). Two months before the data collection period, the researcher collected a letter of authorization from the Kilifi County Ministry of Education (Appendix V). The researcher also sought permission from the management of each of the public schools to collect data in their schools.

A pilot-study was carried out two weeks before the actual study. This was important as to test the validity and reliability of the data collection instrument. questionnaire is required prior of utilizing them to collect data (Saunders et al., 2012). The researcher used an exploratory design for the pilot study. The rule of the thumb that 10% of the respondents was used for the pilot study (Sekaran & Bougie, 2009). This means that only 3 respondents from sampled parastatals participated in the pilot study. The participants of the pilot study were selected by convenience sampling. The participants were not part of the participants that would be involved in the final study.

Results and Discussion

Data analysis is where data gathered is condensed to a more manageable and suitable content piece of information (Kothari & Gaurav, 2014). Data was cleaned, edited and entered into the SPSS software Version 25. The study applied descriptive statistics for a summary of the study by focusing on the variables of interest. Descriptive analysis was carried out using percentages, frequencies, mean and standard deviations to provide results for the study variables and the results.

Eighty Six (86) public primary schools comprised the total population of Parastatals in 4 selected Sub-Counties of Kilifi County in Kenya. However, only 26 public primary schools (30%) participated in the study. Further, two (2) CBC primary school teachers from each of the 26 public primary schools participated in the study. A total of 52 questionnaires were issued to 26 public primary schools in sub-counties in Kilifi County. Only 38 questionnaires were received, this represented 73.08%. Mugenda and Mugenda (2003) observes that a 60% and above is good and very good rating for 70%. The response rate of 73.08% in this case good and was satisfactory to make conclusions for this study. According to Theuri et al. (2015) this obtained similar response rates hence adequate as shown on Table 1:

Response	Frequency	Percent
Responded	38	73.08%
No Response	14	26.92%
Total	52	100%

Reliability and Validity of the Questionnaire: Reliability shows consistency and reliability results in different contexts (Saunders et al., 2012). In the context of this study the reliability test helped measure the degree of different test items review the same variable to give comparable results. Cronbach alpha values obtained for all the variables was higher than .6. The Cronbach's alpha is obtained by the formula below: Where; N = the number of items, \bar{c} = average covariance between item-pairs, \bar{v} = average variance.

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N - 1) \cdot \bar{c}}$$

The Cronbach's alpha statistic in this study for Teaching Content was .765 and Instructional methods competency skills .739, The average Cronbach alpha was .7 for all the constructs.

There exist no selection biases for this study, hence, the questionnaire was a valid instrument for the study as the actual respondents were CBC teachers from public primary schools in sub-counties in Kilifi County in Kenya.

E-Collaboration in Content Knowledge and CBC Learners' Performance

To understand the relationship between e-learning in teaching methodology and CBC learners' performance. The study performed a correlation analysis. It is concerned with associations of different variables. The study investigated correlated independent variable of Teaching Content (content knowledge) and CBC Learners' (formal test scores and adaptive behavior). It aimed at determining the extent of the relationship between.

Table 3: Teaching Methodology and CBC Learner's performance Correlations Results

		Teaching Content	Instructional Methods	CBC Learners' Performance
Teaching Content	Pearson	1	-.107	.695**
	Correlation			
	Sig. (2-tailed)		.222	.000
	N	38	38	38
Instructional Methods	Pearson	-.107	1	-.040
	Correlation			
	Sig. (2-tailed)	.323		.725
	N	38	38	38
CBC Learners' Performance	Pearson	.754**	.378	1
	Correlation			
	Sig. (2-tailed)	.000	-.003	
	N	38	38	38

The Pearson correlation coefficient generated at 0.01 significance level (2-tailed) shows correlation matrix showing the correlation analysis had varied extent of association between teaching content, instructional methods and CBC learners' performance in public primary school in sub-counties in Kilifi County in Kenya.

Table 4.2 shows that CBC learners’ performance and teaching methodology have a strong ($r=0.754$, $p=0.000$) positive relationship and CBC learners’ performance and instructional methods had a moderate ($r=.378$, $p=-0.003$) negative significant effect. Kothari (2004) the nearer the value is to 1 the greater the degree of correlation.

Other results give regression coefficients results of the moderated teaching methodology was conducted. The interaction variable between teaching methodology and management and leadership skills has a p-value of .000 ($p > .05$). It shows the moderating variable, management and leadership skills, has significant moderating effect on teaching methodology role models and CBC learners’ performance. Hence, the null hypothesis is rejected. In

summary the moderated regression model is as shown: $Y_i = 1.375 + 0.608X_1$
 (model 1)

Where X_1 is Teaching Methodology

In conclusion,, there is moderator had a significant effect on management and leadership strategies on teaching methodology public primary schools in sub-counties in Kilifi County.

In addition, Analysis of Variance (ANOVA) test was used to establish whether the model had a significant fit of the data. Creswell (2013) ANOVA tests the statement that there is any significant difference three or more sample means. It shows the assumption by comparing two estimations of the population variances. Results show a significant link exists between teaching methodology and CBC learners’ performance. ($F = 48.534$, $p = .000$) for Model 1. When moderating variable i.e. management and leadership strategies was presented, the results showed F value increased ($F = 76.657$, $p = .000$) as indicated in Model 2. P value of both models is less than .05. Predictor variables show the disparity of the dependent variable that is performance. According to Lakew and Rao (2009) where the significance value of F is more than 0.05 then the independent variables would not describe the variation in the dependent variable.

The Moderation Effect of Management and Leadership Skills in e-collaboration in teaching Methodology and CBC Learners’ Performance

The moderated regression model is stated as shown:

$Y_i = -0.951 + 1.849X_1$

 (model 2)

Where X_1 is Content Knowledge

In conclusion, there exists a moderation effect of e-collaboration in content knowledge and CBC learners’ performance in Kilifi County.

Overall Correlations Results

Pearson Bivariate correlation coefficient computed the correlation among the dependent variable i.e. leadership performance, the moderating variable, organizational culture and the

independent variables i.e. teaching methodology. Pearson’s correlation coefficient test the statistical link between two variables. This is the best method of testing the link between variables and is founded on the technique of covariance(Tabachnick & Fidell, 2007).

Pearson Bivariate correlation coefficient computed the correlation between the dependent variable(CBC learners’ performance), the moderating variable(management and leadership strategies) and the independent variable(teaching methodology). Pearson’s correlation coefficient is a measures the statistical relationship between two variables. It is best method of measuring the association between variables as it is founded on the method of covariance(Tabachnick & Fidell, 2007).

Table 4: Overall Correlation Results

		Teaching Methodology	Management and Leadership Strategies	CBC Learners’ Performance
Teaching Methodology	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	38		
Management and Leadership Strategies	Pearson Correlation	.701**	1	
	Sig. (2-tailed)	.000		
	N	38	38	
CBC Learners’ Performance	Pearson Correlation	.658**	.729**	1
	Sig. (2-tailed)	.000	.000	
	N	38	38	38

Table 4.3 presents the overall correlation matrix shows the correlation analysis and the extent of interrelationship among independent variables, the moderating variable and the dependent variable. The Pearson correlation coefficient was produced at .01 significance level (2-tailed). Findings were instituted on the variables of the study as follows:

Specifically, e-collaboration in instructional methods and CBC learners’ in public primary schools and their performance is strong and the correlation was significant ($r=.658, p<.000$). The results show that when more e-collaboration efforts are inculcated in instructional methods the better performance of CBC learners. This is consistent with Martin et al. (2020) who asserts that without good pedagogy or appreciation of learners’ varied backgrounds it would be difficult for learners’ to benefit from traditional instructional methods.

Correlation analysis was run to determine the link between management and leadership skills and CBC learners' performance in Kilifi County. The Pearson correlation coefficient was generated at 0.01 significance level (2-tailed). Moderated regression analysis aimed at determining whether teaching methodology and the moderator had a significant effect on learners' performance in public primary schools in Kilifi.

Table 4.3 shows that content knowledge has significant effect on CBC learners' performance as the p value of the slope is less than .05. It shows that the null hypothesis is rejected. In conclusion, there is significant relationship between CBC learners' performance and content knowledge. The model is presented by equation 3 as:

$$Y_i = 1.017 + 0.759X_1 \dots\dots\dots (model 3)$$

Where X_1 is content knowledge

The following hypotheses was tested to establish the moderation effect of management and leadership skills on content knowledge and CBC learners performance:

Hypothesis One

H05: There was no statistically significant moderating effect of management and leadership skills on content knowledge and CBC learners' performance in Kilifi County.

Hypothesis Two

H05: There is no statistically significant moderating effect of management and leadership strategies on teaching methodology and CBC learners' performance in public primary schools in sub-Counties of Kilifi County. Moderated regression analysis computed to empirically identify whether teaching methodology moderated with management and leadership strategies had any significant influence on CBC learners' performance in public primary schools in sub-Counties of Kilifi County.

Overall Analysis of Variance (ANOVA) Results

The results show significant relationship occurs between e-collaboration in teaching methodology and CBC learners' performance in public primary schools in sub-Counties of Kilifi County. ($F = 48.328$, $p = .000$) as shown in Model 1. When moderating variable i.e. management and leadership strategies, was incorporated, the F value increased ($F = 75.648$, $p = .000$) as indicated in Model 2. This implies a mutual understanding of the content and its significance in impact teaching and learning for CBC learners. (van Den Bossche et al. 2011).

This shows there exists a significant relationship between e-collaboration in teaching methodology and CBC learners' performance (formal test scores). This implies the predictor

variables gives variation in the independent variable of teaching methodology and management and leadership strategies on learners' performance.

Overall Analysis of Variance was used to determine any significant link between management and leadership strategies and e-collaboration in teaching methodology in public primary schools.

Conclusions and Recommendations

This study aimed to determine the influence of teaching methodology on CBC learners' performance in public schools in Kilifi County. The study generally concluded that a number of variables influence women leadership performance as demonstrated by the antecedents which are predictors of women leadership performance. Management and leadership traits was introduced as the moderator of this study. Literature shows a variety of leadership in the educational system as well as revealing a gap in literature with regard to teaching methodologies. Distinctively, exploring factors like content knowledge and instructional methods have not been exhausted. Social constructivist theory postulate that learning is explicit and takes place in a dynamic environment. These theories suggest that there exists need for manipulating the learners' contextual space by use of latest technology in order to enhance their performance. This study investigated the degree to which e-collaboration influences content knowledge and instructional methods in enhancing CBC learners' performance. The results showed that preparation of CBC lesson plans across schools helps in affirming content which plays a key role in enhancing teaching instructional methods. It can also be concluded that as the percentage of teachers rises then the CBC learners enhance their learning skills. The contributions made by teachers from different primary schools' aids in teaching CBC better. A vast majority of respondents also agreed that e-collaboration positively supports teachers' instructional methods.

Recommendations for policy

The current study commends that a relative analysis between public and private primary schools is out on teaching methodology and CBC learners' performance. This analysis would provide answers to the variation that exists between these schools in terms of teaching methodology. The study also recommends that the Ministry of Education should establish policy guidelines to boost the incorporation of team learning between schools. It will enhance the learners' capacity in grasping new material exposed to them.

Suggestions for Further Research

The study recommends that future research to focus on determining the influence of e-collaboration on teachers' performance. This would provide the need to address emerging problems that exist in the teaching-learning environment. Further research can also focus on

organizational culture and its influence on teaching methodology in public schools. This may provide open discourse on the value of e-collaboration in public schools.

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