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INFLUENCE OF STRATEGIC HUMAN RESOURCE DEVELOPMENT ON PERFORMANCE OF HIGH SCHOOLS IN BUSIA SUB-COUNTY, KENYA

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ABSTRACT: *Strategic human resource development (HRD) has been emphasised as a key contributor to ensuring organisational effectiveness and the maximum return from their most important asset; the people. Organisations that are seeking not only to survive, but to maximise operational effectiveness in an ever changing environment, need to ensure that at all levels, the human resource development strategy is aligned with broader strategic imperatives, and that sufficient emphasis is placed on the human resource development function. In Kenya, Schools and other organizations sanctioned by the ministry of education have engaged their teachers in a number of development programs in form of workshops, seminars, refresher courses and in-service trainings. However, the impact of these strategic development programs has not been established. This scenario raises basic policy concerns about the influence of the strategic human resource development on the performance of the schools. The purpose of this study is to investigate the influence of SHRD on performance of high schools in Busia sub-county.The study adopted ex-post facto research design. The sample size comprised 82 teachers out of a population of 104 teachers consisting of principal, deputy principals, senior teachers and heads of department from17 high schools in Busia Sub County was arrive at using Fisher's model as cited in (Mugenda & Mugenda, 2003. The data collected was analyzed using correlation analysis and analysis of variance. Correlation analysis showed the degree of correlation between the independent variables and the dependent variable was .550. This is interpreted as moderate. R-square showed that approximately 30.2% of the variations in KCSE mean score was attributed to variation in strategic human resource development.*

KEYWORDS; Strategic Human Resource, Performance, High School, Science and Mathematics, Sub-count

INTRODUCTION

Strategic Human Resource Development entails careful analysis of the performance goals and matching them to the training needs of the employees. It refers to the process by which the basic mission and objectives of the organization are set and the process by which the organization uses its resources to achieve those objectives (Tichy, Fombrun and Devanna 1982) Employees are then offered relevant trainings focusing on raising both their individual as well as collective performance. There are three fundamental component areas of human resource development (HRD): individual development (personal), career development (professional), and organizational development. The importance of each component will vary from organization to organization according to the complexity of the operation, the criticality of human resources to organizational efficiency, and the organization's commitment to improved human resources. All the three components focus on individual performance improvement and since individual performance improvement is the heart of an HRD program, HRD can be described as the "area of congruence" among the three components. (Tichy, et-al, 1982)

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Individual development refers to the development of new knowledge, skills, and/or improved behaviors that result in performance enhancement and improvement related to one's current job (training) Cullen (1999). In this study individual development will entail the trainings undertaken by teachers such as; training as national examiners, and SMASSE trainings which aim at improving subject competencies in dissemination and evaluation skills. Career development focuses on providing the analysis necessary to identify the individual interests, values, competencies, activities, and assignments needed to develop skills for future jobs (development). Career development includes both individual and organizational activities. Individual activities include career planning, career awareness, and utilizing career resource centers. Organizational activities include job posting systems, mentoring systems, career resource centre development and maintenance, using managers as career counselors, providing career development workshops and seminars, human resource planning, performance appraisal Cullen (1999). In this study career development will entail the development workshops and seminars undertaken by teachers.

Organizational development is directed at developing new and creative organization solutions to performance problems by enhancing congruence among the organization's structure, culture, processes, and strategies within the human resources domain. The ultimate goal of organizational development is to develop the organization's self-renewing capacity. This refers to the organization's ability to look introspectively and discover its problems and weaknesses and to direct the resources necessary for improvement. As a result, the organization will be able to regenerate itself over and over again as it confronts new and ever-challenging circumstances (Alexander, Heaviside, & Farris, 1998). In this study, organizational development will be looked in to in terms of bench marking with other schools in order to improve its structure, culture, processes, strategies and its human resources.

Globally, Human Resource Development in organizations is increasingly taking a strategic HRD approach. Most academic researchers have concentrated on the relationship between human resource practices and firm performance (Mello, 2009). According to Kuratko, Ireland, & Hornsby (2009), firms can gain competitive advantage through effective management and development of staff. A focus on strategic human resource development (HRD) has been emphasized as a key contributor to ensuring organizational effectiveness and the maximum return from their most important asset; the people in the organization. It has been argued that effective management and innovative approaches to the development of employees will enable organizations to capture and embed knowledge and skills (Kuratko, 2009).

Organizations that are seeking not only to survive, but to maximize operational effectiveness in an ever changing environment, need to ensure that at all levels, the human resource development strategy is aligned with broader strategic imperatives, and that sufficient emphasis is placed on the human resource development function (Carneiro, 2001). It is the role of management to ensure that the organization and its people acquire the competencies and knowledge it needs through education, training and development activities. In manufacturing firms seeking to achieve improved performance through systematic change processes such as continuous improvement (CI), it is important that the human resource development function plays a role in the CI process (Carneiro, 2001).

Schools seeking to improve their position and processes must sustain a high level of learning that both refines current practices and capabilities and develops new ones. Human resource development has evolved as a critical element of broader business and human resource management strategies. The importance of an appropriately skilled and developed workforce

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is recognized by many in business as essential to the implementation of continuous improvement programs.

In Kenya, there has been Public outcry over the dismal students' performance in Mathematics at Secondary school level over the years. The deteriorating performance in Mathematics at national examinations has been a major concern to students, teachers, educationists, politicians and other stake holders. Several measures have been put in place through workshops, seminars, refresher courses and in-service training of teachers through Strengthening of Mathematics and Science in Secondary Education In-service of Teachers (SMASSE INSETS). A study carried out by Onyango (2009) on the impact of SMASSE training programme on Mathematics performance in Secondary schools in Kenya and specifically in Bomet District revealed a positive correlation. But there has been a lot of resentment from a number of teachers as well on whether SMASSE has any positive influence on performance in the sciences in schools. Whereas such insets could be well intended, the strategy in terms of the development of teachers for improved performance could be lacking. If the goal of education reform is to improve student performance through changes in teaching practices, and if changes in teaching practices are likely to result only from high-quality professional development, human resource development must be taken as a priority (Alexander, Heaviside, & Farris, 1998)

Improved performance in schools will largely depend on strategic teacher development approaches adopted by the institutions. This will require application of strategic development tools in sustaining and improving human resource in the schools. This will include; subjecting teachers to long term or short term courses, workshops/ seminars, benchmarking with teachers in other schools, and allowing teachers to further their studies. Planned development of teachers' competencies which identifies performance opportunities and establishes strategic performance priorities in line with the performance goals has not been the practice. Schools in Kenya have endeavored to develop their teaching staff but not in a uniform manner. It has also not been planned and coordinated from the employer in all aspects. This leaves the teacher development effort at the discretion of the individual schools and occasionally at the discretion of the individual teachers. Where individual teachers take an initiative to go for further studies, it's normally the interest of the teacher that prevails in terms of area of study and this may not be in line with the area in need for a particular school. The purpose of this study is to answer the question on whether the teacher development programs currently adopted by high schools improve the performance of the schools.

Statement of the study problem

Strategic human resource development (HRD) has been emphasised as a key contributor to organisational effectiveness and the maximum return on their most important asset; the people. In an effort to improve the output of their teachers, management of high schools have embraced HRD programs. The teachers have been encouraged to undertake both short term and comprehensive training programs. The short courses have targeted improvement of subject competencies in terms of content dissemination and evaluation of skills. Comprehensive courses include some teachers being encouraged to undertake further studies in diverse curricular areas. Despite a large number of schools engaging their teachers in these training and development programs, the performance of schools in K.C.S.E has not uniformly improved. This creates a need to determine whether these development programs are of any strategic value in terms of improving the teachers and schools performance. This study therefore aims at establishing the influence of strategic human resource development on performance of high schools in Busia sub-county Kenya.

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Objectives of the study

i. To determine the influence of strategic human resource development on KCSE mean score in high schools in Busia Sub County;
ii. To establish the influence of strategic human resource development on KCSE performance in sciences & mathematics in high schools in Busia Sub County; and
iii. To assess the influence of strategic human resource development on the number of students obtaining mean score of B+ and above in high schools in Busia Sub County.

Research hypotheses

i. H_0: Strategic human resource development has no significant influence on KCSE mean score in high schools in Busia Sub County.
ii. H_0: Strategic human resource development has no significant influence on KCSE performance in sciences & mathematics in high schools in Busia Sub County.
iii. H_0: Strategic human resource development has no significant influence on number of students obtaining mean score of B+ and above in high schools in Busia Sub County.

LITERATURE REVIEW

Training involves employees acquiring skills and knowledge that they will be able to use immediately; employee development involves learning that will aid the employee and the organization later. In early work on teacher productivity, researchers estimated education production functions by regressing aggregate student achievement levels on measures of teacher training and various other controls using cross-sectional data (Hanushek (1986). There is evidence that better trained and more experienced teachers tend to be assigned to students of greater ability and with fewer discipline problems (Clotfelter et al. 2006) & (Feng, 2005).

A focus on strategic human resource development (HRD) has been emphasized as a key contributor to ensuring organizational effectiveness and the maximum return from their most important asset; the people in the organization. It has been argued that effective management and innovative approaches to the development of employees will enable organizations to capture and embed knowledge and skills (Kuratko, 2009). Employees are then offered relevant trainings focusing on raising both their individual as well as collective performance.

Human resource development has been a top priority for the development of Kenya through education. Therefore, there has been a need for comprehensive training policy that would produce adequate manpower for development. Studies on quality of education in Kenya indicated poor quality and performance especially in mathematics and science compared with that of social science subjects. Studies on how to improve education quality indicate that this could be done through improvement of quality of teachers by making them more effective in their teaching. The MOE strategy for improvement of education quality gives in–service education and training (INSET) of teachers a top priority in order to enhance the quality of teaching and learning. This has been done in the course of education expansion in Kenya. (Kibe, 2008)

There is total agreement that what teachers do in the classroom matters deeply. A recent investigation into the practices of the world's top 25 school systems put it this way: "The quality of an education system cannot exceed the quality of its teachers" (Barber & Mourshed,

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2007). A wide body of research shows that the single greatest factor affecting student achievement is classroom instruction. In one study, Mortimore & Sammons (1987) found that classroom instruction has more impact on student learning than any other factor, more important than the next six factors they studied combined. As McKinsey & Company concluded in their study of the world's best schools, "The only way to improve outcomes is to improve instruction."

In analysing the impact of HRM on organisational performance each of the HRM performance linkage models developed complements the others by adding constructs, variables or relationships (Alcazar, Fernandez, & Gardey, 2005). A serious limitation that recent reviews of the literature points out is that the link between HRM and business performance is considered like a 'black box', i.e., lack of clarity regarding 'what exactly leads to what' (Gerhart, 2005; Alcazar et al., 2005).

There is evidence that incentive compensation and performance management systems as well as training and development opportunities are highly valued and are linked to firm performance, most likely due to their motivational effects, and because they reflect a regard for empowerment and accountability (Denison and Fey, 2003). However, (Denison and Fey, 2003) did not point out whether compensation, training and development are used as strategies for improvement of firms' performance.

Supangco (2001) studied the relationship between sophistication of HRM plan and perceived organizational performance; the relationship between sophistication of HRM plan and the degree to which companies undertake practices with high strategic value; and the relationship between strategic value of human resource activities and perceived organizational performance. Her work focused on HRM systems that have great strategic value. Her findings supported all the hypotheses that all three relationships were positive and significant. However, Supangco did not specifically explain the exact human resource practices that greatly influence organizational performance.

Effective organizations are increasingly realizing that the human resource element is the most critical in the organization. Regardless of their size or nature of the organization, the activities it undertakes, and the environment in which it operates, its success is determined by the decisions its employees make, and the environment in which it operates. Managers at all levels of the organizations are becoming increasingly aware that the critical source of competitive advantage often comes not from having the most ingenious product design or service, the best marketing strategy, state-of-the-art technology, or the most savvy financial management but from having the appropriate systems for attracting, motivating, and developing the organizations` HR (Mello,2009). However, Mello (2009), failed to explain how size and nature of the organization influence the training and development practices undertaken by the various organizations.

Human resource development has been a top priority for the development of Kenya through education. Therefore, there has been a need for comprehensive training policy that would produce adequate manpower for development. Studies on quality of education in Kenya indicated poor quality and performance especially in mathematics and science compared with that of social science subjects. Due to resource constraints and need to improve quality of mathematics and science education, the GOK/MOE requested assistance from the development partners and the Government of Japan (GOJ) responded positively. Also, studies on how to improve education quality indicate that this could be done through improvement of quality of

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teachers by making them more effective in their teaching. The MOE strategy for improvement of education quality gives in–service education and training (INSET) of teachers a top priority in order to enhance the quality of teaching and learning. This has been done in the course of education expansion in Kenya, (JICA & Kibe, 1998).

Sustaining a competitive advantage increases the probability of long-term survival and financial success of the organization (Kuratko, Ireland, & Hornsby, 2001). It has been argued that in the knowledge era, this competitive advantage can be obtained by the effective involvement, management and development of staff. In turn, the most strategic way to invest in people is through learning activities. Carneiro (2001) argues that an organization should have the capacity to exploit its knowledge and learning capabilities, as a competitive strategy. Further Cullen (1999) argues the significance of both individual and organizational learning in order to develop organizational capacities.

Boer et al (2001) present learning aspects similar to Cullen (1999), but they believe organizational capacities enable learning behaviors to develop across the organization.

To remain internationally competitive, firms seeking to improve their position and processes must sustain a high level of learning that both refines current practices and capabilities and develops new ones. Human resource development has evolved as a critical element of broader business and human resource management strategies. The importance of an appropriately skilled and developed workforce is recognized by many in business as essential to the implementation of continuous improvement programs.

The adequacy and quality of education inputs and students' learning achievement (as outputs) are generally used as a measure of education quality. The need for quality education is in line with the GOK policy on Vision 2030 which aims at making Kenya middle level economy. The emphasis on quality education therefore is aimed at nurturing and developing students' knowledge and skills in mathematics and sciences towards this end. Teachers of these subjects are therefore targeted so that they deliver lessons with the suitable approaches and methodologies that would translate into upgrading young Kenyans capability in mathematics and sciences (Kibe, 2008).

The basis for INSET is capacity development for teachers with the aim of enhancing their capacities in effective classroom practices to facilitate learning and therefore high retention of knowledge and skills, and learners' acquisition of positive attitudes. To this end all stakeholders in education need to be involved in developing policy, recommendations and way-forward to guide the programmes on how education quality and relevance could be maintained and improved. It is recorded that the technical cooperation for capacity development for SMASSE has been effected through long-term training, short-term exchange visits, study tours, seminars, workshops, and mentoring by short-term and long-term Japanese experts. SMASSE has been acknowledged as an appropriate and suitable example of technical cooperation in capacity development for developing countries.

The analysis of study by Ogwel, on Impact of SMASSE INSET on Students' Capacity through Improved Teaching and Learning in the Classroom revealed that SMASSE INSET has positive impact on students' capability, and results to a significant improvement in students' cognitive skills. It further revealed the role that over 600 principals who have attended principals' workshops play in the improvement of quality of education in mathematics and sciences. The analysis confirmed the role of attitude in teaching and learning as also established

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in the SMASSE baseline study by JICA &Kibe, (1998). The analysis also reveals that teacher's disposition to change their practices and embrace more student-centred instruction depends on the quality of professional development. It creates opportunities for professional interaction where teachers share their experiences and challenges.

The Third Teacher Education Conference held in December 1994 emphasized the need for institutionalized and regularized INSET for teachers as a means of improving the education quality and performance. The Kenya Secondary Schools Heads Association was also urging its members and MOE to organize INSET for teachers on a continuous basis (ADEA, 2005; World Bank, 2007). This was also in line with the 45th Session of International Conference (ICE) held in October1996 which recommended among others, that "in-service training should be organized to a greater extent within educational establishments and through teamwork, with the active participation of teachers themselves in defining the program" (UNESCO, 1996).

The JICA training of Kenyan personnel in Japan started in July 1998 after the baseline study for implementation of SMASSE INSET. From 2002, training in the Philippines and later in Malaysia, opened up more opportunities for capacity development for teachers, teacher trainers and education managers. Towards the objective of upgrading learners' capability in mathematics and sciences, SMASSE has had a positive impact as evidenced in lesson participation and increased enrolment in science subjects, especially Physics which is an elective subject. This has been particularly observed in the case of girls. Lesson observation carried out from time to time show changes from teacher-centred towards learner-centred methods. In particular, students' activities and participation were more frequent as a result of the INSET.

Benchmarking is a way of discovering what is the best performance being achieved whether in a particular organization, by a competitor or by an entirely different industry. This information can then be used to identify gaps in an organization's processes in order to achieve a competitive advantage. Competitive benchmarking is used when a company wants to evaluate its position within its industry. In addition, competitive benchmarking is used when a company needs to identify industry leadership performance targets. Strategic benchmarking is used when identifying and analyzing world-class performance. This form of benchmarking is used most when a company needs to go outside of its own industry, (Delayne, 2000)

The purpose of training and management development programs is to improve employee capabilities and organizational capabilities. When the organization invests in improving the knowledge and skills of its employees, the investment is returned in the form of more productive and effective employees. Training and development programs may be focused on individual performance or team performance. The creation and implementation of training and management development programs should be based on training and management development needs identified by a training needs analysis so that the time and money invested in training and management development is linked to the mission or core business of the organization (Watad & Ospina, 1999).

Effective training and management development programs need to take into account that employees are adult learners (Forrest & Peterson, 2006). Knowles's (1990) theory of adult learning or "Andragogy" is based on five ideas: adults need to know why they are learning something, adults need to be self-directed, adults bring more work-related experiences into the learning situation, adults enter into a learning experience with a problem-centered approach to

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learning, and adults are motivated to learn by both extrinsic and intrinsic motivators. Having a problem-centered approach means that workers will learn better when they can see how learning will help them perform tasks or deal with problems that they confront in their work (Aik & Tway, 2006).

Human Resource Development (HRD) in organizations is increasingly taking a strategic approach. This entails careful analysis of the performance goals and matching them to the training needs of the employees. Employees are then offered relevant trainings focusing on raising both their individual skills as well us collective levels, (Mello, 2009). Most academic researchers have concentrated on the relationship between human resource practices and firm performance. Studies carried out in other business organizations reveal that, organizations that are seeking not only to survive, but to maximize operational effectiveness in an ever changing environment, need to ensure that at all levels, the human resource development strategy is aligned with broader strategic imperatives, and that sufficient emphasis is placed on the human resource development function. It is the role of management to ensure that the organization and its people acquire the competencies and knowledge it needs through education, training and development activities. In manufacturing firms seeking to achieve improved performance through systematic change processes such as continuous improvement (CI), it is important that the human resource development function plays a role in the CI process (Carneiro, 2001). At different stages of their careers, employees need different kinds of training and different kinds of development experiences. Although a business degree might prepare students for their first job, they will need to gain knowledge and skills through education and experience as they progress through their career. Peters, (2006) suggests that there are four stages of management education with different learning outcomes: Functional competence, an understanding of finance, accounting, marketing, strategy, information technology, economics, operations, and human resources management; Understanding context and strategy and how organizational processes interrelate, to make sense of societal changes, politics, social values, global issues, and technological change; Ability to influence people, based on a broad understanding of people and motivations; and Reflective skills, to set priorities for work efforts and life goals. Therefore, to maximize the effectiveness of training and development, organizations must constantly assess their employees' current training and development needs and identify training and development needs to prepare employees for their next position. This requires that organizations recognize that different employees will have different needs and that these needs will change over time as these workers continue in their careers.

Conceptual framework

In this section, a conceptual framework relating strategic human resource development practices and academic performance is constructed. The details are shown in figure1.

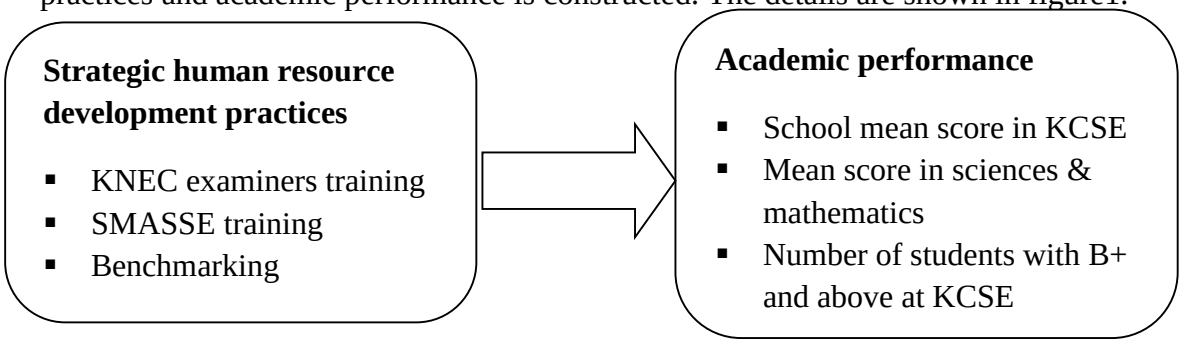

Figure 1: Conceptual framework relating strategic human resource development and academic performance
Source: Authors (2015)

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RESEARCH METHODOLOGY

This study adopted ex-post-facto research design. This design is suitable when establishing causal-effect relationship between variables. The study will target 104 teachers in high schools of Busia Sub County. This will entail all the 17 secondary schools in Busia Sub County.

Sampling techniques

The study sample will be selected by using stratified random sampling on principals, deputy principals, senior teachers and head of departments. The sample size comprised 82 teachers from the 17 high schools in Busia Sub County. To arrive at the sample size, Fisher's model as cited in (Mugenda & Mugenda 2003) was used. The sample was distributed between the schools in the proportion of number in the population expressed in percentage as recommended by Onen & Oso (2009).

Data analysis

Descriptive statistics used were: frequency, percentages, mean and standard deviation. Descriptive statistics was used to analyze general information about the schools, demographic characteristics of the respondents and preliminary sections of correlation and regression. Inferential statistics was used to test multi correlation between strategic human resource development indicators and academic performance indicators. The results of the analysis were presented through tables.

DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS

In this sub section, effect of strategic human resource development on mean score at KCSE is analyzed, discussed and interpreted. The descriptive statistics showing valid data items, the mean, and the standard deviation for each variable is analyzed. The results are shown in table 1.

Table 1: descriptive statistics

Constructs	N	Mean	Std. Deviation
KNEC examiners training	78	3.27	1.059
SMASSE training	78	3.55	.921
Bench marking initiatives	78	3.00	1.088
KCSE mean score	78	3.42	.933

Source: Survey data (2015)

Further test of correlation between the variables was conducted to check on the multi-collinearity. The results are shown in a correlation matrix table 2.

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Table 2: correlation matrix

		KNEC examiners training	SMASSE training	Bench marking initiatives	KCSE mean score
KNEC examiners training	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	78			
SMASSE training	Pearson Correlation	.128	1		
	Sig. (2-tailed)	.267			
	N	78	78		
Bench marking initiatives	Pearson Correlation	.285*	.091	1	
	Sig. (2-tailed)	.012	.429		
	N	78	78	78	
KCSE mean score	Pearson Correlation	.534**	.148	.258*	1
	Sig. (2-tailed)	.000	.195	.023	
	N	78	78	78	78

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
Source: Survey data (2015)

Table 2 shows the highest correlation coefficient of .534, between KCSE mean score and KNEC examiners trainings. This was statistically significant at 1% level. Correlation coefficients of .258 between KCSE mean score and bench marking initiatives was also significant at 5% level.

The regression results was therefore analyzed and interpreted in stages. The details are provided in table 3a and table 3b.

Table 3a: summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin - Watson
1	.550[a]	.302	.274	.798	1.891

a. Predictors: (constant), Bench marking initiatives, SMASSE training, KNEC examiners training
b. Dependent Variable: KCSE mean score

Table 3b: ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20.167	3	6.722	10.545	.000[b]
	Residual	46.535	73	.637		
	Total	66.701	76			

a. Dependent Variable: KCSE mean score
b. Predictors: (Constant), Bench marking initiatives, SMASSE training, KNEC examiners training
Source: Survey data (2015)

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In table 3a, the column R is the correlation coefficient. The regression model results in ANOVA table 3b show that the overall model was statistically significant (*F*-ratio = 10.545; p< .05). The null hypothesis was therefore rejected.

A further analysis was conducted to explore the contribution of each of the independent variables in the model. The output table of standardized coefficients table 4 shows that each independent variable contributes differently to change in KCSE mean score.

Table 4: strategic human resource development coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.445	.464		3.117	.003		
	KNEC examiners training	.436	.091	.493	4.808	.000	.908	1.101
	SMASSE training	.072	.100	.072	.725	.471	.980	1.020
	Bench marking initiatives	.095	.088	.111	1.085	.282	.915	1.092

Dependent variable: KCSE mean score

Source: Survey data (2015)

Table 4 shows that standardized coefficient used to compare the contributions of each of the independent variables. The largest Beta coefficient of .493 (p< 0.05) was for KNEC examiners training. The variable was significant and made the strongest unique contribution in explaining the dependent variable, when the variance explained by all other variables in the model was controlled. The Beta value for SMASSE training was the least at .072 (p>0.05) and was insignificant. Benchmarking initiatives with a beta value of .111 (p>0.05) was also insignificant.

Regression model for the relationship between the dependent variable, namely; KCSE mean score and independent variables KNEC examiners training, SMASSE training and bench-marking initiatives is provided as

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \xi \quad (4.1)$$

where

$Y = KCSE\ mean\ score$

$x_1 = KNEC\ exa\ \text{min}\ ers\ training$

$x_2 = SMASSE\ training$

$x_3 = Bench\ marking\ initiatives$

$\xi = error\ term$

Table 4 and model 4.1 provides the optimum level regression equation

$$Y = 1.445 + .436x_1 + .072x_2 + .095x_3 + \xi \quad (4.2)$$

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Regression equation 4.2 is a reasonable multi-correlation (r = .550) between changes in KCSE mean score and the three independent variables factored in the model. The model is 30.25% explained by the variation in independent variable and was statistical significant.

In this sub section, change of performance in sciences & mathematics due to change of strategic human resource development is analyzed, discussed and interpreted. The descriptive statistics showing valid data items, the mean, and the standard deviation is shown in table 5.

Table 5: descriptive statistics

	Mean	Std. Deviation	n
KCSE performance in Science and Mathematics	3.08	1.097	78
KNEC examiners training	3.27	1.059	78
SMASSE training	3.55	.925	78
Bench marking initiatives	3.00	1.088	78

Source: Survey data (2015)

Table 5 shows the mean and standard deviation of the dependent variable, namely; KCSE performance in sciences and mathematics as (3.08 and 1.097) and the same measures for the independent variables: KNEC examiners training (3.27 and 1.059); SMASSE training (3.55 and .921); and bench marking initiatives (3.00 and 1.088). The mean of KCSE performance in mathematics & sciences is lower than those of the independent variables by some point except for bench marking initiatives casting some doubt as to whether there is a relationship between them.

In order to ascertain multi-collinearity, a test on correlation between the variables involved was conducted. The results are shown in a correlation matrix table 6.

Table 6: correlation matrix

		KNEC examiners training	SMASSE training	Bench marking initiatives	KCSE performance in science and mathematics
KNEC examiners training	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	78			
SMASSE training	Pearson Correlation	.128	1		
	Sig. (2-tailed)	.267			
	N	78	78		
Bench marking initiatives	Pearson Correlation	.285*	.091	1	
	Sig. (2-tailed)	.012	.429		
	N	78	78	78	
KCSE performance in	Pearson Correlation	.298**	.196	.308**	1
	Sig. (2-tailed)	.008	.086	.006	

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science and mathematics	N	78	78	78	78

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
Source: Survey data (2015)

Table 6 shows the highest correlation coefficient of .308, was observed between KCSE performance in sciences & mathematics and bench marking initiatives. This was statistically significant at 1% level. Correlation coefficient of .298 between KCSE performance in sciences & mathematics and KNEC examiners training was also significant at 1% level. The correlation coefficients between the independent variables were all between the recommended interval of -.70 and .70 and as such there was no multi-collinearity problem.

The regression results were therefore analyzed and interpreted in stages. The details are provided in table 7a and table 7b.

Table 7a: summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin - Watson
1	.409[a]	.167	.133	1.022	1.800

c. Predictors: (constant), Bench marking initiatives, SMASSE training, KNEC examiners training
d. Dependent Variable: KCSE performance in sciences & mathematics

Table 7b: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	15.283	3	5.094	4.877	.004[b]
	Residual	76.249	73	1.045		
	Total	91.532	76			

a. Dependent Variable: KCSE performance in sciences & mathematics
b. Predictors: (Constant), Bench marking initiatives, SMASSE training, KNEC examiners training
Source: Survey data (2015)

In table 7a, the column R is the correlation coefficient and it indicated that there was no correlation between the adjacent residuals; that is, they were independent. ANOVA table 7b show that the overall regression model was statistically significant (F-ratio = 4.877; $p < .05$). The null hypothesis was therefore rejected. The variation in KCSE performance in sciences & mathematics was therefore attributed to the variation in strategic human resource development in the institutions studied.

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Table 8: strategic human resource development coeffients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.000	.593		1.684	.096		
	KNEC examiners training	.219	.116	.212	1.889	.063	.908	1.101
	SMASSE training	.184	.128	.155	1.439	.154	.980	1.020
	Bench marking initiatives	.236	.113	.234	2.095	.040	.915	1.092

a. Dependent Variable: KCSE performance in science and mathematics

Source: Survey data (2015)

Table 8 shows that standardized coefficient was used to compare the contributions of each of the independent variables. The largest Beta coefficient was for bench marking initiatives .234 ($p< 0.05$). The variable was therefore significant and made the strongest unique contribution in explaining the dependent variable, when the variance explained by all other variables in the model was controlled. The Beta value for SMASSE training was the least at .155 ($p>0.05$) and was insignificant. KNEC examiners training with a beta value of .212 ($p>0.05$) was also insignificant.

Regression model for the relationship between the dependent variable KCSE performance in sciences & mathematics and the independent variables KNEC examiners training, SMASSE training and bench marking initiatives is provided as

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \xi \quad (4.3)$$

where

$Y = KCSE\ performance\ in\ sciences\ \&\ mathematics$

$x_1 = KNEC\ exa\,\text{min}\,ers\ training$

$x_2 = SMASSE\ training$

$x_3 = Bench\ marking\ initiatives$

$\xi = error\ term$

Table 8 and model 4.3 provides optimum level regression equation

$$Y = 1.000 + .219x_1 + .184x_2 + .236x_3 + \xi \quad (4.4)$$

In this sub section, change in number of students obtaining mean score of B+ and above at KCSE due to change in strategic human resource development is analyzed, discussed and

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interpreted. The descriptive statistics showing valid data items, the mean, and the standard deviation is shown in table 9.

Table 9: descriptive statistics

	Mean	Std. Deviation	n
Number of students obtaining B+ and above in KCSE	2.76	1.057	78
KNEC examiners training	3.29	1.056	78
SMASSE training	3.54	.930	78
Bench marking initiatives	3.01	1.089	78

Source: Survey data (2015)

Table 9 shows the mean and standard deviation of the dependent variable, namely; number of students obtaining B+ and above in KCSE was (2.76 and 1.057) and the same measures for independent variables: KNEC examiners training (3.29 and 1.056); SMASSE training (3.54 and .930); and bench marking initiatives (3.01 and 1.089). The mean number of students obtaining B+ and above in KCSE is lower than those of the independent variables by some point casting some doubt as to whether there is a relationship between them.

To ascertain this, a preliminary test on correlation between the variables involved was then conducted to check on the multi-collinearity. The results are shown in a correlation matrix table 10.

Table 10: Correlation matrix

		KNEC examiners training	SMASSE training	Bench marking initiatives	Number of students obtaining B+ and above in KCSE
KNEC examiners training	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	78			
SMASSE training	Pearson Correlation	.128	1		
	Sig. (2-tailed)	.267			
	N	78	78		
Bench marking initiatives	Pearson Correlation	.285*	.091	1	
	Sig. (2-tailed)	.012	.429		
	N	78	78	78	
Number of students obtaining B+ and above in KCSE	Pearson Correlation	.337**	.098	.304**	1
	Sig. (2-tailed)	.003	.398	.008	
	N	78	78	78	78

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
Source: Survey data (2015)

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Table 10 shows the highest correlation coefficient of .337 was observed between number of students obtaining B+ & above at KCSE and KNEC examiners training. This was statistically significant at 1% level. Correlation coefficient of .304 between number of students obtaining B+ & above at KCSE and bench marking initiatives was also significant at 1% level. The correlation coefficients between the independent variables were all between the recommended interval of -.70 and .70 and so there was no multi-co linearity.

The regression results were therefore analyzed and interpreted in stages. The details are provided in table 11a and table 11b.

Table 11a: summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.404[a]	.163	.128	.987	1.384

a. Predictors: (constant), Bench marking initiatives, SMASSE training, KNEC examiners training
b. Dependent Variable: Number of students obtaining B+ and above at KCSE

Table 11 b: ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.641	3	4.547	4.671	.005[b]
	Residual	70.095	72	.974		
	Total	83.737	75			

a. Dependent Variable: Number of students obtaining B+ and above in KCSE
b. Predictors: (Constant), Bench marking initiatives, SMASSE training, KNEC examiners training

Source: Survey data (2015)

The regression model results in the ANOVA table 11b show the overall model was statistically significant (F-ratio = 4.671; $p < .05$). The null hypothesis was therefore rejected. The variation in number of students obtaining B+ and above in KCSE was therefore attributed to variation in strategic human resource development in the institutions studied.

A further analysis was conducted to explore the contribution of each of the independent variables in the model. The output table of standardized coefficients table 12 shows that each independent variable contributes differently to change in number of students obtaining B+ and above in KCSE.

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Table 12: strategic human resource development coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.084	.575		1.885	.063		
	KNEC examiners training	.271	.113	.271	2.396	.019	.912	1.096
	SMASSE training	.036	.124	.032	.290	.773	.977	1.023
	Bench marking initiatives	.220	.109	.226	2.016	.048	.921	1.086

a. Dependent Variable: Number of students obtaining B+ and above in KCSE
Source: Survey data (2015)

Table 12 shows that standardized coefficient was used to compare the contributions of each of the independent variables. The largest Beta coefficient was KNEC examiners training .271 ($p< 0.05$). The variable was therefore significant and made the strongest unique contribution in explaining the dependent variable, when the variance explained by all other variables in the model was controlled. The Beta value for SMASSE training was the least at .032 ($p>0.05$) and was insignificant. Bench marking initiatives with a beta value of .226 ($p<0.05$) was also significant. It was therefore not surprising to discover that despite the fact that KNEC examiners training and bench marking initiatives made unique significant contributions to change in number of students obtaining B+ and above in KCSE, SMASSE training did not make significant unique contribution in prediction.

Regression model for the relationship between the dependent variable; that is, number of students obtaining B+ and above in KCSE and the independent variables KNEC examiners training, SMASSE training and bench marking initiatives is provided as

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \xi$$

(4.5)

where

$Y = Number\ of\ students\ obtaining\ B+\ and\ above\ in\ KNEC$

$x_1 = KNEC\ exa\,\text{min}\,ers\ training$

$x_2 = SMASSE\ training$

$x_3 = Bench\ marking\ initiatives$

$\xi = error\ term$

Table 12 and model 4.5 provides the optimum level regression equation

$$Y = 1.084 + .271x_1 + .036x_2 + .220x_3 + \xi$$

(4.6)

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CONCLUSIONS

Strategic human resource development has a moderate influence on mean score at KCSE. A reasonable proportion of the variations in KCSE mean score is attributed to variation in strategic human resource development. KNEC examiners training are significant and made the strongest unique contribution in explaining the dependent variable, when the variance explained by all other variables in the model is controlled. SMASSE training and benchmarking initiatives though made contributions but were insignificant.

Strategic human resource development has influence on performance in sciences & mathematics at KSCE. A low proportion of the variation in KCSE performance in sciences & mathematics is attributed to variation in strategic human resource development**.** Bench marking initiatives are significant and made the strongest unique contribution in explaining the dependent variable, when the variance explained by all other variables in the model is controlled. SMASSE-training and KNEC examiners training though made contributions but were insignificant.

Strategic human resource development has influence on the number of students obtaining mean score of B+ and above at KCSE. A low proportion of the variations in number of students obtaining B+ and above in KCSE is attributed to variation in strategic human resource development**.** KNEC examiners' training is significant and made unique contribution in explaining the dependent variable, when the variance explained by all other variables in the model is controlled. Bench marking initiatives are also significant while SMASSE training in insignificant.

RECOMMENDATIONS

Schools should emphasize more on strengthening KNEC examiners training and bench marking initiative because of their strong and unique contribution in explaining academic performance, when the variances explained by all other variables are controlled.

SMASSE implementation strategies should also be strengthened as it was felt to be weak and therefore weakened its contribution to academic performance

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