SELECTED SCHOOL BASED FACTORS' INFLUENCE ON VALUE ADDITION IN SECONDARY EDUCATION IN PUBLIC SECONDARY SCHOOLS IN RACHUONYO SOUTH SUB-COUNY, KENYA

BY

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SCHOOL OF EDUCATION

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DECLARATION

DECLATION BY STUDENT

This thesis is my original work and has not been presented for the award of a degree in any other university.

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DEDICATION

This Thesis is dedicated to my family members. Their love always kept me going.

ABSTRACT

Value addition operates on a pretest to post test results scenario to determine the value added by schools to students' academic progress. When the post test results are lower than the pretest results, value added is negative and when the post test results are higher than the pretest results, value addition is positive. The Kenyan education system, however, solely uses post test results to rank and judge schools at KCPE and KCSE examinations without considering the pretest results. The KCPE scores of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County were 7.392 and 7.632 respectively whereas the corresponding KCSE results were 4.722 and 4.091 respectively. Hence, the need to determine value addition in secondary education of the two cohorts in this region as opposed to ranking of schools, which only consider post test results. Moreover, the post test results of the two cohorts were lower than the pretest results. Hence, the need to examine selected-school based factors' influence on value addition. The objectives of the study are; to determine value addition of in secondary education of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County, to examine performance appraisal's influence on value addition; to examine continuous assessments' influence on value addition and to examine classroom push and pull factors' influence on value addition. A conceptual model developed from the basic model of school effectiveness by Scheerens (2000) and a correlational research design guided the study. The populations for the study were 49 public secondary schools, 49 Deputy Principals, 49 Directors of Studies and 4351 students. Yamane's formula was used to determine 39 public secondary schools from which 39 Deputy Principals, 39 Directors of Studies were purposively sampled and 780 students simple randomly sampled. Primary data were collected using questionnaires. Secondary data were collected using document analysis guide from 2013 and 2014 form one admission lists and 2016 and 2017 KCSE result print outs. Two experts from the department of Educational Management and Foundations ascertained content validity of the instruments. Reliability was determined using Pearson's Correlation Coefficient, where p-values of .86 for TPAD tool, 0.79 for questionnaire for CAT and 0.82 for WIHICQ were obtained. The p-values were above 0.7. Hence, the instruments were deemed reliable. Data were analyzed both descriptively (frequencies, percentages and mean) and inferentially (regression analysis) with the aid of Statistical Package for Social Sciences V.21. Findings revealed that TPAD (β=0.364, p=0.008), CA (β=0.154; P=0.034) and CPP (β=0.284, p=0.018) have positive significant relationships with value addition for 2013 cohort. For 2014 cohort, TPAD (β=0.386, p=0.009), CA (β=0.094, P=0.047) and CPP (β=0.109, p=0.031) have significant relationship with Value addition in secondary education. Moreover, findings revealed that school-based factors contributed to 16% variance in academic achievements of 2013 cohort and 17% variance in academic achievements of the 2014 cohort. The findings of the study may be used as a tool for school improvement, checking school progress and accountability. The study recommends: teacher appraisal with multiple continuous classroom observations, continuous assessments with feedback and creation of conducive classroom atmosphere for maximum learners' academic achievements.

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ABBREVIATIONS AND ACRONYMS

CAT Continuous Assessment Tests

CPD Continuous Professional Development

CPP Classroom Push and Pull Factors

DoS Directors of Studies

KCPE Kenya Certificate of Primary Education

KCSE Kenya Certificate of Secondary Education

MoEST Ministry of Education Science and Technology

SDGs Sustainable Development Goals

SPSS Statistical Package for Social Sciences

TES Teacher Evaluation System

TPAD Teacher Performance Appraisal and Development

TSC Teachers Service Commission

VA Value Addition

VAM Value Added Modelling

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The concept 'value addition' originates from economics when referring to "the difference between inputs, such as raw materials, energy and value of sales (Spours & Hodgson, 1996). In economic context, "value addition applies to goods whose value and quality is increased by high levels of technology and skills in the manufacturing process". In a similar vein, Downs and Vindurampulle (2007) assert that "value addition," "is derived from economics where it is used in commercial settings to describe the additional value a business generates or contributes to a product or a service". Further, Braun, Chudowsky & Koenig (2010) state that "value addition is used in economics when referring to the difference between the total sales' revenue and the total cost of materials and services purchased from other firms within a reporting period (usually one year)".

Spours & Hodgson (1996) use input/output notion as in economics to describe value addition in education as "the difference between the state of knowledge or qualifications of a pupil on course entry and his state on exit". Similarly, Downs & Vindurampulle (2007) assert that "value addition is used to describe the additional value schools bring to the learning outcomes of their students". Further, Peng & Klieme (2014) define value addition as "a quantitative measure of the relative academic progress made by pupils in a school over a particular period of time". It is "the difference between their academic attainments when they have completed their education and what they had already attained by the time they began''. For the purpose of this study, however, value addition is defined as a quantitative measure of the relative academic progress made by learners in the school process.

Value-addition measurement is rooted in a series of school effects research in the United States, which began with Coleman Report that claimed schools have 'little' or 'no' influence on students' academic achievements (Coleman *et al.,* 1966; OECD, 2008). Initially, high-achieving schools were identified by comparing students' average test scores and ranking schools in league tables. Ranking schools based on students' average test scores continued up to 1980s when criticisms began by researchers in school effectiveness. Thomas, Salim, Munoz-Cherau & Peng (2012) argue that students' average test scores provide a poor method of comparing schools' performance since they do not consider students' intake abilities. Moreover, Organization for Economic and Cultural Development (OECD, 2008) states that using students' raw test scores to measure school effectiveness lack the analytic framework since it solely depends on test scores collected at a particular point in time, but does not consider students' initial academic achievements.

Subsequent studies in school effectiveness in the 1990s developed analyses models that take into consideration students' initial academic achievements and value-added models (VAM) started to gain popularity in school evaluations, especially, in the USA the development of the "Tennessee Value-Added Assessment System" (TVAAS, Sanders & Horn 1994) helped popularize the use of VA modeling (Everson 2017). In the same year, VAMs for school evaluation were developed in France ("Indicateurs de valeur ajoutée," Duclos & Murat, 2014). Later in UK, contextual VA (CVA) dubbed progress 8 was developed for school accountability (Perry, 2016). In Uganda, value-addition modelling based on the UK CVA, "Progress 8" Model was introduced in Ugandan education (Burgess, Wilson & Worth J., 2013). In Kenya, however, value addition is a new concept in education. Consequently, students' ranking by marks and grades in national examinations has been the yardstick for measuring school effectiveness.

The 8.4.4 system of education concludes both Primary and Secondary Educations with nationwide standardized examinations that are centrally graded and determine which students qualify for the next level of education. At the conclusion of primary education, pupils take KCPE examination, which is graded from 0 to 500 marks. Students who score from 0-250 marks are ranked below average, while students who score from 251-500 marks are ranked above average (Amutabi, 2003). Statistics by Kenya National Examinations Council (KNEC, 2014) revealed that the students who scored below average marks in 2012 KCPE examinations were 395,030 (48.65%), while the students who scored above average marks were 416,900 (51.35%). In 2013, students who scored below average marks were 422,276 (50.29%), whereas students who scored above average were 417,483 (49.71%). Table 1.1 illustrates national KCPE examinations performance in 2012 and 2013.

Table 1.1: 2012 and 2013 National KCPE Performance

CATEGORY	YEAR AND CANDIDATES OBTAINING THE RANGE OF MARKS	
	2013	2012
Below Mean (001 – 250)	422,276 (50.29%)	395,030 (48.65%)
Above Mean (251 – 500)	417,483 (49.71%)	416,900 (51.35%)
Total Number who sat for Examination	839,759 (100%)	811,930 (100%)
Candidates Absent	4,810 (0.57%)	7,422 (0.91%)
Total Candidates Registered	844,569 (100%)	819,353 (100%)

At the conclusion of secondary education, students take Kenya Certificate of Secondary Education (KCSE) examinations that is graded in a 12-point grading index from A to E. See Appendix VII for 12-point grading index. Students who score C+ (Plus) grades and above qualify for degree

courses offered in public universities, whereas students who score C (Plain) grades and below qualify for diploma and certificate courses offered in tertiary colleges (Amutabi, 2003). According to statistics by Institute of Economic Affairs (2017), the candidates who scored grade "A" in 2016 were 141 (0.02%) and 2636 (0.5%) in 2015 KCSE examinations. Moreover, the candidates who scored grade C+ (plus) and above in 2016 were 88929 (16%) and 169910 (33%) in 2015. Finally, the candidates who scored between grade D+ and E in 2016 were 376,414 (66%) and 212,720 (41%) in 2015. Figure 1.1 illustrates national KCSE performance in 2015 and 2016.

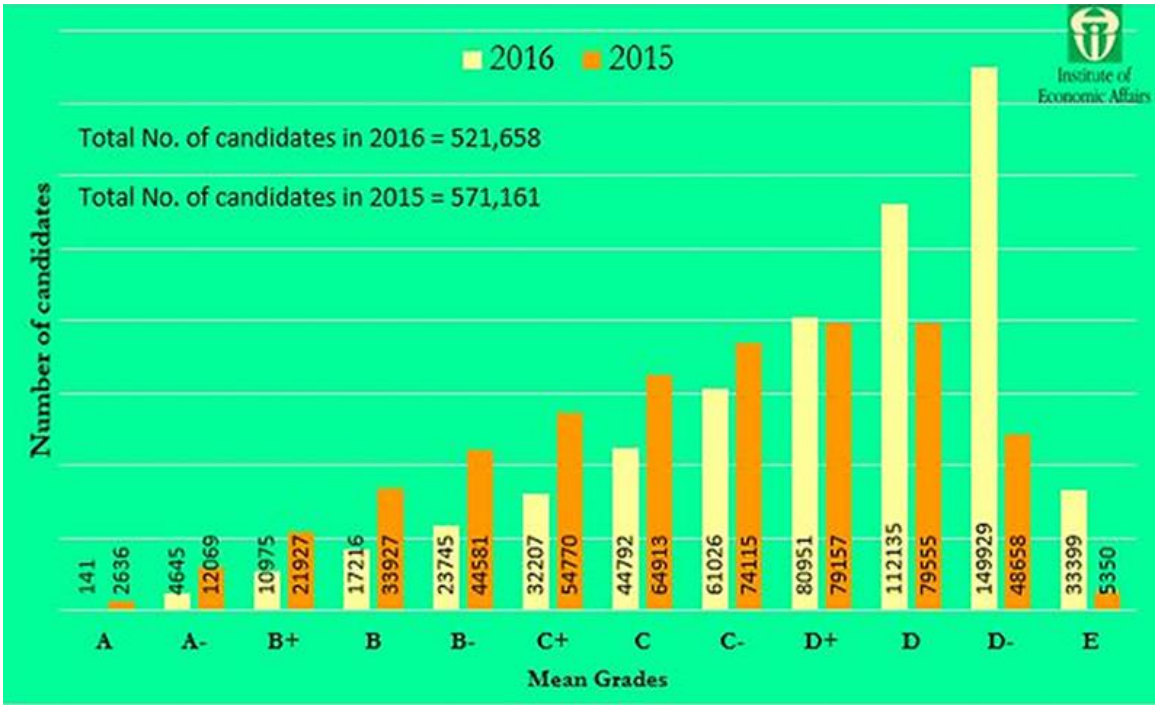

Fig.1.1: National KCSE Examinations Performance in 2015 and 2016

Source: ***Institute of Economic Affairs (2017)***

Similarly, in Homa Bay County, public secondary schools were ranked using KCPE and KCSE scores. In KCPE examinations of 2007, 2008, 2009 and 2010 cohorts, the schools were ranked according the mean scores per the six sub-sub-counties in Homa Bay County. The sub-county that posted the highest mean scores ranked top, whereas the sub-county that posted least mean scores

ranked last. For the purpose of this study, the KCPE mean scores were converted to the 12-point grading index (see Appendix VII for 12-point grading index) by diving each KCPE score by 500 (maximum score in KCPE examinations) then multiplying by 12 (maximum points in KCSE examinations). The KCPE mean rankings for Homa Bay County was summarized in Table 1.2.

Table 1.2: KCPE Mean Performance in Homa Bay County from 2010 to 2013

Sub-County	**Annual KCPE Mean Score**			
	2010	2011	2012	2013
Rachuonyo South	7.027	7.308	7.416	7.644
Rachuonyo North	6.576	6.972	7.228	7.384
Homa Bay	7.312	7.424	7.561	7.718
Ndhiwa	6.216	6.721	6.804	7.020
Mbita	6.485	6.648	6.248	6.408
Suba	6.384	6.816	7.012	6.792

The four cohorts progressed to secondary education as 2011, 2012, 2013 and 2014 cohorts. At the conclusion of secondary education of the four cohorts, the schools were ranked according to KCSE mean scores of the four cohorts per sub-county. The sub-county that registered the highest KCSE mean scores ranked first, whereas the sub-counties that registered lowest KCSE mean score ranked last. The KCSE mean rankings for Homa Bay County was summarized in table 1.3.

Table 1.3: KCSE Mean Performance in Homa Bay County from 2014 to 2017

Sub-County	**Annual KCSE Mean Score**			
	2014	2015	2016	2017
Rachuonyo South	6.174	6.345	4.722	4.091
Rachuonyo North	5.756	5.938	4.588	3.316
Homa Bay	6.805	6.976	4.908	4.227
Ndhiwa	5.163	5.273	3.614	3.561
Mbita	5.987	6.088	4.356	3.597
Suba	5.261	5.752	3.979	3.483

Focusing in Rachuonyo South Sub-County, the region ranked second in KCPE mean ranking of the four cohorts in Homa Bay County with mean scores of 7.027, 7.308, 7.416 and 7.644. At the conclusion of secondary education, the sub-county ranked best in KCSE in Homa Bay County with mean scores of 6.174, 6.345, 4.722 and 4.091 respectively (MoEST, Rachuonyo South Sub-County, 2018). Despite admitting the four cohorts with KCPE marks above average and ranking best in KCSE in secondary education of the four cohorts in Homa Bay County, 2013 and 2014 cohorts graduated with KCSE mean scores below average. It is the below average KCSE mean scores in comparison to the corresponding average KCPE mean scores of the two cohorts that prompted the researcher to conduct a study in this region using the two cohorts.

Ranking schools according to marks and grades in national examinations has been used to judge school effectiveness in Kenya. Schools that record high mean scores are judged to be more effective than schools that record low mean scores. This system, however, has received criticisms from scholars given that it uses examination scores collected at one point in time. According to David (2010), judging schools' effectiveness solely on the basis of end year test scores without regard to where the students started does not give the actual contribution of schools to students' academic progress. Similarly, Teacher Advancement Program (2012) document that "value-added measurement focuses on the change in students' scores over a given time period instead of scores collected at a specific point in time". Hence, the need to determine value addition in secondary education of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County using KCPE mean scores as the entry scores and KCSE mean scores as the exit scores as opposed to ranking of schools that solely considers the exit scores.

School based factors are those within the school that can affect the academic performance of students especially in public secondary schools (Magulod, 2017). The landmark publications of

Coleman *et al.* (1969) and Jencks *et al.* (1972) in school effectiveness research, which claimed that schools have 'little' or 'no' influence on students' academic performance, aroused interest in researchers to explore the school factors that influence students' academic performance. Researchers like (Scheerens, 2000; Hopkins *et. al.,* 2013; Muijs *et. al.,* 2013; Reynolds *et. al*., 2013) identified the following school factors to show that a school is effective: clear goals; effective educational leadership; positive school climate; high expectations from students and observation of students' improvement. These researchers, however, did not focus on some school factors including but not limited to teacher performance appraisal, continuous assessments and classroom climate.

The influence of teachers in students' academic achievements is unequivocal so much that they are considered the most important among school factors for students' learning (Hannaway & Mittleman, 2011). Improving the effectiveness of teachers through performance appraisal is therefore an important policy target to increase students' academic achievements. Moreover, continuous assessments are part and parcel of instructional process that has to be taken as a key tool in educational quality assurance endeavor (Abejehu, 2016) since it gives teachers information, they can use to inform their teaching and improve students' learning (Greenstein, 2010). Last, classroom is a primary micro context in which students and teachers interact. The quality of social and emotional interaction in the classroom between students and teachers and among the students creates the classroom emotional climate (Jia *et al.*, 2009), which influences academic performance (Stuhlman & Pianta (2009).

Tyler (2011) examined the influence of teacher evaluations on students' academic performance. Findings revealed that students assigned to teachers after participating in teacher evaluation scored about 10% of a standard deviation higher than similar students taught by the same teachers before

participating in teacher evaluation. Kiplagat (2016) examined the effects of formative assessments on mathematics achievement among primary school pupils of standard six in Nandi County. Findings revealed a positive significant effect of formative assessments on mathematics achievements. Bakar (2015) examined the influence of classroom climate on students' academic performance. Findings revealed a significant positive relationship emotional classroom climate and students' academic performance. For the purpose of this study, classroom climate operationalized as classroom push and pull factors.

In spite of the measures put up by schools to improve students' academic gains in schools and several studies having been undertaken on school-based factors affecting academic performance, public secondary schools in Rachuonyo South Sub-County registered KCSE scores that were lower than the corresponding KCPE scores of 2013 and 2014 cohorts. Hence, the need to examine selected school-based factors' influence on value addition in secondary education in this region.

1.2. Statement of the Problem

Final marks and grades in national examinations has been used to measure school effectiveness in Kenya. Schools that rank fist are judged to be more effective in students' academic performance than schools that rank last. However, ranking does not give the value added by schools to students' academic progress since it relies solely on final academic performance, but does not consider students' intake abilities. Hence, there is need to determine value addition in secondary education of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County using KCPE mean scores of 7.392 and 7.632 as entry academic abilities and KCSE mean scores of 4.722 and 4.091 as final academic abilities as opposed to ranking students using the final academic scores solely. Moreover, the KCSE mean scores of the two cohorts were lower than the KCPE scores, but it has not been established why KCSE mean scores of the two cohorts were lower than the KCPE

mean scores. Hence, the need to examine selected school-based factors' influence on value addition in secondary education of the two cohorts.

1.3. Purpose for the Study

The purpose for the study was to examine selected school-based factors' influence on value addition in secondary education in public secondary schools in Rachuonyo South Sub-County.

1.4. Objectives of the Study

The study was guided by the following specific objectives**:**

i. To determine value addition in secondary education of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub- County.
ii. To examine teacher performance appraisal's influence on value addition in secondary education.
iii. To examine continuous assessments' influence on value addition in secondary education.
iv. To examine classroom push and pull factor's influence on value addition in secondary education.

1.5. Research Questions

i. What is the value addition in the secondary education of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County?
ii. What is the influence of teacher performance appraisal on value addition on secondary education?
iii. What is the influence of continuous assessments on value addition in secondary education?

iv. What is the influence of classroom push and pull factors on value addition in secondary education?

1.6. Scope of the Study

i. The study was limited to public secondary schools in Rachuonyo South Sub-County. The foci are 2013 and 2014 cohorts. The two cohorts are necessary for evaluation of value addition in secondary education by performance appraisal; continuous assessments and classroom pull and push factors given that the study adopted a cross-sectional approach and therefore one cohort would be inadequate to make conclusions about value addition in secondary education.

ii. A multilevel value-added model was used to estimate the quantitative measures of the value added in secondary education. The schools were further investigated by means of correlational design in order to form a link between the quantitative measure and the qualitative investigation of processes that make schools add value to students' academic achievements.

1.7 Limitations of the Study

This study was limited by the following:

i. Some respondents were hesitant to give the mean scores of their schools. The researcher was thus unable to get the required information from all the schools in the sample. The researcher therefore used only the information provided by the schools that accepted to give the required information in the analysis.

ii. There was a dearth of local literature on value addition in secondary education. The researcher could not get adequate information from Kenya and therefore resorted to relying majorly on international literature in explaining the concept 'value addition' in relation to Kenyan education.

1.8. Significance of the Study

The findings of the study may contribute in the following ways:

i. Value addition analyses can be used to identify high-performing schools whose practices other schools that make little progress in students' academic gains may emulate.

ii. Schools can use value added information as part of self-evaluation and target setting. Moreover, The Ministry of Education can use value addition data to asses school improvement.

iii. Researchers can use value added data to construct value added models to indicate the progress of students in certain types of schools.

iv. Value added assessment data can help parents in making informed choices about schools for their children because higher or lower scores would no longer be equated with better or worse schools.

1.9. Conceptual Framework

This study is based on literature from school effectiveness research model by (Scheerens, 2000) in developing the conceptual model that may explain and validate the relationship between Teacher Performance Appraisal, Continuous Assessments and Classroom Push and Pull Factors, which form the independent variables and value addition as the dependent variable. A conceptual framework is a diagrammatic relationship between the independent variable and the dependent variable of a study (Orodho, 2009). Figure 1.2 depicts the envisaged relationship between and among the independent and dependent variables of the study.

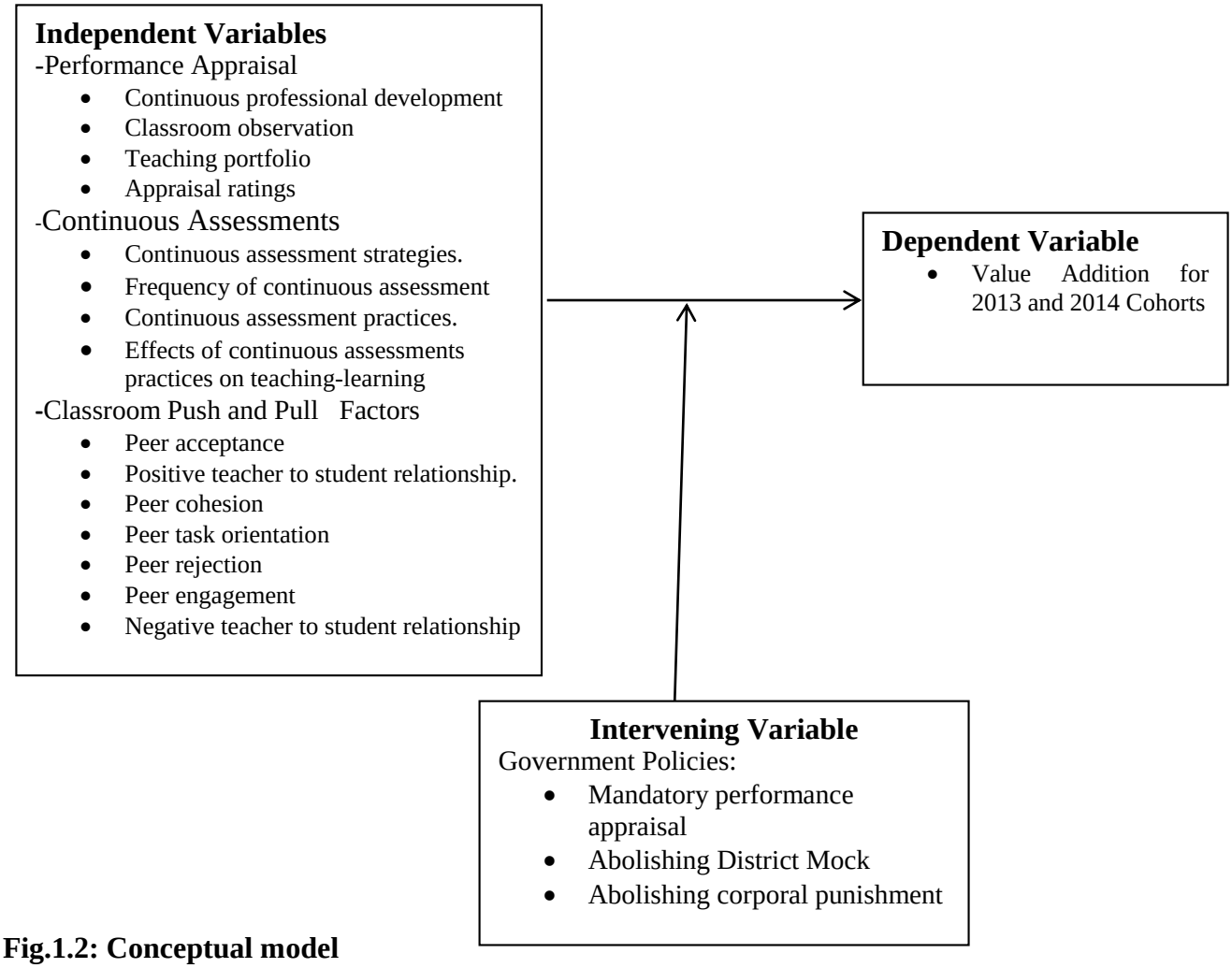

Fig.1.2: Conceptual model

Source: Modified from basic model of school effectiveness (Scheerens, 2000)

This study is rooted on the seminal works of Coleman *et al.* (1966) and Jencks *et al.* (1972), which identified the following criteria to show that a school is effective (Scheerens, 2000; Hopkins *et. al*., 2013; Muijs *et. al.*, 2013; Reynolds *et. al*., 2013): clear goals; effective educational leadership; positive school climate; high expectations from students; observation of student improvement; support and contribution of parents and society; and support for teachers' career development. All these variables are captured in the conceptual model and hence operationalized as performance appraisal; continuous assessments and classroom push and pull factors.

The intervening variable, government policies, affect the way school-based factors operate in the value addition process. For instance, TSC (2016) introduced TPAD appraisal policy framework, which makes performance appraisal mandatory for all Kenyan teachers. Teacher appraisal controls teachers' quality in terms of preparedness, school attendance and conduct as they discharge their duties in schools. Moreover, the government policy on examinations abolished form four MOCK examinations on grounds the examinations make the curriculum more examination oriented and are a source of pessimism, especially to candidates who perform poorly in the MOCK examinations. This policy controls the frequency of public examinations students are exposed to before the final KCSE examinations. Last, the government abolished corporal punishment in schools given that it contributed to negative teacher to student relationships as teachers tended to be more controlling than being friendly and supportive to students. Strained teacher to student relationship contributes to non-conducive learning environment in schools and classrooms, which can contribute to poor academic performance.

The study sought to determine value addition in secondary education of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County and to examine selected school-based factors' influence on value addition in secondary education.

1.10. Definition of Key Operational Terms

Academic performance:	Skills developed in school process, which is measured by test scores in standardized examinations.
Classroom pull and push factors:	An array of classroom social factors that make students perceive classroom as conducive or non-conducive for learning.
Cohort:	A group of learners of a similar level of learning who enter and exit a school's program the same time
Examination:	The process of evaluating how well a student has learnt a concept
Grade:	An index of success in education in the form (e.g., 0-500, A-E)
Input:	Students' achievement at Kenya Certificate of Primary Education.
Public schools:	Schools maintained by central government and benefit from government funds such as; free tuition grants.
School effectiveness:	The extent to which schools make progress on learners' academic achievements
Selected school-based factors:	Factors with school control that can influence students' academic performance.
Output:	Students' achievement in Kenya Certificate of Secondary Education
Value addition	A quantitative measure of the relative academic progress made by learners in the school process.
Value addition negative	Value addition when the exit academic performance is worse than the entry academic performance.
Value addition positive	Value addition when the exit academic performance is better than the entry academic performance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section looks at literature review on selected school based factors' influence on value addition in secondary education from the following sub sections as per the objectives of the study: to determine value addition in secondary education of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County, to examine performance appraisal's influence on value addition in secondary education, to examine continuous assessments' influence on value addition in secondary education and to examine classroom push and pull factors' influence on value addition in secondary education.

2.2. Determining Value Addition in Secondary Education of 2013 and 2014 Cohorts

The estimation of the magnitude of school effects has been a controversial issue since the landmark publication, which claimed that schools have 'no' influence or 'little' influence of up to 16% on students' academic performance (Coleman *et al.,* 1966). Teddlie *et al*.'s (2000) review of several studies quantified the size of school effects as 5-18%. Some studies have reported school effect sizes of around 2%. This led a number of critics to argue that school effects size is trivial and thus conclude that schools have little impact on students' academic performance compared to other factors.

The magnitude of school effects varies across several different 'contexts' by phase of schooling, classes, teachers and the country in which the study is conducted (Teddlie, 2000). In Cyprus, Kyriakides & Luyten (2011) report that percentages of variance in students' achievement are attributable to students at 70%, 18% for classrooms and 13% for schools. In UK, Opdenakker & Van Damme (2000) report that 13% of the variance in students' academic achievements is between

schools, 18% between teachers, 15% between classes and 54% between students. In North Carolina, Zhu, Jacob, Bloom & Xu (2012) report that 7-17% of variance decomposition of students' test scores at secondary school is attributable to teachers.

According to Reynolds *et al.* (2013), "value-added models have become the de facto approach to estimate school effects on students' academic attainments". Rather than directly compare schools in terms of average students' final attainment in standardized examinations, value-addition approach compares schools in terms of the average academic progress made by students in each school over the current phase of schooling. The OECD (2008) documents that" value-added models express a school's contribution to the progress of a pupil in relation to predetermined educational goals". The implicit assumption is that student's outcomes worsen or improve in the school process.

In UK, schools and school systems use progress 8 value added system to estimate school effects (DfE, 2018c). The system measures the progress pupils make between the ends of primary schooling key stage two tests (KS_2) and the KS_4 (GCSE) examinations. "Progress 8 scores are centered around 0, with students' scores within the range of -1 to 1. A score of '0' means pupils on average do about as well at KS4 as those with similar attainment at KS_2. A positive score means pupils on average do better at KS_4 than those with similar attainment at KS_2. A negative score means pupils on average do worse at KS_4 as those with similar attainment at KS_2 (DfE, 2018c)".

In Tennessee, the statistical method for determining the effectiveness of school systems is known as Tennessee Value Added Assessment System (TVAAS) (Fiblo & Leb, 2011). "The system uses students' data that capture scores on Tennessee Comprehensive Assessment Program (TCAP), which is a group of tests in 5 subject areas administered annually to all students in Tennessee in grades 3 through 8 and end of course tests in high school subjects. Each student's data are

accumulated over time and linked to that student's teachers, school and school system. The accumulative average gain is the primary indicator by which value addition is measured" (Everson, 2017).

In Uganda, value added measure is created by comparing students' performance on a base line examination (PLE-Primary School Leaving Examination) and a subsequent examination (UCE-Secondary School Leaving Examination). To create the value-added measure, students with the same result on the base line assessment are grouped together. The average results in the subsequent assessment for these students are then calculated to create a predicted score for each student. Schools receive points in a value-added model for each student who has performed better than the predicted score and loose points for each student who has performed worse than the predicted score. The final value-added score for each school shows the average number of marks above or below the expectations achieved by its students (Burgess, Wilson & Worth 2013).

In Kenya, value addition is a new concept in educational context. Consequently, there is no defined value-added methodology in Kenyan education. However, literature documents studies on value addition in Kenya. A study in Kisumu and Siaya Counties by Nicodemus & John (2019) determined value added by extra-county schools to students' entry marks (KCPE) upon exit (KCSE) marks. Findings revealed different value-added sizes ranging from -3 to +1 for the four sampled schools. This study determined value addition in secondary education, however, it used one cohort in extra county schools sampled from different counties and was based on the Tennessee Value Added Assessment System (TVAAS) by William Sanders (1994), which works with a projected mean. This formed the point of departure from the current study, which sought to determine value addition in secondary education using two cohorts from one sub-county based a value-added model developed by Chetty, Friedman & Rockoff (2014a).

2.3. Teacher Performance Appraisal and Value Addition in Secondary Education

Performance appraisal has two main approaches, summative or formative (Liu, 2016). According to Marzano (2012), "summative appraisal provides conclusive evaluation of a teacher's performance to determine how well a teacher has done his or her work. A supervisor evaluates a teacher using a combination of measures that may include students' test scores, lesson plans, artifacts and rating scales. Teachers are not involved and the results are used for accountability decisions such as pay awards or dismissal". On the other hand, Sayavedra (2014) asserts that "formative approach provides ongoing information about a teacher's practices with the goal of providing feedback that helps teachers improve. Teachers are involved through self-assessment and the results are used to make decisions regarding professional development for teachers". When performance appraisal is used for both accountability and developmental purposes, the one that identifies and enhances teaching quality is the ideal quality assurance mechanism (Danielson & McGreal, 2011). Hay Group (2012) reiterates that performance appraisal that focuses on teachers' development is the most effective in improving quality of teaching.

The crucial factor in teacher appraisal is its link to professional development and improvement that relate to issues of teacher quality, learning and students' achievement (Darling-Hammond, 2010). The National Education Sector Strategic Plan (NESSP, 2018-2022) outlines that "in order to enhance the impact of teacher development programs on learning outcomes, there is a shift towards having smart cascade and institutionalizing school-based teacher professional development. Training needs and professional development gaps for teachers shall be identified from TPAD by individual teachers and their supervisors". According to (TSC, 2016), "TSC has a statutory mandate through enactment of TSC Act CAP 212 Section 11 (e) to facilitate professional development of teachers". Consequently, TSC introduced parameters that promote teachers'

professional development. For the purpose of this study, four parameters were considered to promote teachers' professional development with the goal improving students' academic performance.

The first parameter promoting professional development is Continuous Professional development (CPD). Liu (2011) defines continuous professional development as "a term used to describe all the activities in which teachers engage, during the course of a career, which are designed to enhance their work". According to Levin (2014), "the rationale for CPD is that teachers keep learning from practice and become experienced in every passing year in their careers". Therefore, CPD involves a wide range of activities and programs used to help teachers develop professionally throughout their career. For instance, SMASSE program, which aims at enhancing the teaching of mathematics and sciences in secondary schools in Kenya (Gatumbi *et al.*, 2013; JICA, 2013).

Wallace (2016) examined the influence of continuous professional development on students' achievement in Tennessee and found that continuous professional development has a small, but statistically significant effect on students' achievement. Ekpoh (2013) reports that teachers who participated in staff development programs were more effective in their job performance than those who did not in terms of knowledge of subject matter, classroom management, teaching methods and evaluation of students' work in Nigeria. In Kenya, a monitoring and evaluation exercise on the effects of SMASSE program on teaching approaches to mathematics and science subjects found that teachers who had attended the programs had positive attitude towards their work and had already improved on how they conducted their lessons, but there was no improvement on learners' academic performance (SMASSE, 2013).

The second parameter promoting professional development is lesson observation. Dandala (2019) posits that "the most frequently utilized appraisal process remains observation based, which is

widely regarded as the best, given it provides the only setting in which all aspects of teaching can be observed". Zang & Ng, (2017) asserts that "it is through classroom observation that the evaluator can best take on an understanding of a teacher's effectiveness, as it allows physical classroom environment, students' engagement and a teacher's standards of conduct to be considered". According to Marshall (2009), "frequent, focused classroom observations that include immediate and specific feedback to teachers is vital in teacher development, since the teacher needs feedback just like students need feedback in formative assessments".

A study by Arujo *et al*. (2016) in Ecuador found improved learning gains among pupils of standard one of teachers exposed to multiple classroom observations. Another study in US by Taylor & Tyler (2011) found that "high quality and frequent classroom observations improved the performance of mid-career teachers both during the period of appraisal and in subsequent years. Students assigned to a teacher after participating in multiple classroom observations scored about 10% deviation higher in mathematics than similar students taught by the same teacher prior to participation in teacher evaluation".

The third parameter promoting teachers' professional development is teaching portfolio. Goldberg (2011) defines teaching portfolio as "a coherent set of materials that represents teaching practice as related to students' teaching". According to OECD (2013), "teaching portfolio can include lesson plans and teaching materials, samples of students' work and commentaries on that work, self-reported questionnaires and reflection sheets". Seldin *et al* (2010) assert "teacher portfolio can stimulate reflection upon improvement. They not only provide teachers the tools for self-assessment, but also serve as tools for teachers' own professional development".

The organization and construction of portfolio should be a continuous and dynamic process. As teachers improve their practice, they should reflect on current portfolio by replacing them with improved ones (Joseph & Brennan, 2013). Brookfield (2017) describes portfolios for learning as focused on process, integration, formative feedback and individual and group processes. According to Groon & Maunonen-Eskalinen (2006), "portfolios for learning include planning, organization of instruction, presentation of knowledge, teacher-student interaction, teacher-parent interaction, assessment and evaluation, classroom management and curriculum development".

The fourth parameter promoting teachers' professional development is appraisal rating. According to Afriyie (2009), "appraisal rating provides a well-structured performance appraisal, where an employee's performance is rated against a scale with points that range from "poor" to "excellent." The ratings are based on the ability of the employee to work as a team player, communication skills and technical competence. On this note, Kithuku (2012) asserts that "appraisal ratings put employees on toes as they want to rate high and therefore, they work hard and raise their competencies". In the context of TPAD, appraisal rating anticipates teacher performance in five levels ranging from 'very good' to 'inadequate'. The annual rating scores are the average agreed scores between appraiser and appraised and the teachers who consistently display poor ratings are recommended for professional development programs (TSC, 2016).

A study by Sertain *et al*. (2011) in Chicago found positive relationship between teachers' ratings and learners' progress. "Students taught by teachers rated as distinguished made approximately 30% progress more than students taught by teachers rated as unsatisfactory". In Zambia, a study by Hadi (2006) indicated that there is no correlation between the supervisors' ratings of teachers and the success of the teachers' students. In Kenya-Narok Sub-County, most of the teacher ratings range from 50% to 70%. However, when the learners' scores are assessed, they range from 15%

to 60%. This shows that teachers' competencies are above average while that of the learners are below average (Julie, 2012).

Contrary to studies reviewed in this section, the current study sought to examine performance appraisal's influence on value addition in secondary education.

2.4. Continuous Assessments and Value Addition in Secondary Education

Continuous assessment is a school-based process that uses a variety of assessment tools to measure behavior of learners' performance during the course instruction (Omeba, 2014). It is a formative assessment tool, which informs feedback, remediation and enriches target to students' leaning (Muskin, 2017). According to Arega (2014) it is a formative evaluation procedure concerned with finding out, in a systematic manner, the over-all gains that a student has made in terms of knowledge, attitude and skills after a given set of learning experience. Ajuonuma & Oguguo (2015) asserts that continuous assessment is a formative process of gathering and fashioning data into an interpretable form of making decisions about subsequent instruction.

Teachers assess the students' knowledge and their level of understanding through continuous assessment techniques before moving on to the next concept or information (Arega, 2014). They observe the students' performance, their level of understanding, and the level at which their knowledge is relied upon (Rezaei, 2015). The process of continuous assessment is based on the complete information used to collect data from the students, including all of the sources used in the data collection, the ways and methods used to analyze, interpret, and evaluate the results and sum of information about the students (Oli & Olkaba, 2020). According to Mwebaza (2010), oral tests, written tests, take-home assignments and recap exercises are the most common continuous

assessment strategies teachers use to collect data and information about students' academic performance.

The essence of continuous assessments during instructional process is to support learning by regularly monitoring learning and progress; providing teachers with information to understand students' learning needs and guide instruction and helping students understand the next steps in their learning through feedback (De Lisle, 2009) and assure the quality of the education system on the basis of which cognitive, psychomotor and affective domains are assessed and it helps the teachers to assess, redesign and make changes in the teaching strategies and helps them plan new activities, enabling the students to improve their performance (Hernández, 2012). Further, continuous assessments provide regular follow-ups to the students and the teachers, which indicate coordination between teaching and learning and improve students' learning skills in the areas in which they are most commonly taught practical and problem-solving skills (Rai, 2019).

The frequency of continuous assessments plays a key role in academic performance of students. Regular assessment makes the students able to learn about the differences between their current and previous performances. It also helps them realize their potential to work in teams and individually (Mahmoudi *et al.*, 2014). Frequent assessments are essential to learning in the sense that they improve students' academic achievement, especially when teachers choose to use feedback effectively to promote instruction (Rudner & Burton, 2003). Frequent testing administered in the form of practice tests (formative tests) has the potential to improve students' retention and thereby learning (Rowland, 2014). Frequent tests might act as extrinsic motivators, leading students to study harder and teachers and schools to increase efforts to improve students' achievement (Cabrera, & Cid, 2017). A study by McDaniel *et al*. (2011) examined the influence of frequent testing in eighth grade in science classes in UK. The findings revealed that "frequent

tests increased students' performance on unit exams from baseline level of 79% to levels of more than 90%".

Feedback in continuous assessments is vital to teaching and learning because it serves as an indicator as to whether learning has taken place or not. Shute (2008) contend that feedback provided through formative assessments has significant benefits when motivating students, helping them to improve their learning, reinforcing their work and providing them with a learning profile. According to Butler & Roediger (2012), feedback is an important part of any assessment method and it provides chances for learners to decrease the gap between actual and desired knowledge. Turner & Briggs (2018) state that feedback helps the teacher to find out why students are failing in some areas of the curriculum and provides the insight into how learners experience the teaching in order to improve the teaching process. Moreover, test results provide teachers with information about a given student's difficulties and strengths, thus serving to quality personal feedback (Dunlosky *et al.,* 2013) and allowing for better aimed individual and class-level instruction (Black & Wiliam, 2009).

Several studies from different countries reveal that continuous assessments have influence on students' academic performance. Shirvani (2009) examined whether daily recap tests had a significant impact on students' mathematics achievement compared to weekly tests in USA. The results indicated that daily recap tests significantly increased students' mathematics achievement on the final exam. Mwebaza (2016) examined the influence of continuous assessments on academic achievements of students in 'A' level secondary schools in Uganda. The findings revealed that continuous assessments boost students' performance in their academics. Moreover, the study revealed that continuous assessment helps teachers to assess their own performance and effectiveness of their teaching. Kiplagat (2016) examined the effects of formative assessments on

mathematics achievement among primary school pupils of standard six in Nandi County, Kenya. Findings revealed a positive significant effect of formative assessments on mathematics achievements. The study concluded that frequent formative assessments improve achievements in primary school mathematics. Contrary to the studies in this section, the current study sought to examine continuous assessments' influence on value addition in secondary education in public secondary schools in Rachuonyo South sub-county.

2.5. Classroom Push and Pull Factors and Value Addition in Secondary Education

Classroom is the central organizing unit of schools, which arranges students in classes intended to promote learning by allowing teachers and students to interact with different activities that result in learning (Epstein *et al.,* 2008). The teacher is at the center of classroom interactions that promote social and cognitive developments of learners and they are the agents who impart instructions and monitor the performance and behavior of learners in the classroom. According to William (2012), the position of the teacher is to influence directly or indirectly students' achievement during classroom learning practices. It is thus imperative to consider teacher-to-student relationship as the basis for the social context in which learning takes place. Split *et al.* (2015a) posit that teachers with positive classroom relationships with students are more motivated to engage with students more often. During these interactions, they learn more about the students and understand them better (Shepard, 2017) and they can adapt their instruction to better meet the students' needs to help them learn more (Bennett, 2011). Moreover, when a teacher cares about, encourages, and supports a student, the student is more likely to be motivated, exert more effort, study more and learn more (Lawman & Wilson, 2013).

Allen *et al.* (2013) examined the relationship between teacher-student interactions and achievement among students. Results showed that positive classroom climates characterized by

teacher sensitivity, regard for adolescents' perspectives, order and organization, and task-focus significantly predicted students' achievement. Perry *et al*. (2007) examined the effects of average classroom positive relations on first grade achievement and found that students achieved higher academic gains on a curriculum-based math test and a higher percentage of students met end-of-year math and reading standards in classrooms where teachers exhibited more support for the students.

On the contrary, if the foundation of good relations lacks, it affects negatively the students' behavior. Students will resist rules and they will neither trust the teacher nor listen to what they have to say if they sense teachers do not respect them (Boynton & Boynton, 2005). When teachers are more controlling by emphasizing rules, grade and ability differences among students, students tend to emphasize performance and avoidance goals (Mainhard, 2015) and they may become overly concerned about failing, which may undermine mastery orientation (Patrick *et al*., 2015). Negative teacher-student relationship that contributes to a lower sense of child belonging may result in lower motivation, academic achievement and a child becoming more disaffected over time, especially when faced with academic challenges (Fong Lam *et al*., 2015).

Peer interactions represent the primary developmental context for the acquisition not only of social skills but also of cognitive and academic competencies (Gest & Rodkin, 2011). Positive interpersonal relations and optimal learning opportunities for students in all demographic environments could increase achievement levels and reduce maladaptive behavior (Wentzel, Baker & Russel, 2009). Children who are more socially included by peers display higher levels of school engagement and academic performance (Gallardo, Barrasa & Guevara-Viejo, 2016). Students who experience higher levels of peer inclusion tend to develop a greater sense of belonging to the classroom community and to engage more in classroom activities, thereby improving their

academic skills (Tetzner, Becker, & Maaz, 2017). Moreover, working together (e.g., by helping each other do homework) can improve students' academic achievement (Johnson & Johnson, 2008).

A study by Gallardo *et al.* (2016) reported a significant and positive association of acceptance from the peer group with academic achievement although this association was greater during early adolescence compared to the middle adolescence. Bankole & Ogunsakin (2016) investigated the influence of peer group on the academic performance of students. The finding showed that positive peer's relationship influences academic performance of students. Studies have found that children who forge positive relationships with their class peers, experiencing feelings of relatedness and support, have increased expectations for success, enhanced intrinsic value and achieve better academically (Allen *et al.,* 2018).

On the contrary, children who are rejected by peers, or who do not form secure peer attachments, experience more loneliness and social isolation and are more likely to become disaffected from academic activities (Buhs *et al.,* 2006). Peer rejection is associated with lower school well-being, school interest, academic self-perception and higher levels of depressive symptoms, which undermine academic achievement (Yang *et al.,* 2020) and students who are rejected by peers are more likely to skip school, drop out and obtain lower grades (Cillessen & van den Berg, 2012). When students have less support from their peers, they are more likely to feel afraid to accomplish tasks, which lessens their learning engagement (Juvenen *et al*., 2012). A study by Buhs *et al.* (2006) found that the rejection from the peer predicted a decrease in classroom participation and an increase of children's school avoidance among children from kindergarten through Grade 5.
Contrary to the studies in this section, several studies have been conducted in different regions seeking to examine classroom social factors' influence on academic performance, none, however, has been conducted to examine classroom push and pull factors' influence on value addition in secondary education. Hence, the study sought to examine classroom push and pull factors' influence on value addition in public secondary schools in Rachuonyo South sub-county.

CHAPTER THREE

RESEACH METHODOLOGY

3.1. Introduction

This chapter discusses the research methodology used in the study. It explains the research design, area of study, population for study, sampling procedures and sample size, instruments for data collection, validity and reliability procedures, collection procedures, analysis procedures and ethical considerations.

3.2. Research Design

"Research design is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure," (Kothari, 2012). The research design that guided the study was correlational. Correlational research design is, "a non-experimental quantitative design in which the researcher applies correlational statistics to measure and describe the degree of association among variables," (Creswell., 2018). Correlational research design was appropriate for this study since it enabled the researcher to collect independent and dependent variable data sets, with a view to determine the relationship between them.

A multiple linear regression based on a structural equation model developed by Chetty, Friedman & Rockoff (2014b) was used in the analysis. The data sets were students' factors, KCPE and KCSE scores for 2013 and 2014 cohorts and school factors; teacher performance appraisal, continuous assessments and classroom push and pull factors.

3.3. Area of Study

The study was carried out in Rachuonyo South Sub- County, Homa Bay County, Kenya. Rachuonyo south is one of the six sub-counties in Homa Bay County. It is located in the southwestern Kenya. It boarders Nyakach Sub-county in the North, Kericho County in the East, Nyamira and Kisii Counties to the South East. The district lies between longitudes 34˚25 and 35˚0 East and latitudes 0˚15 and 0˚45 south. It covers a geographical radius of 945km^2. It has a population of 307,126 (Census, 2009). 40% of this population falls in in the age bracket of 15-29 years (Republic of Kenya, 2010). This implies that almost half of the population is of school going age. Academic performance therefore should be given dominance in this area. See map in Appendix VI.

3.4. Population of Study

A population is the entire group of elements that have at least one thing in common (Orodho, 2009). The target population is the larger group from which the researcher hopes to generate the findings. For this study, the target populations were 49 public secondary schools in Rachuonyo South Sub-County, 49 Deputy Principals, 49 Directors of Studies and 4351 students.

3.5. Sample and Sampling Technique

A sample is, "part of a target population that has been procedurally selected to represent a population," (Oso & Onen, 2009). Data gathering is crucial in research as it is meant to contribute to a better understanding of a conceptual framework (Bernard *et al*., 2010). "It then becomes imperative that selecting the manner of obtaining data and from whom the data will be acquired be of sound judgment, especially since no amount of analysis can make up for improperly collected data," (Bernard *et al.,* 2010). In this regard, the researcher
sed the formula by Yamane (1967) to arrive at scientifically reliable sample sizes.

$$\mathbf{n} = \frac{N}{1+N(e)^2}$$

Where; N; the population
n; the sample size

e; the level of precision set at 100% with a confidence level at 95%. Thus,

for the schools:

$$n = \frac{44}{1+44(0.05)^2}$$
$$n = \frac{44}{1+44(0.0025)}$$
$$n = \frac{44}{1+0.0025}$$
$$n = \frac{44}{1.11}$$
$$n = 39$$

For students:

$$n = \frac{4351}{1+4351(0.05)^2}$$
$$n = \frac{4351}{1+4351(0.0025)}$$
$$n = \frac{4351}{1+ (10.8775)}$$
$$n = \frac{4351}{11.8775}$$
$$n = 368$$

In the case of teachers, the researcher employed purposive sampling to select 39 Deputy Principals and 39 Directors of Studies from the 39 sampled schools.

In the case of students, although the calculations using Yamane's (1967) was considered, the recommendation of larger sample size was followed in this study to reduce sampling error and increase the generalizability of results, a sample of 780 students was chosen. Cohen *et al.* (2009) posit that it is rare that perfectly representative samples can be created, but the chances of getting a representative sample can be increased by the sampling technique used. Probability sampling was thus used in obtaining a representative sample, since it ensured that each student in the population had an equal chance of being included in the sample. The public secondary schools in the sample were stratified into county and sub-county schools. The two categories of schools had different student populations in different cohorts. To ensure equal representation, the researcher decided in the interest of the study to choose 10 students to represent a cohort apiece from each school. Thus, 20 students from each school were chosen, which totaled to 780 students.

The Deputy Principals were selected on grounds that they are in charge of teacher performance appraisal in schools. They were thus best suited to provide information about Teacher Performance Appraisal Data. Directors of Studies were selected on grounds that they implement and guide-learning activities including assessments of learners thus were best suited to provide information about the influence of continuous assessments. While students from the candidate classes were selected on grounds that they have interacted with different activities and people in the teaching-learning process at the classroom longer than any other group of learners in secondary education,

thus were in position to provide reliable information in connection to the influence of school-based factors on value addition in secondary education.

3.6. Instruments of Data Collection

The researcher used the following instruments to collect data from sampled schools for analysis:

3.6.1. Document Analysis Guide

The researcher used a Document Analysis Guide to collect KCPE and KCSE scores of 2013 and 2014 cohorts. The Document Analysis Guide was structured to collect KCPE and the corresponding KCSE scores of the two cohorts. The documents analyzed included 2013 and 2014 form one admission lists to get KCPE scores and 2016 and 2017 KCPE results printouts to get KCSE scores.

3.6.2. Questionnaire

Questionnaire is considered as the heart of survey operation for data collection (Kothari, 2012). The researcher used three questionnaires that contained closed ended questions to elicit information from three groups of respondents in this study.

The first questionnaire, researcher made questionnaire, sought information about performance appraisal's influence on value addition in secondary education from Deputy Principals. The researcher designed the instrument in the interest of relevance to the study to include four parameters on TPAD appraisal framework enhancing teacher professional development (viz. continuous professional development, classroom observation, teaching portfolio and appraisal ratings). Each parameter had five question items, which were rated on the Likert Scale: Strongly Disagree=5; Disagree=4; Moderately Agree=3; Agree=4; Strongly Agree=5).

The second questionnaire, researcher made questionnaire, sought information about the influence of continuous assessments on value addition in secondary education from Directors of Studies. The questionnaire was designed to include four continuous assessment strategies, interval for administering continuous assessments, continuous assessment practices and effects of continuous assessment practices on teaching-learning process. The items on interval for administering continuous assessment practices were rated on the Likert scale: Termly=1; Half Termly=2; Monthly=3; Weekly=4; Daily=5. The items on influence of continuous assessment practices on teaching-learning process were rated on the Likert scale: Strongly Disagree=1; Disagree=2; Moderately Agree=3; Agree=4; Strongly Agee=5.

The third questionnaire, WIHICQ (What Is Happening In this Class Questionnaire), sought information about the influence of classroom push and pull factors on value addition in secondary education from form four classes in the sampled schools. WIHICQ is a well-established and widely used questionnaire in classroom environment research (Aldridge & Fraser, 2000). As this study involved data collection on facets of classroom life for students, the researcher decided in the interest of relevance of the study to use seven scales of the questionnaire: Teacher Support, Equity, Student' Cohesiveness, Task Orientation, Peer support and Academic Efficacy. The facets of classroom life were rated on a 5-point Likert scale (viz. Never=1, Seldom=2, Sometimes=3, Often=4, Always=5).

3.6.3 Validity of Research Instruments

Validity is the extent to which a method of data collection measures what it is supposed to measure (Amin, 2005). Content validity refers to whether a measurement instrument has adequate and representative coverage of the concepts in the variables being measured. According to Mohajan (2017), to establish content validity researchers must seek experts' opinion on the

representativeness and suitability of the measurement instruments and suggestions must be allowed to be made to the structure of the instrument. As such, two university supervisors from the department, Educational Management and Foundations, ascertained the content validity of the document analysis guide and the questionnaires. Unnecessary items were discarded and the document analysis guide and the questionnaires were restructured.

3.6.4 Reliability of Research Instruments

"Reliability is a measure to which a research instrument yields consistent results after repeated tries," (Mugenda & Mugenda, 2012). To ensure reliability of the questionnaires, the researcher pretested the questionnaires in a pilot study in 5 schools, 10% of the population recommended by Kothari (2012), in which 5 Deputy Principals, 5 Directors of Studies and 50 students, who did not participate in the final study, participated. The questionnaires were administered two times to the same respondents in a span of two weeks and results from both administrations were recorded. Test-retest method was used to establish the reliability of the questionnaires using Pearson's Correlation Coefficient expressed in the formula:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{\lfloor n\sum x^2 - (\sum x)^2 \rfloor \lfloor n\sum y^2 - (\sum y)^2 \rfloor}}$$

Where; X; responses of the first administration

Y; responses of the second administration

N; number of administrations

$\sum$; summation term

According to Oluwatayo (2012), a scale is usually considered good if the coefficient value is 0.7 or more. For the current study, coefficient values of .86 for TPAD tool, 0.79 for questionnaire for CAT and 0.82 for WIHICQ were obtained, hence the instruments were deemed reliable.

3.7. Data Collection Procedures

The researcher obtained a letter of introduction from The Ethical Review Board of Maseno University. The letter was used as a permit to collect information from the respondents, Deputy Principals, Directors of Studies and Students. The respondents were contacted and dates for visits scheduled. With permission, the researcher visited the sampled schools and accessed form one admission lists and KNEC result printouts for 2013 and 2014 cohorts. The researcher also administered questionnaires to Deputy Principals, Directors of Studies and Students from candidates' classes, which were collected on agreed dates.

3.8. Data Analysis Procedures

The purpose for data analysis is making sense of the accumulated data. The researcher must organize what they have seen, heard and read and try to make sense of it in order to create explanations, develop theory or pose new questions (Buckingham, 2012). Hence, the researcher analyzed data according to the research objectives with the aid of Statistical Package for Social Science (SPSS) version 21 software.

The study involved three independent variables (performance appraisal, continuous assessments and classroom push and pull factors) and one dependent variable (value addition in secondary education of 2013 and 2014 cohorts). Each variable was measured to address the four research objectives. The analysis was done in three levels.

The first level of analysis involved determining value addition in secondary education of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub- County. To address this objective, the researcher used a document analysis guide (see Appendix II) to collect KCPE and the corresponding KCSE scores for the two cohorts. The KCPE scores were converted to the 12-

point grading index in Kenyan education (see Appendix VII) by diving KCPE scores by 500 (maximum KCPE scores), then multiplied by 12 (maximum points in KCSE examinations). Value addition was determined by subtracting KCPE mean scores from KCSE mean scores.

The second level of analysis involved measuring the independent variables of the study. The independent variables addressed objectives two, three and four. The second objective sought to examine performance appraisal's influence on value addition in secondary education. To address this objective, a researcher made questionnaire (see Appendix III) was used to collect data. The questionnaire had four parameters enhancing teacher professional development. Each parameter had five question items, which were rated on the Likert Scale (Viz. Strongly Disagree=1; Disagree=2; Moderately Agree=3; Agree=4; Strongly Agree=5). The ratings were analyzed in frequencies, means and standard deviations.

The third objective sought to examine the influence of continuous assessments on value addition in secondary education. To address this objective, a researcher made questionnaire with four measurement scales (see Appendix IV) was used to collect data. The first measurement scale had four continuous assessment strategies. The respondents were asked to tick (√) the continuous assessment strategy employed in assessing the students. The second scale had four question items on interval for administering continuous assessment practices. The question items were rated on the Likert scale (Termly=1; Half-termly=2; Monthly=3; Weekly=4; Daily=5). The third scale had nine question items about what teachers do when administering continuous assessments. The respondents were requested to indicate the continuous assessment practice by ticking (√). The fourth scale had nine items collecting data about effects of continuous assessment practices on teaching-learning process. The items were measured on the Likert scale (Strongly Agree=5; Agree

=4; Moderately Agree =3; Disagree =2; Strongly Disagree =1). The ratings in the measurement scales were analyzed in frequencies, percentages, means and standard deviation.

The fourth objective sought to examine the influence of classroom push and pull factors on value addition in secondary education. To address this objective, a measurement scale-a researcher modified WIHICQ (see Appendix V) was used to collect data about seven classroom facets. The classroom facets were rated on a 5-point Likert scale (viz. Almost Never, Seldom, Sometimes, Often, and Always). The ratings were analyzed in frequencies, means and standard deviation.

The second level of analysis involved testing the relationship between independent variables and dependent variable of the study. Multiple linear regression analysis based on a structural equation model by Chetty, Friedman, and Rockoff (2014a) was involved.

Student level (level 1): $y_{ij(2)} = \beta_{oj} + \beta_{ij}\{y_{ij(1)} - \bar{y}_{j(1)}\} + +\varepsilon_{ij}$

School level (level 2); $\beta_0 = y_{oo} + y_{os}w_{sj} + u_{oj}$

$\beta_{1j} = y_{10}$

Regression analysis: $y_{ij(2)} = \beta_0$

Where; $y_{ij(2)}$: the current score for student i in school j ($KCSE\ scores$)

$y_{ij(1)}$: the prior test score for student i (KCPE scores)

$\bar{y}_{j(1)}$: the mean prior test score for school j (KCPE mean score)

β_{0j}: the level 1 intercept (KCSE mean score for school j)

β_{1j} : the level-1 regression slope for KCPE scores

ε_{ij} : the residual which is assumed to be normally distributed and independent of level-1 covariates.

w_{sj}: the school characteristics (teacher performance appraisal, continuous assessments and classroom push and pull factors).

y_{00}: the level-2 intercept.

y_0: the level-2 regression slope for school characteristics

u_{oj}: the residual, which is assumed to be normally distributed and independent

of level 2 covariates.

In the model, each coefficient represents the slope for each independent variable at school *j*, but the meaning of the intercept (β_{oj}) is determined by the location of the level-1 covariates, which centers around the grand mean i.e. mean of sub-samples ($x_{ij} - \bar{x}$). The resulting values are called 'mean corrected', which are conceived as dependent variable at level-2.

3.9 Ethical Considerations

The major ethical obligation in a research study is maintaining the dignity of participants (Mugenda & Mugenda, 2012). Throughout this study, the researcher upheld ethical issues to ensure dignity of participants was maintained. At the beginning of the study, the researcher introduced himself by giving. a letter of introduction and stating the mission and purpose of the study to the respondents.

The researcher gained the consent of key stakeholders such as Principals, Deputy Principals and Directors of Studies. Further, the researcher sought minors' consent by requesting the school principals to call the minors' parents requesting them to allow their children to participate in the study.

The researcher protected the participants' right to participation by utilizing voluntary participation from both teachers and students' populations. Moreover, the respondents had the freedom to withdraw from the study anytime they deemed fit.

The researcher upheld anonymity of the respondents by ensuring that no personal identification information was collected from the respondents. The questionnaires included no specific information that could potentially lead to identification, such as date of birth or identification number.

Finally, the researcher consciously guarded the privacy and confidentiality of information obtained from this research study by ensuring that the collected data were kept in a secure cabinet under lock and key, which could only be accessed by the researcher to protect data from access by parties that were not involved in this study and the information was used strictly to the extent of achieving the objectives of the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents the results of the study based on the data collected from the field. The data analysis and findings of the study are presented in two sections. The first section provides demographic characteristics of the respondents of the study, while the second section provides the results and discussions of the research objectives.

4.2. Demographic Characteristics of Respondents

This section presents the questionnaire response rate and distribution of respondents by gender, age, duration in service, duration of service at current stations, duration in service as Deputy Principals and Director of Studies and school category.

4.2.1. Response Rate

To obtain data for the study, questionnaires were issued to 39 Deputy Principals, 39 Director of Studies and 780 students. The analyses of the response were done to determine the number of respondents who responded using frequency counts and percentages. The response rates were summarized in Table 4.1.

Table 4.1 Response Rate for Deputy Principles, Directors of Studies and Students

Survey	**Deputy**	**Principals**	**Directors**	**of Studies**	**Student**	
Response	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Responses	32	82.5	32	82.5	500	64.1
Total	**39**	**100**	**39**	**100**	**780**	**100**

Table 4.1 illustrates that the response rates were (82.5%) for Deputy Principals and (82.5 %) for Directors of Studies. The response rates were above 70%, hence, acceptable for analysis of self-administered questionnaires as recommended by Heir *et al.*, (2018). Further, the table illustrates that the response rates for the students were (64.1%). This response rate was good for analysis and reporting in this study as recommended by Mugenda & Mugenda (2012) that "a response rate of 60% is good for analysis and reporting".

4.2.2 Distribution of Respondents by Gender

The gender of Deputy Principals, Directors of Studies and Students were summarized in Table 4.2.

Table 4.2 Distribution of Deputy Principals, Directors of Studies and Students by Gender

Gender	Deputy Principals		Directors of Studies		Students	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Male	20	62.5	25	78.12	297	59.40
Female	12	37.5	07	21.88	203	40.60
Total	32	100	32	100	780	100

Table 4.2 illustrates that of the 39 Deputy Principals surveyed, (62.5%) were male and (37.5%) were female Deputy Principals. Moreover, the table illustrates that of the 39 Directors of Studies surveyed, there were (78.12%) male and (21.88%) female Directors of Studies. Finally, the findings revealed that there were (59.40%) male and (40.60%) female students in the sample.

4.2.3. Age Distribution of Respondents

The age distribution of Deputy Principals, Directors of Studies and Students were summarized in table 4.4.

Table 4.3 Distribution of Deputy Principals, Directors of Studies and Students by Age

Age	Deputy Principals		Director of Studies		Students	
Bracket	Frequency	Percentages	Frequency	Percentages	Frequency	Percentage
10-19	00	00	00	00	433	86.60
20-29	00	00	6	18.75	67	13.40
30-39	03	09.37	17	53.12	00	00
40-49	22	68.75	9	28.13	00	00
50-59	07	21.88	00	00	00	00
Total	32	100	32	100	500	100

Table 4.3 illustrates that (68.75%) of the Deputy Principals were in the age bracket of 40-49 years and (21.88%). In the case of Directors of Studies, (53.12%) were in the age bracket of 30-39 years, (28.13%) were in the age bracket of 40-49 years and 18.75% were in the age bracket of 20-29 years. Finally, the table illustrates that (86.60%) of students were in the age bracket of 10-19 years and (13.40%) were in the age bracket of 20-29 years.

4.2.4 Distribution of Deputy Principals and Directors of Studies by Service Duration

The Deputy Principals and Directors of Studies were categorized according to duration in service as summarized in Table 4.4.

Table 4.4: Duration of Service as Deputy Principals and Directors of Studies

	Deputy Principals		Director of Studies	
Duration in Service	Frequency	Percentage (%)	Frequency	Percentage (%)
1-3 years	14	43.75	7	21.87
4-6 years	10	31.25	12	37.50
7-9 years	04	12.50	10	31.25
10 and above years	04	12.50	3	09.37
Total	32	100	32	100

Table 4.4 illustrates that out of the 39 Deputy Principals surveyed, (43.75%) have served between 1-3 years, (31.75%) had served between 4-6 years. Moreover, the table illustrates that out of the 39 Directors of Studies surveyed, (37.5%) had served for up to six years at the position and (31.25%) had served between 7-9 years.

4.2.5. Distribution of Schools by Categorization

The schools were categorized into County and Sub-County Schools. The findings were summarized in Table 4.5.

Table 4.5: School categorization

School Category	Frequency	Percentage (%)
Sub County Schools	30	93.75
County Schools	2	06.25
Total	**32**	**100**

Table 4.5 illustrates that of the 39 sampled public secondary schools, (93.75%) were sub-county schools while (6.25%) were county schools.

4.3. Performance of Secondary Schools in Rachuonyo South Sub-County in KCSE

The KCSE performance of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County were summarized in Table 4.6.

Table 4.6 KCSE Performance of 2013 and 2014 Cohorts in Public Secondary Schools in Rachuonyo South Sub-County

2013 Mean Score	Cohort Frequency	Percentage	2014 Frequency	Cohort Percentage
0.0-2.9	00	00.00	00	00.00
3.0-3.9	16	50.00	15	46.88
4.0-4.9	10	31.25	12	37.50
5.0-5.9	02	06.25	04	12.50
6.0-6.9	02	06.25	00	00.00
7.0-7.9	01	03.13	00	00.00
8.0-8.9	01	03.13	01	03.12
9.0-9.9	00	00.00	00	00.00
Total	**32**	**100**	**32**	**100**

Table 4.6 illustrates that (50%) of schools scored between 3.0-3.9 points, (31.25%) scored between 4.0-4.9 points (, (6.25%) scored between 5.0-5.9 and 6.0-6.9 points in the 2013 cohort. In the 2014 cohort, (46.88%) scored between 3.0-3.9 points, (37.50%) scored between 4.0-4.9 points, (12.50%) scored between 5.0-5.9 points and (3.13%) scored between 8.0-8.9 points (See Appendix VII for interpretation).

4.4. Value Addition in Secondary Education in Public Secondary Schools in Rachuonyo South Sub-County

The first objective of the study sought to determine value addition in the secondary education of the 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County. To achieve this, a document analysis guide was designed to collect KCPE and the corresponding KCSE scores of 2013 and 2014 cohorts in public secondary schools in Rachuonyo South Sub-County. The KCPE scores were converted to the 12-point grading index used in Kenyan education; where A=12, A- (minus)=11, B+ (plus)=10, B (plain)=9, B- (minus)=10, C+ (plus)=7, C (plain)=6,

C- (minus)=5, D+ (plus), D (plain)=3, D- (minus)=2 and E=1 by dividing each score by 500 (maximum score in KCPE examinations), then multiply by 12 (maximum scores in 12-point grading index) in order to match KCSE scores grading.

Value addition was determined by subtracting KCPE mean score from KCSE mean score at school and sub-county levels. Value additions were summarized in Table 4.7.

Table 4.7: Value Additions for 2013 and 2014 Cohorts

KCPE 2012 Mean score	KCSE 2016 Mean score	VALUE ADDED	KCPE 2013 Mean score	KCSE 2017	VALUE ADDED
6.18	3.22	-2.96	6.61	3.67	-2.94
6.3	3.7	-2.6	6.7	3.35	-3.34
6.7	3.9	-2.8	6.72	3.3	-3.42
5.6	4.34	-1.26	5.2	4.51	-0.69
5.04	4.35	-0.69	5.87	3.06	-2.81
5.72	3.29	-2.43	5.76	3.27	-2.49
5.32	3.9	-1.42	6.77	4.36	-2.41
6.02	7.36	1.34	6.01	5.06	-0.95
5.54	4.12	-1.42	5.9	3.58	-2.32
8.4	8.52	0.12	8.31	8.3	-0.01
6.22	6.17	-0.05	6.65	5.77	-0.88
5.8	3.37	-2.43	5.71	3.35	-2.36
5.6	4.7	-0.9	5.56	3.9	-1.62
5.97	4.18	-1.79	6.01	4.4	-1.58
5.57	5.9	0.33	6.01	4.3	-1.71
6.02	3.7	-2.32	5.55	3.5	-2.01
5.66	4.95	-0.71	6.04	4.04	-2
6.01	3.91	-2.1	5.45	3.9	-1.51
6.54	4.91	-1.63	6.77	5.28	-1.49
5.88	3.02	-2.86	5.45	3.24	-2.21
5.66	3.8	-1.86	5.87	3.36	-2.51
5.87	3.7	-2.17	6.85	4.1	-2.75
6.33	4.4	-1.93	5.87	4.45	-1.42
5.81	6.02	0.21	6.93	5.86	-1.07
5.44	4.1	-1.34	5.63	3.6	-2.03
5.56	5.2	-0.36	5.78	4.9	-0.88
5.95	3.9	-2.05	6.87	4.2	-2.67
5.34	3.7	-1.64	5.04	3.5	-1.53
5.74	3.03	-2.71	6	3.6	-2.4
5.75	3.8	-1.95	5.76	3.8	-1.93
6.77	3.77	-3	6.76	4.5	-2.23
6.66	4.02	-2.64	5.76	4.0	-1.79
		-1.563125			**-1.9363125**

Table 4.7 illustrates that three schools in the 2013 cohort had positive value addition, while 29 schools had negative value addition in secondary education. Consequently, value addition for the sub-county was -1.563125. For 2014 cohort, it was found that 32 schools had negative value addition in secondary education. Consequently, value addition for the sub-county was -1.9363125. This means that the two cohorts on average performed worse at KCSE examinations than at the corresponding KCPE examinations. Consequently, value addition was negative (-) in the secondary education of the two cohorts. This finding is in agreement with earlier research findings in a study by Nicodemus & John (2019) in Kisumu and Siaya Counties, which determined value added by four extra-county schools. Findings revealed different value-added sizes ranging from -3 to +1. The similarity in negative value-added findings could be attributed to the fact that performance in KCSE examinations has been below on decline from 2016 academic year.

4.5. Performance Appraisal and Value Addition in Secondary Education

The second objective of the study sought to examine Performance Appraisal's influence on value addition in secondary education. To address this objective, four measurement scales, each scale a parameter enhancing teachers' professional growth, were selected. Each measurement scale had five question items, which were rated on the Likert Scale:

Strongly Disagree= 1; Disagree=2; Moderately Agree=3; Agree=4; Strongly Agree=5. The ratings were analyzed in frequencies, means and standard deviation. The findings were summarized in different tables.

4.5.1 Continuous Professional Development and Teachers' Professional Development

The first measurement scale was continuous professional development. It had five question items that sought Deputy Principals' opinions on continuous professional development and teachers' professional development. The findings were summarized in Table 4.8.

Table 4.8: Continuous Professional Development and Teachers' Professional Development

Continuous Professional Development	N=32	Rating					
		SA	A	MA	D	SD	MEAN
Teachers in my staff engage in continuous professional development activities and programs.	Frequency	8	9	4	6	5	3.28
Continuous professional development aids teachers in developing new pedagogical theories and skills in the career.	Frequency	11	14	2	2	3	3.88
Continuous professional development helps teachers enhance expertise in their work	Frequency	16	14	0	1	1	4.34
Continuous professional development enables teachers improve their quality of teaching in classroom.	Frequency	18	12	1	1	0	4.47
Continuous professional development helps teachers develop professionally throughout their career.	Frequency	20	10	0	1	1	4.47
Overall							**4.08**

Table 4.8 illustrates Deputy Principals' ratings on continuous professional development and teachers' professional growth. Findings revealed that': teachers engage in professional development activities and programs (mean=3.28); continuous professional development aids teachers in developing new pedagogical skills and theories in their career (mean=3.88). This finding agrees with the earlier findings in a monitoring and evaluation exercise on the effects of SMASSE program on teaching approaches to mathematics and science subjects in Kenya, which found that teachers who had attended the programs had acquired new pedagogical skills and theories and had already improved on how they conducted their lessons (Gatumbi *et al.*, 2013); continuous professional development help teachers enhance their expertise in their work (mean=4.34); continuous professional development enables teachers improve their quality of teaching in classroom (mean=4.47). This finding agrees with research finding by Ekpoh (2013) in

Nigeria, which revealed that, "teachers who participated in staff development programs were more effective in their job performance than teachers who did not in terms of knowledge of subject, classroom management and teaching methods". Further, findings revealed that continuous professional development help teachers develop professionally throughout their career (mean=4.47).

The average mean rating for Deputy Principals in continuous professional development was 4.08. This means that Deputy Principals in public secondary schools in Rachuonyo South Sub-County agreed that continuous professional development enhances teachers' professional development.

4.52. Classroom Observation and Teachers Professional Development

The second measurement scale was classroom observation. The scale had five question items seeking teachers' opinions on classroom observation and teachers' professional development. The findings were summarized in Table 4.9.

Table 4.9: Classroom Observation and Teachers' Professional Development

Classroom Observation	**N=32**	**Rating**					
		SA	**A**	**MA**	**D**	**SD**	**MEAN**
Teachers in my staff participate in classroom observation	Frequency	14	12	1	3	2	4.03
Classroom observation enables the appraiser to observe all aspects of a teacher's teaching.	Frequency	18	12	0	1	1	4.41
Classroom observation enables teachers identify their aspects of teaching that need improvement.	Frequency	10	16	1	2	3	3.88
Classroom observation provides immediate feedback to teachers about their performance in teaching.	Frequency	22	10	0	0	0	4.69
Classroom observation enables teachers develop professionally	Frequency	16	13	1	1	1	4.31
Overall							**4.26**

Table 4.9 illustrates that: teachers participate in classroom observation (mean=4.03); classroom observation enables the appraiser to observe all aspects of a teacher's teaching (mean=4.41). This finding agrees with earlier findings by Dandala (2019), which revealed that, "the most frequently utilized appraisal process remains observation based given it provides the only setting in which all the aspects of teaching can be observed,". Moreover, findings revealed that classroom observation enables teachers identify their aspects of teaching that need improvement (mean=3.88); classroom observation provides immediate feedback to teachers about their teaching (mean=4.69). This finding agrees with the finding of Marshal *et al.* (2009) in USA, which revealed that classroom observation that include immediate and specific feedback to teachers is vital in teacher professional development since the teacher needs feedback just like students need feedback in formative assessments. Last, classroom observation enables teachers develop professionally (mean=4.31).

The average mean rating for Deputy Principals' rating on classroom observation is 4.26. This means that Deputy Principals in public secondary schools in Rachuonyo South Sub-County agreed that classroom observation enhances teachers' professional growth.

4.53. Teaching Portfolio and Teachers' Professional Development

The third measurement scale was teaching portfolio. The scale had five question items, which sought Deputy Principals' opinions on teaching portfolio and teachers' professional development. The findings were summarized in Table 4.10.

Table 4.10: Teaching Portfolio and Teachers' Professional Development

Teaching Portfolio	N=32	Rating					
		SA	A	MA	D	SD	MEAN
Teachers in my staff construct teaching portfolio.	Frequency	10	12	2	4	4	3.63
Teaching portfolio enable teachers identify teaching practices that require improvement.	Frequency	8	18	1	2	3	3.81
Teaching portfolio enable teachers do self-assessment of their teaching practices.	Frequency	10	12	2	4	4	3.63
Teaching portfolio provides immediate formative feedback to teachers about their teaching practices.	Frequency	9	16	1	3	3	3.78
Teaching portfolio enables teachers room for professional development.	Frequency	10	18	2	1	1	4.09
Overall							**3.78**

Table 4.10 illustrates that Deputy Principals indicated that: teachers construct teaching portfolio (mean=3.63); teaching portfolio enable teachers identify teaching practices that require improvement (mean=3.81); teaching portfolio enable teachers do self-assessment of their teaching practices (mean=3.63); teaching portfolio provides immediate formative feedback to teachers about their teaching practices (mean=3.78); teaching portfolio enables teachers room for professional development (mean=4.09).

The overall mean for teaching portfolio and teacher's professional growth is 3.78. This means that Deputy Principals agreed that teaching portfolio enhance teachers' professional development in public secondary schools in Rachuonyo South Sub-County.

4.5.4. Performance Appraisal Ratings and Teachers' Professional Development

The fourth measurement scale was performance appraisal ratings. The measurement scale sought teachers' opinions on performance appraisal ratings on teachers' professional growth. The findings were summarized in Table 4.11.

Table 4.11: Appraisal Rating and Teachers' Professional Development

Appraisal Rating		Rating					
Rating	**N=32**	**SA**	**A**	**MA**	**D**	**SD**	**MEAN**
Teachers in my staff participate in performance appraisal.	Frequency	18	12	0	1	1	4.14
Performance appraisal ratings help teachers identify the areas they need to improve on.	Frequency	12	16	1	2	2	4.16
Performance appraisal ratings help teachers develop their competencies.	Frequency	13	14	1	2	2	4.06
Performance appraisal ratings keep teachers on toes in service as they fight to meet the expected standards in teaching.	Frequency	20	8	1	2	2	4.22
Performance appraisal ratings help teachers develop professionally	Frequency	16	11	1	2	2	4.16
Overall							**4.2**

Table 4.11 illustrates that: teachers participate in performance appraisal (mean=4.41); appraisal ratings help teachers identify the areas they need to improve on (mean=4.16); performance appraisal ratings help teachers develop their competencies (4.06); performance appraisal ratings keep teachers on toes in service as they fight to meet the expected standards in teaching (mean=4.22). This finding agrees with the earlier research findings by Khan (2013), which revealed that appraisal ratings put employees on toes as they want to rate high and therefore work hard and raise their competencies; performance appraisal ratings help teachers grow professionally (mean 4.16).

The average Deputy Principals' mean rating in performance appraisal ratings was 4.2. This implies that on average, Deputy Principals in public secondary schools in Rachuonyo South Sub-County agreed that performance appraisal rating enhance professional growth.

4.6. Continuous Assessments and Value Addition in Secondary Education

The second objective of the study sought to examine Continuous Assessments' influence on value addition in secondary education. To address this objective, four measurement scales with multiple question items were selected and rated on different Likert Scales.

4.6.1. Continuous Assessment Strategies Employed in Assessing Learners

The first measurement scale sought to find information about continuous assessment strategies employed in assessing students in public secondary schools in Rachuonyo south Sub-County. To address this, a measurement scale with four continuous assessments strategies was selected and presented to respondents to tick (√) the continuous assessment strategy employed. The findings were analyzed in frequencies and percentages and summarized in Table 4.12.

Table 4.12: Continuous Assessment Strategies Employed in Assessing Students

Continuous Assessment Strategy	Rating	
	Frequency	Percentage (%)
Oral tests	8	25
Written tests	32	100
Assignments	28	85
Recap exercises	20	60

Table 4.12 illustrates that most schools employed all continuous assessment test strategies in assessing the learners as follows: Written test (100%); Assignments (85%) and recap exercises (60%). Oral tests are the least utilized (25%) continuous assessment strategy in public secondary schools in Rachuonyo South Sub-County. This finding agrees with earlier research findings in Uganda by Mwebaza (2010), which revealed that written tests, take-home assignments, recap exercises and oral tests are the most commonly utilized continuous assessment strategies in schools. This implies that public secondary schools administer four continuous assessment strategies during continuous assessments.

4.6.2. Interval for Administering Continuous Assessments

The second measurement scale sought to find information about the interval for administering continuous assessments in assessing the learners. Four question items were selected and rated on the Likert point from 5= Daily (D); 4= Weekly (W), 3= Fortnightly (F); 2= Half Termly (H/T) and 1= Termly (T). The ratings were analyzed in frequencies, mean and standard deviation. The findings were summarized in Table 4.13.

Table 4.13: Interval for Administering Continuous Assessments

Question Items	Rating	T	H/T	M	W	D	Mean
Oral test	Frequency	0	0	2	19	11	4.28
Written tests	Frequency	6	17	3	4	2	2.34
Assignments	Frequency	1	2	0	15	14	4.22
Recap exercises	Frequency	0	0	3	12	17	4.44
Overall							**3.05**

Table 4.13 illustrates that most teachers administer; oral tests (mean=4.28) weekly; written tests (2.34) half termly; assignments (mean=4.22) weekly and recap exercises (mean=4.44) weekly. The findings imply that the most frequently utilized continuous assessment strategy in assessing students in public secondary schools in Rachuonyo South Sub-County are daily recap exercises and weekly written tests.

Overall, the average mean rating for interval of continuous assessments was (mean=3.05). This means that continuous assessments are administered at an interval of two weeks in public secondary schools in Rachuonyo South sub-county.

4.6.3. Continuous Assessment Practices During Teaching-Learning Process

The third measurement scale sought to find information about what teachers do when continuously assessing students. To address this, a measurement scale with nine question items was selected. The items were presented to Directors of studies, who were requested to indicate the continuous assessment practice by ticking (√). The ratings were analyzed in frequencies and percentages. The results were summarized in Table 4.14.

Table 4.14: Continuous Assessment Practices

Continuous Assessment Practice	Rating	
	Frequency	Percentage
Assessing students' knowledge and understanding frequently.	28	87.50
Providing continuous assessments' feedback.	24	75.00
Using continuous assessments' feedback data to provide students' learning profile.	20	62.50
Using students' learning profile to understand students' learning needs.	19	59.38
Using students' learning needs data to design subsequent instruction.	26	81.25
Using continuous assessments' data to provide follow up to students and teachers.	28	87.50
Using continuous assessments' data to find out why students are failing in some questions.	26	81.25
Determining why students make specific mistakes when attempting learning tasks.	20	62.50
Using students' results to monitor learning progress in class and school.	28	87.50

Table 4.14 illustrates that most Directors of Studies indicated that: (87.5%) assess students' knowledge and understanding during teaching and learning; (75%) Marking continuous assessments and providing feedback: (62.5%) using continuous assessments' feedback data to provide students learning profile; (59.38%) using students' learning profile to understand students' learning needs; (81.25%) using students' learning needs data to design subsequent instruction; (87.5%) using continuous assessment data to provide follow up to students and teachers to indicate coordination between teaching and learning; Using continuous assessments' data to find out why students are failing in some questions (81.25%); Determining why students are making mistakes when attempting learning tasks (62.5%); Using students' results to monitor learning progress in class and school (87.5%).

These findings imply that teachers in public secondary schools in Rachuonyo South Sub-County do not stop at continuous assessments' administration. They mark the continuous assessments,

analyze the results to find out why students achieve or don't achieve, give results and use the results to monitor learning progress at classroom and school levels.

4.6.4. Effects of Continuous Assessment Practices on Teaching-Learning Process

The fourth measurement scale sought to find information about the effects of continuous assessment practices on teaching-learning process. To address this, nine question items were selected and rated on the Likert scale: Strongly Disagree (SD)=1; Disagree (D)=1; Moderately Agree (MA)=3; Agree (A)=4; Strongly Agree (SA)=5. The ratings were analyzed in frequencies, mean and standard deviation. The results were summarized in Table 4.15

Table 4.15: Effects of Continuous Assessment Practices on Teaching-Learning Process

Effects of Continuous Assessment Practices on	**N=32**		**Rating**			
	SA	**A**	**MA**	**D**	**SD**	**Mean**
Assessing students' knowledge and understanding frequently makes students study harder and teachers make efforts to improve students' achievements.	20	9	0	1	1	4.34
Providing feedback helps teachers understand individual student's difficulties.	18	10	0	1	1	4.16
Using continuous assessments' feedback data to provide students' learning profile helps teachers understand each student's academic ability.	18	14	0	0	0	4.56
Using students' learning profile to understand students' learning needs helps the teachers decide remedial actions appropriate for the students.	22	10	0	0	0	4.69
Using students' learning needs data to design subsequent instruction helps teachers adjust teaching that suits the students.	20	10	0	1	1	4.47
Using continuous assessments' data to provide follow up to students and teachers helps teachers to indicate coordination between teaching and learning.	22	8	1	1	0	4.59
Using continuous assessments' data to find out why students are failing in some questions helps teachers identify areas of syllabus to concentrate.	18	12	0	1	1	4.41
Determining why students make specific mistakes when attempting learning tasks helps teachers correct students' mistakes before final assessments.	16	16	0	0	0	4.50
Using continuous assessments' results to monitor learning progress in class and school helps teachers assess the effectiveness of school teaching programs.	22	10	0	0	0	4.69
Overall						**4.49**

Table 4.15 illustrates that Directors of studies in public secondary schools in Rachuonyo South Sub-County indicated that: Assessing students' knowledge and understanding frequently makes students study harder and teachers make efforts to improve students' academic performance (mean=4.34). This finding is agreement with earlier research findings by Bernatzsky, Cabrera, & Cid (2017), which revealed that frequent assessments act as extrinsic motivators that lead students to work harder and make teachers to increase efforts to improve students' academic achievements.

Directors of Studies agreed that providing continuous assessments' feedback helps teachers understand individual student's difficulties (mean=4.16). This finding is in line with literature by Dunlosky et al. (2013), which revealed that test results provide teachers with information about a given student's difficulties and strengths, thus serving to quality personal feedback and allowing for better aimed individual and class-level instruction (Black & William, 2009).

Directors of Studies strongly agreed that using continuous assessments' feedback data to provide students' learning profile helps teachers understand each student's academic ability (mean=4.56). This finding is in agreement with earlier research findings by Shute (2008), which revealed that feedback provided through formative assessments has significant benefits when motivating students, helping them to improve their learning, reinforcing their work and providing them with a learning profile that use to decide teaching methodology appropriate for leaners of varying abilities.

Directors of Studies agreed that using students' learning profile to understand students' learning needs helps teachers decide the remedial actions appropriate for the students (mean=4.69). This finding agrees with literature of Muskin (Muskin, 2017), which holds that continuous assessments is a formative assessment tool, which informs feedback, remediation and enriches target to students' leaning.

Directors of Studies agreed that using students' learning needs data to design subsequent instruction helps teachers adjust the teaching that suits the students (mean=4.47). This finding agrees with earlier research findings by Hernandez (2012), which revealed that using students learning needs' data assure the quality of the education system on the basis of which cognitive, psychomotor and affective domains are assessed and it helps the teachers to assess, redesign and make changes in the teaching strategies and plan new activities that enable the students to improve their performance.

Directors of studies agreed that using continuous assessments' data to provide follow up to students and teachers to indicate coordination between teaching and learning (mean=4.59). This finding is in line with literature by Rai (2019), which holds that continuous assessments provide regular follow-ups to the students and the teachers, which indicate coordination between teaching and learning and improve students' learning skills in the areas in which they are most commonly taught practical and problem-solving skills.

Directors of Studies agreed that using continuous assessments' data to determine why students are failing in some questions helps teachers identify which areas of the syllabus to concentrate (mean=4.41).

Directors of Studies agreed that determining why students make mistakes when attempting questions learning tasks helps teachers correct students' mistakes before the final exams (4.50). Directors of Studies strongly agreed that using continuous assessments' data to monitor learning progress at class and school helps teachers assess the effectiveness of school teaching programs (mean=4.69).

The overall mean rating for the Directors of Studies in this section is 4.49, which implies that Directors of Studies agreed that continuous assessment practices have effects on teaching and learning process.

4.7. Classroom Push and Pull Factors and Value Addition in Secondary Education

The fourth objective of the study sought to examine classroom push and pull factors' influence on value addition in secondary education. To address this objective, two measurement scales with question items rated on different Likert scales were selected.

4.7.1. Frequency of Implementing Classroom Push and Pull Factors

The first measurement scale sought to establish the frequency of implementing classroom push and pull factors in public secondary schools in Rachuonyo South Sub-County. To address this, a measurement scale with seven question items was selected and rated on a 5-point Likert scale from 1=Almost Never (AN); 2=Sometimes (SM); 3=Moderate (M); 4=Often (OF); 5= Always (A). Table 4.16 summarized the findings.

Table 4.16: Classroom Push and Pull Factors

Classroom Push N=500		**Rating**					
Pull Factors		**AN**	**SMT**	**M**	**OF**	**A**	**Mean**
Peer acceptance	Frequency	31	109	31	94	235	3.79
Positive teacher to student relationship.	Frequency	31	63	16	188	202	3.94
Peer Cohesion	Frequency	16	203	78	47	156	3.25
Peer task orientation	Frequency	0	219	16	187	78	3.26
Peer Rejection	Frequency	31	172	31	172	94	3.25
Peer engagement	Frequency	16	47	31	156	250	4.15
Negative teacher to student relationship	Frequency	0	47	31	141	141	2.91
Overall mean							**3.51**

Table 4.16 illustrates that students moderately rated all the Classroom Push and Pull Factors under consideration. The findings revealed that: Peer acceptance (mean=3.79) is an often occurrence among students. This implies that students relate with peers positively at the classroom level and this is one of the social factors that create conducive classroom environment for learning. This finding is consistent with literature as Gallardo, Barrasa, Guevara-Viejo (2016) purport that children who are more socially included by peers display higher levels of school engagement and academic performance.

Positive teacher-to-student relationship (mean=3.94) is an often occurrence in public secondary schools in this region. This implies that teachers relate with students positively at classroom level and this helps create conducive learning environment for students. This finding is in agreement with the opinion of Split *et al*. (2015), which holds that teachers with positive classroom relationships with students are more motivated to engage with students more often and during such interactions they learn more about students and understand them better and they can adapt their instruction to better meet the students' needs to help them learn more.

Peer cohesion (mean=3.26). The findings revealed that peer cohesion is a moderate occurrence among students in public secondary schools in this region. This implies that students in this region work together in classrooms.

Peer task orientation (mean=3.25). The findings revealed that students in public secondary schools in this region moderately incline towards performing school tasks like classroom assignments.

Peer Rejection (mean=3.25). The findings revealed that peer rejection is a moderate occurrence in public secondary schools in this region. This implied that some students in this region exclude their peers in classroom thereby making the classroom environment nonconductive for learning and this may explain the negative value additions in the secondary education for 2013 and 2014

cohorts in public secondary schools in this region. This finding is in agreement with literature as Yang *et al.* (2020) suggest that peer rejection is associated with lower school well-being, school interest, academic self-perception and higher levels of depressive symptoms, which undermine academic achievement.

Peer engagement (mean=4.15). This finding implies that students in public secondary schools in Rachuonyo South Sub-County often engage with peers at classroom level. This explains that peer engagement is a social factor necessary for creation of conducive classroom environment ideal for learning.

Negative teacher to student relationship (mean=2.91). The findings revealed that negative teacher-to-student relationships moderately existed in public secondary schools in this region. This implies that teachers in this region have conflicting relationships with students, which create nonconductive classroom learning environment for the students. This could be a reason explaining negative value additions in the secondary education of 2013 and 2014 cohorts in public secondary schools in this region. This finding agrees with the opinion of Mainhard (2015), which holds that teachers who have conflicting relationships with students tend to be more controlling by emphasizing rules, grade and ability differences among students. Such students tend to emphasize goals and avoidance goals and they may become overly concerned about failing, which may undermine mastery orientation.

Overall students moderately rated classroom push and pull factors (mean=3.51). From these findings it's evident that teachers in public secondary schools in Rachuonyo South Sub-County relate with students positively at classroom level and consider the needs of the students, which consequently create positive classroom climates that support learners' academic achievements.

4.7.2. Classroom Push and Pull Factors' Influence on Academic Performance

The second measurement scale sought to examine classroom push and pull factors' influence on academic performance. The measurement scale had seven question items rated on the Likert Scale: Strongly Disagree (SD)= 1; Disagree (D)=2; Moderately Agree (MD)=3; Agree (A)=4; Strongly Agree (SD)=5. The ratings were analyzed in frequencies and means. Table 4.17 summarized the findings.

Table 4.17: Effects of Classroom Push and Pull Factors on Academic Performance

Classroom Push N=500		**Rating**					
Pull Factors		**SD**	**D**	**MA**	**A**	**SA**	**Mean**
Peer acceptance improves academic performance.	Frequency	39	101	36	87	237	3.88
Positive teacher to student relationship improves academic performance.	Frequency	28	92	41	140	199	3.91
Peer cohesion improves academic performance	Frequency	16	56	88	183	156	3.31
Peer task orientation improves academic performance.	Frequency	17	197	24	156	106	3.26
Peer rejection improves academic performance.	Frequency	19	181	27	188	88	3.23
Peer engagement improves academic performance.	Frequency	13	54	34	164	255	4.17
Negative teacher to student relationship improves academic performance.	Frequency	27	43	36	148	154	2.97
Overall mean							**3.53**

Table 4.17 illustrates that: Students agreed that peer acceptance improves academic performance (mean=3.88). This finding agrees with earlier research findings by Allen *et al.* (2018), which

revealed that children who forge positive relationships with their class peers, experience feelings of relatedness and support have increased expectations for success, enhanced intrinsic value and achieve better academically.

Students agreed that positive teacher to student relationship improves academic performance (mean=3.91). This finding agrees with earlier research findings by Allen *et al.* (2013), which examined the relationship between teacher to student interactions and students' academic performance. Findings revealed that positive classroom climates characterized by teacher sensitivity, regard for adolescents' perspectives, order and organization and task focus predict students' academic performance;

Students moderately agreed that peer cohesion improves academic performance (mean=3.31). This finding agrees with the findings of Roseth, Johnson & Johnson (2008), which revealed that working together (e.g., by helping each other do homework) can improve students' academic achievement.

Students agreed that peer task orientation improves academic performance (mean=3.26). This finding seems to contradict earlier research findings by Juvenen *et al*. (2012), which revealed that when students have less support from their peers, they are more likely to feel afraid to accomplish tasks, which lessens their learning engagement.

Students moderately agreed that peer rejection improves academic performance (3.32). This finding agrees with earlier research findings by Yang *et al.* (2020), which revealed that peer rejection is associated with lower school well-being, school interest, academic self-perception and higher levels of depressive symptoms, which undermine academic achievement. Students who are

rejected by peers are more likely to skip school, drop out and obtain lower grades (Cillessen & Van den Berg, 2012).

Students agreed that peer engagement improves academic performance (mean=4.17). This finding is in agreement with earlier research findings by Tetzner, Becker, & Maaz (2017), which revealed that students who experience higher levels of peer inclusion tend to develop a greater sense of belonging to the classroom community and engage more in classroom activities, thereby improving their academic skills.

Students disagreed that negative teacher to student relationship improves academic performance (mean=2.97). This finding is in agreement with earlier research findings by Fong Lam et *al.* (2015), which revealed that negative teacher to student relationship that contributes to a lower sense of child belonging may result in lower motivation, academic achievement and child becoming more disaffected over time, especially when faced with academic challenges.

Overall, the mean for classroom push and pull factors and academic performance is 3.53. This implies that students agreed that classroom push and pull factors influence academic performance in public secondary schools in Rachuonyo South Sub-County.

4.8. Selected School Based Factors and Value Addition in Secondary Education of 2013 and 2014 Cohorts

This section presents the inferential statistics used in the study. The inferential statistics involved a multiple regression analysis between independent latent variables and the dependent latent variable of the study. The independent latent variables were the overall means obtained from the questionnaires addressing objectives two, three and four. The dependent latent variables were the value additions for the two cohorts under study (See Appendix VIII).

"Multiple regression analysis is used when one is interested in predicting a continuous dependent variable from a number of independent variables. It shows the percentage of the variation of the dependent variable that can be explained by the independent variables and this is assessed using the coefficient of determination (R^2), which is used for judging the explanatory power of the linear regression of dependent variable on independent variables. R^2 is a measure of the goodness of fit of the regression line to the observed sample values of dependent and independent latent variables," (Carver & Scheier, 2014).

"The R^2 can range from 0 to 1.0, with 1.0 showing a perfect fit, which indicates that each point is on the line," (Carver *et al.*, 2009). "Adjusted R-Square (R^2) adjusts the value of R^2 when the sample size is small since the estimate of R^2 obtained when the sample size is small tends to be higher than the actual R^2 in the population,". "The rule of thumb is to report adjusted R^2 when it substantially differs from $R^{2,}$" (Green & Salkind, 2010).

4.8.1. Multiple Regression Analysis for 2013 Cohort

The regression analysis for 2013 cohort was carried out between the overall means of the responses in the instruments addressing objectives two, three and four and value addition for 2013 cohort. The findings were summarized in the tables below.

Table 4.18: Summary for Regression Analysis for 2013 Cohort

model	R	R^2	$AdjustedR^2$	Std. Error of the Estimates
1	$.428^a$	.311	.16.4	.9843

a. Predictors: (Constant), TPAD, CA, CPP

Table 4.17 revealed that adjusted R^2=16.4. This coefficient of determination (predictor indicator) reveals that every adjustment in school-based factors results in 16% change in value addition in secondary education for the 2013 value added model. Thus, teacher performance appraisal, continuous assessment and classroom push and pull factors account for 16% of the value addition in secondary education of 2013 cohort in public secondary schools in Rachuonyo South Sub-County. This finding is in line with earlier research findings in school effectiveness research by (Coleman *et al.*,1966), which revealed that up to 16% of the variance in students' academic achievements is attributable to schools.

Table 4.19: Regression Analysis for 2013 Cohort

	Unstandardized Coefficients		Standardized Coefficient		
Model	B	Std. Error	Beta	T	Sig
1(constant)	-12.563	4.832		-1.813	.001
TPAD	2.405	1.432	.364	1.689	.008
CA	.329	.244	.154	.278	.034
CPP	.489	.213	.282	1.691	.018

b. Dependent Variable: VA2013

The beta (β) values allow us to compare the relative strength of each independent variable's relationship with the dependent variable. Table 4.18 illustrates that TPAD (β=0.364, p=0.008) has a significant positive relationship with value addition in secondary education. Moreover, findings revealed that Continuous assessments (β=0.154; P=0.034) has a weak significant relationship with value addition in secondary education. Finally, findings revealed that Classroom Push and Pull Factors have a weak positive significant relationship with value addition in secondary education in public secondary schools in Rachuonyo South Sub-County (β=0.282, p=0.018).

Thus, the prediction equation for the 2013 cohort value added model becomes:

$$Y = -13.474 + 0.322\ (\text{Teacher Performance Appraisal and Development}) + 0.05\ (\text{Continuous Assessments} + 0.273\ (\text{Classroom Push and Pull Factors})$$

This means that value addition in secondary education is predicted to increase by 0.322 when Teacher Performance Appraisal and Development increases by one unit, 0.05 when Continuous Assessments increase by one unit and by 0.273 when Classroom Push and Pull Factors increase by one unit.

4.8.2. Multiple Regression Analysis for 2014 Cohort

The regression analysis for 2014 cohort was carried out between the overall means of the responses in the instruments addressing objectives two, three and four and value addition for 2014 cohort. The findings were summarized in the tables below.

Table 4.20: Summary of Regression Analysis for 2014 Cohort

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.461	.215	.173	.65412

c. Predictors: (Constant), TPAD, CA, CPP

Table 4.20 reveals that adjusted-R^2=17.3. The coefficient of determination (predictor indicator) reveals that every adjustment in school-based factors results in 17% change in value addition in secondary education for the 2014 value added model. Thus, teacher performance appraisal, continuous assessment and classroom push and pull factors account for 17% of the value addition in the secondary education of 2014 cohort in public secondary schools in Rachuonyo South Sub-County. This finding is larger than earlier research findings in school effectiveness research by (Kyriakides & Luyten, 2011; Opdenakker & Van Damme, 2000) in UK, which revealed that up to 13% of the variance in students' academic achievements is between schools. The difference could be due to phase of schooling and the country in which the study was conducted (Teddlie *et al.*,

2000). The finding, however, falls within Teddlie *et al., (*2000) meat-analysis, which revealed that between 5-18% of students' academic performance is attributed to schools.

Table 4.21: Regression Analysis for 2014 Cohort

	Unstandardized Coefficients		Standardized Coefficient		
Model	B	Std. Error	Beta	T	Sig
1(constant)	-12.563	3,231		-2.346	.006
TPAD	2.016	1.026	.386	1.972	.009
CA	.217	0.150	.094	0.335	.047
CPP	.185	0.123	.109	0.387	.031

a). Dependent variable: VA2014

The beta (β) values allow us to compare the relative strength of each independent variable's relationship with the dependent variable. Table 4.19 illustrates that TPAD (β=0.386, p=0.009) has a significant relationship with value addition in public secondary schools in Rachuonyo South Sub-County. Moreover, findings revealed that continuous assessments (β=0.094, P=0.047) have significant relationship with value addition in secondary education in public secondary schools in Rachuonyo South Sub-County. Finally, findings revealed that Classroom Push and Pull Factors have a weak significant relationship with value addition in secondary education (β=0.109, p=0.031).

Thus, the prediction equation for 2014 cohort value addition model becomes:

$$\begin{aligned} Y = -2.871 &+ 0.633\ (\text{Teacher Performance Appraisal and Development}) \\ &+ 0.364\ (\text{Classroom Push and Pull Factors}) \\ &- 0.22(\text{CContinuous Assessments}) \end{aligned}$$

This means that value addition in secondary education is predicted to increase by 0.633 when Teacher Performance Appraisal and Development increases by one unit and increase by 0.364 when Classroom Push and Pull Factors increase by one unit.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of key findings, conclusions based on the findings, for improving value addition and suggestions for future research.

5.2 Summary of Findings

The summary of findings was based on the sequence of the levels of study analysis. The first level of analysis involved measuring the dependent variable and the independent variables of the study using frequencies, percentages and means. The second level of analysis involved multiple regression analyses between independent and dependent variables of the study.

5.2.1 Value Addition in Secondary Education

The study findings revealed that most schools (30) in the 2013 cohort had negative value additions. Consequently, the value addition for the sub-county was -1.563125. Further, findings revealed that all schools (32) in the 2014 cohort had negative value additions. Consequently, value addition for the sub-county was -1.9363125.

5.2.2 Teacher Performance Appraisal and Value Addition

The study findings revealed that teachers in public secondary schools in Rachuonyo South Sub-County: participate in continuous professional development programs and activities; are observed in classroom; construct teaching portfolio and are rated in performance appraisal.

Further, regression analysis revealed positive significant relationships between performance appraisal and value addition in secondary education of 2013 cohort (β=0.364, p=0.008) and 2014 cohort (β=0.386, p=0.009) in public secondary schools in Rachuonyo South Sub-County.

5.2.3 Continuous Assessments and Value Addition in Secondary Education

The findings revealed that all continuous assessment strategies are administered in public secondary schools in Rachuonyo South Sub-County. Moreover, findings revealed that continuous assessment are administered at daily, weekly, fortnightly, monthly and termly intervals. Finally, findings revealed that continuous assessment practices have effects on teaching and learning process.

Finally, regression analysis revealed that continuous assessments (β_1=0.154, p=0.034) have significant relationship with value addition in secondary education of 2013 cohort and an insignificant relationship (β=0.094, p=0.047) with value addition in secondary education of 2014 cohort.

5.2.4 Classroom Push and Pull Factors and Value Addition in Secondary Education

The findings revealed that: peer acceptance, positive teacher to student relationships and peer engagement are often occurrences in classrooms. Peer cohesion, peer task orientation and peer rejection occur moderately in classrooms and negative teacher to student relationships sometimes occur in classrooms.

Further, findings revealed that: students agreed that peer acceptance, positive teacher to student relationship and peer engagement improve academic performance. Findings further revealed that students moderately agreed that peer cohesion, peer task orientation, peer rejection and negative teacher to student relationship improve academic performance.

Finally, regression analysis revealed a significant positive relationship between classroom push and pull factors and value addition for the 2013 cohort (β=0.282, p=0.018) and 2014 cohort (β=0.109, p=0.031).

5.2.5 Contributions of School Based Factors to Value Addition in Secondary Education

The regression analysis revealed that adjusted R^2=0.164 This coefficient of determination (predictor indicator) revealed that every adjustment in school-based factors results in 16% change in value addition for the 2013 cohort.
For the 2014 cohort, the regression analysis revealed that the adjusted R^2=0.173 The coefficient of determination (predictor indicator) reveals that every adjustment in school-based factors results in 17% change in value addition for the 2014 cohort.

5.3 Conclusions

Based on the summary of findings, the researcher draws the following conclusions:

5.3.1 Value Addition in secondary Education of 2013 and 2014 Cohorts

The study concludes that negative value addition exists among the sampled secondary schools in the Sub-County for the 2013 and 2014 cohorts. The negative value additions imply that the two cohorts performed worse at KCSE examinations than at the corresponding KCPE examinations.

5.3.2 Teacher performance Appraisal and Value Addition in Secondary Education

The study found a significant positive relationship between teacher performance appraisal and value addition in secondary education of 2013 and 2014 cohorts. This means that teacher performance appraisal and value addition are statistically dependent. Thus, a conclusion was made to the effect that value addition is predictive on teacher performance appraisal. This means that if teacher performance appraisal practices increase, value addition also increases.

5.3.3 Continuous Assessments and Value Addition in Secondary Education

The study found a significant positive relationship between continuous assessments and value addition in secondary education of 2013 and 2014 cohorts. This means that continuous assessments and value addition are statistically dependent. Consequently, a conclusion was made that value addition in secondary education is explained by continuous assessments.

5.3.4 Classroom Push and Pull Factors and Value Addition in Secondary Education

The study found a positive significant influence between classroom push and pull factors and value addition for 2013 and 2014 cohorts. It was therefore concluded that classroom social factors like positive teacher-to-student relationship, positive student-to-student relationship, students' engagement, task orientations and students' behavior positively influence value addition in secondary education.

5.4 Recommendations

Since selected school-based factors influence value addition in secondary education, the study made recommendations for improving value addition and recommendations for further research.

5.4.1 Recommendations to Improving Value Addition in Education

Based on the conclusions drawn from the study, the following recommendations are made for the improvement of value addition and consequently academic performance.

i. The values additions in secondary education can inform schools' self-reviews. Since schools take into account students' prior attainment, value added results can be used as a regular process of schools' self-evaluation and review. The study recommends that schools should consciously promote active monitoring and supervision of its academic programmes and institutionalise continuous self-evaluation by both staff and its students. When monitoring the progress of students, each student's prior attainment in a particular

subject must be taken into account. By focussing on the subject results as well as the overall effectiveness, the school academic department can identify strengths and weaknesses and appropriate measures be employed to improve academic progress.

ii. The study found that teacher performance appraisal influences students' academic performance. Therefore, the study recommends that performance appraisal and development framework include more classroom observations from one and adopt multiple classroom observations like the Tennessee System of continuous multiple classroom-based teacher evaluation.

5.4.2 Recommendations for Further Research

To widen the scope of research in school-based factors and value addition, this study recommends further research in the following areas.

i. The study was limited to Teacher Performance Appraisal and Development (TSC, 2016) framework, which recommends one classroom observation per term for teachers. The study therefore recommends research on multiple classroom observations with immediate feedback to teachers in a term and its influence on value addition.
ii. The current study focused on the interval for implementing continuous assessment practices' influence on value addition in secondary education. The study therefore recommends a study on continuous assessments data's influence on value addition in secondary education.
iii. The current study focused on classroom social factors' influence on value addition in secondary education. The study therefore recommends research on other classroom factors and their influence on value addition in secondary education.

REFERENCE

Abejehu, S.B. (2016). The practice of continuous assessment in primary schools: The Case of Chagni, Ethiopia. *Journal of Education and Practice*, 7(31). 24-30.

Afriyie, M. (2009). The Influence of Planning Activity on Employee Performance Review

Ajuonuma, J. O., & Oguguo, C.E. (2015). Teachers' perception of the impact of Continuous Assessment Strategies on Students' Learning in Secondary Schools. *Nigerian Journal of Educational Research and Evaluation,* 14(2), 127-137

Aldridge, JM & Fraser, BJ 2000, 'A cross-cultural Study of Classroom Learning Environments in Australia and Taiwan', *Learning Environments Research,* vol. 3, pp. 101-134.

Allen, D.A., & Fraser, B.J. (2013). Parent and Student Perceptions of Classroom Learning Environment and its Association with Student Outcomes. *Learning Environments Research, 10, 67-82. Doi:10.1007/s10984-007-9018-z*

Amin, M. K. (2005). Social science Research*: Conception Methodology and Analysi*s.

Kampala: Makerere University Printer

Amutabi, M.N. 2003. Political interference in the Running of Education in Post-Independence Kenya*:* A Critical Retrospection. *International Journal of Educational Development*. 23: 127-144

Araujo, M.C., Carneiro, P., Cruz-Aguayo, Y., & Schady, N (2014). A Helping Hand? *Teacher Quality and Learning Outcomes in Kindergarten*. Banco Interamericano de Dessarollo, Wahington DCInedi'to.

Arega, M. (2014). Classroom assessment manual for primary and secondary school teachers. *National Educational Assessment and Examination Agency*. Addis Ababa, University, Ethiopia

Bankole E. T., & Ogunsakin F. C. (2015). Influence of Peer Group on Academic Performance of Secondary School Students in Ekiti State. *International Journal of Innovative Research and Development*, 4(1): 324-331

Bernard, H.R. (2010). Research Methods in Anthropology*: Qualitative and Quantitative Methods*. *3rd edition*. NAltaMira Press, Walnut Creek, California

Bernstein, D. & Jossey B. (2011) Making Teaching and Learning Visible

Bennett, R. E. (2011). Formative Assessment: A critical review. *Assessment in Education*: Principles, Policy and Practice 18, 5-25.

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. Educational Assessment, Evaluation and Accountability (formerly*: Journal of Personnel Evaluation in Education*, 21(1), 5.

Boynton, M. & Boynton, C. (2005). Developing Positive Teacher-Student Relationships. *Educator's Guide to Preventing and Solving Discipline Problems*. Retrieved fromhttp://www.ascd.org/publications/books/105124/chapters/Developing_Positive_Teacher Student_Relations.aspx

Braun, H., Chudowsky, N., & Koenig, J. (Eds.). (2010). *Getting value out of value-added: Report of a workshop*. Washington, D.C.: The National Academies Press.

Brekelmans, J. M. G., Mainhard, T., Brok, den, P. J., &Wubbels, T. (2011). Teacher control and affiliation: do students and teachers agree? *Journal of Classroom Interaction, 46*(1), 17-26

Brookfield, S. (2017). *Becoming a Critically Reflective Teacher, 2nd ed*. San Francisco: Jossey Bass

Bruns, B., D. Filmer and H. Patrinos (2011), Making Schools Work: New Evidence on Accountability Reforms, World Bank, Washington.

Buckingham, S. S. (2012). *Policy Brief: Learning Analytics*. UNESCO Institute for Information Technologies in Education

Burgess, Wilson & Worth J. (2013) A natural experiment in school accountability. The Impact of School Performance Information on Pupil Progress. *Journal of public economics, 106, 56-57*

Butler, A. C., & Roediger, H. L. I. I. I. (2012). Feedback enhances the positive effects and reduces the negative effects multiple-choice testing. *Memory & Cognition*, 36, 604–616.

Cabrera, J.M., & Cid, A. (2017). Gender Differences to Relative Performance Feedback: *A Field Experiment in Education*. Working paper, Universidad de Montevideo.

Retrieved from:http://fcee.um.edu.uy/investigacion/areas/

Carver, C. S., & Scheier, M. F. (2014). Dispositional optimism. *Trends in Cognitive Sciences*, 18(6), 293–299. https://doi.org/10.1016/j.tics.2014.02.00

Cillessen, A. H. N., & van den Berg, Y. H. M. (2012). Popularity and school adjustment.

In A. M. Ryan & G. W. Ladd (Eds), Adolescence and Education. *Peer relationships and adjustment at school* (pp. 135–164). Information Age Publishing.

Chetty, Raj, John N. Friedman, & Jonah E. Rockoff. 2014a. "Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates." *American Economic Review* 104(9):2593–2632.

Cohen, J. McCabe, E.M, Michelli, N.M & Pickeral T. (2009) School Climate: *Research, Policy, Teacher Education and Practice*

Coleman, J.S., Campbel.E., Hobson, C.,McPartland, J., Mood, A, Weinfeild, F. and York, R. (1966). *Equality of Educational Opportunity*. Washington DC: US Government Press

Creswell, J.W. & Creswell, J.D. (2018). Research Design, (5th Edition) London. Sage Edge

Publishers.

Darling-Hammond, L. (2010). Evaluating Teacher Effectiveness: *How Teacher Performance Assessment Can Measure and Improve Teaching*. Centre for American Progress, www.americanprogrss.org (Accessed 4 Aug 2011)

Danielson, C. & McGreal, T.L. (2011). Teacher evaluation: To enhance professional practice. Alexandria, VA: *Association for Supervision and Curriculum Development.*

Dandala, S. (2019). Human Resource Policy and Teacher Appraisal in Ontario in The Era of Professional Accountability. *Management in Education*, 33(1), 5-10

De Lisle, J. (2015). The promise and reality of formative assessment practice in a continuous assessment scheme: The case of Trinidad and Tobago. *Assessment in Education: Principles, Policy & Practice*, 22(1), 79–103

DfE (2018c) Secondary Accountability Measures: *Guide for Maintained Secondary Schools.* Academies and Free Schools (London, Department for Education).

Downes, D., & Vindurampulle, O. (2007). Value-added Measures for School Improvement. Melbourne: *Department of Education and Early Childhood Development*.

Duclos, M., & Murat, F. (2014). Comment évaluer la performance des lycées? Un point sur la méthodologie des IVAL (Indicateurs de valeur ajoutée des lycées). Éducation & Formations, 85, 73–84

Dunlosky, J., Rawson, K.A., Marsh, E.J., Nathan, M.J., & Willingham, D.T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest*. (in press).

Everson, K. C. (2017). Value-added modeling and educational accountability: are we answering the real questions? Review of Educational Research, 87, 35–70. https://doi.org/10.3102/0034654316637199.

Ekpoh U.I. (2018) Assessing University Students' Satisfaction with Service Delivery*: Implications for Educational Management. Global Journal of Arts, Humanities and Social Sciences Vol.6, No.6, pp.48-60*

Epstein, M., Atkins, M., Cullman, D., Kutash, K.& Weaver. (2008). Reducing 94 Behaviour Problems in Elementary School Classroom. *A Practice Guide (NCEEU2008-012)*. Washington DC, National Centre for Education Evaluation and Regional Assistance, Institute of Education Sciences, US Department of Education.

Figlio, D., Loeb, S., (2011) School Accountability, in: Hanushek, E.A., Machin, S.,

Woessmann, L. (Eds.), *Handbook of the Economics of Education*. Vol. 3: [...], Handbooks in Economics. North-Holland, Amsterdam.

Fong Lam, U., Chen, W., Zhang, J., & Liang, T. (2015). It feels good to learn where I belong: School belonging, academic emotions, and academic achievement in adolescents. *School Psychology International*, 36(4), 393–409. https://doi.org/10.1177/0143034315589649

Fraser, B.J., Treagust, D.F. & Dennis, N.C. (2000). *Development of an Instrument for Assessing Classroom Psychosocial Environment at Universities and Colleges*. Studies in Higher Education, 11, 43–54.

Gallardo, L., Barrasa, A., & Guevara-Viejo, F. (2016). Positive peer relationships and academic achievement across early and mid-adolescence. *Social Behavior and Personality: An International Journal,* 44, 1637-1648.

doi:10.2224/sbp.2016.44.10.163

Gathumbi, A., WN. J, & Mungai, N.J & Hanitez, D.L(2013). Towards Comprehensive Professional Development for Teachers*:* The case of Kenya. *International Journal of press education*

Gest, S.D. & Rodkin, P.C. (2011). Teaching Practices and Elementary Peer Ecologies. *Journal of Applied Development Psychology,* 32(2011), pp. 288-296

Goldberg, G. L. (2011, May). Portfolio assessment as a tool for teacher evaluation. Presentation made to the Maryland Council for Educator Effectiveness. Retrieved from http://marylandpublicschools.org/NR/rdonlyres/69B8F5FC-6A4A-468F-8886E089A2605AD8/28669/Portfolio_Assessment_Presentation_Outline_05161.pdf

Green, S.B & Salkind, NJ.,2010. Using SPSS for Windows and Macintosh: *Analyzing and Understanding data.* Prentise Hall Press.

Greenstein, L. (2010). *What Teachers Really Need to Know About Formative Assessment?* Alexandria: ASCD

Groom, B., & Maunonen-Eskeninen, I (2006). The use of Portflio to Develop Reflective Practice in Teacher Training: *A Comparative and Collaborative Approach between Two Teacher Training Providers in the UK and Finland*.

Hadi A. (2006). *The Relationship between Teachers' Performance Ratings and the Achievement of their Students Education.* Organization of Zanjan. Applied H.R.M. Research, Volume 11, (1): 75-78. Julie

Hannaway, J., & Mittleman, J. (2011). Education politics and policy in an era of evidence. D. Mitchell, R. Crowson, & D. Shipps, *Shaping Education Policy*, 81-91

Hay Group (2012). Growing our Potential: *Hay Group's view on Implementing an Effective Performance Improvement and Development Framework for Teachers*. Melbourne, Vic.: Hay Group.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate Data Analysis* (8th ed.). United Kingdom: Cengage Learning

Hernández, R. (2012). Does continuous assessment in higher education support student

learning? *Higher education*, 64(4), 489-502.

Hopkins, D., Stringfeld, S., Harries, A., Stoll, L., and Mackay, T., (2013) School and

System Improvement. School Effectiveness and School Improvement, 24.

Institute of Economic Affairs (2017*) Comparative Analysis of KCSE performance.*

Downloadedatwww.ieakenya.or.ke/number_of_the_week/comparative-analysis-

of-KCSE-performance

Jencks, C, S., M., Ackland, H., Bane, M.J., Cohen D., Gintis, H., Heyns, B. & Michelson, S. (1972). Inequality: *A Reassessment of the Effect of the Family and Schooling in America*. New York: Basic Books.

Jia, Y., Ling., Chen, X., Ke, X., Way, N., Yoshikawa, H., Lu, Z (2009). The Influence of

Students' Perception of School Emotional and Academic Adjustment: A Composition of Chinese and American Adolescents. *Child Development,* 80, 1514-1530

JICA (2013), Kenya SMASSE/SMASE projects (1998-2013).

Johnson, D., & Johnson, F. (2009). Joining together: *Group Theory and Group Skills* (10th

ed.). Upper Saddle River, N.J: Pearson Education.

Joseph, G.E., Brennan, C (2013). Framing Quality: *Annotated Video-based portfolios of Classroom Practice by Pre-service Teachers.*

Julie, A. N. (2012) Effects of Teacher Evaluation on Teachers Effectiveness and Student Achievement. *A published MED thesis, Northern Michigan University*.

Juvoven, J., Espinoza, G., & Knifsend, C. (2012). The Role of Relationships in Student

Academic and Extracurricular Engagement. In S. Christenson, A. Reschly, & C. Wylie (eds.), *Handbook of Research on Student Engagement* (pp. 387-402). NY: Springer.

Kithuku, V. M. (2012). Effects of Performance Appraisal on Job Satisfaction at Kenya Commercial Bank. University of Nairobi.

Kiplagat P. (2016*).* Rethinking Primary School Mathematics Teaching: A Formative

Assessment Approach. *Baraton Inter-Disciplinary Research Journal (2016), 6(Special Issue) pp 32-38.*

Kyriakides, L., & Luyten,H.(2011).The contribution of schooling to the cognitive development of secondary education students in Cyprus: *An application of regression discontinuity with multiple cut off points. School Effectiveness and School Improvement, 20(2)*

Kothari C.R (2012). *Research Methodology, Methods and Techniques*. (2nd ed) New Delhi: Pitman Publishers.

Lawman, H. G., & Wilson, D. (2013). Self-determination theory. In M. D. Gellman, & J.

R. Turner (Eds.), *Encyclopedia of Behavioral Medicine* (pp. 1735–1737). Springer

Lau, C.,2016. Formative good? Summative bad? - *A Review of the Dichotomy in Assessment Literature. Journal of Further and Higher Education*, 40(4), PP.509-525.

Levin, B. (2014). *Professional Development and The Promotion of Highly-Effective Teaching.* Paper presented in 29th annual Emerging Issues Forum in North Carolina- USA on 10-11 February 2014.

Liu, O. L. (2011). Value-added assessment in higher education*: A comparison of Two Methods. Higher Education, 61, 445-461.*

McDaniel, M. A., Agarwal, P. K., Huelser, B. J., McDermott, K. B., & Roediger, H. L.

(2011). Test-enhanced learning in a middle school science classroom: *The Effects*

of Quiz Frequency and Placement. Journal of Educational Psychology, 103(2),

399-414. doi:10.1037/a002178

Magulod Jr, G. C. (2017). Factors of school effectiveness and performance of selected public and private elementary schools: implications on educational planning in the

Philippines. *Asia Pacific Journal of Multidisciplinary Research*, 5(1), 73-83.

Mahmoudi, S., Ghasemi, F., Mohammadfam, I., & Soleimani, E. (2014). Framework for

continuous assessment and improvement of occupational health and safety issues in construction companies. *Safety and Health at Work*, 5(3), 125-130

Mainhard, T., Oudman, S., Hornstra, L., Bosker, R. J., & Goetz, T. (2018). Student

emotions in class: The Relative Importance of Teachers and Their Interpersonal Relations with Students. *Learning and Instruction*, 53, 109–119.doi: 10.1016/j.learninstruc.2017.07.011

Marshall, K (2009). Rethinking Teacher Supervision and Evaluation: *How to Work Smart, Buld Collaboration and Close the Achievement Gap*. San Francisco, CA:Jossey-Bass.

Marzano, R. J. (2012). Teacher Evaluation: What's fair? What's effective? The Two Purposes of Teacher Evaluation. *Educational Leadership, 70(3), 14–19. Alexandria, VA: ASCD.*

MoEST, (2018*): Rachuonyo South Sub-County Education Report, KCPE Analysis*. Unpublished

Mohajan, H. (2017). Two criteria for good measurements in research: Validity and

Reliability. *Annals of Spiru Haret University. Economic Series*, *17*(4), 59-82.

Muijs, D., Creemers, B., Kyriakides, L., Van der Werf, G., Timperley, H., & Earl, L. (2013). Teaching Effectiveness. A State-of-the-Art Review. *School Effectiveness and School Improvement, 24.*

Mugenda, O. M., & Mugenda, A. G. (2012). *Research Methods Dictionary*. Act press Nairobi.

Muskin, J. (2017), "Continuous Assessment for Improved Teaching and Learning: A Critical Review to Inform Policy and Practice", *Current and Critical Issues in Curriculum, Learning and Assessment* No. 13, https://unesdoc.unesco.org/ark:/48223/pf0000255511

Mwebaza, M. (2010). *Continuous Assessment and Students' Performance in 'A' level Schools in Masaka Distric*t. A dissertation for award of Masters of Education in Curriculum teaching and media studies, Makerere University, Kampala Uganda

Nicodemus, O.A., & John, M.B. (2019). School Effectiveness and Improvement: Value-added by Extra-County Schools to Students' Entry Marks Upon Exit. *Journal of African Studies in Educational Management and Leadership.* Vol: 11, May-August 2019, 39-55

Obaki O. (2017). Impact of Classroom Environment on Children's Social Behavior.

International Journal of Education and Practice

OECD (2008c) Measuring Improvements in Learning Outcomes: *Best Practices to Assess the Value Added of Schools (Organization for Economic Co-Operation and Development Publishing & Center for Education Research and Innovation)*

OECD (2013), Education at a Glance 2012: OECD Indicators, Paris OECD (2013), PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy, OECD, Paris.Ofsted (2006), *The initial Training of Further Education for Teachers:* findings from 2004/05 inspections of courses leading to national awarding body qualifications.

Oli, G., & Olkaba, T. (2020). Practices and challenges of continuous assessment in Colleges of teachers' education in west Oromia region of Ethiopia. *Journal of Education, Teaching and Learning,* 5(1), 8-20

Oluwatayo, J. 2012. Validity and reliability issues in educational research. *Journal of Education and Social Research 2 391-400.*

Omeba, C. A. (2014). Continuous Assessment in Nigeria. Issues and Challenges. *Journal*

of Education, 2(7), 15-17

Opdenakker, M.-C., & Van Damme, J. (2000). Effects of schools, teaching staff and classes on achievement and well-being in secondary education: *Similarities and Differences between School Outcomes*. School Effectiveness and School Improvement, 11(2), 165–196.

Orodho, A.J. (2009*). Elements of Education and Social Sciences Research Methods*, Kanezja Publisher.

Onyehalu, J. (2014*).* Engaging youth in schools: Empirically-based models to guide the feature innovations. *A Handbook for National society for the study of education (NSSE).*

Oso, W. Y., & Onen, D. (2009). *A General Guide to Writing Research Proposal and Report*

Patrick, H., Kaplan, A., & Ryan, A. M. (2015). Positive classroom motivational environments: Convergence between mastery goal structure and classroom social climate. *Journal of Educational Psychology*, *103*(2), 367–382. https://doi.org/10.1037/a0023311

Perry, T. (2007). English value-added measures: examining the limitations of school performance measurement. *British Educational Research Journal*, 42, 1056–1080. https://doi.org/10.1002/berj.3247

Peng P & Klieme E (2014) *One-year value-added school effects from various models and their intertemporal variability: Evidence from China*. Unpublished manuscript. Available at: www.invalsi.it/ invalsi/ri/improving_education/Papers/peng/151.doc (accessed 02 December 2015).

Rai, C. (2019). Teacher's Perception of Continuous Assessment System at Basic Level.

Molung Educational Frontier, 9, 55-64. https://doi.org/10.3126/mef.v9i0.33585

Republic of Kenya. (2010*).* Taskforce report on the re-alignment of the education sector to the constitution of Kenya 2010: *Towards A Globally Competitive Quality Education for Sustainable Development.* Nairobi. Government Printers

Republic of Kenya (2018). National Education Sector Strategic Plan (NESSP), Nairobi: *Ministry of Education Science and Technology.*

Reynolds, D. (2010b). Failure free education? *The Past, Present and Future of School*

Effectiveness and School Improvement. London: Routledge

Reynolds *et. al*. (2013) Reynolds, D., Sammons, P., De Fraine, B., Townsend, T., Van Damme, J., Teddlie, C., &Stringfield, S. (2012). Educational Effectiveness Research (EER): *A state of the Art Review. School Effectiveness and School Improvement, 24.*

Rezaei, A. R. (2015). Frequent collaborative quiz taking and conceptual learning. *Active Learning in Higher Education*, 16(3), 187–196. doi:10.1177/1469787415589627

Sanders, W. L., & Horn, S. P. (1994). The Tennessee Value-Added Assessment System (TVAAS): mixed model methodology in educational assessment. *Journal of Personnel Evaluation in Education*, 8, 299– 311.

Sartain, L., Stoelinga, S., & Brown, E (2013). Rethinking Teacher Evaluation in Chicago: *Lesson Learned from Classroom Observations. Principal-Teacher Conference and District Implementation*. Chicago, IL: Chicago Consortium on Chicago School Research.

Sayavedra, M. (2014). *Teacher Evaluation*. ORTESOL Journal, 31, 1–9.

Scheerens, J. (2000). *Improving school effectiveness*. (Fundamentals of Educational Planning; No. 68). UNESCO International Institute for Educational Planning

Seldin, P., Miller, J. E., & and Seldin, C. A. (2010). The teaching portfolio: *A Practical Guide to Improved Performance and Promotion/Tenure Decisions*. John Wiley & Sons.

Sartain, L., Stoelinga, S., & Brown, E(2011). Rethinking Teacher Evaluation in Chicago: *Lesson Learned from Classroom Observations. Principal-Teacher Conference and District Implementation*. Chicago, IL: Chicago Consortium on Chicago School Research.

Shepard, L. A. (2017). *Formative Assessment*: Caveat emptor. In The future of assessment

(pp. 279–303). Routledge

Shirvani, H. (2009). Examining an assessment strategy on high school mathematics achievement: *Daily quizzes vs. weekly tests. American Secondary Education*, 38(1), 34-45.

Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Effects*, 78(1), 153–189. http://dx.doi.org/10.3102/0034654307313795

SMASSE project (2013). *Statistical Analysis on SMASSE Project Impact Assessment Survey*, JICA. Tokyo, Japan

Spilt, J. L., Hughes, J. N., Wu, J. Y., & Kwok, O. M. (2015a). Dynamics of teacher–student relationships: Stability and change across elementary school and the influence on children's academic success. *Child Development,* 83(4), 1180–1195. https://doi.org/10.1111/j.1467-8624. 2012.01761. x.

Spours K, Hodgson A (1996*),* Value Added and Raising Achievement*: A Formative Approach. London: Institute of Education.*

Stuhlman, M., & Pianta, R. (2009). Profiles of Educational Quality in the First Grade. *The Elementary School Journal,* 109,323-342.doi:10.1086/593936

Teacher Advancement Program. (2012). *Understanding Value-Added Analysis of Student Achievement.* Retrieved on July 17, 2012, from http://www.tapsystem.org/policyresearch/policyresearch.taf?page= value added

Teachers Service Commission (2016). *Teacher Performance Appraisal and Development Tool*. TSC website.pdf. (Accessed on 20th May, 2017)

Teddlie, C., Reynolds, D. & Sammons, P. 2000. The Methodology and Scientific Properties of School Effectiveness Research. In D. Reynolds & C. Teddlie (Eds.), *The International Handbook of School Effectiveness Research. (pp.53-133).* London: Falmer Press.Taylor, E.S. and J.H.

Tetzner, J., Becker, M., & Maaz, K. (2017). Development in multiple areas of life in adolescence: Interrelations between academic achievement, perceived peer acceptance, and self-esteem. *International Journal of Behavioral Development*, 41, 704 – 713. doi:10.1177/016502541666443

Thomas, S., Salim, M., Muñoz-Chereau, B. and Peng, W-J. (2012) *Educational Quality, Effectiveness and Evaluation*: Perspectives from China, South America and Africa, in Ch. Chapman, P. Armstrong, A. Harris, D. Muijs, D. Reynolds and P. Sammons (Eds.), School Effectiveness and School Improvement Research, Policy and Practice. Challenging the Orthodoxy. London, Routledge pp. 125-145

Turner, J., & Briggs, G. (2018). To see or not to see? Comparing the effectiveness of examinations and end of module assessments in online distance learning. *Assessment & Evaluation in Higher Education*, 43(7), 1048–1060.

Tyler (2011), "The Effect of Evaluation on Performance: Evidence from Longitudinal Student Achievement Data of Mid-Career Teachers", NBER Working Paper Series, No. 16877, *National Bureau of Economic Research*, Cambridge.

UNESCO. 2013. *Policy Guidelines for Mobile Learning*. Paris, Author. http:// unesdoc.unesco.org/images/0021/002196/219641E.pdf

Wallace, T. L., Kelcey, B., & Ruzek, E. (2016). What can student perception surveys tell us about teaching? Empirically testing the underlying structure of the tripod student

perception survey. *American Educational Research Journal*, 53(6), 1834-1868

Wentzel, K., Baker, S., & Russell, S. (2009). Peer relationships and positive adjustment at

school. In R. Gilman, E. S. Huebner, & M. J. Furlong (Eds.), *Handbook of Positive Psychology in Schools* (pp. 229–243). Routledge/Taylor Group

Yamane, Taro. (1967). Statistics: *An Introductory Analysis*, 2nd Edition New York: Harper and Row.

Yang Y, Chen L, Zhang L, Ji L, Zhang W. Developmental changes in associations between

depressive symptoms and peer relationships: A four-year follow-up of Chinese adolescents. *Journal of Youth and Adolescence.* 2020; 49:1913–1927.

Zhang, X., & Ng, H. (2017). An Effective Model of Teacher Appraisal: *Evidence from Secondary Schools in Shanghai, China*. *Educational Management Administration & Leadership*, 45(2), 196-218

Zhu, P., Jacob, R., Bloom, H., & Xu, Z. (2012). Designing and analyzing studies that randomize schools to estimate intervention effects on student academic outcomes without classroom-level information. *Educational Evaluation and Policy Analysis*, 34(1), 45–68. https://doi.org/10.3102/016237371142378

APPENDICES

APPENDIX I: INTRODUCTORY LETTER

Informed Consent Letter
Department of Educational Management and Foundations,
Maseno University,
Private Bag, Maseno

Dear participant,

RE: PARTICIPATION IN THE STUDY

I am a postgraduate student pursuing a Master's Degree Program in Educational Planning and Economics at the Department of Educational Management and Foundation.

I am conducting a study for a Master's Thesis on Selected School Based Factors' Influence on Value Addition in Secondary Education of 2013 and 2014 Cohorts in Public Secondary Schools in Rachuonyo South Sub-County.

I humbly request your honest and sincere participation in this study. The information you will give will be treated with utmost confidentiality and will be used exclusively for the purpose of this study.

You are mandated a democratic space to withdraw from this study any time you deem fit. You also have the permission to request the researcher to inform you about the findings of this study. Please, sign in the space provided below. Thank you in advance.

Yours faithfully,

……

Odera Phelix Amoke

…… ……

Participant Date

APPENDIX II: PERMIT FROM ETHICAL REVIEW COMMITTEE OF MASENO UNIVERSITY

MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050
Fax: +254 057 351 221
Private Bag – 40105, Maseno, Kenya
Email: muerc-secretariate@maseno.ac.ke

REF: MSU/DRPI/MUERC/00946/21 **Date:** 30th July, 2021

TO: Phelix Amoke Odera
PG/MED/ED/00046/2014
Department of Educational Management and Foundations
School of Education, Maseno University
P. O. Box, Private Bag, Maseno, Kenya

Dear Sir,

RE: Selected School Based Factors' Inflience on Value Addition in Secondary Education in Public Secondary Schools in Rachuonyo South Sub-County, Homabay County, Kenya

This is to inform you that **Maseno University Ethics Review Committee (MUERC)** has reviewed and approved your above research proposal. Your application approval number is MUERC/00946/21.The approval period is 30th July, 2021 – 29th July, 2022.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by Maseno University Ethics Review Committee (MUERC).
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to Maseno University Ethics Review Committee (MUERC) within 24 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to Maseno University Ethics Review Committee (MUERC) within 24 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to Maseno University Ethics Review Committee (MUERC).

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely

Prof. Philip O. Owuor, PhD, FAAS, FKNAS
Chairman, MUERC

MASENO UNIVERSITY ETHICS REVIEW COMMITTEE 30 JUL 2021 P.O. BOX PRIVATE BAG MASENO

MASENO UNIVERSITY IS ISO 9001: CERTIFIED

APPENDIX III: DOCUMENT ANALYSIS GUIDE

School category:			
Cohort:			
Candidates:			
Index Number	Student *'i'*	Scores	
		KCPE	KCSE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

APPENDIX IV: QUESTIONNAIRE FOR DEPUTY PRINCIPALS

The purpose for this questionnaire is to collect information on teacher performance appraisal's influence on value addition in secondary education in public secondary schools in Rachuonyo South Sub-County. Please, fill in the information as required.

Section A: Background Information

1. Your sex _____
2. Your age _____
3. Duration in service _____
4. Duration of service at current station _____
5. Duration in service as a deputy principal _____
6. School category _____

SECTION B: Parameters Enhancing Teacher Professional Growth on Teacher Performance Appraisal and Development (TPAD) Framework

This section talks about parameters that enhance teacher professional growth on Teacher Performance Appraisal and Development (TPAD) framework. For the interest of relevance to the study, the researcher decided to use four parameters including: continuous professional development, classroom observation, teaching portfolio and appraisal ratings. Each of the four parameters has five question items, which were rated on the Likert Scale: Strongly Disagree= 1; Disagree=2; Moderately Agree=3; Agree=4; Strongly Agree=5.

7. Rate your level of agreement or disagreement with the following statements about continuous professional development and teacher's professional growth.

Continuous Professional Development	**N=32**	**Rating**				
		SA	**A**	**MA**	**D**	**SD**
Teachers in my staff engage in continuous professional development activities and programs.	Frequency	8	9	4	6	5
Continuous professional development aids teachers in developing new pedagogical theories and skills in the career.	Frequency	11	14	2	2	3

Continuous professional development helps teachers enhance expertise in their work	Frequency	16	14	0	1	1
Continuous professional development enables teachers improve their quality of teaching in classroom.	Frequency	18	12	1	1	0
Continuous professional development helps teachers develop professionally throughout their career.	Frequency	20	10	0	1	1
Overall						

8. Rate your level of agreement or disagreement with the following statements about continuous professional development and teacher's professional growth.

Classroom Observation	**N=32**	**Rating**				
		SA	**A**	**MA**	**D**	**SD**
Teachers in my staff participate in classroom observation	Frequency	14	12	1	3	2
Classroom observation enables the appraiser to observe all aspects of a teacher's teaching.	Frequency	18	12	0	1	1
Classroom observation enables teachers identify their aspects of teaching that need improvement.	Frequency	10	16	1	2	3
Classroom observation provides immediate feedback to teachers about their performance in teaching.	Frequency	22	10	0	0	0
Classroom observation enables teachers develop professionally	Frequency	16	13	1	1	1
Overall						

9. Rate your level of agreement or disagreement with the following statements about teaching portfolio and teacher's professional growth.

Teaching Portfolio	**N=32**	**Rating**				
		SA	**A**	**MA**	**D**	**SD**
Teachers in my staff construct teaching portfolio.	Frequency	10	12	2	4	4
Teaching portfolio enable teachers identify teaching practices that require improvement.	Frequency	8	18	1	2	3
Teaching portfolio enable teachers do self-assessment of their teaching practices.	Frequency	10	12	2	4	4
Teaching portfolio provides immediate formative feedback to teachers about their teaching practices.	Frequency	9	16	1	3	3
Teaching portfolio enables teachers room for professional development.	Frequency	10	18	2	1	1
Overall						

10. Rate your level of agreement or disagreement with the following statements about teaching portfolio and teacher's professional growth.

Appraisal Rating	**N=32**	**Rating**				
		SA	**A**	**MA**	**D**	**SD**
Teachers in my staff participate in performance appraisal.	Frequency	18	12	0	1	1
Performance appraisal ratings help teachers identify the areas they need to improve on.	Frequency	12	16	1	2	2
Performance appraisal ratings help teachers develop their competencies.	Frequency	13	1	1 4	2	2
Performance appraisal ratings keep teachers on toes in service as they fight to meet the expected standards in teaching.	Frequency	20	8	0	1	1
Performance appraisal ratings help teachers develop professionally.	Frequency	16	11	1	2	2
Overall						

APPENDIX V: QUESTIONNAIRE FOR DIRECTORS OF STUDIES

The purpose for this survey is to collect information on continuous assessments' influence on value addition in secondary education in public secondary schools in Rachuonyo South Sub-County. Please, fill in the information as required.

Section A: Background Information

1. Sex _____
2. Age _____
3. Duration in service _____
4. Duration of service at current station _____
5. Duration in service as Deputy Principal _____
6. School category _____

Section B: Continuous Assessment Strategies Employed in Assessing Students

This section talks about continuous assessment strategies and practices employed in assessing students. Please, provide relevant information as required.

7. a). Please, indicate by ticking (√) the continuous assessment strategies you employ in assessing students in your school.

Continuous Assessment Strategy	**Tick (√) in this column**
Recap exercise	
Assignment	
Oral tests	
Written tests	

b). Please, rate the interval for administering the following continuous assessment strategies in assessing students in your school. Use the Likert scale: Termly=1; Half-termly=2; Monthly=3; Weekly=4; Daily=5.

Continuous Assessment Strategy	Rating (%)
Recap exercises	
Assignments	
Oral tests	
Written test	

8. a). Indicate what you do when administering continuous assessments by ticking **(**√**)** against the following statements.

Table 4.14: Continuous Assessment Practices

Continuous Assessment Practice	Rating
Assessing students' knowledge and understanding frequently.	
Providing feedback assessments' feedback.	
Using continuous assessments' feedback data to provide students' learning profile.	
Using students' learning profile to understand students' learning needs.	
Using students' learning needs data to design subsequent instruction.	
Using continuous assessments' data to provide follow up to students and teachers.	
Using continuous assessments' data to find out why students are failing in some questions.	
Determining why students make specific mistakes when attempting learning tasks.	
Using students' results to monitor learning progress in class and school.	

8b). Please, indicate your level of agreement and/or disagreement with the following continuous assessment practices on teaching-learning process in your school. Use the Likert scale: Strongly Agree (SA)=5; Agree(A) =4; Moderately Agree (MA)=3; Disagree(D) =2; Strongly Disagree (SD) =1.

Effects of Continuous Assessment Practices on Teaching and Learning	**Rating**
Assessing students' knowledge and understanding during teaching and learning helps students improve academic performance.	
Marking continuous assessments and providing feedback helps teachers understand the learning areas that require remedial actions.	
Using continuous assessments' feedback data to provide students' learning profile helps teachers know each student's academic ability.	
Using students' learning profile to understand students' learning needs helps teachers decide remedial action appropriate for each student.	
Using students' learning needs data to design subsequent instruction helps teachers adjust teaching that suits the students.	
Using continuous assessments' data to provide follow up to students and teachers helps indicate coordination between teaching and learning.	
Using continuous assessments' data to find out why students are failing in some questions helps teachers identify areas of syllabus to concentrate.	
Determining why students make specific mistakes when attempting learning tasks helps correct learning mistakes before the summative assessments.	
Using continuous assessments' results to monitor learning progress in class and school helps teachers assess the effective of the school teaching programs.	

APPENDIX VI: QUESTIONNAIRE FOR STUDENTS

The purpose for this questionnaire is to collect data on classroom pull and push factors' influence on value addition in secondary education in Public Secondary Schools in Rachuonyo South Sub-County. Please, fill in the information as required.

Section A: Background Information

1. Your sex _____
2. Your_____

Section B: Researcher Modified 'What Happens In This Classroom Questionnaire.'

To assess classroom-pull and push factors, five scales from the What Is Happening In this Class (WIHIC) questionnaire developed by Fisher (2000) was used. The WIHIC is a well-established and widely used questionnaire in classroom environment research (Aldridge & Fraser, 2000). As this study involved data collection on five facets of classroom life for students (viz. classroom environment and academic achievement), the researcher decided in the interests of economy to use five of the seven WIHIC scales: Student' Cohesiveness, Teacher Support, Student's Involvement, Task Orientation, and Equity. A five-point Likert response format (viz. Almost Never, Seldom, Sometimes, Often, and Almost Always) will be used, i.e.: Likert point; 1=N; Never; 2=S; Seldom; 3=ST; Sometimes; 4=O; Often; 5=A; Always.

3. For each of the classroom push and pull factors below, rate what happens in your classroom.

NO.	Classroom Push and Pull Factors	Rating				
		N	**S**	**SM**	**O**	**A**
i.	Students are friendly, value academics and support for each other in class					
ii.	Teachers are sensitive to students' needs, regard for students' perspectives and help students stay task focused.					
iii.	Students have attentive interest, participate in class and involve with other students.					
iv.	Students carry out investigations in different tasks to test ideas in problem solving by students.					

v.	Students' complete classroom tasks and stay on subject matter.					
vi.	Students' cooperate with each other in discussions during classroom tasks.					
vii.	Teachers support and help students in their learning needs.					

4. The second measurement scale sought to examine classroom push and pull factors' influence on academic performance. The measurement scale had seven question items rated on the Likert Scale: Strongly Disagree (SD)= 1; Disagree (D)=2; Moderately Agree (MD)=3; Agree (A)=4; Strongly Agree (SD)=5. The ratings were analyzed in frequencies and means. Table 4.17 summarized the findings.

I	Students' friendliness, value for academics and support for each other in class improve academic performance.					
ii	Teachers' sensitivity to students' needs, regard for students' perspectives and helping students stay task focused influence academic performance.					
iii	Students' attentive interest, participation in class and involvement with other students improve academic performance.					
iv	Carrying out investigations in different tasks to test ideas in problem solving by students improve academic performance.					
V	Students' completing classroom tasks and staying on subject matter improve academic performance.					
vi	Students' cooperation with each other in discussions during classroom tasks improve academic performance.					
vii	Teachers' support and help to students their learning needs improves academic performance.					

APPENDIX VII: 12-POINT GRADING INDEX IN KENYAN EDUCATION

A (Plain)	12 points
A- (Minus)	11 points
B+ (Plus)	10 points
B (Plain)	9 points
B – (Minus)	8 points
C+ (Plus)	7 points
C (Plain)	6 points
C - (Minus)	5 points
D + (Plus)	4 points
D (Plain)	3 points
D – (Minus)	2 points
E	1 point

APPENDIX VIII: INDEPENDENT AND DEPENDENT VARIABLE VALUES

INDEPENDENT VARIABLES	DEPENDENT VARIABLE
1. Performance Appraisal's mean=3.89	
2.Continuous Assessments= The instrument addressing objective two used different Likert scales. Consequently, it was impossible to present the mean for the findings in this instrument. However, in the software used in the analyses, the mean was presented.	2013 cohort value addition= -1.563125
3.Classroom Push and Pull Factors' mean =3.52	2014 cohort value addition= -1.936125

APPENDIX IX: MAP OF RACHUONYO SUB COUNTY