

**PERFORMANCE APPRAISAL OUTCOMES AND ENTRY TO TEACHER
CAPACITY BUILDING PROGRAMMES IN PUBLIC SECONDARY
SCHOOLS IN MATETE SUB-COUNTY-KAKAMEGA COUNTY, KENYA**

GODWIN M. SASITA

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ECONOMICS AND PLANNING (PLANNING OPTION) OF MASINDE
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DECLARATION

This thesis is my own original work prepared with no other than the indicated sources and support and has not been presented elsewhere for a degree or any other award.

Signature: Date:

Name: Godwin Musungu Sasita

Reg No. EPM/G/07/12

CERTIFICATION

The undersigned certify that they have read and hereby recommend the acceptance of Masinde Muliro University of Science and Technology a thesis entitled: **“Performance Appraisal Outcomes and Entry to Teacher Capacity Building Programmes in Public Secondary Schools in Matete Sub-County-Kakamega County, Kenya”**.

Signature: Date:

Dr. Epari Ejakait

Department of Education Planning and Management

Masinde Muliro University of Science and Technology

Signature: Date:

Dr. Pamela Buhere

Department of Education Planning and Management

Masinde Muliro University of Science and Technology

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DEDICATION

This thesis is dedicated to my son Ephie Musungu, my daughters Siana Mirielle and Avayah Brielle, Ivy Murunga (Wife) and my extended family at large (Mr. Sasita) for their financial and mental support, encouragement, and inspiration throughout the research period.

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ABSTRACT

The study sought to find out whether performance appraisal outcome is used for entry into teacher capacity-building programmes in government high schools in Matete sub-county, Kakamega County. The objectives of the study were to establish the relationship between application of professional knowledge, learner protection and innovation and creativity and entry into capacity-building programmes in government high schools in Matete Sub-County. The study used Yee and Chen's 2009 model on performance appraisal and reward of organizational employees. The accessible study population comprised 151 TSC teachers in the 16 public secondary schools in Matete Sub-County. A sample of 110 teachers was obtained using a stratified random sampling of schools and all teachers in the randomly sampled schools were included in the study. 122 questionnaires were fielded (110 for teachers and 12 for Principals). Data were entered using Epi Info[™] version 7.2.4.0 before being imported into Stata version 15.1 for coding, cleaning, and analysis. The reliability coefficient was 0.79 for the teachers' questionnaires and 0.82 for the principals' questionnaires, which means the research questionnaires were reliable in collecting the information required. The count dependent variable was measured on the ratio scale. The research question for objective 1, is there any statistically significant relationship between application of professional knowledge and entry into teacher capacity building programmes? It was revealed that application of professional knowledge has significant relationship to entry into capacity-building programmes in Matete Sub-County and was rejected because the p-value for the total streams ($p=.002$) was statistically significant. ZINB findings showed that bigger schools are likely to take more of their teachers for capacity building programmes. Also a unit increase in evaluation increases chances of teachers doing the correct practice and needed no capacity building programmes at all. It is also worth noting that an extra year since posting to the current school increases the chances of a teacher's performance gaps being identified but he/she has not gone for capacity buildings programmes. In objective 2, is there any statistically significant relationship between learner protection and entry into teacher capacity-building programmes? All the other explanatory variables were statistically non-significant, therefore, there is no statistically significant relationship between learner protection and teacher capacity-building programmes. Zinb findings revealed that an extra enrolment of a learner in a school is likely to result in more teachers attending capacity building programmes. Lastly, in objective 3, is there any statistically significant relationship between innovation and creativity and entry into teacher capacity building programmes? It was revealed that there is statistically significant relationship between innovation and creativity and entry into capacity building programmes. Zinb results showed that if a teacher was to increase his/her number of times of the use of ICT equipment by one, his/her rate ratio for courses attended on innovation and creativity would be anticipated to increase. In objective 1, it was recommended that smaller schools should merge so that these teachers can be able to attend capacity building programmes and long serving teachers be given priority for training. Objective 2, it is recommended that learner protection should be enhanced in schools to attract more enrolment of the learners which will result to more teachers attending capacity building programmes. Lastly, in objective 3, it was recommended that teachers should develop the desire to integrate ICT equipment in teaching so that they can be picked upon for such kind of training.

TABLE OF CONTENTS

TITLE PAGE.....	i
DECLARATION.....	ii
CERTIFICATION.....	ii
COPYRIGHT.....	iii
DEDICATION.....	iv
ACKNOWLEDGEMENTS.....	v
ABSTRACT.....	vi
TABLE OF CONTENTS.....	vii
LIST OF TABLES.....	xii
LIST OF FIGURES.....	xiv
ABBREVIATIONS AND ACRONYMS.....	xv
DEFINITION OF SIGNIFICANT TERMS.....	xvii
CHAPTER ONE.....	1
INTRODUCTION.....	1
1.1 Background of the Study.....	1
1.2 Statement of the Problem.....	7
1.3 Purpose of the Study.....	9
1.4 Objectives of the Study.....	9
1.5 Research Questions.....	9
1.6 Significance of the Study.....	10
1.7 Assumption of the Study.....	10
1.8 Scope of the Study.....	10
1.9 Limitations of the study.....	11
1.10 Theoretical Framework.....	11

1.11 Conceptual Framework.....	12
CHAPTER TWO.....	14
LITERATURE REVIEW.....	14
2.1 Introduction.....	14
2.2 Application of professional knowledge and Entry into Capacity Building Programmes.....	14
2.3 Learner Protection and Entry into Capacity Building Programmes.....	23
2.4 Innovation and Creativity in Teaching.....	29
CHAPTER THREE.....	35
RESEARCH METHODOLOGY.....	35
3.1 Introduction.....	35
3.2 Study Design.....	35
3.3 Study Location.....	35
3.4 Target Population.....	37
3.5 Sampling Technique.....	37
3.6 Research Instruments.....	38
3.6.1 Validity.....	38
3.6.2 Reliability.....	39
3.7 Procedure for Data Collection.....	39
3.8 Data Analysis Methods.....	40
3.9 Ethical Issues.....	41
CHAPTER FOUR.....	43
DATA PRESENTATION, INTERPRETATION, AND DISCUSSION OF THE FINDINGS.....	43
4.1 Introduction.....	43

4.2 Distribution of Teachers Across the Sampled Schools and Analytical Dataset	43
4.3 Description of the Variables Used in the Analysis.....	44
4.4 Objective 1: To Establish the Relationship Between Application of Professional Knowledge and Entry into Teacher Capacity Building Programmes in Matete Sub-County.....	46
4.4.1 Descriptive Statistics.....	46
4.4.2 Pair-Wise Correlation Between the Outcome Variable and Application of Professional Knowledge Variables.....	47
4.4.3 Pair-Wise Correlation Between the Outcome and Teacher-Level Variables	49
4.4.4 Pair-Wise Correlation Between the Outcome Variable and School Variables.....	50
4.4.5 Two-Tailed Independent T-Test and One-Way Anova.....	52
4.4.6 Zero Inflated Negative Binomial Regression Analysis.....	54
4.4.7 Reasons for Zero Inflated Negative Binomial Regression.....	55
4.4.8 Results for Zero Inflated Negative Binomial Regression.....	55
4.4.9 Model Diagnostic.....	58
4.4.10 Testing of the Research Question.....	59
4.4.11 Discussion of the Findings Under Objective 1.....	60
4.5 Objective 2: To Establish the Relationship Between Learner Protection and Entry into Teacher Capacity Building Programmes in Secondary Schools Matete Sub-County.....	63
4.5.1 Descriptive Statistics.....	63
4.5.2 Pairwise Correlation Between the Outcome and Learner Protection Variables.....	65

4.5.3 Pairwise Correlation Between the Outcome Variable and Teacher Variables.....	67
4.5.4 Pairwise Correlation Between the Outcome and School Variables.....	68
4.5.5 Two-Tailed Independent T-Test and One-Way ANOVA.....	70
4.5.6 Zero-Inflated Negative Binomial Regression Analysis.....	71
4.5.7 Reasons for Zero Inflated Negative Binomial Regressions.....	72
4.5.8 Results of the Zero-Inflated Negative Binomial Regression.....	72
4.5.9 Model Diagnostic.....	75
4.5.10 Testing of the Research Question.....	76
4.5.11 Discussion of the Findings Under Objective 2.....	76
4.6 Objective 3: To Establish the Relationship Between Innovation and Creativity in Teaching and Access Teacher Capacity Building Programmes in Matete Sub-County.....	82
4.6.1 Descriptive Statistics.....	82
4.6.2 Pair-Wise Correlation Between the Outcome Variable and Innovation and Creativity-Level Variables.....	83
4.6.3 Pair-Wise Correlaton Between the Outcome and Teacher Variables.....	86
4.6.4 Pair-Wise Correlation Between the Outcome and School Variables.....	87
4.6.5 Two-Tailed Independent T-Test and One-Way ANOVA.....	88
4.6.6 Zero inflated Negative Binomial Regression Analysis.....	89
4.6.7 Reasons for Zero Inflated Negative Binomial Regressions.....	90
4.6.8 Results of the Zero Inflated Negative Binomial Regression.....	90
4.6.9 Model Diagnostic.....	93
4.6.10 Testing of the Research Question.....	94
4.6.11 Discussion of the Findings Under Objective 3.....	95

CHAPTER FIVE.....	98
SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS	98
5.1 Introduction.....	98
5.2 Summary of Findings.....	99
5.2.1 Objective 1: Establish the Relationship Between Application of Professional Knowledge and Entry into Teacher Capacity Building Programmes in Public Secondary Schools in Matete Sub-County.....	99
5.2.2 Objective 2: Establish the Relationship Between Learner Protection and Entry into Teacher Capacity Building Programmes in Public Secondary Schools in Matete Sub-County.....	100
5.2.3 Objective 3: Establish the Relationship Between Innovation and Creativity in Teaching and Entry into Teacher Capacity Building Programmes in Public Secondary Schools in Matete Sub-County.....	101
5.3 Conclusion.....	102
5.4 Recommendations.....	102
5.5 Suggestions for Further Research.....	103
REFERENCES.....	105
APPENDICES.....	120
APPENDIX A: TEACHER’S QUESTIONNAIRE.....	120
APPENDIX B: PRINCIPAL’S QUESTIONNAIRE.....	128
APPENDIX C: MAP KAKAMEGA SHOWING MATETE SUB-COUNTY....	131
APPENDIX D. RESEARCH AUTHORIZATION AND PERMIT.....	132
.....	132

LIST OF TABLES

TABLE 3.1: AVERAGE NUMBER OF TEACHERS IN EACH SCHOOL PER SUB COUNTY...	36
TABLE 3. 2: A SUMMARY OF THE ANALYSIS OF THE OBJECTIVES.....	41
TABLE 4.1: DISTRIBUTION OF TEACHERS ACROSS THE SAMPLE SCHOOLS.....	44
TABLE 4.2: DESCRIPTION OF VARIABLES USED IN THE ANALYSIS OF THE DATA.....	45
TABLE 4. 3: DESCRIPTIVE STATISTICS FOR OBJECTIVE 1.....	46
TABLE 4.4: PAIR-WISE CORRELATION BETWEEN THE OUTCOME AND APPLICATION OF PROFESSIONAL KNOWLEDGE VARIABLES.....	48
TABLE 4.5: PAIR-WISE CORRELATION BETWEEN THE OUTCOME AND TEACHER VARIABLES.....	49
TABLE 4.6: PAIR-WISE CORRELATION BETWEEN THE OUTCOME AND THE SCHOOL VARIABLES.....	51
TABLE 4.7: ONE-WAY ANOVA BETWEEN NUMBER OF COURSES ATTENDED FOR APPLICATION OF PROFESSIONAL KNOWLEDGE AND SCHOOL TYPE.....	53
TABLE 4.8 PAIR-WISE COMPARISON RESULTS FOR THE TUKEY POST HOC TEST.....	54
TABLE 4.9: ZERO INFLATED NEGATIVE BINOMIAL REGRESSION ANALYSIS.....	56
TABLE 4.10: COMPARISON OF MODEL 1 AND MODEL 2 FOR OBJECTIVE 1.....	59
TABLE 4.11: DESCRIPTIVE STATISTICS FOR OBJECTIVE 2.....	64
TABLE 4.12: PAIRWISE CORRELATION MATRIX VARIABLES ASSOCIATED WITH LEARNER PROTECTION IN 2017.....	66
TABLE 4. 13: PAIRWISE CORRELATION MATRIX FOR VARIABLES ASSOCIATED WITH TEACHERS.....	67
TABLE 4.14: PAIRWISE CORRELATION MATRIX FOR VARIABLES ASSOCIATED WITH SCHOOL-LEVEL VARIABLES.....	69
TABLE 4. 15: ZERO INFLATED NEGATIVE BINOMIAL REGRESSION ANALYSIS.....	73

TABLE 4.16: COMPARISON OF MODEL 1 AND MODEL 2 FOR OBJECTIVE 2.....	75
TABLE 4. 17: DESCRIPTIVE STATISTICS FOR OBJECTIVE 3.....	83
TABLE 4.18: PAIR-WISE CORRELATION BETWEEN THE OUTCOME AND INNOVATION AND CREATIVITY VARIABLES.....	85
TABLE 4. 19: PAIR-WISE CORRELATION BETWEEN THE OUTCOME AND TEACHER VARIABLES.....	86
TABLE 4. 20: PAIR-WISE CORRELATION THE OUTCOME AND SCHOOL VARIABLES. .	87
TABLE 4.21: ZERO INFLATED NEGATIVE BINOMIAL REGRESSION ANALYSIS.....	91
TABLE 4.22: COMPARISON OF MODEL 1 AND MODEL 2 FOR OBJECTIVE 3.....	93

LIST OF FIGURES

FIGURE 1: RESEARCHER’S CONCEPTUAL FRAMEWORK SHOWING THE LINKAGE TEACHER PERFORMANCE APPRAISAL AND CAPACITY BUILDING PROGRAMMES.	13
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ABBREVIATIONS AND ACRONYMS

AVU	African Virtual University
GOK	Government of Kenya
ICT	Information and Communication Technology
IEG	Independent Evaluation Group
IIEP	International Institute for Educational Planning
ISO	International Standard Organization
JICA	Japanese International Co-operation Agency
KCSE	Kenya Certificate of Secondary Education
M.O.E	Ministry of Education
MBOs	Management By Objectives
MDAs	Ministries, Departments, and Agencies
MDGs	Millennium Development Goals
Met	Measures of Effective Teaching
MOU	Memorandum of Understanding
OECD	Organization for Economic Co-operation and Development
PLC	Professional Learning Community
SPSS	Statistical Package For Social Sciences
TPAD	Teacher Performance Appraisal and Development
TSC	Teachers Service Commission
TSC	Teachers Service Commission
UNDP	United Nations Development me
UNESCO	United Nations Educational, Cultural, and Scientific Organization
VA	Value Added
WWW	World Wide Web
ZINB	Zero Inflated Negative Binomial Regression

DEFINITION OF SIGNIFICANT TERMS

Application of professional knowledge: Refers to availability and use of approved professional records/learning aids, exam related materials, individualized Education Programs, completion of syllabus on time, lesson observation rating and weak/talented learner's identification by a teacher.

Capacity building programme: Refer to organized programmes for training teachers in the performance gaps identified during performance appraisal exercise so that they may teach effectively.

Innovation and creativity: Refers to the ability to improvise and use locally available resources for effective teaching and learning outcomes especially ICT related.

Entry: Refers to a teacher being taken for capacity building programmes based on the results of the appraisal exercise.

Learner protection: Refers to scores on knowledge on matters related to sexual, mental/psychological, physical harassment/abuse of learners and offering the right solutions.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Some countries such as Finland, Singapore and Netherlands have developed their own teacher performance evaluation systems. In South Korea the evaluation process of teachers consists of three main aspects and each aspect operates independently from one another and with different purpose. Since the year 1960 she has used three different teacher evaluation systems: teachers being rated according to their performance, teacher pay based on performance and teacher professional development appraisal (Hee and Ji-Hye, 2016). Performance management appraisal is utilized for teacher's accountability, promotion decisions and career development opportunities. On the other hand, professional development evaluation uses several measures (teacher classroom observation, student and parent surveys), to determine teachers who will take capacity building programmes (Centre for Development and Enterprise, 2015). In addition, teachers who achieve a specific role/target are put on an incentive scheme/performance based reward.

Teacher self-evaluation is used for measuring teacher's performance in countries such as China, Japan and Singapore (Centre for Development and Enterprise, 2015). Student performance is another way of evaluating teachers and commonly used in Singapore and China (Lee, 2018); and in China and Japan teacher's contribution to the school and community is used to evaluate teachers.

Teacher's performance gaps determine the evaluation system to be used in education institutions especially in the United Kingdom. Its use is key because every institution is

required to determine the education quality. Furthermore, to ascertain the weaknesses in providing quality education in order to plan for future improvement and establish institutional development requirement (Phillips & Phillips, 2016).

The teachers' employer (TSC) began to appraise approximately 300,000 teachers in public schools as of April 2016 Wangui, (2016, Feb 29th). It was a move perceived to help T.S.C assign responsibilities, promote teachers to various positions, deploy teachers to various administrative positions, and promote capacity building (Regina & Oywecha, 2019). In the past, the TSC has taken concern over the increasing absenteeism of teachers, unprofessionalism, and in some cases poor content mastery the TSC Chief Executive officer Mucharia (2017). However, with the performance appraisal, T.S.C will identify teacher performance gaps where teachers are assisted to perform better and provide required results through the capacity building programmes before it is late.

However, in the year 2019, the implementation of professional development training programmes for determining the promotion of teachers was stopped by Labour court Nyaundi (2021, September 22nd). As per now all teachers are supposed to undertake professional development training six times with each module taking five (5) years. According to a policy statement paper prepared by TSC in 2018, Teachers' training will last for about five (5) days during school holidays (Media Team, 2023). They also emphasized that at the start of the TPAD training, a teacher acquires a certificate that is renewable after 5 years.

This research dealt with the influence of the performance appraisal on entry to capacity building programmes, since out of about 400,000 teachers employed by TSC only a smaller percentage of about 90,000 teachers have enrolled for TPD modules (Roy

2022, June 20th). Thus, the present work would allow showing whether performance appraisal outcome for teachers relates to entry to capacity-building programmes, deepen the theoretical knowledge about the relationship between teacher performance appraisal and capacity-building programmes and clarify their links.

Cronin (2013) states that if performance appraisal is well designed and implemented properly it can be used for training employees to enhance their capacity building. Performance appraisal is embraced in the broader public sector reform to improve efficiency and effectiveness. This is done to reduce total costs; teacher evaluation reforms should be in line with the changes in the body of knowledge for teaching that supports continuous capacity building with meaningful feedback. Capacity building, therefore, is vital in performance appraisal exercises.

Capacity building for educators should reconsider Sessional Paper No. 1 of 2005; a policy Framework for Education, Training, and Research which suggests that there is an urge for continuous provision of capacity building for teachers to continuously upgrade their skills (Mugambi, 2014; Cody, 2015). If there should be an improvement in teaching, then there should be high-quality capacity building for all teachers in the Teacher Performance Appraisal and Development Tool (Smylie, 2014).

Education is ever-changing because of the dynamic society (Davies, 2016). Technology in the field of science has greatly improved and therefore, knowledge is ever-changing. The curriculum and syllabus are also being changed to match the changing society. Frequent teacher capacity-building programmes can save the teacher from facing difficulties in the classroom when teaching.

A research by (Maritim, 2019) showed that 35 respondents (3%) did not have plans for capacity building programmes and many of the respondents 1133 (97%) confirmed

that capacity building for secondary school educators improved the gaps that had been identified.

The study carried out by (Umoh 2013) revealed that 16.7 % of the educators didn't participate in any capacity-building programmes because they were new employees of TSC and also some teachers were employed for a long time and had not been trained. To solve the performance gaps, (Obanya, 2010) argues that teachers require entry into capacity-building programmes; both life-long and detailed so that they acquire skills, subject content, and methods that will solve the performance gaps identified. Although performance appraisal has been widely used in recent times as a way of determining the effectiveness of teachers Berlner (2013) and Konstantopoulous (2013), it is unlikely to support teacher capacity building Valli (2013).

In Kenya, evaluation policies have some weaknesses that are supposed to be addressed immediately to provide quality learning. These weaknesses include untimely provision of feedback for evaluation, lack of capacity building, and teacher ineffectiveness and inefficiency (OECD, 2022).

The Teachers Service Commission has supported the need for frequent teacher training in Kenya and other countries. According to T.S.C as reported by its Chief Executive officer Mucharia (2017), capacity building will enable teachers to get opportunities to improve their content and teaching methods. This will greatly improve teachers' content delivery and offer education that enables learners to adapt to the ever changing environment.

Some scholars argue that the connection between performance appraisal and capacity building is missing as cautioned by Master (2011) "When the performance of teachers is equated to learner performance, teachers find ways to change the results so that they

are favoured. In addition, Darling Hammond (2014) said that available performance appraisals never assist educators to distinguish between their levels of performance or improvement and therefore this makes it difficult to assist them to improve their output.

The TSC TPAD Evaluation Report for 2016-2019 revealed that 9.27% of the respondents failed to undertake target setting meeting which shows the start of the appraisal process. Another 16% didn't undertake appraisal rating meeting and 21.6% didn't indicate their development gaps as teachers (Teachers Service Commission, 2021a). Owuor and Jonyo (2016) were of the opinion that Kenyan teacher appraisal is necessary and key in order to get areas of teacher practice that need further improvement. The research also emphasized the need for credible appraisal reports so that it would be easy for policy makers to identify areas for professional development (Owuor & Jonyo, 2016).

The main reason for the implementation of teacher performance appraisal was to improve the quality of education, with the objective of determining performance of teachers and directing teacher capacity building so as to enhance the outcomes of learning (Iqbal, Akbar & Budhwar, 2015).

Capacity building is structured for teachers' development as human resource in education institutions. For teachers to perform their functions accordingly it is important for them to access capacity building programmes to acquire new skills and modern methodology in this fast ever changing world. The higher educational goals will only be achieved if the level of education for teachers is higher. In line with that, the national policy on Education (2014) said that the education level in a country is equal to the quality of its teachers. To solve the increasing demand for education in a globally

competitive economy it is important to secure proper teacher capacity building programmes for teacher to acquire new skills, information and practice.

Zhang and Ng (2015) states that performance appraisals have become a routine work in education institutions and is not linked to teacher improvement and professional development European Scientific Journal June 2020 edition Vol.16, No.16 ISSN: 1857-7881 (Print) e - ISSN 1857-7431 234. It is due to this that the whole appraisal process is not credible and the urge to find out if the performance appraisal reports are considered in addressing teacher professional development needs in newly introduced Teacher Performance Appraisal and Development (TPAD) in Kenya government schools.

Section 52 of the Code of Regulations for Teachers (2015) states that the TSC shall in implementing performance appraisal determine areas for teacher capacity building and provide solutions where the performance is unsatisfactory. One of the reasons of introduction of teacher evaluation is to identify teacher performance gaps and provide capacity building programmes.

Since the introduction of the teacher appraisal function by the Teachers Service Commission in 2016, there is still no clarity on the relationship between the results of the appraisal exercise and entry into capacity-building programmes in areas flagged by the appraisal function as envisaged in the appraisal policy. Despite the presence of teacher appraisal exercises in Kenyan public secondary institutions for 8 years, the use of reports of appraisal/performance gaps to inform capacity building is still limited. According to the TPAD evaluation report (2021), improvement was needed in the area of individual teacher education programme supported by 11.6% of Headmasters, 13.7% of teachers, 20% Sub-County support officers, and 15.4% of appraisers. There

are only two main functions for teacher performance appraisal, analysing teacher performance gaps and providing support through provision of capacity building programmes.

The government of Kenya has regularly shown interest to improve the quality in teaching by concentrating on capacity building programme (see, for example, the Kenya Education Sector Support Program 2005–2010 and the National Educational Sector Plan 2014–2018). In reality however, capacity building rarely happens for majority of the teachers; in a recent study it was reported that more than 80% of teachers in 72 schools in Kenya across six districts revealed that they had no teacher capacity building programmes in the past 18 months (Ngware, Oketch, & Mutisya, 2014).

In developed countries such as the United States of America, a large amount of money, time and research is directed towards the provision of capacity building programmes. Piper & Zuilkowski (2015) argued that in low-resource endowment settings, capacity training on the list of education priorities is often below building classrooms and other infrastructure, purchasing textbooks, and training newly employed teachers. Yet the lack of capacity building for teachers has severe effects on learning and teaching. Further, the literature suggested that the new capacity building programmes are not addressing the key issues in the education sector (Lowe & Prout, 2018). It was therefore out of this interest that the study sought to find out if the current teacher evaluation processes create room for teacher entry into capacity building programmes.

1.2 Statement of the Problem

Section 52 of the Code of Regulations for Teachers (2015) states that the commission shall in implementing performance evaluation process identify performance gaps and

provide solutions in cases of unsatisfactory performance. One of the reasons of the introduction of performance evaluation process for teachers is to identify performance gaps and provide capacity building programmes to solve teacher performance gaps.

Since the introduction of the teacher appraisal function by the Teachers Service Commission in 2016, there is still no clarity on the relationship between the results of the appraisal exercise and entry into capacity-building programmes in areas flagged by the appraisal function as envisaged in the appraisal policy. Despite the presence of teacher appraisal exercises in Kenyan public secondary schools for 8 years, the use of reports of appraisal/performance gaps to inform capacity building is still limited. According to the TPAD evaluation report (2021), improvement was needed in the area of individual teacher education programme supported by 11.6% of Headmasters, 13.7% of teachers, 20% Sub-County support officers, and 15.4% of appraisers. There are only two main functions for Teacher performance appraisal, analysing teacher performance gaps and providing support through provision of capacity building programmes.

The government of Kenya has severally shown its interest in improving the quality teacher classroom instruction by providing proper capacity building programmes (see, for example, the Kenya Education Sector Support Program 2005–2010 and the National Educational Sector Plan 2014–2018). In reality, however, capacity building programme occur rarely for majority of the teachers; one of the new study revealed that more than 80% of teachers in 72 schools in Kenya across six districts having no capacity building programmes in the last 18 months (Ngware, Oketch, & Mutisya, 2014). Further, the literature suggested that the new capacity building programmes are not in line with performance gaps identified hence don't solve key issues in the

education sector (Lowe & Prout, 2018). It was therefore out of this interest that the study sought to find if the current teacher appraisal processes create room for teachers to enter into capacity building programmes.

1.3 Purpose of the Study

This investigation sought to determine if the appraisal outcome is used for teachers to enter into capacity-building programmes in Public secondary schools in Matete Sub-County, Kakamega County.

1.4 Objectives of the Study

- i. To establish the relationship between application of professional knowledge and entry into teacher capacity building programmes in Matete Sub-County.
- ii. To establish the relationship between teacher protection of learners and entry into teacher capacity-building programmes in Matete Sub-County.
- iii. To establish the relationship between innovation and creativity in teaching and entry into capacity building programmes Matete Sub-County.

1.5 Research Questions

- i. Is there any statistically significant relationship between application of professional knowledge and entry into teacher capacity-building programmes in Matete Sub-County?
- ii. Is there any statistically significant relationship between learner protection and entry into teacher capacity-building programmes in Matete Sub-County?
- iii. Is there any statistically significant relationship between innovation and creativity and entry into teacher capacity building programmes in Matete Sub-County?

1.6 Significance of the Study

This study has suggested ways that teacher performance appraisal can be strengthened to achieve quality in teaching being a young phenomenon that is still growing. Furthermore, the findings can benefit Teachers Service Commission by ensuring the efficiency and effectiveness of the teachers' labour force, which will improve the quality of education. The findings would also assist the stakeholders to identify the challenges of the new teacher appraisal in Kenya and suggested ways how to solve them. The received information would help educators and principals in choosing relevant training so that they may improve their teaching practices. Lastly, the teachers also have made appropriate recommendations on the structure of the appraisal tools to influence educators to enrich their methods of teaching, therefore, improving the performance of teachers in government high schools.

1.7 Assumption of the Study

The assumptions made are that all teachers' employed by the Teacher Service Commission that were on duty participated in the TPAD process and that the TSC teachers from the sampled schools were knowledgeable and had adequate information and gave honest opinion devoid of biasness on the questions asked. In addition, school level data on total guiding and counselling programmes for February 2018, total population of learners and total streams in a school taken from specific schools would be valid.

1.8 Scope of the Study

It focused on the relationship between teacher appraisal outcomes and entry into capacity-building programmes in government high schools in Matete Sub-County-

Kakamega County, Kenya. The TSC teachers in Matete Sub-County participated in this research.

1.9 Limitations of the study

A smaller proportion of teachers' in this region did not participate in the performance appraisal and were supposed to participate or were not on duty during that period. Some respondents may have given wrong information which affected the analysis of the data. In addition, the collection of data was done in the course of term 2 and therefore the data collected was for term 1 where the appraisal process was complete.

1.10 Theoretical Framework

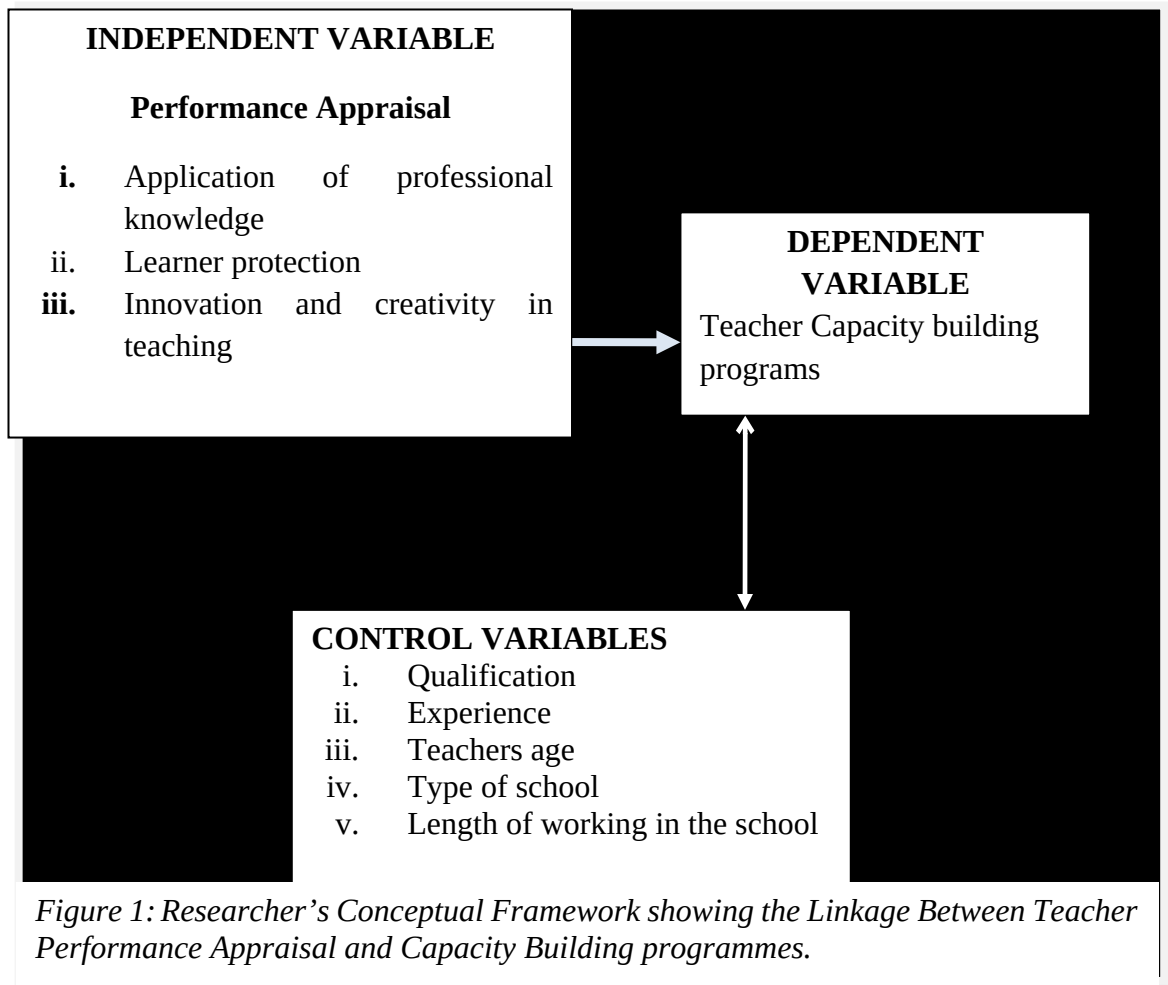
Vroom (1964) developed expectancy/expectancy valence theory. He asserted that it is an individuals' expectations in their performance that determine their conduct and the kind of reward that they look for. It states that motivation to work is propelled by the realization of the performance results and attached reward level such as capacity building. Vroom organization indicated that behaviour appraisal is imperative. He outlines that motivation of teachers' depends upon their expectations of probability that the effort will yield results, instrumentality or assumed link between performance and provision of capacity building programmes, and the valence that is assumed valued is connected to the reward. Vroom (1964) also believes that if a person is aware of the value of a goal and convinced that they will accomplish it through their actions, they will be energized to accomplish it. Vroom's theory attests that individuals' inspiration towards doing anything is because of the principals putting a specific incentive on the goal and the likelihood of accomplishing that goal. The theory encourages supervisors/principals to understand the link between motivation, teacher performance appraisal and capacity building. Vroom points out that inspiration relies upon the

expectation that effort will bring about capacity building programmes. Valency theory is key in this study since it explains performance evaluation components such as connecting it to the provision of capacity building programmes.

1.11 Conceptual Framework

This study used Yee and Chen's (2009) performance appraisal model. They proposed a teacher evaluation model on multi-factorial appraisal system in dealing with appraisal awards that are usually put in linguistic terms. The project was done in one of the ICT Company in Malaysia using their performance evaluation. This model suggested that the appraisal is utilized in the school to develop teachers so that teaching can be effectively done. This model proposed an annual appraisal system, which required teachers to set up yearly targets and report on the progress at the end of the year. The yearly targets are accustomed to assessing the teacher's performance yearly.

Three main standards considered in this study and the standards are divided into different sub-sections, as follows: (a) Application of professional knowledge: This standard evaluates teaching effectiveness. (b) Learner's protection: This standard measures the ways that are put in place to make sure that there is a safe and conducive learning environment. (c) Innovation and creativity: This standard determines the ability of a teacher to utilize ICT materials in his/her teaching. The important function of the appraisal is to identify the gaps that educators need to improve performance. The key player in entry into teacher capacity-building programmes is the school management which may use resources to provide quality capacity training. Figure 1.1 illustrates the interaction between performance appraisal and teacher capacity-building programmes.



Teacher performance appraisal is the independent variable that was determined by three key components: application of professional knowledge, learner protection, and innovation and creativity in teaching. On the other hand, the dependent variable is teacher capacity-building programmes. The control variable includes the teacher's experience, qualification, age, type of school, and length of work in the school among others.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews the information of the influence of teacher appraisal on entry into teacher capacity-building programmes in Kenyan government schools. The review followed a particular format and started with a brief overview of the three objectives.

2.2 Application of professional knowledge and Entry into Capacity Building Programmes

The Kenyan Teachers code of Regulation by the Teachers Service Commission (TSC), section 52 part 1 and section 11 part (f) and 35 part 1 of the TSC Act (2012), gives responsibility to TSC to formulate teachers' evaluation procedure to closely supervise and check on the output of teachers so that high teaching standard can be maintained in all government schools University of Nairobi Enterprises and Services Limited [UNESL], 2021). The objectives of introduction of TPAD in 2016 were to:

- i. Provision of high standard and quality learning to all government schools;
- ii. Avail an avenue to educators to expand their teaching skills and knowledge;
- iii. identify teacher's weaknesses so as to select proper capacity building programmes for them;
- iv. keep comprehensive records for teacher's output so that it can be used for making decisions in future;
- v. avail a valid and credible appraisal system for teachers, and

- vi. avail safe environment for learners and adhere to learner's rights (UNESL, 2021).

This competency area was selected from the seven because it had the highest marks (30 marks) and also dealt with preparation of professional documents to deliver the subject content TSC (n.d). According to Teacher performance evaluation tool these competency areas include: preparation of proper schemes of work, timely and proper lesson plans and notes using the new curriculum and syllabi, recording what has been taught, teaching and learning aid, proper evaluation of learner and timely feedback and prepare and maintain learners' progress records and taking of learners individual differences TSC (n.d).

It further stated that performance targets are teacher termly lesson observation, preparation and keeping professional documents such as approved schemes of work, personal timetable, lesson plans, lesson notes, mark books, marked and checked learners exercise books and value added index. Teaching material should also be prepared in line with the current curriculum before the start of the lesson, use of current syllabi in preparation for teaching Devangana, (2024, June 14th), have minutes of the departmental meetings and weekly checked record of work. In addition, teachers are to assess learners on content mastery according to school testing policy (Edugorilla Prep Experts, 2023), and record learners progress record. Lastly teachers to arrange, record and initiate IEP programmes to take care of learner individual differences and timely coverage of syllabus (Ravivarman, 2020).

It is expected that a teacher who don't show improved subject content, improved performance in examinations, learners recalling the learnt content, apply practically

the learnt information and timely syllabus coverage have performance gaps and should be taken for capacity building programmes.

Most scholars have written and published on TPAD implementation in Kenya, information on entry into capacity building programmes is rarely published. This is supported by the TSC consultancy report by UNESL that TPAD evaluation helped in determining teacher's capacity building needs, specific teacher performance weaknesses, identify areas that needed training and provide solutions through capacity building programmes as indicated by 67% of the institutional heads and 89.4% of the teachers' appraised, (UNESL, 2021). No records or evidence have been provided showing teachers attending any capacity building programmes as a result of the TPAD. Introduction of performance contracting for Heads and teacher evaluation has some positives like reduced teacher absenteeism, better feedback, accountability and quality teaching, the TSC Chief Executive Officer, Macharia (2020) but leaves out capacity building for teachers in the process.

Most of the studies have dealt with TPAD and learner academic achievement. Kimeli and Letangule (2021) dealt with the implementation of teacher evaluation on secondary school learners' performance in Kenyan government schools (Kieni West Sub county). Using a sample of 138 appraisees, they asserted that provision of capacity building programmes to teachers, application of professional knowledge and time management on a large extend affects learners scores hence improving learners' academic achievement. Kirui et.al (2023) studied the influence of teacher appraisal on learners' academic achievement in Kenyan government high schools (Trans Mara East Sub county). With a sample of 242 appraisees on a multilinear regression, the findings revealed that learners' performance is positively influenced by teacher's practice.

Tumusiime (2021) conducting a research on how principals' implemented TPAD and its influence on teacher's results in government high schools. Using a sample 190 appraisees from Kikuyu constituency and multiple linear regression to analyze the data. Though it was not clarified the outcome variable measurement scale whether interval, ratio or on a Likert scale making the interpretation difficult. The findings show that rewarding those who correctly implement TPAD, provision of capacity building programmes, TPAD evaluation feedback, involving teachers in TPAD implementation, and a positive attitude TPAD implementation by principals has a statistically significant positive influence on teachers' performance in government high schools.

Apart from TPAD and learners' performance, there is also linked evidence on the effectiveness of teachers. This is evidenced by a qualitative study done in Taita Taveta linking reduced teacher absenteeism, increased instructional time, and keeping of records for future use. However, teachers revealed their concern on the TPAD tool that it took a lot time, expensive and stressful, because of keeping more records, alongside other problems originating from upload TPAD reports to the Teachers Service Commission website (Mwae, 2018).

Also, Khatete and Macharia (2020) using 90 high school education providers Nyandarua South Sub county found that there was improved stay of teachers in institutions due to monitoring their arrival and departure times which has increased contact hours between teachers and the use of class attendance ensured that syllabus is covered on time as learners are being prepared for the examination. The results also suggest that the use of deadlines in performing tasks had brought in a positive culture in the institutions that were sampled.

The purpose of the scheme of work is to break down the syllabus content into an easy perceived teacher's way of curriculum implementation. The scheme work as explained by Thungu, Wandera, Gachie, & Alumande (2010) as quoted by (Njiku, 2016) is a document that arranges and interprets the learning content (syllabus) for easy lesson delivery by the teacher who prepares it. It determines in advance the speed of lesson delivery and teaching aids available or which are supposed to be prepared before the start of the lesson. It guides a teacher for a long period of time which sometimes may last for a year. It determines when the syllabus is completed or not. While on the other hand, the lesson plan is a 40-minute teacher guiding document. It is a document made by a teacher which covers a single or double lessons and is obtained from the schemes of work (Thungu, Wandera, Gachie, & Alumande, 2010) quoted by (Njiku, 2016).

According to Weems and Rodgers (2010), appraisals should avail teachers of important feedback and opportunities for capacity building. In many appraisal system teachers are observed in class at most twice by the appraiser and concludes on the findings to provide a suitable solution (Stufflebeam & Zhang, 2017). Tyler and Taylor (2012) found that performance appraisal can assist teachers to change the way they behave and develop appropriate skills. Classroom observation of teachers can help identify good teaching skills and can be important in the provision of capacity building for teachers (Allen et.al, 2011; Met Project, 2010; Pianta et.al, 2008).

The indicators of instructional delivery include pedagogical competence, lesson planning, learning materials' improvisation and mode of curricular delivery, and they all play a crucial role in evaluating the effectiveness (Munyi, 2024) and quality of teaching methods. Pedagogical competence is a key aspect, reflecting the teacher's proficiency in employing diverse instructional strategies and techniques that cater for

diverse learning needs of students (Emiliasari, 2018). Effective lesson planning is another indicator, representing the careful organization and sequencing of instructional content to optimize student comprehension and retention.

According to Hawes (2021), asserted that teachers need to prepare professional documents and have capacity building programmes in order to provide quality education, so as to achieve educational objectives, which are presented with challenging and changing problems as a result of emergence of new knowledge, curriculum changes, new concepts and teaching methodology (Maicibi, 2013).

Assessment plays a crucial function in every education system in that examination reports provide required information for making crucial decisions. Credible results have to be generated for determining if learning is actually taking place in the classroom (Mogapi, 2016).

As a teacher preparing before lesson delivery is critical to successful lesson delivery in History and Geography subjects in high schools which help a teacher to combine all ways and skills for thinking in line with curriculum hence improving the learning environment (STiR education, 2022). Ugandan teachers are enthusiastic about the current NCDC structured syllabus content and the efforts required to prepare professional documents such as schemes of work, lesson plans and notes coupled with challenges like lack of adequate classrooms for teaching and learning, limited skills and guidelines on the new content (Tiberius, 2021).

A study by Makunja (2016) on challenges of Tanzanian teacher preparedness found that teachers had not been trained through provision of capacity building trainings to enlighten them on key competency areas for the implementation of curriculum and

syllabus implementation. Lack of teachers' pedagogical readiness was a challenge to the implementation of high school syllabus content.

In most countries, school environment is not favourable, as lack of enough qualified teachers, lack capacity building programmes and unavailability of resources required for teacher promotion. It is recognized by comprehensive vocational training programs that all teachers work with talented learners, therefore all teachers need capacity building programmes so as to support the gifted learners in nurturing their talents. In this case the amount and content needed dependent on teacher's role in upbringing the talented learners (World Council for Gifted and Talented Children, 2021).

Generally, parents, teachers and education stakeholders lack awareness of persons who are gifted and talented. For instance, a study on teacher identification of the gifted learners and availability of resources revealed that regular school educators had little to average knowledge of the characteristics of giftedness (Mwangasha, Kariuki, & Omulema, 2019).

The findings by Teachers Service Commission (2021) TPAD evaluation report showed that in term 1-2016, 82.93% in SIP and 84.21% of all teachers, term 2-2017, 88% in SIP and 87% of all the teachers were appraised while in term 3-2019, there was the highest of 91.34% in SIP and 91.53% of all teachers appraised. This indicates that there is a smaller proportion of teachers that were not appraised.

The ability of teachers in teaching determines the quality of education in a country. As indicated by the General Directorate of Teacher Training and Development (GDTTD), that an effective teacher should have the following key elements: subject content, skills, and attitudes/values. If a teacher has three elements mentioned will have good mastery of the content and syllabus, possesses pedagogical knowledge, follow legal

regulations, good classroom control and management, uses appropriate teaching methods, communicates properly with learners, gives priority to personal and professional development, and upholds various values including national, spiritual, and universal principles. This combination of competencies shows a teacher's overall proficiency (GDTTD, 2017)

Bradgete, (2001) was quoted by Alube, (2015) who found that in the appraisal process, the teacher (appraisee) will give his/her main undoing and performance gaps so that they can provide quality teaching. This would in turn result in future arrangements for capacity building through imparting new pedagogical skills; a higher responsibility improving their general ability to provide quality education through the provision of capacity building programmes, giving assignments, improving work progress through training, and utilizing development opportunities which would motivate them.

Kamiti, (2014) said that a good appraisal structure is the one that motivates teachers to give their best. This can only happen when professional development is also included in the performance appraisal process. Personal appraisal through lesson observation, provision of feedback, and mentoring teachers after observation, appraisers identified individual performance gaps and learners challenge.

According to the current society, teachers need to understand their content well and assist learners create useful pictures in their minds, link ideas, and eliminate deceiving concepts. There is a need for teachers to conceptualize concepts across everyday life and fields. A deep understanding of the content provides a concrete foundation for teachers to make learners understand what they are being taught (Said, 2017).

Okemwa and Nyamwaya, (2019) found that the feedback from performance appraisal helps teachers to appropriately identify their performance gaps. They further found that

appraisal records are inclined to notify solutions required to solve teacher performance voids. This fact is also supported by OECD (2017) which suggested that teacher appraisal should provide appropriate feedback to teachers, recognize teachers performing well, provide opportunities for capacity building, identify poor-performing educators and connect teachers and Heads of institutions to provide quality teaching and learning.

Capacity building programmes are essential for instilling the right skills and knowledge in teachers and therefore performing their tasks efficiently (Degraft-Otoo, 2012). Training is particularly important in directing and influencing teachers' attitudes in education institutions to make them more committed and productive (Nassazi, 2013).

World over, Performance appraisal systems for teachers is a critical undertaking; in the United States of America (USA), Teacher appraisals focuses on three tiers of teachers: newly employed, experienced and those who require support.

World over, performance appraisal systems for teachers is a critical undertaking; in the United States of America (USA), teacher appraisal focuses on three tiers of teachers:

newly employed, experienced and those who require support (Chirchir & Letangule, 2021).

The main reason of teacher evaluation process is to direct teachers in order to improve their lesson deliver by addressing performance gaps and availing timely feedback (Daoanis, 2012). In countries like for instance, England appraisal for teachers was utilized in helping teachers to plan for their career and capacity building programmes (Bartlet, 2000). It is also observed by Alberta Teachers Association (1995) that formative evaluation is important in determining promotion and capacity building for teachers.

Organization for Economic Cooperation and Development (OECD, 2009) states that appraisal for teachers identifies teacher's achievement level, capacity building needs and provides appropriate solutions. Teacher evaluation system is one of the tool used by managers to determine individual teacher performance. This has been used in other parts of the world and won recognition as a form of inspiring teachers as compared to profits generated and teacher capacity building (Ademola, 2017).

Formative appraisal (Gordon & McGhee, 2019), is used for teacher capacity development. This process is constructive through the feedback that is given on how teachers should improve and appropriate capacity building provided. If it is used this way, teacher appraisal has the ability to increase teacher quality.

Teacher professional development is a crucial aspect of enhancing teacher capacity building for education for all. Teachers require capacity building programmes for improving their knowledge, skills and attitude required to be an effective teacher in the current world (Ravindra & Chandan, 2023).

Nyonator (2017) emphasized on the issue of teachers going for workshops, seminars and conferences in order to gain knowledge that help in improving teaching skills, results and use variety of teaching methods in classroom.

2.3 Learner Protection and Entry into Capacity Building Programmes.

This competency area was selected because it determined a conducive learning and teaching environment for the learners as well as teachers.

Learner protection is basically on a teacher having information on sexual, mental, physical abuse and the right solutions to these problems. According to Teacher performance appraisal and development tool (TPAD) the performance targets in this competency area are teachers to illustrate understanding laws concerning education and consequences of not adhering to and provide safe, conducive and learner friendly environment by promoting individual awareness through enlightenment programmes and use of the right learning/teaching aids. In addition, teachers should keep learner discipline records, challenging behaviour and remedies and also keep records of parental involvement in the control of learner challenging behaviour (TSC,n.d).

The learner protection targets are evidenced by compliant teachers to CORT, COCE, and Children's Act and other laws on children's rights, support learners' safety and self-awareness by using teaching aids to create learner friendly environment. They should also organize sensitization programmes, keep records of learner's discipline and remedies such as involvement of parents. Nevertheless, learners still encounter different forms of abuse, harmful practices and other forms of risks. This clearly indicates that there are still some performance gaps in the area of learner protection and trainings over the same should be continually provided.

Teacher performance appraisal and development outlines professionalism and laws that teachers are supposed to follow in COCE CHILDREN'S Act, CORT, and other laws on children's act shown on TSC CIRCULAR No. 12/2017 on 5th June as Dorothy and Bonn (2017) quotes.

The learners are suffering as a result of negligence of those who are supposed to take care of them and provide security. The safety of learners is in doubt on school's grounds where they are supposed to feel more protected. The frequent occurring of incidences showing negligence and carelessness on teachers given the responsibility to secure them. The recurring incidents highlight the negligence and carelessness on the part of those entrusted with the welfare and security of our children (Amnesty, 2023). TSC CIRCULAR 3/2010 on protection of learners from sexual abuse State that teachers have a duty to take responsibility as a parent and act at the best interest of the learner at all times. It is because of these reasons and power given to teachers to secure learners that is why it is important to take these teachers for a learner protection capacity course so that they are able to perform this task as expected.

Most scholars have written and published on TPAD implementation in Kenya, information on entry into capacity building programmes is rarely published. This is supported by the TSC consultancy report by UNESL that TPAD evaluation helped in determining teacher's capacity building needs, specific teacher performance weaknesses, identify areas that needed training and provide solutions through capacity building programmes as indicated by 67% of the institutional heads and 89.4% of the teachers' appraised, (UNESL, 2021). No records or evidence have been provided showing teachers attending any capacity building programmes as a result of the TPAD. Introduction of performance contracting for Heads and teacher evaluation has some

positives like reduced teacher absenteeism, better feedback, accountability and quality teaching, the TSC Chief Executive Officer, Macharia (2020) but leaves out capacity building for teachers in the process.

Njoki (2018) explored the effect of safety in schools on teaching and learning process in government high schools in Nyeri and Nairobi Counties, Kenya. With a sample comprising of three hundred and eighty-three (383) form 2 & 3 students, forty-four (44) Principals, and forty-four (44) Deputy Principals, two (2) County Quality Assurance & Standards officers, their results suggest that provision of safety in schools greatly affected the teaching and learning activities in education institutions.

Wanjiku (2023) explored school factors affecting the provision of child-friendly environment in Kenyan schools. Reviewing Secondary information from Kenyan ten studies and another ten from the rest of the world where varied methodologies were used and gave differing results. This study showed that institution with comprehensive child protection mechanisms will enable prevent child abuse by detecting such and reporting to the relevant authorities.

In addition, Mutiso (2019) exploring the effect of institutional factors on the implementation of required safety standards in government high schools in Matungulu Sub-County, Machakos County – Kenya. Reviewing a sample of 11 principals, 44 TSC teachers and 264 learners from 35 government schools, showed that when health and safety measures are correctly put in place this will help reduce absenteeism and truancy. The study also revealed that there is a statistically significant relationship between institutional factor and safety standards implementation.

Mbaruramye (2021) investigated child rights and ways for safeguarding child rights in Dagoretti Sub-County high schools in Nairobi. With a sample 3 principals, 18 teachers

and 132 learners. The results suggest that documents on children's rights were considered not available and unfamiliar to the respondents.

Mubita et.al (2021) the study revealed that some of the importance of provision of safety and health management include high learner academic achievement, reduces absenteeism, and better physical and mental health for learners.

This literature that is reviewed shows that there are inadequate studies that have been done on the relationship between teacher appraisal outcome and entry into capacity building programmes in performance gaps identified in the appraisal exercise in Kenya. This paper will contribute information fill up this particular gap.

Principals have a role in ensuring that physical infrastructures are safe as learners use them to reduce injuries that can be caused by them (MOE 2008, Njoki 2018). The learners can be safeguarded against mental and physical abuse by the parents, teachers, peers, and community. They further recommended physical infrastructure be in the right condition as per the recommendations of Health Act Cap 242 and the Ministry of Public Works building regulation standards.

The Teachers Service Commission (2021) TPAD evaluation report results on learner safety and protection that 54.1% of the heads of the institution, 51.3% of appraisers, 93.3% of the CSOs, and 48.3% of appraisees indicated that the activity concerning knowledge on matters related to sexual, mental/psychological, physical harassment/abuse and the appropriate solutions was very appropriate. A total of 45.9% of HOIs, 48.7% of appraisers, 51.7% of appraisees and 1.7% of CSOs indicated that the activity on adherence to legal and professional provisions governing provision of education was very appropriate.

The study by WCEFA (1990) and WEF (2000) as quoted by Njoki (2018), also concluded that the learners should be protected from mental, physical abuse, social, and emotional well-being. School safety refers to the situation where students are safe in an environment that is free from violence, bullying, harassment, and drug abuse.

For a school to provide safe environment learners should be protected from violence, threats, exposure to weapons, bullying, harassment, theft, drug abuse, and other emergencies. At the same time, learners in unsafe school environments result in absenteeism, poor academic achievement, and dropping out of school (Hawkins, 2018).

Emotional safety in schools refers to learners feeling emotionally okay when displaying their emotions in schools. As learners express their emotions they should be secure and confident as they display their emotions and take up situations that would encourage them to try on new things (The National Academies of Science, Engineering, and Medicine, 2019).

The school also should provide enough operational, hygienic, and different toilets for boys and girls learners as well as female and male educators. WFP standards for sanitation education institutions (cited by IIEP-UNESCO, 2010), suggested that one toilet cubicle to serve 25 female learners as well as one cubicle toilets for every 100 male learners and every 40 to 60 boys provide one urinal.

Gatua (2013) provided statistical information on unsafe classrooms in Nigeria as follows: 87% overcrowded, 12 had no learners' seats, 3% had no boards in class, 38% had no classroom ceiling, and 77% learners had no access to textbooks and 36% of the learners had no writing materials.

The Kenyan Government through the Ministry of Education, is plighted to establishing and maintaining safety in schools to provide quality education. However, it is the community as a whole that provides school safety and not fences and walls used to demarcate the boundaries of the school. It is because of this reason that to ensure child safety in and out of school building a strong interrelationship between an educational institution and the community (Ministry of Education, 2008). Institution safety threats can originate from within the school or outside the community (Ministry of Education, 2008). Threats to school safety include the following:

Accidents – people have wrongly assumed that calamities just occur and attempting to avert them is fruitless. Nevertheless, calamities are brought about by some factors which they can be prevented. Most accidents in schools are a result of mankind, i.e. caused by carelessness, lack of attention, lack of knowledge, not taking responsibility seriously, or carelessness by learners, teachers, and other stakeholders in education. The hurting and damage from accidents are caused by: too many objects on the floor, clutter and poor arrangement of the classroom, and lack of lighting among others.

Teacher-learner violence is in the form of physical violence through canning, sexual abuse, a pinch of the ear, and a slap. Other emotional punishments for students such as abuse and harassment, taunts, and looking down upon the learners (Ministry of Education, 2008). These emotional abuses strike the self-confidence and self-worth of a student. Alternatively, learner-on-learner violence is seen in the form of fighting, sexual harassment, and mistreatment of other learners among others.

Wanyama (2011) and Mburu (2012) found out that safety committees in most schools had not been set up and most of the teachers had not been trained. The study revealed that in cases where safety standards had not been put in place the teachers had not been

committed to sensitize learners on safety standards. Consequently, despite the government putting up policy document 17 to ensure that institutions comply with the safety standards the implementation process is still slow and low in most high schools. It is out of these events that the researcher felt that there is need for trainings/capacity building programmes provided to teachers because the performance gaps have been seen in the entire education system.

2.4 Innovation and Creativity in Teaching

The utilization of appropriate resources in education increases teacher performance and learner attainment. Teachers Service Commission report on supervising and management of teachers from the officers in the field and quarterly CIRCULAR NO. 12/2017 June confirms that TPAD is enhancing creativity and innovation in implementing the curriculum. They also suggested that educators should prepare appropriate resources for teaching and learning before the lesson from resources present in their environment and the internet to be appropriate for the content preparation and delivery.

Teachers Service Commission. (2021) TPAD evaluation report on Innovation and creativity in teaching, a total of 47.3% of the heads of the institution, 47.9% of appraisers, 46.0% of appraisees, and 100% of CSOs reported modifying locally available resources for quality teaching and learning were appropriate while 33% of HoIs, 31.8% of appraisers, 34% of appraisees and 88.9% of CSOs showed that incorporating technology in teaching and learning is appropriate.

Ogbulogo et.al (2014) researched on methods that assist teaching to take place, quality content delivery, and effectiveness in learning in Nigerian Private Schools This was done in the Humanities department that used various ICT materials such as a

microphone, projector, and electronic board among others. They discovered that employment of appropriate education resources makes the students discover the reality that exists outside the classrooms. According to Okoth (2018), for intellectual stimulation of learners, the principal should encourage teachers to become innovative to select effective teaching methods as they render their services

Learning materials' improvisation involves the ability to adapt and World Journal of Advanced Research and Reviews, 2024, 21(03), 995–1002 997 create resources that enhance the learning experience, fostering a dynamic and interactive classroom environment (Kiambi & Waithaka, 2023). Additionally, the mode of curricular delivery assesses how well teachers align their instructional methods with the prescribed curriculum, ensuring that educational objectives are met while promoting a comprehensive and engaging learning experience for students. Together, these indicators contribute to the holistic evaluation of instructional delivery and its impact on the overall effectiveness of teaching.

Education providers are supposed to identify appropriate teaching and learning aids that reinforce the learned content and this requires innovativeness and creativity. This concurs with Lyon (2012), who was quoted by Atieno (2014) who describes learning as a complex activity where various factors are in play like school infrastructure, learner motivation, teaching aids, and the right attitude towards learning and the demands of the curriculum. Ranasinghe and Leisher, (2009) quoted by Khuramnaqvs et. al (2015), also revealed that the utilization of technology in teaching and learning starts with the teacher's preparation of a lesson that utilizes appropriate ICT teaching aid as recommended by the syllabus Kindiki (2008).

A study investigating teachers' readiness in incorporating ICT materials in the learning process in government primary teacher training institutions in Central Kenya (Omariba, 2016) reported that 67.4% of tutors are ICT trained while 27.9% are not ICT trained. It was evident that the majority of the tutors have the authority to incorporate IT resources in providing education, however, 4.7% of them remained silent. Also, the majority of the respondents reported that computers, textbooks, whiteboards, blackboards, television, and overhead projectors were available while other ICT materials were available in minimal percentages.

Tweed (2013) using 321 teachers sample size reported a weak positive relationship between the length of ICT training ($M=1.9$, $SD=1.02$) and classroom use ($M=2.17$, $SD=.69$) and a statistically non-significant relationship [$r(110) = .16$, $p = .10$].

According to Dlamini and Mbatha (2018), the unavailability of capacity-building programmes was an issue affecting the use of ICT materials. About 80% of teachers were of the view that capacity building through sharing with other teachers was key for the provision of quality education; 81% of teachers expressed the need for special needs capacity building and 73% showed the need for diverse learners' capacity building.

Technology plays a key function in ensuring learning takes place in the current curriculum and policy (Rajammal, 2021). Most scholars and experts agree that when technology is appropriately used it can improve the teaching and learning process to a great extent as well as provide avenues for teacher's capacity building. Burniske (2008) refers to computer illiteracy as new illiteracy in the current society. This has led to an investment in equipping schools with computers and computer-literate personnel to provide learners with a strong foundation in computers. Computers can aid in giving

instruction and direction to learners. Many researchers have found a positive impact on learners relating to incorporating ICT in the teaching process (Kaite, 2021) and shared in-depth scrutiny of incorporation of computers in the instructional process in schools in the United States.

Teacher capacity building promotes the concept of embedding technology training into teacher schooling and in service training that will serve as a useful determinant in the provision of quality education. For school effectiveness and improvement teachers' education and training are considered essential (Omar, 2014).

Fundamentally, improper teacher ICT training and lack of capacity-building programmes for teachers have slowed down the process of accessing ICT equipment, internet connection, and computers, and inadequate incorporation of audio-visual resources and equipment in Nigerian secondary schools (Ololube, 2006). Omar (2014) argued that in most schools these ICT resources are available but most of the time they don't incorporate them in their teaching and learning.

Nzarirwehi and Atuhumuze (2019) added that capacity building is ongoing training of TSC teachers that is organized by TSC or school boards that for teachers eliminate their content delivery weaknesses.

According to Wardani et al. (2020) the incorporation of technology in lesson delivery can't be effective until something is done for teachers to have the appropriate attitude, skills, and knowledge. In addition, they reported that teachers with skills, positive attitudes, and knowledge on the use of ICT resources can learn anything from the ICT material. As an alternative, they may use methods of teaching that don't need technology for content delivery. In other words, the task of the teacher is to prepare and utilize ICT resources in the processing of teaching. Other scholars investigated the

challenges that educators face when incorporating ICT in teaching and learning. Although finally, through technology other options or ways are being sought that don't require ICT (Lawrence & Tar, 2018), and one of the suggested way is to change teacher's perception to be positive through provision of capacity building programmes.

Pelila et al. (2022) put much emphasis that there is reason why some teachers are confident on the use technology in teaching and this is attributed to the fact of provision of ICT related capacity building programmes to nurture their abilities. Also, if teachers are more involved in ICT related activities it leads to a possibility of successful incorporation of ICT in teaching and learning. Therefore, adequate training can impart relevant technological skills in teachers to become quality teachers. However, the provision of capacity building programmes in ICT related activities for teachers is not adequate to assist teachers (Pelila et al., 2022).

This agrees with the views of Ugwu and Oboegbulm (2011) that the appropriate utilization of ICT resources in teaching and learning provides accessibility to a lot of information in this era of globalization. Ghavifekr et.al (2012) stated that the achievement of educational targets, aspirations, and intentions relies heavily on the incorporation of ICT in the teaching and learning environment.

In an attempt to find availability and Internet access, Ghavifekr et.al (2012) found that email had not yet been known as a tool for linking teachers to learners. About 20 percent of the schools had less than 5 computers and were mostly used for administrative functions. It is only about a third of the schools involved in the study that have complete computer laboratories for the provision of education.

In determining the extent of ICT use in elementary institutions in Malaysia, (Lau & Sim, 2008) observed that ICT helps about 75% in content delivery, 49% in classroom management, and 26% used for communication with peers.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

It gives the study design, study locale, population of the study, techniques used in sampling, research instruments, reliability, validity, data collection procedure, methods of data analysis, and ethical issues. This chapter contains a format of executing the research.

3.2 Study Design

A correlational research design was used in this study. It was because it determined the correlation between TPAD outcome and entry into teacher capacity building programmes with easy to control the variables (Suresh & Ankit, 2021). It related application of professional knowledge, learner protection and creativity and innovation variables to entry into capacity building programmes.

3.3 Study Location

The Matete Sub-County was chosen from Kakamega's 13 sub-counties that have public secondary schools with TSC teachers that fills the Teacher Performance Appraisal forms. The Sub-County is in two sections of the education zones namely, Matete West zone and Matete East zone. The study involved all government high schools in Matete Sub-County, Kakamega County. Table 3.1 illustrates the staffing of teachers in Sub-Counties of Kakamega County.

Table 3.1: Average number of teachers in each school per Sub County

Sub-County	Teachers	Schools	Average no. teachers	Rank
Kakamega Central	321	23	14	1
Kakamega South/Ikolomani	339	29	12	2
Navakholo	256	27	10	3
Matete	151	16	10	3
Kakamega East	416	44	10	3
Butere	291	31	10	3
Mumias East	214	24	9	7
Mumias West	211	23	9	7
Likuyani	556	62	9	9
Khwisero	158	18	9	10
Kakamega North-Malava	414	49	9	11
Matungu	122	32	4	12
Total	3,508	378	9	12

Source: Kakamega County Education Office, (2017)

According to the 2019 census statistics, Matete Sub County had a total population of 66,172 people and lies along latitude 0.5667°-1°N and longitude 34.5-35°E. It borders Lugari Sub County to the North, Uasin Gishu and Kakamega North Sub County to the East, and Bungoma County to the West. It covers 101.9 Km² with arable land of 83 km². It lies at an altitude of 1300-1600 M above the sea level. It experiences rainfall total amount of between 1000-1600 mm per year. It receives long rains between March and June while the short rains are between August and November. The soil type is mainly clay and loam. The major economic activity in the Sub-County is mixed farming. Sugar cane is the major cash crop that is delivered to Butali factory and subsistence maize farming is carried out extensively in the area. Matete is an area dominated by Tachoni and Kabaras communities.

3.4 Target Population

The target population comprised of the 151 TSC teachers and 16 secondary school principals offering their services in public secondary schools in Matete Sub-County and participated in the appraisal exercise.

3.5 Sampling Technique

The sample size was measured by employing a formula for proportions proposed by

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

Yamene (1967) as shown

n =The study sample, N = The study population, and e =Precision level. The sample obtained was 110 teachers as calculated below

Therefore, all the principals from the 12 schools where 110 teachers were sampled from were included in the research.

The researcher sampled 110 TSC teachers from the 12 schools arrived at by finding the average between the size of the sample (110 teachers) averaged with the mean of TSC teachers in Matete Sub-County (10 teachers). The target population was categorized proportionately into teacher's who work in boys' boarding, girls boarding, and mixed schools before randomly obtaining the sample size. Stratified random sampling methodology was used because the respondents from the sub-group are picked randomly (Gall & Borg, 2010). It also finds the sample size results to be approximate the of the result if the entire population was involved. Using stratified random

sampling, the study sampled 110 TSC teachers from 12 schools and hence all the 12 principals of the sampled teachers were included in the research.

3.6 Research Instruments

Information was obtained by using questionnaires because it was a correlational type of research. The questionnaires were also suitable for collecting the information because: Questionnaires could be filled by different respondents at the same time therefore it takes a short time to collect the information and would allow enough time for respondents to respond to the items. Questionnaires were also a confidential method and an objective way of collecting information since it results in minimal bias from personal characteristics (Cleave, 2021). There were questionnaires for teachers, and principals. The supervisors guided the researcher to design structured questionnaires consisting of closed-ended questions. The teachers' questionnaires sought information on the relationship between teacher appraisal and capacity building of teachers. The study fielded one hundred and ten copies of teacher questionnaires and twelve principals' questionnaires. Before collecting the questionnaire from the respondents, the researcher cross-checked the responses from teachers to that in the Teacher Performance Appraisal and Development (TPAD) tools in the principal's office. This was to ensure the accuracy of the respondent's answers.

3.6.1 Validity

The research instrument validity was enhanced by consulting the supervisors' expert advice who ascertained that the instruments developed had face and content validity. The supervisors scrutinized the level of relevance of questionnaire items to the research topic. Moreover, to achieve validity, the researcher with the supervisors' help reviewed the questionnaire items for readability, clarity, and comprehensiveness. In

addition, apart from performance appraisal, the other factors relating to teacher entry into teacher capacity-building programmes were controlled, during the analysis.

3.6.2 Reliability

The internal consistency technique was utilized in the measurement of the research instruments' reliability. The formula that was used to compute the reliability coefficient (Kuder-Richardson K-R₂₀)

$$KR_{20} = \frac{(K)S^2 - \sum S^2}{(S^2)(K-1)}$$

Where KR₂₀=Reliability coefficient of internal consistency

K=Total items used to measure the concept

(S²) =Variance of all scores

S²= Variance of individual scores.

Radhakrishna (2007) suggested that the coefficient reliability coefficient ranges from 0 to 1, where 0 represents an item with errors while 1 shows a total absence of errors; and coefficient results of at least 0.7 is considered acceptable to collect information. Rahim (2010) asserted that a reliability coefficient of between 0.72 to 0.80 is considered reliable.” The teachers' questionnaire reliability coefficient was 0.79 and 0.82 for both teachers' and principals' questionnaires, which means the research questionnaire is reliable in collecting the information required.

3.7 Procedure for Data Collection

The Director of Post Graduate Studies (DPS) of Masinde Muliro of Science and Technology issued an introductory letter to the researcher that was used to acquire National Commission for Science and Technology (NACOSTI) research permit. The consent from Kakamega County Commissioner, the Director of education Kakamega

County, and Matete Sub-County TSC unit. Advance request to the sampled school principals for research to be done in their schools was done. The research then proceeded in the schools sampled after the consent was granted by the principals. Copies of the questionnaires were given to teachers employed by TSC in the randomly sampled schools who assembled in a hall to fill in. The researcher availed himself so that he clarified areas where there was need for clarification. The respondents were asked to crosscheck the questionnaires for completeness before collecting them.

3.8 Data Analysis Methods

The dependent variable was the number of capacity building programmes attended by a teacher and had a poisson distribution, which is numerical count data in nature. It involved estimating the regression coefficients using the maximum likelihood of an event (teacher training) happening. Data was analysed by used of Stata version 15.2 and data from both teachers' and principals' questionnaires was entered using Epi Info TM programme.

The outcome variable for the objectives was teacher capacity building programmes attended on application of professional knowledge, learner protection and innovation and creativity which were measured on a ratio scale.

Univariate statistics like the mean, standard error (mean), standard deviation minimum and maximum were utilized in the analysis of data especially in cases where there was one variable for every element in a data sample or there are many variables in each data set. The bivariate statistics such as a pairwise correlation was done to determine which plausible variables that are to be used for Zero-inflated negative binomial regression. The two-tailed independent t-test examined whether the means of female and male teachers differed statistically significantly. On the other hand, one-way ANOVA was

utilized in examining whether the means of capacity building programmes in the boy schools, girl schools, and mixed schools as well as day, boarding, and day/boarding schools differed significantly. Used when there are two variables to examine the relationship and the cause of the relationship between the two variables. The multivariate statistic, zero-inflated negative binomial analysis was the main tool for analysis. Zero-inflated negative binomial regression obtained the incident rate ratio that explained the rate at which certain events would occur.

The findings from the research were presented according to the objectives using graphical illustrations as shown in Table 3.3

Table 3. 2: A summary of the analysis of the objectives

Research Question	Independent Variable	Statistical Tests
i. Is there any statistically significant relationship between the application of professional knowledge and entry into teacher capacity building in public secondary schools?	Application of professional knowledge	Mean, Standard error, Standard deviations, T-test, one-way ANOVA and Zero inflated negative binomial regression
ii. Is there any statistically significant relationship between learner protection and entry into capacity-building programmes?	Learner protection	Mean, Standard error, Standard deviations, T-test, one-way ANOVA and Zero inflated negative binomial regression
iii. Is there any statistically significant relationship between innovation and creativity in teaching and entry into teacher capacity-building programmes in public secondary schools?	Innovation and creativity	Mean, Standard error, Standard deviations, T-test, one-way ANOVA and Zero inflated negative binomial regression

Source: Researcher's own, (2017)

3.9 Ethical Issues

Authorization was done by National Commission for Science, Technology, and Innovation and a research permit was given (see Appendix E) before collecting data. The authorization through the research permit was a requirement by Kenyan law before doing research. Patent rights, copyrights, and other forms of intellectual

property was considered by giving credit where it is supposed and citing all sources of information. The researcher accorded proper acknowledgement or credit to all contributions made to this study and therefore there was no plagiarism. The intention of the investigation was clarified to the reporters to ensure that they gave informed consent and the right to respond to the questionnaire items or abandon the research at any given level or make a request for the data collected not to be used for the purpose it was meant for. The person who wished to withdraw from the research study she/he was allowed. The respondents signed a permission sheet showing that they had voluntarily agreed to be part of the research.

The investigator notified the respondent not to put his/her name or any mark that would identify them on the questionnaires to ensure that there is confidentiality and privacy of the respondents. Each participant was given a code for identification without revealing his/her identity. The researcher protected the respondents from their identification by their true names to ensure the anonymity of the respondents.

CHAPTER FOUR

DATA PRESENTATION, INTERPRETATION, AND DISCUSSION OF THE FINDINGS

4.1 Introduction

This section deals with the presentation, interpretation, and discussion of the research findings. The presentation concerning the three objectives sought to find out the relationship between (a) application of professional knowledge outcomes and entry into teacher capacity building programmes, (b) learner protection outcomes and entry into teacher capacity building programmes, and (c) innovation and creativity in teaching and entry into capacity building programmes in Matete Sub-County. Matete Sub-County TSC teachers were involved in this study.

4.2 Distribution of Teachers Across the Sampled Schools and Analytical Dataset

The research involved 12 Matete Sub-County public secondary schools with 110 TSC teachers, and 12 Principals who provided school data. Table 4.1 summarizes sampled teachers in Matete Sub-County. A lion's share of the respondents were male teachers, 67 (60.91%) and 43 (39.09%) were female teachers sampled.

Table 4.1: Distribution of Teachers across the Sample Schools

School ID	Female	Male	Total
1	5	6	11(10%)
2	1	9	10(9%)
3	2	2	4(4%)
4	4	8	12(11%)
5	6	5	11(10%)
6	2	7	9(8%)
7	3	2	5(5%)
8	7	4	11(10%)
9	6	4	10(9%)
10	2	5	7(6%)
11	2	8	10(9%)
12	3	7	10(9%)
Total	43	67	110(100%)

Note. n=110

4.3 Description of the Variables Used in the Analysis

The objective 1 response variable is the number of courses attended on the application of professional knowledge (t21a). Its relationship with significantly correlated covariates was explored: number of indiscipline cases guided Term 1-2018 (p23), number of school classes (p31b), pupil teacher ratio (p35a), and male principal (p41). The exposure variables were the number of years since posted to the current work station (t84c), the number of evaluations in 2017 (t31), the number of years since the first appointment by TSC (t84d), and the Teacher's age in years (t86a). Those were the inflate variables to predict certain zeroes. Teacher Level-1 variables are prefixed with the letter “t” and school level-2 with the letter “p”. Table 4.2 describes variables used in analysing data.

Table 4.2: Description of Variables Used in the Analysis of the Data

Variable	Variable Label	Variable Scale	Variable Values
t21a	Number of courses attended on the application of prof knowledge	Ratio	0-4
t21c	Number of courses attended on innovation and creativity in teaching	Ratio	0-10
t21d	Number of courses attended on learner protection	Ratio	0-5
t31	Number of evaluations in 2017	Ratio	1-5
t52a	Number of computers	Ratio	0-10
t52d	Number of projectors	Ratio	0-1
t55	Number of times teacher used ICT equipment	Ratio	0-10
t651d	Current mean score 2018	Interval	1.5-6.74
t71	Number of Guiding & Counselling programmes Feb 2018	Ratio	1-20
t72	Number of students G&C 1st term 2018	Ratio	0-259
t73	A teacher has a life skills lesson on Timetable	Nominal	0=No;1=Yes
t74	Number of times taught life skills lesson 2018	Ratio	0-32
t77a	0-10 rating: classroom safe for students	Interval	3-10
t77b	0-10 rating: kitchen safe for students	Interval	001-10
t77c	0-10 rating: toilets safe for students	Interval	2-10
t84c	Number of years since posted to current school	Interval	1-18
t84d	Number of years since the first appointment by TSC	Interval	0-34
p22	Number of Guiding & Counselling Sessions Feb2018	Ratio	1-5
p23	Number of indiscipline cases guided Term 1-2018	Ratio	0-20
p31b	Number of school classes	Interval	4-13
p35a	Pupil-Teacher Ratio	Ratio	22-60
p41	Male principal	Nominal	0=Female; 1=Female
p46	Principals' years of schooling	Categorical	13=UT;15=Diploma;16=Degree; 18= Masters

Note. Teacher Level-1 variables are prefixed with the letter "t" and school level-2 with the letter "p"

The response variable was the total teacher capacity building programmes on application of professional knowledge (t21a) for objective 1, the number of courses

attended on learner protection (t21d) for objective 2, and the number of courses attended on innovation and creativity (t21c) for objective 3.

4.4 Objective 1: To Establish the Relationship Between Application of Professional Knowledge and Entry into Teacher Capacity Building Programmes in Matete Sub-County.

4.4.1 Descriptive Statistics

Objective 1 attempted to determine the relationship between application of professional knowledge and entry into capacity-building programmes in Matete Sub-County public schools.

The research question stated that is there any statistically significant relationship between application of professional knowledge and entry into teacher capacity building programmes in Matete Sub-County. Table 4.3 presents descriptive statistics for objective 1

Table 4. 3: Descriptive Statistics for Objective 1

Variable Label	Mean	Standard error (Mean)	Standard deviation	Min.	Max.
Number of courses attended on application professional knowledge	0.50	0.07	0.76	0	4
Observed in class 2018	0.98	0.01	0.13	0	1
Number of class observation in 2018	2.33	0.14	1.57	0	10
Number of lessons since 2018 began	45.32	5.18	54.30	0	300
Number of days since notes were updated	38.74	3.19	33.47	0	94

Note. Obs.=Observation; Min=Minimum; Max=Maximum; $n=110$

The outcome variable was total teacher capacity building programmes on application of professional knowledge (t21a) with a mean of 0.50 and standard deviation of 0.76.

Teachers responses in the outcome variable ranged between 0 and 4 courses attended on application of professional knowledge and this variable was measured on a ratio scale. A teacher was observed at least once when in-class teaching in the year 2018 term one. In the first term of the year 2018, teachers taught between 0 and 300 lessons. The highest number of days since a teacher had updated his/her notes was 94 days and the lowest was daily (0 days).

4.4.2 Pair-Wise Correlation Between the Outcome Variable and Application of Professional Knowledge Variables

The Pair-wise correlation was given preference for analysis because it determined the variables to use in the zero-inflated binomial regression models. After all, the ratio scale was used for measurement of the outcome.

Pair-wise correlation was employed because its output included p-values and the size of the sample. A significant correlation is determined when the two-tailed significance is used. The null hypothesis showed that the correlation is zero and rejected at 5% significance level. The null hypothesis stated that the correlation coefficient is zero and was rejected at 5% or less than $\alpha=.05$ (Acock, 2006).

The master analytical data set for objective 1 had 33 applications of professional knowledge variables. Table 4.4 shows pair-wise correlation between the outcome variable for objective 1 and application of professional knowledge variables. Due to lack of space, the meaningful variables matrix to this research was presented, which is the matrix between the outcome variable and its correlates, is fully presented under the outcome variables' column. The pair-wise result of ≤ 0.35 shows a weak correlation; 0.36-0.67 as moderate; 0.68-0.89 as strong; ≥ 0.90 as very strong (Taylor, 1990)

Table 4.4: Pair-Wise Correlation Between the Outcome and Application of Professional Knowledge Variables

			t21a	t651c	t651d	t652a	t654a	t654d	t655a
t21a	Number of courses attended on the application of prof knowledge		1						
t651c	Subject target mean score 2018	a	-0.24	1					
		b	<.001						
t651d	Current mean score 2018	a	-0.20	0.75	1				
		b	<.001	<.001					
t652a	Class 2018	a	0.25	-0.31	-0.34	1			
		b	<.001	<.001	<.001				
t654a	Class 2018	a	-0.51	0.17	0.24	-0.21	1		
		b	<.001	0.15	<.001	0.06			
t654d	Current mean score 2018	a	0.27	0.14	0.34	0.22	-0.22	1	
		b	<.001	0.21	<.001	0.05	<.001		
t655a	Class 2018	a	-0.97	0.99	0.59	-0.88	0.92	-0.87	
		b	<.001	<.001	0.30	0.05	<.001	0.05	1
t655c	Subject target mean score 2018	a	0.98	-0.95	-0.86	1.00	-0.88	0.58	-0.89
		b	<.001	<.001	0.06	<.001	0.05	0.31	0.04
t655d	Current mean score 2018	a	1.00	-0.97	-0.97	0.94	-0.98	0.78	-0.95
		b	<.001	<.001	0.11	0.02	<.001	0.02	0.01

Note. Pair-wise correlation: ≤ 0.35 =Weak correlation; 0.36-0.67= Moderate correlation; 0.68-0.89= Strong correlation; ≥ 0.90 =Very strong correlation; Adapted from “Interpretation of Correlation Coefficient,” by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 69(1), P 37

a Pearson correlation coefficient; b p-values ($\alpha=.05$)

Subject target mean score 2018 ($r=0.98$, $p<.001$); current mean score ($r=0.47$, $p<.001$) and class 2018 ($r=0.98$, $p<.001$) significantly correlated to the outcome. Class 2018 (t655a) and subject target mean score 2018 (t655c) are strongly correlated, $r=0.9995$ and hence, class 2018 (t655a) was eliminated in the model. Also, other variables strongly correlated with the subject target mean score of 2018 (t655c) and the current mean score of 2018 (t655d). In the model the current mean score 2018 (t655d) had 100 cases, the number of computers (t52a) had 97 cases and the number of projectors (t52d) had 97 cases.

4.4.3 Pair-Wise Correlation Between the Outcome and Teacher-Level Variables

The Pair-wise correlation was given preference for analysis because it determined the variables to use in the zero-inflated binomial regression models. After all, the ratio scale was used for measurement of the outcome.

Pair-wise correlation was employed because its output included p-values and the size of the sample. A significant correlation is determined when the two-tailed significance is used. The null hypothesis showed that the correlation is zero and rejected at 5% significance level. The null hypothesis stated that the correlation coefficient is zero and was rejected at 5% or less than $\alpha=.05$ (Acock, 2006).

The master analytical data set had 7 teacher variables. Due to lack of space, the meaningful variables matrix to this research was presented, which is the matrix between the outcome variable and its correlates, is fully presented under the outcome variables' column. The pair-wise result of ≤ 0.35 shows a weak correlation; 0.36-0.67 as moderate; 0.68-0.89 as strong; ≥ 0.90 as very strong (Taylor, 1990).

Table 4.5 shows the relationship between the outcome and teacher variables for objective 1

Table 4.5: Pair-Wise Correlation Between the Outcome and Teacher Variables

Variable	Variable		t21a	t81	t82	t83a	t84c	t84d	t85
t21a	Number of courses attended on prof knowledge and application		1						
t81	Teacher is male	a	0.13	1					
		b	0.16						
t82	Teacher's religion	a	-0.01	0.04	1				
		b	0.91	0.71					
t83a	Teacher major subject	a	-0.10	-0.08	0.14	1			
		b	0.30	0.38	0.15				
t84c	Number of years since posted to the current school	a	0.15	0.00	-0.16	-0.17	1		

(continued)

Table 4.5: Pair-Wise Correlation Between the Outcome and Teacher Variables (continued)

Variable	Variable		t21a	t81	t82	t83a	t84c	t84d	t85
		b	0.13	0.97	0.09	0.07			
t84d	Number of years since first appointed by TSC	a	0.12	0.07	-0.12	0.04	0.64	1	
		b	0.23	0.49	0.20	0.65	<.001		
t85	Number of years of schooling	a	0.08	0.08	-0.12	-0.17	-0.07	-0.18	1
		b	0.38	0.42	0.21	0.07	0.44	0.05	
t86a	Teacher's age in years	a	0.04	0.06	-0.09	0.15	0.55	0.94	-0.22
		b	0.70	0.57	0.36	0.13	<.001	<.001	<.001

Note. Pair-wise correlation: ≤ 0.35 = Weak correlation; 0.36-0.67= Moderate correlation; 0.68-0.89= Strong correlation; ≥ 0.90 =Very strong correlation; Adapted from "Interpretation of Correlation Coefficient," by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 6(1), P.37

a Pearson correlation coefficient; b p-values ($\alpha=.05$)

There was no statistically significant teacher variable to the total teacher of professional knowledge programmes.

4.4.4 Pair-Wise Correlation Between the Outcome Variable and School Variables

The Pair-wise correlation was given preference for analysis because it determined the variables to use in the zero-inflated binomial regression models. After all, the ratio scale was used for measurement of the outcome.

Pair-wise correlation was employed because its output included p-values and the size of the sample. A significant correlation is determined when the two-tailed significance

is used. The null hypothesis showed that the correlation is zero and rejected at 5% significance level. The null hypothesis stated that the correlation coefficient is zero and was rejected at 5% or less than $\alpha=.05$ (Adcock, 2006). Due to lack of space, the meaningful variables matrix to this research was presented, which is the matrix between the outcome variable and its correlates, is fully presented under the outcome variables 'column. The pair-wise result of ≤ 0.35 shows a weak correlation; 0.36-0.67 as moderate; 0.68-0.89 as strong; ≥ 0.90 as very strong (Taylor, 1990). A Pair-Wise correlation between school-level variables and the outcome variable for objective 1 was done and the results shown in Table 4.6

Table 4.6: Pair-Wise Correlation Between the Outcome and the School Variables

Variable	Variable		t21d	p2t1	p2t3	p22	p23	p25	p26
t21a	Number of courses attended on prof knowledge and application		1						
p2t1	mean teacher absence T1-2017	a	0.07	1					
		b	0.47						
p2t3	mean teacher absence T2-2017	a	0.02	0.81	1				
		b	0.85	<.001					
p22	Number of G & C sessions	a	-0.12	0.43	-0.55	1			
		b	0.21	<.001	<.001				
p23	Number of Indiscipline case guided T1-2018	a	-0.22	-0.14	0.21	-0.06	1		
		b	<.001	0.15	<.001	0.54			
p25	Number of times taught life skills lesson 2018	a	0.10	0.22	0.58	-0.28	0.39	1	
		b	0.30	<.001	<.001	<.001	<.001		
p26	Number of textbooks for life skills	a	-0.12	0.02	-0.13	-0.19	-0.28	-0.33	1
		b	0.20	0.86	0.18	<.001	<.001	<.001	
p31a	School enrolment	a	0.40	-0.09	-0.13	-0.42	-0.32	0.26	-0.14
		b	<.001	0.36	0.17	<.001	<.001	<.001	0.15
p31b	Number of school classes	a	0.43	-0.06	-0.09	-0.29	-0.10	0.35	-0.20
		b	<.001	0.50	0.33	<.001	0.28	<.001	<.001
p32	school category	a	0.01	0.37	0.36	-0.82	-0.22	0.00	0.32
		b	0.92	<.001	<.001	<.001	<.001	0.98	<.001
p33	School type	a	-0.12	0.08	-0.23	0.45	-0.27	-0.12	0.19
		b	0.20	0.40	<.001	<.001	<.001	0.20	<.001
p35a	Pupil-teacher ratio	a	0.29	-0.21	-0.09	-0.43	-0.16	0.17	-0.40
		b	<.001	<.001	0.34	<.001	0.10	0.08	<.001
p41	1=Male principal	a	-0.26	0.46	0.48	-0.20	0.15	0.21	0.36
		b	<.001	<.001	<.001	<.001	0.13	<.001	<.001
p46	Principal's years of schooling	a	-0.08	-0.12	0.00	0.10	0.48	0.34	0.02
		b	0.39	0.20	0.97	0.32	<.001	<.001	0.84

Note. Pair-wise correlation: ≤ 0.35 =Weak correlation; $0.36-0.67$ = Moderate correlation; $0.68-0.89$ = Strong correlation; ≥ 0.90 =Very strong correlation; Adapted from “Interpretation of Correlation Coefficient,” by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 69(1), P 37

a Pearson correlation coefficient; b p-values ($\alpha=.05$)

Statistically significant school level variables to the outcome variable and were in the following ways: 2018 term 1 indiscipline cases guided ($r=0.22$, $p<.001$); school enrolment ($r=0.41$, $p<.001$); streams ($r=0.43$, $p<.001$); TSC teachers ($r=0.29$, $p<.001$); pupil teacher ratio ($r=0.29$, $p<.001$) and male principals ($r=0.26$,

$p < .001$). School enrolment and streams were strongly correlated with a pairwise correlation value ($r = 0.89$, $p < .001$). Therefore, school enrolment was dropped from models because its p -value ($r = 0.40$, $p < .001$) with t21a (capacity building programmes on application of professional knowledge) which was weaker or lower than that for streams ($r = 0.43$, $p < .001$).

4.4.5 Two-Tailed Independent T-Test and One-Way Anova

To determine whether the means for male and female teachers was significantly different, a two tailed independent t-test was done as well as find if the means of boys, girls, and mixed schools differed statistically significantly.

To examine the means across two unrelated samples with equal variance, where the independent variable is categorical and the dependent variable is continuous a two-tailed independent t-test is the preferred statistical approach.

A two-sample independent t-test did not return any statistically significant difference between capacity building programmes attended by male and female teachers, $\alpha = .05$: $t(105.808) = -1.5094$, $p = 0.1342$.

Similarly, one-way ANOVA determined if t21a (capacity building programmes on application of professional) differed for the three categories of schools. The respondents were 110 TSC teachers and put into three categories; Boys only ($n = 9$), Girl only ($n = 29$), and mixed schools only ($n = 72$). It did not return any statistically significant difference between the capacity building programmes attended by teachers in girls only (Mean = 0.52), boys only (Mean = 0.44), and mixed schools only (Mean = 0.5), $p = 0.9698$.

Another one-way ANOVA was done to find out if t21a (capacity building programmes attended on application of professional knowledge) differed in three types of schools. It involved 110 respondents and put into three categories: Day school ($n = 70$), Boarding schools ($n = 10$), and Day and Boarding schools ($n = 30$). The one-way ANOVA results are shown in Table 4.7

Table 4.7: One-Way ANOVA Between Number of courses attended for Application of Professional Knowledge and School Type

p33 School type	Summary of t21a (Capacity building attended on application of Professional knowledge)		
	Mean	Std. Dev	Freq
1=Day Schools	0.53	0.88	70
2=Boarding school	1.00	0.00	10
3=Day & Boarding schools	0.27	0.45	30
Source	Ss	Df	ms
Between groups	4.19	2	2.10
Within groups	59.31	107	0.55
Total	63.5	109	0.58

$F(2,107)=3.78, p<0.001$

Note. Std. Dev=Standard deviation; ss=sum of squares; df.=degrees of freedom; Ms.=mean of squares; Ms.=mean of squares; $\alpha=0.05$

It returned a statistically significant difference between teacher capacity building programmes attended on application of professional knowledge in three types of schools. The day (Mean=0.53), boarding (Mean=0.10) and day and boarding schools (Mean=0.17), $p=0.03$. The post hoc test results for the ANOVA are shown in Table 4.8

Table 4.8 Pair-Wise Comparison Results for the Tukey post hoc test

Turkey					
Interval	t21a	Contrast	Std. Err..	T	p> t
2=Boarding vs 1=Day		0.47	0.25	1.87	0.15
3=Day & Boarding Vs 1=Day		-0.26	0.16	-0.16	0.25
3=Day & Boarding vs 2=Boarding		-0.73	0.27	-2.70	0.02

Statistically significant differing was registered in the capacity building programmes attended on application of professional knowledge between the “the day and

4.4.6 Zero Inflated Negative Binomial Regression Analysis.

The regression produced two separate models and pooled them together. First, a logit model was created for predicting whether a teacher would be in a “certain zero group” because the assessments did not recommend any training. Another teacher might have zero attended courses because their assessment suggested they needed such training but other factors such as lack of funds for such training made them also record a zero. These two teachers looked similar in the outcome variable, yet they landed at the same outcome through two different processes. Thus, the number of zeroes may be inflated and the number of teachers recording zero courses could not be explained in the same manner.

A negative binomial model was used to predict the count for teachers whose performance appraisal found their practice right and needed no capacity building programmes. On the other hand, Zero-inflated model was used to take care of the excess zeros in the outcome variable. The two model are then combined to form Zero Inflated Negative Binomial regression model. When carrying out the analysis the negative binomial and zero inflated models are specified.

4.4.7 Reasons for Zero Inflated Negative Binomial Regression

The zero inflate model was key in analysing an outcome variable with excessive zeros (62).

It was also adapted in dealing with zeros outcomes resulting from different ways. First, a teacher whose performance practice was right and there was no need for capacity

building programmes for them and a teacher with performance gaps and capacity building programmes was required but did not attend.

Lastly, the mean of the outcome variable (0.50) was less than the variance (0.60) by 0.10. Adaption of the zero-inflated negative binomial regression in handling excessive zeros and zero outcome resulting from two processes necessitated the use of this model.

4.4.8 Results for Zero Inflated Negative Binomial Regression

Zero-inflated negative binomial regression (ZINB) coefficients are interpreted as the log of rate ratio which explains the likelihood of which teachers will attend the application of professional knowledge courses. It is determined by the use of the correlate variables from the Pair-Wise correlation to find the rate at which an outcome variable happens. This is the rate of change of courses on the application of professional knowledge concerning a particular variable. The rate ratio at which events occur is calculated by exponentiation of the ZINB regression coefficient. The results of the ZINB regression analysis is as shown in Table 4.9

Table 4.9: Zero Inflated Negative Binomial Regression Analysis

Variable	Variable Label	Model 1 (t21a)			Model 2 (t21a)		
		IRR Coef	Std Err.	p> z	IRR	Std Err.	p> z
t651d	Current mean score 2018	0.77	0.09	0.022	0.84	0.10	0.148
t52a	Class 2018	1.01	0.06	0.825	0.95	0.10	0.641
t52d	Number of projectors				0.85	0.35	0.688
p23	Number of indiscipline cases guided T1-2018				0.95	0.03	0.097
p31b	Number of school classes				1.45	0.18	0.003
p35a	Number of TSC teachers				0.97	0.02	0.153
p41	1=male principal				0.97	0.32	0.919
_cons		1.70	1.11	0.419	0.34	0.30	0.219
Inflate	t31	2.03	0.92	0.027	1.74	0.85	0.042

	2017						
t84c	Number of years since posted to the current school	-3.70	1.36	0.007	-2.82	1.13	0.012
t84d	Number of years since the first appointment	0.20	0.10	0.038	0.13	0.08	0.116
_cons		-1.77	2.65	0.504	-2.08	2.04	0.307
in alpha		-13.77	1556.78	0.99	-43.31	1556.78	
Alpha		0.00	0.00		0.00	0.00	
N			104.00			104.00	
prob>chi2			0.02			0.00	

Note. Coef.=Coefficient; Std. Err.=Standard Error

The inflate option was used, to adjust the ZINB estimates and avoid bias from total evaluations in the year 2017, years since the teacher was posted to the current school and experience. If a teacher had just been posted, they would probably have no chance of attending a course, hence the need for the exposure variables. Cameron and Trivedi (2009) recommended robust standard errors for Poisson models, so we ran the model with the vce. (robust) option.

In model 1, the relationship between application of professional knowledge and the number of courses attended on application of professional knowledge (t21a) was modelled with statistically significant explanatory variables. The model involved 104 teachers with 62 of those reporting zero course attendance.

The current mean score 2018 (t651d) refers to the estimated rate ratio for a one-unit increase in the current 2018 mean score when other variables are held constant in the model. Where other variables are held constant in the model if a teacher was to increase by one point his/her 2018 mean subject score, their rate ratio decreases by a factor of 0.77 for t21a (number of courses attended on application of professional knowledge). In other words, a teacher whose subject is increasing its mean score is less likely to

attend application of professional knowledge courses. The other correlate variables were statistically non-significant.

The inflate part of Table 4.9 presents predicted values for “certain zeroes”. In it, number of evaluations in 2017 (t31) refers to the estimated rate ratio for a one-unit increase in the number of evaluations in 2017, given the other variables are held constant. If a teacher was to increase the number of evaluations in 2017 by one unit, their rate ratio for being a "certain zero" is likely to increase by a factor of 2.03, when the other factors are held constant. An extra year since posting to the current school (t84c) decreases the rate ratio of membership in the "certain zero" group by a factor of - 3.70.

An extra year since the first appointment by TSC (t84d) decreases the rate ratio of membership in the "certain zero" group by a factor of 0.20.

In model 2, when school-level variables such as p23 (number of indiscipline cases guided in term 1 2018); p31b (number of school classes), p35a (pupil teacher ratio) and p41 (male principal) were added to the ZINB model, then the current mean score 2018 (t651d) became statistically insignificant.

If a school was to increase its number of classes (p31b) by one unit, its teachers' incidence rate ratio for t21a (number of courses attended on the application of professional knowledge) would likely increase by a factor of 1.41, when other variables are held constant. In other words, bigger/larger schools are likely to have their teachers attend application of professional knowledge courses.

For the inflated part of Model-2, an increase by one unit in teacher's number of evaluations in 2017 when all other factors are held constant, increases their rate ratio

for being a "certain zero" by a factor of 1.71. An extra year since posting to the current school (t84c) decreases the rate ratio of membership in the "certain zero" group by a factor of -2.79. The alpha was statistically significant because its confidence interval does not hold a zero, suggesting that zero-inflated negative binomial regression is preferable as compared to a standard negative binomial model.

In conclusion, following current mean score 2018 (t651d), class 2018 (t52a), number of projectors (t52d), and number of indiscipline cases guided Term 1-2018 (p23) are statistically insignificant. Therefore, there is no statistically significant relationship between the application of professional knowledge and teacher capacity building.

4.4.9 Model Diagnostic

The comparison of which model is appropriate between Model 1 and Model 2 was done. The results are presented in Table 4.10

Table 4.10: Comparison of Model 1 and Model 2 for Objective 1			
	Model 2	Model 1	Difference
Log-likelihood			
Model	-83.40	-89.46	6.06
Intercept-only	-99.55	-103.22	3.68
Chi-square			
D(df=92/103/-11)	166.80	178.92	-12.12
LR (df=9/4/5)	32.29	27.53	4.76
p-value	0.00	0.00	0.03
R2			
McFadden	0.16	0.13	0.03
McFadden(adjusted)	0.04	0.07	-0.02
Cox-Snell/ML	0.27	0.22	0.05

	Cragg-Uhler/Nagelkerke	0.31	0.26	0.05
IC				
	AIC	190.80	192.92	-2.12
	AIC divided by N	1.84	1.75	0.08
	Bic (df=12/7/5)	222.54	211.82	10.71
N		104	110	-6

The AIC value supports model 2 (190.80) over model 1 (192.92) and the difference in AIC value is -2.12, also supporting model 2 over model 1. If the AIC and BIC value decreases the better the model fits values. The LR chi-square contrast between the two was substantial, 32.29 for model 2 over model 1 with 27.53 supporting the use of model 2.

4.4.10 Testing of the Research Question

The research question for objective 1 stated that is there is any statistically significant relationship between application of professional knowledge and entry into teacher capacity-building programmes. The research question showed that there is statistically significant relationship between application of professional knowledge and entry into teacher capacity-building programmes in Matete Sub-County because the p-value for the total streams ($p=.002$) was statistically significant.

The average predicted number of courses attended by all teachers regardless of whether they attended courses was 0.51. For example, for the first teacher, the probability of not attending a course was $4.11e-09$ (0.0000000411). On the other hand, the probability of a teacher not attending any course was (0.65).

4.4.11 Discussion of the Findings Under Objective 1

In the first objective, the teacher characteristics were modelled using zero-inflated negative binomial regression to find the relationship between application of professional knowledge and entry into teacher capacity-building programmes in

Matete Sub-County. These results showed that there is no statistically significant relationship between application of professional knowledge and entry into teacher capacity-building programmes. This was evidenced in the p-value of total streams ($p=.002$) which was statistically significant. The p-value measures the compatibility of the data present with a specified statistical model but doesn't determine if the studied hypothesis is true, or if the data produced was collected from a random sample.

The average predicted number of courses attended by all teachers regardless of whether they attended courses was 0.51. For example, for the first teacher, the probability of not attending a course was $4.11e-09$ (0.0000000411). On the other hand, the probability of a teacher not attending any course was (0.65). The results indicate a high probability that a teacher is likely not to attend any capacity-building programme and this is also supported by the excess zeros recorded in the outcome variable.

ZINB results showed that the current mean score 2018 (t651d), class 2018 (t52a), number of projectors (t52d), and number of indiscipline cases guided Term 1-2018 (p23) is statistically insignificant.

However, if a school was to increase its number of classes by one unit, its teachers' incidence rate ratio for courses attended on the application of professional knowledge would likely increase by a factor of 1.41, when other variables are held constant. In other words, bigger/larger schools are likely to have their teachers attend application of professional knowledge courses. Also an increase by one unit in teacher's number of evaluations in 2017 when all other factors are held constant, increases their rate ratio for being a "certain zero" by a factor of 1.71. Furthermore, an extra year since posting to the current school decreases the rate ratio of membership in the "certain zero" group by a factor of -2.79.

One challenge that is facing KEMI capacity building courses is that there is an additional payment which some schools cannot afford (Okusimba, 2017 & Fukuyama, 2017). These schools can't afford because of the low enrolment of learners which leads to lower government disbursement to these schools. Sobeck and Agius (2017) emphasized that the limited resources in school make it difficult for teachers to attend capacity building programmes. Resources are required for schools to organize or teachers to attend capacity building programmes (Draper, 2017). In support White (2017) asserts that the government is held responsible for capacity building programmes not being provided to teachers and lacking of other physical facilities in learning institutions.

An increase in school enrolments will make it possible for all to play a more active part in the great enterprise of transforming the individual's competency in teaching by providing capacity building programmes to them (UNESCO, 1970)

Studies have shown that professional learning experiences in the form of mentoring can facilitate novice teachers' retention intention (Van den Borre et.al, 2021) whereas opportunities for professional development seem to facilitate teacher retention among more experienced teachers due to its intersection with teaching autonomy (Booth et al., 2021; Chiong, et.al, 2017).

The results for the relationship between teacher performance appraisal and capacity-building programmes are of mixed reactions. This research is supported by research carried out by (Waya, 2019) who concurred during personal interviews when he stated that performance appraisal is increasingly being used for accountability purposes. It was also reported that Teachers Service Commission is using the performance appraisal for accountability, as the capacity building has not been forthcoming. The

findings concur with those of Manyinsa (2021) that established loopholes in access to capacity building of teachers. He also found that Kenyan policies on capacity development for teachers were a main research gap that needs necessary intervention. This requires necessary handling by the teachers' employer (TSC) so that many educators seek their job dreams. After about 6 years of teachers carrying out the performance appraisal process, there is no capacity-building programme that is forthcoming. One of the main reasons that TSC implemented teacher performance appraisal is to avail opportunities for capacity building to educators and this is contrary to the 62 zero outcomes recorded.

The research by Muthwasa & Duku (2019) showed that many (66.7%) of teacher respondents and (75%) of the principals felt that appraisals were useful in identifying performance gaps of teachers, while a third of the teachers' respondents and (25%) of principals' respondents noticed that it was not useful in improving teachers' performance gap through training them in the performance gaps identified. However, the government did not offer capacity building on any of the needs identified. The TSC and other stakeholders have not been able to carry out professional growth for teachers because there are no funds allocated by the government for such training and that is why in some cases teachers are required to pay from their pockets. This concurs with the finding of (Wamaitha, 2013) who opines that performance appraisals cannot be effective for capacity building because of the unavailability of resources, or unavailability of capacity building programmes. Performance appraisal does to a minimal extent provide a conducive condition for teachers to undertake capacity-building programme with a standard deviation of 1.26 (Wamaitha, 2013). She further said that the performance gaps identified are addressed to a less extent by providing effective capacity-building programmes.

However, Jepaketer et.al, (2015) using a descriptive survey design found that the majority (57%) of the education providers attended capacity-building programmes and the majority (67.50%) of education providers noticed that organized training helped teachers to acquire appropriate skills and knowledge. This result is consistent with the research findings whereby it was found out that teachers were taken for training relating to the application of professional knowledge.

4.5 Objective 2: To Establish the Relationship Between Learner Protection and Entry into Teacher Capacity Building Programmes in Secondary Schools Matete Sub-County

4.5.1 Descriptive Statistics

The second objective sought to establish the relationship between learner protection and access to teacher capacity-building programmes in Matete Sub-County. The research question stated that is there any statistically significant relationship between learner protection and access to teacher capacity-building programmes in Matete Sub-County government high schools? The outcome variable was measured on a ratio scale. The descriptive statistics for objective 1 are shown in Table 4.11

Table 4.11: Descriptive Statistics for Objective 2

Variables	Variable Label	Mean	Standard Error(mean)	Standard deviation	Min.	Max.	N
t21d	Number of courses attended on learner protection	0.17	0.06	0.69	0	5	110
t71	Number of G & C sessions 1st 2018	3.62	0.31	3.34	1	20	109
t72	Number of students G & C 1st 2018	23.65	3.04	31.79	0	259	109
t73	A teacher has a life skills lesson on Timetable	0.66	0.05	0.48	0	1	109
t74	Number of times taught life skills lesson 2018	3.78	0.57	5.95	0	32	110
t75	Number of textbooks for life skills	8.18	1.62	16.09	0	1	99
t76	the school has a functional red cross club	0.036	0.02	0.19	0	100	110
t77a	0-10 rating: classroom safe for students	6.78	0.16	1.70	0	1	109
t77b	0-10 rating: Kitchen Safe for students	5.36	0.21	2.21	3	10	107
t77c	0-10 rating: toilets safe for students	6.22	0.20	2.06	1	10	109
t77d	0-10 rating: library safe for students	5.09	0.21	2.09	2	10	97
t77e	0-10 rating: staffroom safe for students	5.05	0.23	2.37	1	10	108
t77f	0-10 rating: adm. block safe for students	6.50	0.23	2.14	1	10	88
t77g	0-10 rating: bus safe for students	6.64	0.69	2.29	1	9	11

Note.Obs=Observation; Min=Minimum; Max=Maximum

The number of courses a teacher attended on learner protection was measured on a ratio scale and ranged between 0 and 5. The number of students guided and counselled by teachers in the first term of 2018 was between 0-259, and the number of guiding and counselling sessions was between 0 and 20.

4.5.2 Pairwise Correlation Between the Outcome and Learner Protection Variables

The Pair-wise correlation was given preference for analysis because it determined the variables to use in the zero-inflated binomial regression models. After all, the ratio scale was used for measurement of the outcome.

Pair-wise correlation was employed because its output included p-values and the size of the sample. A significant correlation is determined when the two-tailed significance is used. The null hypothesis showed that the correlation is zero and rejected at 5% significance level. The null hypothesis stated that the correlation coefficient is zero and was rejected at 5% or less than $\alpha=.05$ (Acock, 2006).

The master analytical data set for objective 2 had 13 learner protection variables. Table 4.12 shows a pairwise correlation between the outcome variable and the learner protection variables. Due to lack of space, the meaningful variables matrix to this research was presented, which is the matrix between the outcome variable and its correlates, is fully presented under the outcome variables' column. The pair-wise result of ≤ 0.35 shows a weak correlation; 0.36-0.67 as moderate; 0.68-0.89 as strong; ≥ 0.90 as very strong (Taylor, 1990).

Table 4.12: Pairwise Correlation Matrix Variables Associated with Learner Protection in 2017

Variable	Variable		t21d	t71	t72	t73	t74	t75	t76
t21d	Number of courses attended on learner protection		1						
t71	The number of G & C programmes. Feb 2018	a	0.00	1					
		b	0.96						
t72	Number of students G & C 1st 2018	a	0.02	-0.01	1				
		b	0.85	0.92					
t73	A teacher has a life skills lesson on a timetable	a	-0.16	0.06	-0.12	1			
		b	0.10	0.50	0.20				
t74	Number of times taught life skills lesson 2018	a	0.17	0.29	0.06	0.46	1		
		b	0.07	<.001	0.53	<.001			
t75	Number of textbooks for life skills	a	-0.06	0.39	0.15	0.10	0.50	1	
		b	0.53	<.001	0.14	0.34	<.001		
t76	The school has a functional red cross club	a	-0.05	-0.14	-0.09	0.04	-0.06	-0.08	1
		b	0.61	0.15	0.36	0.70	0.54	0.44	
t77a	0-10 rating: Classroom safe for students	a	0.03	0.09	-0.14	0.08	0.25	0.00	0.11
		b	0.73	0.34	0.15	0.40	<.001	0.98	0.25
t77b	0-10 rating: Kitchen Safe for students	a	0.02	0.07	0.02	-0.09	0.14	-0.13	-0.19
		b	0.88	0.51	0.84	0.34	0.14	0.20	0.05
t77c	0-10 rating: Toilets safe for students	a	0.01	0.23	-0.03	0.02	0.14	0.19	-0.07
		b	0.96	<.001	0.77	0.87	0.16	0.06	0.48
t77d	0-10 rating: Library safe for students	a	-0.17	0.15	-0.06	0.11	0.17	0.12	-0.18
		b	0.10	0.14	0.55	0.29	0.10	0.25	0.07
t77e	0-10 rating: staffroom safe for students	a	-0.02	0.08	-0.09	0.06	0.12	-0.14	-0.17
		b	0.87	0.42	0.38	0.55	0.23	0.17	0.08
t77f	0-10 rating: adm block safe for students	a	0.10	0.20	-0.13	-0.05	-0.04	0.23	-0.03
		b	0.37	0.06	0.24	0.67	0.72	<.001	0.82
t77g	0-10 rating: bus safe for students	a	.	-0.58	0.93	-0.20	-0.18	0.96	.
		b	<.001	0.06	<.001	0.56	0.60	<.001	<.001

Note. Pairwise correlation: ≤ 0.35 = Weak correlation; $0.36-0.67$ = Moderate correlation; $0.68-0.89$ = Strong correlation; ≥ 0.90 = Very strong correlation; Adapted from “Interpretation of Correlation Coefficient,” by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 6(1), P.37

a Pearson correlation coefficient; b p-values ($\alpha=.05$)

In Table 4.12, none of the learner protection variables was statistically significant.

4.5.3 Pairwise Correlation Between the Outcome Variable and Teacher Variables

There was need to carry out a Pairwise correlation between the outcome variable (number of courses attended on learner protection) and teacher-level variables to determine variables to be used in the zero-inflated negative binomial regression analysis. There were seven teacher variables in the master analytical data set. None of the teacher variables was statistically significant to the courses attended on learner protection (t21d) as exhibited in Table 4.13

Table 4. 133: Pairwise Correlation Matrix for Variables Associated with Teachers

Variable	Variable	t21d	t81	t82	t83a	t84c	t84d	t85
t21d	Number of courses attended on learner protection	1						
t81	Teacher is male	^a 0.01 ^b 0.90	1					
t82	Teacher's religion	^a -0.08 ^b 0.43	0.04	1				
t83a	Teacher major subject	^a 0.00 ^b 0.29	-0.08	0.14	1			
t84c	Number of years since posted to the current school	^a -0.12 ^b 0.23	0.00	-0.16	-0.17	1		
t84d	Number of years since first appointed by TSC	^a 0.08 ^b 0.42	0.97	-0.12	0.04	0.64	1	
t85	Number of years of schooling	^a 0.10 ^b 0.29	0.49	-0.12	-0.17	-0.07	-0.18	1
t86a	Teacher's age in years	^a 0.13 ^b 0.16	0.06	-0.09	0.15	0.55	0.94	-0.22
						<.001	<.001	<.001

Note. Pairwise correlation: ≤ 0.35 = Weak correlation; 0.36-0.67= Moderate correlation; 0.68-0.89= Strong correlation; ≥ 0.90 =Very strong correlation; Adapted from "Interpretation of Correlation Coefficient," by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 6(1), P.37

^a Pearson correlation coefficient; ^b p-values ($\alpha=.05$)

4.5.4 Pairwise Correlation Between the Outcome and School Variables

The outcome variable number of courses attended on learner protection (t21d) was correlated to school-level variables to determine which of them would be used for the Zero-inflated negative binomial regression analysis. The result of Pairwise results between school-level variables and the number of courses attended on learner protection are shown in Table 4.14

Table 4.144: Pairwise Correlation Matrix for Variables Associated with School-Level Variables

Variable	Variable		t21d	p2t1	p2t3	p22	p23	p25	p26
t21d	Number of courses attended on learner protection		1						
p2t1	Mean teacher absence T1-2017	a	-0.02	1					
		b	0.86						
p2t3	Mean teacher absence T2-2017	a	-0.07	0.81	1				
		b	0.46	<.001					
p22	Number of G & C sessions	a	0.20	0.43	-0.55	1			
		b	<.001	<.001	<.001	-0.06			
p23	Number of Indiscipline case guided T1-2018	a	-0.11	-0.14	0.21	0.54	1		
		b	0.24	0.15	<.001	-0.28			
p25	Number of times taught life skills lesson 2018	a	0.06	0.22	0.58	<.001	0.39	1	
		b	0.56	<.001	<.001	-0.19	<.001		
p26	Number of textbooks for life skills	a	-0.12	0.02	-0.13	<.001	-0.28	-0.33	1
		b	0.22	0.86	0.18	-0.42	<.001	<.001	
p31a	School enrolment	a	0.40	-0.09	-0.13	<.001	-0.32	0.26	-0.14
		b	<.001	0.36	0.17	-0.29	<.001	<.001	0.15
p31b	Total streams	a	0.39	-0.06	-0.09	<.001	-0.10	0.35	-0.20
		b	<.001	0.50	0.33	-0.82	0.28	<.001	<.001
p32	school category	a	0.11	0.37	0.36	<.001	-0.22	0.00	0.32
		b	0.27	<.001	<.001	0.45	<.001	0.98	<.001
p33	School type	a	-0.18	0.08	-0.23	<.001	-0.27	-0.12	0.19
		b	0.06	0.40	<.001	0.87	<.001	0.20	<.001
p35a	Pupil-teacher ratio	a	0.40	-0.21	-0.09	-0.43	-0.16	0.17	-0.40
		b	<.001	<.001	0.34	<.001	0.10	0.08	<.001
p41	1=Male principal	a	0.24	0.46	0.48	-0.20	0.15	0.21	0.36
		b	<.001	<.001	<.001	<.001	0.13	<.001	<.001
p46	Principal's years of schooling	a	-0.08	-0.12	0.00	0.10	0.48	0.34	0.02
		b	0.40	0.20	0.97	0.32	<.001	<.001	0.84

Note. Pairwise correlation: ≤ 0.35 = Weak correlation; 0.36-0.67= Moderate correlation; 0.68-0.89= Strong correlation; ≥ 0.90 =Very strong correlation; Adapted from “Interpretation of Correlation Coefficient,” by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 6(1), P.37

a Pearson correlation coefficient; b p-values ($\alpha=.05$)

The statistically significant school variables are the number of guiding and counselling

sessions in February 2018 ($r=0.20$, $p=.001$), school enrolment ($r=0.40$, $p=.001$), total

streams ($r=0.39$, $p<.001$), pupil-teacher ratio ($r=0.40$, $p<.001$) and male principal ($r=0.25$, $p=.001$). school enrolment (p31a) and total streams (p31b) are strongly correlated with a coefficient ($r=0.89$, $p<.001$). Therefore, total streams were dropped from models because its ($r=0.39$, $p<.001$) with number of courses attended on learner protection (t21d) is marginally weaker or lower than that for total streams (p31b) which was equal to 0.40.

4.5.5 Two-Tailed Independent T-Test and One-Way ANOVA

A two-tailed independent t-test was carried out to determine whether the means for female and male teachers differed significantly, and one-way ANOVA was utilised to find if the means of boys, girls and mixed schools differed statistically significantly.

To examine the means across two unrelated samples with equal variance, where the independent variable is categorical, and the dependent variable is continuous, the researcher conducted a two-tailed independent t-test as the preferred statistical approach.

A two-tailed independent t-test did not return any statistically significant difference between the number of courses attended by male and female teachers, $\alpha=.05$: $t(75.307) = -0.1149$, $p=0.9088$.

Similarly, one-way ANOVA was done to establish if the number of courses attended on learner protection (t21d) was different for the three groups of schools. Participants were 110 teachers and classified into three groups; boy's schools only ($n=9$), girl schools only ($n=29$) and mixed schools ($n=72$). It did not return any statistically significant difference between the number of courses attended by teachers in girl

schools only (Mean=0.10), boy schools only (Mean=0) and mixed schools (Mean=0.22), $p=0.5446$.

Another one-way ANOVA was done to establish if number of courses attended on learner protection (t21d) was different in various school types. Participants were 110 teachers and classified into three groups: Day schools ($n= 70$), Boarding schools ($n= 10$) and Mixed schools ($n= 30$). It did not return any statistically significant difference between the number of courses attended by teachers in day school (Mean=0.27), boarding school (Mean=0) and day and boarding schools (Mean=0), $p=0.1386$.

4.5.6 Zero-Inflated Negative Binomial Regression Analysis

The regression produced two separate models and pooled them together. First, a logit model was created to predict whether a teacher would be in a "certain zero group" because the assessments did not recommend training. Another teacher might have yet to attend courses because their assessment suggested they needed such training, but other factors, such as lack of funds, made them record a zero. These two teachers looked similar in the outcome variable, yet they landed at the same outcome through two different processes. Thus, the number of zeroes may be inflated, and the number of teachers recording zero courses could be explained differently.

A negative binomial model was created to foretell the counts for the teachers who are not certain zeros. A zero-inflated model was used to take care of the excessive zeros. Finally, the two models (Zero-inflated regression and Negative binomial regression analysis) are combined. When running zero-inflated negative binomial in Stata, both models were specified: the count model, then the model predicting the certain zeros.

4.5.7 Reasons for Zero Inflated Negative Binomial Regressions

Zero-inflated negative binomial regression model allowed for analysing a dataset with excessive zeros in the outcome variable.

It was also adapted in dealing with zeros outcomes resulting from different ways. First, a teacher whose performance practice was right and there was no need for capacity building programmes for them and a teacher with performance gaps and capacity building programmes was required but did not attend.

Lastly, the variance for the count outcome variable is 0.47, greater than its mean of 0.17 by just 0.30. The Zero-inflated negative binomial was adapted to all of the above, and that is why it was used in the analysis.

4.5.8 Results of the Zero-Inflated Negative Binomial Regression

The zero-inflated negative binomial (ZINB) regression coefficients are interpreted as the log of rate ratio, explaining the likelihood of teachers attending learner protection courses. It is determined by using the correlate variables from the Pairwise correlation to find the rate at which an outcome variable happens. The rate ratio is the rate of change of courses undertaken by teachers on learner protection, an outcome variable as associated to a particular variable. The rate ratio at which events occur is calculated by exponentiation of the ZINB regression coefficient. The outcome of the ZINB regression analysis is exhibited in Table 4.15.

Table 4. 155: Zero Inflated Negative Binomial Regression Analysis

		Model 2 (t21d)			Model 1 (t21d)		
Variable	Variable label	IRR Coef	Std. Err.	p> z	IRR Coef	Std. Err.	p> z
t71	The number of G & C programmes. Feb 2018	0.74	0.49	0.645	1.01	0.11	0.911
t72	Number of students Guiding & Counselling 1st term 2018	1.10	0.08	0.194	1.01	0.01	0.313
t73	A teacher has a Life skills lesson on the timetable	0.40	0.82	0.656	2.63	6.58	0.700
t74	Number of times taught Life Skills Lesson 2018	1.00	0.21	0.992	0.97	0.10	0.781
t77a	0-10 rating: Classroom safe for students	1.05	0.92	0.960	0.93	0.30	0.817
t77b	0-10 rating: Kitchen safe for students	1.24	0.23	0.248	0.80	0.16	0.255
t77c	0-10 rating: Toilets safe for students	1.03	0.35	0.930	0.89	0.19	0.577
p22	Number of G & C sessions Feb 2018				0.87	0.45	0.781
p31a	School enrolment				0.98	0.01	0.000
p35a	Pupil-teacher ratio				1.59	0.20	0.000
p41	1=Male				2.39	3.82	0.587
_cons		0.09	0.46	0.640	0.00	0.00	0.077
inflate	t31	-1.39	2.31	0.546	0.20	0.69	0.766
	t84c	0.34	0.47	0.459	0.16	0.21	0.442
	t84d	-0.18	0.23	0.440	-0.46	0.18	0.009
	_cons	5.94	6.50	0.360	3.24	2.76	0.241
	in alpha	-15.57	1.43	0.000	-992.43	0.19	
	Alpha	0.00	0.00		0.00(Omitted)		
N			105			105	
prob>chi2			0.00			0.00	

Note. Coef=Coefficient; Std. Err.=Standard Error

The inflate option was used to adjust the ZINB estimates and avoid bias from the years since the teacher was posted to the current school and experience. If a teacher had just been posted, they would have no chance of attending a course, hence the need for the exposure variables. Cameron and Trivedi (2009) recommend robust standard errors for Poisson models, so we ran the model with the vce (robust) option.

Model 1 modelled the relationship between number of courses attended on learner protection (t21d) and child-friendly environment variables. The model involved 105 teachers, with 96 reporting zero course attendance and insignificant at $p < .001$. The number of courses attended on learner protection (t21d) was the outcome variable, and all the explanatory variables were statistically insignificant. As certain zeros were Inflated, it was found that an extra evaluation in 2017 decreased the rate ratio of membership in the "certain zero" group by a factor of -1.40, although statistically insignificant.

In the final model (2), school-level variables were modelled with the number of courses on learner protection (t21d).

School enrolment (p31a) was significant, and an extra enrolment of a student in a school increases the teacher incidence rate ratio for number of courses attended on learner protection (t21d) by a multiplier of 0.98 when other variables are held constant, although only significant at the 10% level. In other words, bigger/larger schools are likely to have their teachers attend courses on learner protection.

An extra pupil-teacher ratio unit increases the incidence rate ratio for the number of courses attended on learner protection (t21d) by a multiplier of 1.59 when other variables are unchanging in the model. An increase in the pupil-teacher ratio means more students and fewer teachers.

An extra year since the first appointment by TSC (t84d) decreases the rate ratio of membership in the "certain zero" group by a multiplier of -0.46 when other variables are unchanging in the model. The alpha was statistically significant because its confidence interval did not contain a zero, suggesting zero-inflated binomial regression is preferable over a standard negative binomial model.

In conclusion, most learner protection variables, such as the number of students guided and counselled, a teacher has life skills lesson on the timetable, and the number of times taught life skill lessons in 2018, among others, did not make it to the final model. Therefore, learner protection does not influence teacher entry into capacity-building programmes in Matete Sub-County. Furthermore, the number of guiding and counselling programmes in February 2018 (t71), students guided and counselled first term 2018 (t72), a teacher has Life skills lesson on the timetable (t73), 0-10 rating on safety of students: classroom, kitchen and toilet being statistically insignificant. It was concluded that there is no statistically significant relationship between learner protection and entry into teacher capacity-building programmes.

4.5.9 Model Diagnostic

The Model 1 and Model 2 was compared to find out which model was appropriate. The outcomes are exhibited in Table 4.16

Table 4.166: Comparison of Model 1 and Model 2 for Objective 2

		Model 2	Model 1	Difference
Log-likelihood				
	Model	-24.159	-31.687	7.528
	Intercept-only	-43.143	-43.143	0
Chi-square	D(df=92/88/-4)	48.318	63.375	-15.056
	LR (df=14/10/4)	37.967	22.911	15.056
	p-value	0	0	.
R2	McFadden	0.44	0.266	0.174
	McFadden(adjusted)	0.046	-0.036	0.082
	Cox-Snell/ML	0.303	0.196	0.107
	Cragg-Uhler/Nagelkerke	0.542	0.35	0.192
IC	AIC	82.318	89.375	-7.056
	AIC divided by N	0.784	0.851	-0.067
	Bic (df=17/13/4)	127.436	123.876	3.56
N		105	110	-6

The AIC value supports model 2 (82.31) over model 1 (83.80) and the difference in AIC value is -1.59, also supporting model 2 over model 1. If the AIC and BIC value decreases the better the model fits values. The LR chi-square contrast between the two was substantial, 89.38 for model 2 over model 1 with 82.318 supporting the use of model 2.

4.5.10 Testing of the Research Question

The research question states that is there any statistically significant relationship between learner protection and entry into teacher capacity-building programmes in Matete Sub-County.

The average predicted number of courses attended by all teachers, regardless of whether or not they attended the course, was 0.51. For example, for the first teacher, the probability of not attending a course is $4.11\text{e-}09$ (0.0000000331). On the other hand, the probability of a teacher not attending any course was 0.65.

Given that most of the p-values of the other explanatory variables, such as the number of guiding and counselling programmes in February 2018 ($p=.91$), the number of students guided and counselled in first term 2018 ($p=.31$) among others in the model being statistically non-significant. Hence, there is no any statistically significant relationship between learner protection and entry into teacher capacity-building programmes in Matete Sub-County.

4.5.11 Discussion of the Findings Under Objective 2.

The research question stated that is there any statistically significant relationship between learner protection and entry into capacity building programmes in public secondary schools within Matete Sub-County and it was found that there is no statistically significant relationship that exists between the two. The average predicted number of courses attended by all teachers, regardless of whether or not they attended the course, was 0.51. For example, for the first teacher, the probability of not attending a course is $4.11\text{e-}09$ (0.0000000331). On the other hand, the probability of a teacher not attending any course was 0.65.

Given that most of the p-values of the other explanatory variables, such as the number of guiding and counselling programmes Feb 2018 ($p=.91$), the number of students guided and counselled first term 2018 ($p=.31$), a teacher had Life skills lesson on the timetable ($p=.70$), number of times taught Life skills lesson 2018 ($p=.78$) among others in the model being statistically non-significant. Therefore, there is no statistically

significant relationship between learner protection and entry into capacity-building programmes in Matete Sub-County public secondary schools.

In Objective 2, seven teacher-level characteristics were modelled in a ZINB regression as predictors for the number of courses attended by teachers while controlling for school-level covariates. The ZINB results showed that the number of guiding and counselling programmes February 2018 (t71), students guided and counselled first term 2018 (t72), a teacher has Life skills lesson on the timetable (t73), 0-10 rating on safety of students: classroom, kitchen and toilet being statistically insignificant.

On the other hand, an extra enrolment of a student in a school increases the teacher incidence rate ratio for courses attended on learner protection by a multiplier of 0.98 when other variables are held constant, although only significant at the 10% level. In other words, bigger/larger schools are likely to have their teachers attend courses on learner protection.

ZINB results showed that an extra pupil-teacher ratio unit increases the incidence rate ratio for courses attended on learner protection by a multiplier of 1.59 when other variables are unchanging in the model. An increase in the pupil-teacher ratio means more students and fewer teachers.

It also showed that an extra year since the first appointment by TSC decreases the rate ratio of membership in the "certain zero" group by a multiplier of -0.46 when other variables are unchanging in the model.

The student-teacher ratio has been found to be one of the strongest indicators of student success and engagement. Logically, it's little wonder why. The fewer students each teacher works with, the more closely they're able to adapt their teaching to the specific

learning styles. They're also able to develop healthy one-on-one mentoring relationships and offer insight and help in ways that would be impossible in a larger classroom. Additionally, a lower ratio will lighten the workload for teachers, enabling them to focus on the quality rather than the quantity of their teaching and grading.

In a smaller group, students are more likely to feel comfortable voicing their opinions, asking questions, and making their needs known. This setup also provides added care for students who may be struggling with learning obstacles in any given subject. Rather than falling through the cracks in a larger classroom or one with a higher student-teacher ratio, students benefit from the fact that teachers are able to notice and offer tailored assistance more effectively (The Hun School of Princeton, 2019. December).

According to the Hun School of Princeton (2019, December) the number of learners will vary according to budgeting, as smaller class sizes and more teachers cost the school more to staff and train. You'll also often find differences in the student-teacher ratio according to the type of school. Public schools, for example, tend to have a higher student-teacher ratio than private day schools or boarding schools, which typically offer smaller class sizes. This means that where there is a lower teacher learner ratio more of their resources goes to payment of teachers and therefore only little is left for the training of teachers. Hence the set up where there are more teachers and few learners will conduct less trainings. Research has indicated a positive association of smaller class size and higher teacher satisfaction as stated by Education GPS, OECD, (2024, September 9th).

On the other hand, a larger learner teacher ratio shows that there are more learner and few teachers. In this case there is more of the resources and also because handling larger classes is challenging such teachers are likely to be taken more for capacity

building programmes. This is supported by Muturi (2023, June 11th) who recommends the Kenyan government to improve teacher training by providing more opportunities to teachers to learn about effective teaching methods and strategies for working with large class sizes.

The results of the teacher performance appraisal and capacity building programmes are of mixed reactions. This research finding is in line with that of (Waya, 2019), who found that the appraisal system is becoming one that is implemented instead of doing it for teachers' professional development through workshops and seminars. There is no real learner protection training for teachers on the ground to address the teachers' professional gaps, and there are no experts highlighting learner protection professional gaps and making changes through professional learning.

This fact is also supported by Wamaitha (2013), who said that appraisal tools might not be successful in providing capacity building on learner protection because of lack of resources or unavailability of training. She further found out that a large composition of respondents believed they had not been trained on learner protection to improve their content delivery and pedagogical skill due to the appraisal, 17.5% of the respondents to a less extent, 25.4% to a moderate extent, 4.8% to a great extent while only 6.3% to a very great extent. Lack of teacher training from the teacher appraisal exercise may make the activity ineffective, as stated by Stronge (2010), who advises that only appraisal tool that takes care of capacity building and accountability perspective is the most efficient in encouraging teaching and learning.

The absence of learner protection training through workshops and seminars, as held by respondents, is linked to the views held by Naliaka (2017) that the new performance appraisal policy in Kenya is more on accountability and less on professional learning.

Zhang & Ng (2015) observed that performance appraisals are now an order of the day in schools and are not linked to capacity building (learner protection programmes). An appraisal that needs to incorporate capacity-building makes the appraisal process questionable and effective in enhancing learner achievement because teachers are a vital component in the education system. The appraisal process revealed credibility issues impeding education stakeholders to establish areas that required capacity building (Owour & Jonyo, 2016). Kagema and Irungu (2018) concluded that the current structure of the appraisal system needed to give the correct result to the teachers. According to (Kariuki & Guantai, 2020), 59% of teachers revealed that performance appraisal was not utilised for teachers to improve the performance gaps identified, supported by only 26.0% and 72.6% viewed appraisal as not helping inform performance gap in the schooling system and this is contradictory to the reason why performance appraisal was introduced. According to the TSC (2012), the crucial function of assessing teachers is to pinpoint performance weaknesses and plan capacity-building programmes for teachers.

Research by Gichuhi (2011) noticed that the Kenyan appraisal system needed to be more effective. An effective appraisal uses feedback to identify capacity-building programmes for teachers. Stronge (2010) states that for the teacher appraisal tool to serve its purpose, it should combine accountability and capacity building for teachers. The research by Gatemi (2004) stated that only 30.6% of educators revealed that teachers' evaluation improved their capacity building, while a majority (51.8%) found teachers' evaluation is valuable in fixing their performance gaps. Gatemi's study suggests that an interrelationship between teacher appraisal and entry into capacity-building programmes exists and must be established. It, therefore, needs to be clarified whether the appraisal tool helped improve teachers' performance through capacity

building, as revealed by the TSC. An appraisal that does not incorporate capacity building shows that teacher performance gaps would be in limbo since education providers are crucial for a school to improve. There is a requirement for a design that gives solutions to performance gaps identified through the teachers' evaluation process. Stronge (2010) suggested an appraisal tool that factors in both accountability and capacity building to solve the identified performance gaps. An appraisal will be effective if the school plans for capacity building and sets aside some funds for the same process.

The study carried out by Umoh (2013) revealed that 16.7 % of the educators didn't participate in any capacity-building programmes because they were new employees of TSC and also some teachers were employed for a long time but had not been trained.

It is also clear that teachers not taking child-friendly environment courses may lead to school insecurity. It is supported by Kirui (2011), who showed that the most rampantly spread effect of insecurity is incurring extra cost to safeguard learners (64%), emotional and physical security to students (61.5%), timely accomplishment of the syllabus (57.7%), student truancy/absenteeism (46.2%), destruction of school property (34.6%), loss of life /injuries (26.9%), under-utilization of school resources (26.9%) and student transferring from the schools affected (26.9%). The study by (Eliot et al., 1998) and Reuters (2004) shows that school insecurity exists.

4.6 Objective 3: To Establish the Relationship Between Innovation and Creativity in Teaching and Access Teacher Capacity Building Programmes in Matete Sub-County

4.6.1 Descriptive Statistics

The objective sought to establish the relationship between innovation and creativity in teaching and access to teacher capacity building programmes in Matete Sub-County. The research question stated that there is no statistically significant relationship between innovation and creativity in teaching and access to teacher capacity building programmes in Matete Sub-County public secondary schools. The descriptive statistics for objective 3 are exhibited in Table 4.17.

Table 4. 177: Descriptive Statistics for Objective 3

Variable Label	Variables	Obs	Mean	se(mean)	Min.	Max.
Number of courses attended on innovation and creativity in teaching	t21c	110	0.30	0.11	0	10
School has computers	t51a	110	0.89	0.03	0	1
School has radios	t51b	110	0.40	0.05	0	1
School has TVs	t51c	110	0.75	0.04	0	1
School has projectors	t51d	110	0.25	0.04	0	1
School has cameras	t51e	110	0.11	0.03	0	1
Number of computers	t52a	110	3.36	0.18	0	10
Number of radios	t52b	110	0.40	0.05	0	1
Number of TVs	t52c	110	0.83	0.05	0	2
Number of projectors	t52d	110	0.23	0.04	0	1
Number of cameras	t52e	110	0.12	0.03	0	1
The main use of computers	t53a	99	2.09	0.04	1	3
The main use of radios	t53b	56	3.68	0.09	1	4
The main use of TVs	t53c	110	31.38	4.15	2	99
The main use of projects	t53d	22	2.86	0.10	1	3
The main use of cameras	t53e	13	2.62	0.21	1	3
Keeper of ICT equipment	t54	98	20.18	3.53	1	96
Number of times teacher used ICT equipment	t55	110	1.37	0.18	0	10
rating 0-10 ICT and capacity building	t56a	110	3.62	0.21	0	8
rating 0-10 appraisal and utilization of ICT	t56b	110	3.80	0.19	0	7

Note. Obs=Observation; Min=Minimum; Max=Maximum

The outcome variable was the number of courses attended on innovation and creativity (t21c) with a mean of 0.17 and a standard deviation of 0.69. The number of training attended by a teacher on innovation and creativity ranges between 0 and 10. It is evident that some schools lacked ICT materials such as radios, projectors, TVs, Radios, and computers among others for teaching and learning

4.6.2 Pair-Wise Correlation Between the Outcome Variable and Innovation and Creativity-Level Variables

The Pair-wise correlation was given preference for analysis because it determined the variables to use in the zero-inflated binomial regression models. After all, the ratio scale was used for measurement of the outcome.

Pair-wise correlation was employed because its output included p-values and the size of the sample. A significant correlation is determined when the two-tailed significance is used. The null hypothesis showed that the correlation is zero and rejected at 5% significance level. The null hypothesis stated that the correlation coefficient is zero and was rejected at 5% or less than $\alpha=.05$ (Acock, 2006).

The master analytical data set for objective 3 had 20 innovation and creativity variables. Table 4.18 shows a pair wise correlation between the courses on innovation and creativity and innovation and creativity variables for objective 3. Due to lack of space, the meaningful variables matrix to this research was presented, which is the matrix between the outcome variable and its correlates, is fully presented under the outcome variables' column. The pair-wise result of ≤ 0.35 shows a weak correlation; 0.36-0.67 as moderate; 0.68-0.89 as strong; ≥ 0.90 as very strong (Taylor, 1990).

Table 4.188: Pair-Wise Correlation Between the Outcome and Innovation and Creativity Variables

Variable	Variable label		t21c	t51a	t51b	t51c	t51d	t51e	t52a
t21c	Number of courses attended on innovation and creativity in teaching		1						
t51a	School has computers	a	-0.18	1					
		b	0.06						
t51b	School has radios	a	-0.16	0.23	1				
		b	0.10	<.001					
t51c	School has TVs	a	-0.05	0.46	0.48	1			
		b	0.64	<.001	<.001				
t51d	School has projectors	a	-0.11	0.20	0.08	-0.09	1		
		b	0.25	<.001	0.43	0.35			
t51e	School has cameras	a	0.01	0.12	0.37	0.20	0.06	1	
		b	0.92	0.20	<.001	<.001	0.51		
t52a	Number of computers	a	-1408	0.61	0.39	0.24	-0.06	0.03	1
		b	0.14	<.001	<.001	<.001	0.55	0.79	
t52b	Number of radios	a	-0.16	0.23	1.00	0.48	0.19	0.37	0.39
		b	0.10	<.001	<.001	<.001	<.001	<.001	<.001
t52c	Number of TVs	a	-0.08	0.44	0.52	0.85	0.93	0.12	0.24
		b	0.42	<.001	<.001	<.001	<.001	0.23	<.001
t52d	Number of projectors	a	-0.10	0.19	0.13	0.02	0.29	0.09	-0.01
		b	0.30	<.001	0.17	0.85	<.001	0.36	0.90
t52e	Number of cameras	a	0.00	0.13	0.39	0.21	0.04	0.96	0.02
		b	0.98	0.18	<.001	<.001	0.64	<.001	0.84
t53a	The main use of computers	a	-0.03	0.02	0.10	-0.09	0.30	0.22	-0.31
		b	0.75	0.82	0.32	0.38	<.001	<.001	<.001
t53b	The main use of radios	a	-0.12	-0.09	0.14	0.14	-0.11	-0.03	0.35
		b	0.36	0.49	0.30	0.31	0.43	0.82	<.001
t53c	The main use of TVs	a	0.02	-0.48	-0.52	-0.82	-0.05	-0.22	-0.23
		b	0.83	<.001	<.001	<.001	0.59	<.001	<.001
t53d	The main use of projects	a	0.09	.	0.36	0.49	-0.07	0.16	-0.55
		b	0.68	<.001	0.10	<.001	0.77	0.47	<.001
t53e	The main use of cameras	a	-0.21	.	0.93	.	-0.66	0.36	0.20
		b	0.49	<.001	<.001	<.001	<.001	0.23	0.51
t54	Keeper of ICT equipment	a	-0.09	0.04	0.08	0.19	-0.27	-0.19	0.36
		b	0.39	0.71	0.42	0.06	<.001	0.06	<.001
t55	Times teacher used ICT equipment	a	0.20	0.1	0.01	0.24	0.15	0.07	-0.16
		b	<.001	0.30	0.95	<.001	0.12	0.47	0.11
t56a	rating 0-10 ICT and capacity building	a	-0.04	0.39	0.20	0.25	0.05	0.09	0.16
		b	0.65	<.001	<.001	<.001	0.57	0.36	0.09
t56b	rating 0-10 performance appraisal and utilization of ICT	a	-0.07	0.35	0.21	0.26	-0.08	0.06	0.29
		b	0.47	<.001	<.001	<.001	0.43	0.51	<.001

Note. Pair-wise correlation: ≤ 0.35 = Weak correlation; 0.36-0.67= Moderate correlation; 0.68-0.89= Strong correlation; ≥ 0.90 =Very strong correlation; Adapted from "Interpretation of Correlation Coefficient," by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 6(1), P.37

a Pearson correlation coefficient; b p-values ($\alpha=.05$)

There was only the number of times teachers used ICT equipment ($r=0.20$, $p<.001$) that was statistically significant innovation and creativity variable to the number of courses attended on innovation and creativity (t21c).

4.6.3 Pair-Wise Correlation Between the Outcome and Teacher Variables

There was the need to carry out a Pair-Wise correlation and determine variables that would be used in the Zero inflated negative binomial regression analysis. There were only 8 teacher variables. The correlation results between teacher-level variables and the number of courses attended on innovation and creativity are exhibited in Table 4.19

Table 4. 199: Pair-Wise Correlation Between the Outcome And Teacher Variables

Variable	Variable		t21c	t81	t82	t83a	t84c	t84d	t85
t21c	Number of courses attended on innovation and creativity in teaching		1						
t81	Teacher is male	^a	0.05	1					
		^b	0.64						
t82	Teacher's religion	^a	0.00	0.04	1				
		^b	0.99	0.71					
t83a	Teacher major subject	^a	0.00	-0.08	0.14	1			
		^b	0.79	0.38	0.15				
t84c	Number of years since posted to the current school	^a	-0.15	0.00	-0.16	-0.17	1		
		^b	0.11	0.97	0.09	0.070			
t84d	Number of years since first appointed by TSC	^a	-0.07	0.07	-0.12	0.04	0.64	1	
		^b	0.44	0.49	0.20	0.650	<.001		
t85	Number of years of schooling	^a	-0.04	0.08	-0.12	-0.170	-0.07	-0.18	1
		^b	0.72	0.42	0.21	0.070	0.44	0.05	
t86a	Teacher's age	^a	-0.08	0.06	-0.09	0.150	0.55	0.94	-0.22
		^b	0.42	0.57	0.36	0.130	<.001	<.001	<.001

Note. Pair-wise correlation: ≤ 0.35 = Weak correlation; $0.36-0.67$ = Moderate correlation; $0.68-0.89$ = Strong correlation; ≥ 0.90 =Very strong correlation; Adapted from "Interpretation of Correlation Coefficient," by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 6(1), P.37

^a Pearson correlation coefficient; ^b p-values ($\alpha=.05$)

No teacher characteristic was statistically significant to the number of courses attended on innovation and creativity (t21c).

4.6.4 Pair-Wise Correlation Between the Outcome and School Variables

To determine school control variables to be used for zero negative binomial regression analysis, the outcome variable t21c (number of courses attended on innovation and creativity) was correlated to school control variables. The Pair-Wise correlation results between the school-level variables and number of courses attended on innovation and creativity are as shown in Table 4.20

Table 4. 20: Pair-Wise Correlation the Outcome and School Variables

Variables	Variable label		t21c	p2t1	p2t3	p22	p23	p25	p26
t21c	Number of courses attended on innovation and creativity in teaching		1						
p2t1	Mean teacher absence T1-2017	^a	0.03	1					
		^b	0.73						
p2t3	Mean teacher absence T2-2017	^a	-0.03	0.81	1				
		^b	0.78	<.001					
p22	Number of G & C sessions	^a	-0.04	0.43	-0.55	1			
		^b	0.69	<.001	<.001				
p23	Number of Indiscipline case guided T1-2018	^a	-0.08	-0.14	0.21	-0.06	1		
		^b	0.39	0.15	<.001	0.54			
p25	Number of times taught life skills lesson 2018	^a	0.02	0.22	0.58	-0.28	0.39	1	
		^b	0.84	<.001	<.001	<.001	<.001		
p26	Number of textbooks for life skills	^a	-0.12	0.02	-0.13	-0.19	-0.28	0.33	1
		^b	0.22	0.86	0.18	<.001	<.001	<.001	
p31a	School enrolment	^a	0.12	-0.09	-0.13	-0.42	-0.32	0.26	-0.14
		^b	0.23	0.36	0.17	<.001	<.001	<.001	0.15
p31b	Number of school classes	^a	0.15	-0.06	-0.09	-0.29	-0.10	0.35	-0.20
		^b	0.11	0.50	0.33	<.001	0.28	<.001	<.001
p32	school category	^a	-0.02	0.37	0.36	-0.82	-0.22	0.00	0.32
		^b	0.81	<.001	<.001	<.001	<.001	0.98	<.001
p33	School type	^a	-0.15	0.08	-0.23	0.45	-0.27	-0.12	0.19

(continued)

Table 4.20: Pair-Wise Correlation Between the Outcome and School Variables (continued)

Variables	Variable label		t21c	p2t1	p2t3	p22	p23	p25	p26
		^b	0.13	0.40	<.001	<.001	<.001	0.20	<.001
p35a	Pupil-teacher ratio	^a	0.18	-0.21	-0.09	-0.43	-0.16	0.17	-0.40
		^b	0.05	<.001	0.34	<.001	0.10	0.08	<.001

p41	1=Male principal	a	-0.18	0.41	0.48	-0.20	0.15	0.21	0.36
		b	0.05	<.001	<.001	<.001	0.13	<.001	<.001
p46	Principal's years of schooling	a	-0.22	-0.12	0.00	0.10	0.48	0.34	0.02
		b	<.001	0.20	0.97	0.32	<.001	<.001	0.84

Note. Pair-wise correlation: ≤ 0.35 = Weak correlation; 0.36-0.67= Moderate correlation; 0.68-0.89= Strong correlation; ≥ 0.90 =Very strong correlation; Adapted from “Interpretation of Correlation Coefficient,” by R. Taylor, 1990, Journal of Diagnostic Medical Sonography, 6(1), P.37

a Pearson correlation coefficient; b p-values ($\alpha=.05$)

There was only Principal’s years of schooling ($r=0.22$, $p=<.05$) that was a statistically significant school-level variable to the number of courses attended on innovation and creativity.

4.6.5 Two-Tailed Independent T-Test and One-Way ANOVA

A two-tailed independent t-test was carried out determined whether the means of female teachers and male teachers differed significantly as well as one-way ANOVA was applied in finding if the means of boys, girls and mixed schools differed statistically significant.

To examine the means across two unrelated sample with equal variance, where the independent variable is categorical in nature and the dependent variable is continuous a two- tailed independent t-test is the preferred statistical approach.

A two-tailed independent t-test didn’t return any statistically significant difference between the number of courses attended by male and female teachers, $\alpha=.05$: $t(62.8808) = -0.4263$, $p=0.6713$.

Similarly, a one-way ANOVA was carried out to find if number of courses attended on innovation and creativity (t_{21c}) was different for the three groups of schools. Participants were 110 teachers and classified into three groups; boys’ schools only ($n=9$), girl schools only ($n=29$) and mixed schools only ($n=72$). The one-way ANOVA

did not return any statistically significant difference between the number of courses attended by teachers in girl schools only (Mean=0.41), boy schools only (Mean=0.22) and mixed schools only (Mean=0.26), $p=0.8364$.

Another one-way ANOVA was also carried out to find if number of courses attended on innovation and creativity (t21c) was different for groups of school type. Participants were 110 teachers and classified into three groups: day schools only ($n= 70$), boarding schools only ($n= 10$) and day/boarding schools only ($n= 30$). It didn't return any statistically significant difference between number of courses attended by teachers in day school only (Mean=0.44), boarding schools only (Mean=0) and day/boarding schools only (Mean=0.07), $p=0.2550$.

4.6.6 Zero inflated Negative Binomial Regression Analysis

The regression produced two separate models and pooled them together. First, a logit model was created for predicting whether a teacher would be in a "certain zero group" because the assessments did not recommend any training. Another teacher might have zero attended courses because their assessment suggested they needed such training but other factors such as lack of funds for such training made them also record a zero. These two teachers looked similar in the outcome variable, yet they landed at the same outcome through two different processes. Thus, the number of zeroes may be inflated and the number of teachers recording zero courses could not be explained in the same manner.

A negative binomial model was created for foretelling the counts for the teachers who are not certain zeros and zero inflated model to take care of the excessive zeros. Finally, the two models (Zero inflated regression and Negative binomial regression analysis) are combined. When running zero-inflated negative binomial in Stata, both

models were specified: first, the count model, then the model predicting the certain zeros.

4.6.7 Reasons for Zero Inflated Negative Binomial Regressions

Zero-inflated model allowed for analysing a dataset with an excessive number of zeros (95) in the outcome variable.

Zero inflated negative binomial regression was adapted also in analyzing an outcome variable zero resulting from two processes. The first process is a teacher whose performance appraisal found everything right and therefore needed no training and the second process of a teacher whose performance appraisal suggested him/her to train but was never taken for any capacity building programmes.

Lastly, the variance for the count outcome variable is 1.44 greater than its mean of 0.30 by just 1.14. The zero inflated negative binomial regression was adapted to all the above and that is why it was used in the analysis.

4.6.8 Results of the Zero Inflated Negative Binomial Regression

The zero inflated negative binomial (ZINB) regression coefficients is interpreted as the log of rate ratio which explains the likelihood of which teachers will attend innovation and creativity courses. It is determined by the use of the correlate variables from the Pair-Wise correlation to find the rate at which an outcome variable happens. This is the rate of change of courses on innovation and creativity in relation to a particular variable. The rate ratio at which events occur is calculated by exponentiation of the ZINB regression coefficient. The outcomes of the ZINB regression analysis are as exhibited in Table 4.21

Table 4.21: Zero Inflated Negative Binomial Regression Analysis

Variable	Variable label	Model 1 (t21c)			Model 2 (t21c)		
t21c		IRR Coef	Std. Err.	p> z	IRR coef	Std. Err.	p> z
t55	Number of courses attended on innovation and creativity	1.34	0.13	0.003			
t46	Times on ICT use	0.50	0.19	0.063			
p46	Class 2018				0.61	0.17	0.073
_cons	Principal's years of schooling	9659.91	55646.82	0.111	812.10	3520.12	0.122
inflate	t31	51.44	12.59	0.000	32.85	110.09	0.765
	t84c	36.24	8.37	0.000	23.63	64.38	0.714
	_cons	-493.03	121.37	0.000	-315.44	926.20	0.733
	Inalph	1.12	0.48	0.019	1.69	0.43	0.000
	Alpha	3.07	1.47		5.42	2.33	
N			110			110	
prob>chi2			0.0081			0.0733	

Note. Coef=Coefficient; Std. Err.=Standard Error

The inflate option was used, to adjust the ZINB estimates and avoid bias from the number of years since the teacher was posted to the current school and the number of evaluations in 2017. If a teacher had just been posted, they would probably have no chance of attending a course, hence the need for the exposure variables. Cameron and Trivedi (2009) recommend robust standard errors for Poisson models, so we ran the model with the vce (robust) option. The model involved 110 teachers with 95 of them reporting zero course attendance.

Number of times teachers used ICT equipment (t55) refers to the estimated rate ratio for a one-unit increase in the number of times teachers used ICT equipment given the other variables are held constant in the model. If a teacher was to increase the number of times they used ICT equipment by one, their rate ratio for the number of courses

attended on innovation and creativity (t21c) would be anticipated to increase by a multiplier of 1.34 while holding the other variables constant in the model.

Principal's years of schooling (p46) refers to the estimated rate ratio for a one-unit increase in the principal's years of schooling, when the other variables are held constant. If a principal was to increase his/her years of schooling by one, their teachers' rate ratio for number of courses attended on innovation and creativity (t21c) is likely to increase by a multiplier of 0.50, although this result is only statistically significant at 10% when holding other variables constant.

Certain zeros were inflated with the number of years since a teacher was posted to current school (t84d), number of evaluations in 2017 (t31) and number of years since posted to current school (t84c).

The number of evaluations in 2017 (t31) results show that an extra evaluation in 2017 increased the rate ratio of membership in the "certain zero" group by a factor of 51.44, given the number of years since the teacher was posted to the current school (t84c) is in the model.

The number of years since posted to current school (t84c) shows that an extra year in the current school increased the rate ratio of membership in the "certain zero" group by a factor of 36.24, given the number of evaluations in 2017 (t31) is in the model.

Alpha was statistically significant because its confidence interval does not contain a zero, suggesting zero inflated negative binomial regression is preferable over a standard negative binomial regression.

In conclusion, there is statistically significant relationship between innovation and creativity in teaching and access to teacher capacity building programmes in Matete

Sub-County. It was only the number of times a teacher used ICT equipment in teaching that was statistically significant. The results showed that if a teacher was to increase his/her number of times of the use of ICT equipment by one, his/her rate ratio for the number of courses attended on innovation and creativity (t21c) would be anticipated to increase by a multiplier of 1.34 when the other variables are held constant in the model.

4.6.9 Model Diagnostic

The comparison of which model is appropriate between Model 1 and model 2 was carried out. The outcomes are as exhibited in Table 4.22.

Table 4.222: Comparison of Model 1 and Model 2 for Objective 3				
		Model 2	Model 1	Difference
Log-likelihood				
	Model	-55.88	-59.02	3.14
	Intercept-only	-64.67	-64.67	0
Chi-square				
	D(df=105/105/0)	111.75	118.04	-6.29
	LR (df=2/2/0)	17.58	11.29	6.29
	p-value	0.01	0.07	.
R2				
	McFadden	0.14	0.09	0.05
	McFadden(adjusted)	0.06	0.01	0.05
	Cox-Snell/ML	0.15	0.10	0.05
	Cragg-Uhler/ Nagelkerke	0.21	0.14	0.07
IC				
	AIC	121.75	128.04	-6.29
	AIC divided by N	1.11	1.16	-0.06
	Bic (df=5/5/0)	135.26	141.54	-6.29
	N	104	110	-6

The difference in BIC value of 6.29 provides strong support for model 2. AIC value also supports model 2 (121.75) versus model 1 (128.04) and also the BIC supports model 2 (135.26) versus model 1 (141.54). The lower the AIC, BIC and deviance the better the model fits the values. As more parameters are added, the fit improves; in the first model, current mean score 2018 (t55) was omitted which is the explanatory

variable for objective 3 and included in the final model. As it is seen, there is substantial evidence for including the number of times teachers used ICT equipment (t55) in the model. There is an increase in all pseudo-R2 as more variables are added which is an ideal state. All the various pseudo-R2 measures go up (of course, most have to when you add variables). The LR chi-square difference between the two models is substantial which is 6.29.

4.6.10 Testing of the Research Question

The statement of the research question is that is there any statistically significant relationship between innovation and creativity in teaching and entry into teacher capacity building programmes in Matete Sub-County.

Given the p-value of the explanatory variable number of times a teacher used ICT equipment ($p=.03$) in the model was statistically significant, we concluded that there is statistically significant relationship between innovation and creativity in teaching and entry into teacher capacity building programmes in Matete Sub-County.

The average predicted number of courses attended by all teachers regardless of whether or not they attended the course was 0.51. For example, for the first teacher, the probability of not attending a course is $4.11e-09$ (0.0000000331). On the other hand, the probability of a teacher not attending any course is 0.65

4.6.11 Discussion of the Findings Under Objective 3

The research question was that is there is any statistically significant relationship between innovation and creativity in teaching and entry into capacity building

programmes in Matete Sub-County and there was a relationship between the two variables. Given the p-value of the explanatory variable number of times a teacher used ICT equipment ($p=.03$) in the model was statistically significant, we concluded that there is statistically significant relationship between innovation and creativity in teaching and entry into teacher capacity building programmes in Matete Sub-County.

The average predicted number of courses attended by all teachers regardless of whether or not they attended the course was 0.51. For example, for the first teacher, the probability of not attending a course is $4.11e-09$ (0.0000000331). On the other hand, the probability of a teacher not attending any course is 0.65.

In Objective 3, seven teacher-level characteristics were modelled in a ZINB regression as predictors for the number of courses attended by teachers while regulating school variables. ZINB results showed that there is statistical significant relationship between innovation and creativity in teaching and access to capacity building programmes in Matete Sub-County. It was only the number of times a teacher used ICT equipment in teaching that was statistically significant. The results showed that if a teacher was to increase his/her number of times of the use of ICT equipment by one, his/her rate ratio for the number of courses attended on innovation and creativity (t21c) would increase by a multiplier of 1.34 while other variables are constant.

Dlamini and Mbatha, (2018) using a total sample of 986 teachers found that lack of access to capacity building programmes was an issues raised by teachers: 80% of teachers said there was need for capacity building for teachers; 81% it is necessary for capacity building in teaching special needs learners; and 73% showed the necessity in diverse learners' issues.

A study investigating difficultness to integrating ICT into the curriculum (Ghavifekr et.al, n.d) found that 11% of teachers always have difficulty of incorporating ICT, 23% frequently had difficulty, 16% sometimes, 27% once experienced difficulty and 23% didn't have difficulty and majority of teachers didn't like utilizing ICT resources in providing education because it requires more time to prepare.

Research done on teacher's incorporating ICT resources in teaching Kenyan competency based curriculum in government primary schools (Murithi & Yoo, 2021) found that majority of the learning institutions (87.7%) don't have internet connection and about 70% their learning institutions didn't have projectors to enable them integrate some of these technology in their learning and teaching. It may be because of the lack of ICT materials like projectors, cameras, radios and TVs in education institutions and training on the integrating technology in learning institutions that teachers don't use ICT materials regularly. On the contrary (Makanda, 2015) investigating the incorporation of technology in instructing during physics lessons in Kimilili central Sub-County high schools, Bungoma county, found that in the sampled schools (70%) of the instructors had been prepared on the use of computers and 60.0% of the educators had been prepared on coalescing of ICT in preparing Physics learners. The findings of Makanda (2015) are supported by Odhiambo's (2013) study that found that there is minimal absorbing of ICT resources in preparing learners.

The results of teacher innovation and creativity in preparing teachers concerning teacher capacity building are not clear. Most of the investigation done shows the linkage between teacher utilization of technology in preparing learners. Other scholars delved in the preparation of educators on how to assimilate ICT in learning and

teaching, especially during teacher training. Therefore, this research provides a board of knowledge to which other scholars can refer to.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter summarises the findings, conclusion, recommendations, and suggestions for further research. This study aimed to examine the influence of performance appraisal on entry into teacher capacity-building programmes using the zero-inflated negative binomial regression models for analysis. The study set out to:

- a) Establish the relationship between application of professional knowledge and entry into teacher capacity-building programmes in public secondary schools in Matete Sub-County.
- b) Establish the relationship between learner protection and entry into teacher capacity-building programmes in public secondary schools in Matete Sub-County.
- c) Establish the relationship between innovation and creativity in teaching and entry into teacher capacity-building programmes in public secondary schools in Matete Sub-County.

The corresponding research questions were:

- i. Is there any statistically significant relationship between application of professional knowledge and entry into teacher capacity-building programmes in Matete Sub-County?
- ii. Is there any statistically significant relationship between learner protection and entry into teacher capacity-building programmes in Matete Sub-County?
- iii. Is there any statistically significant relationship between innovation and creativity and entry into teacher capacity building programmes in Matete Sub-County?

5.2 Summary of Findings

5.2.1 Objective 1: Establish the Relationship Between Application of Professional Knowledge and Entry into Teacher Capacity Building Programmes in Public Secondary Schools in Matete Sub-County

The research question for Objective 1 stated that is there any statistically significant relationship between application of professional knowledge and entry into teacher capacity-building programmes in Matete Sub-County?

This research question was tested after fitting the zero-inflated negative binomial regression models. Given that the p-value for the application of professional knowledge variables such as the number of school classes ($p=.02$) is statistically significant. There is statistically significant relationship between application of professional knowledge and entry into teacher capacity-building programmes in Matete Sub-County.

In conclusion, the ZINB results showed that bigger schools are likely to take more of their teachers for capacity building programmes. Also an increase in the number of evaluations by unit increases chances of teachers found to be doing the correct practice and needed no capacity building programmes at all. It is also worth noting that an extra year since posting to the current school increases the chances of a teacher's performance gaps being identified but he/she has not been provided with capacity buildings programmes.

5.2.2 Objective 2: Establish the Relationship Between Learner Protection and Entry into Teacher Capacity Building Programmes in Public Secondary Schools in Matete Sub-County

The research question for objective 2 stated that is there any statistically significant relationship between learner protection and entry into teacher capacity-building programmes in Matete Sub-County?

This research question was tested after fitting the zero-inflated negative binomial regression models. Given that the p-values of the other explanatory variables, such as the number of guiding and counselling programmes Feb 2018 ($p=.91$), number of students guided and counselled first term 2018 ($p=.31$), a teacher has life skills lesson on the timetable ($p=.70$), number of times taught Life skills lesson 2018 ($p=.78$), 0-10 rating: classrooms safe for students ($p=.82$), 0-10 rating: kitchen safe for students ($p=.26$), 0-10 rating: toilets safe for students ($p=.58$), number of guiding and counselling sessions in February 2018 ($p=.78$), school enrolment ($p<.01$), pupil-teacher ratio ($p<.01$) and male principal ($p=0.59$) in the model not being statistically significant, it was concluded that there is no statistically significant relationship between learner protection outcome and entry to teacher capacity building programmes in Matete Sub-County.

In conclusion, the results from the zero inflated negative binomial regression showed that an extra enrolment of a learner in school is likely to result in more teachers attending capacity building programmes.

5.2.3 Objective 3: Establish the Relationship Between Innovation and Creativity in Teaching and Entry into Teacher Capacity Building Programmes in Public Secondary Schools in Matete Sub-County

The research question for Objective 3 stated that is there any statistically significant relationship between innovation and creativity and entry into teacher capacity building programmes in Matete Sub-County?

This research question was tested after fitting the zero-inflated negative binomial regression models. Given that the p-values of the explanatory variable, the number of times a teacher used ICT equipment ($p=.03$) in the model being statistically significant, we concluded that there is a statistically significant relationship between innovation and creativity and entry into teacher capacity building programmes in Matete Sub-County. The results from the zero inflated negative binomial regression showed that teachers who incorporated ICT in their teaching are likely to be picked for capacity building trainings.

In conclusion, it was found that teachers needed to be trained as per the recommendations of the performance appraisal process. The teachers were never trained in line with the performance appraisal process. It was only the number of times a teacher used ICT equipment in instruction that was statistically significant. The results showed that if a teacher increased the use of ICT equipment by one, their rate ratio for the number of courses attended on innovation and creativity (t21c) would be anticipated to increase by a component of 1.34. At the same time, other variables are held constant in the model.

5.3 Conclusion

Zero-inflated negative binomial regression was used to analyse the information, and the summary of the analysis is as follows:

1. Long serving teachers with performance gaps and have never been taken for capacity building programmes should be given the first priority.
2. School environment should be made safer for learners since this will attract more student enrolment making the schools to be larger in size and have financial muscle. These bigger schools are more likely to take teachers for capacity building programmes.
3. If a teacher increased the use of ICT equipment by one, their rate ratio for the number of courses attended on innovation and creativity (t21c) would be anticipated to increase as a component of 1.34. At the same time, other variables are held constant in the model. There is no statistically significant relationship between innovation and creativity in teaching and teacher capacity building.

5.4 Recommendations

From the findings, the following recommendations are suggested:

1. Objective 1

Since bigger schools are likely to take more of their teachers for capacity building programmes, it is recommended that smaller schools within the same geographical area should merge so that these teachers can be able to attend capacity building programmes.

It is also recommended that long serving teachers with performance gaps in the appraisal and have never had capacity building programmes should be given priority to be trained.

2. Objective 2

Since the study findings revealed that extra enrolment of learners in school is likely to result in more teachers attending capacity building programmes, it is recommended that learner protection should be enhanced in schools to attract more enrolment of the learners which will result to more teachers attending capacity building programmes.

3. Objective 3

If a teacher was to increase the number of times he/she used ICT equipment (t55) by one, their rate ratio for the number of courses attended on innovation and creativity (t21c) would be anticipated to increase by a multiplier of 1.34 when other variables in the model are held constant. A teacher using ICT equipment frequently will likely attend a capacity-building programme on innovation and creativity. It is recommended that teachers should develop the desire to know and learn how to utilize ICT equipment in teaching and learning. A teacher who regularly incorporates ICT in teaching learns more out of their passion and is more likely to be picked for such training.

5.5 Suggestions for Further Research

This study sought to examine the influence of teacher performance appraisal on entry into capacity-building programmes in Matete Sub-county, Kakamega County.

In line with the research results, deductions and recommendations, the following clues are for further research:

- i. This study was done in all government high schools in Matete Sub-County. Whether the same condition also exists in other Sub-Counties of Kakamega County and the entire country has yet to be settled. The same can be done based on a different sample of educational institutions from a different region in the country and the comparison of the results with those of this study. This study will produce vast knowledge on performance appraisal's function in accessing teacher capacity-building programmes.
- ii. The gaps or weaknesses identified during the appraisal process should be used to determine teacher capacity-building programmes for effective teacher appraisal.

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APPENDICES

APPENDIX A: TEACHER'S QUESTIONNAIRE

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY DEPARTMENT OF EDUCATION PLANNING AND MANAGEMENT TEACHERS' QUESTIONNAIRE					
TEACHER PERFORMANCE APPRAISAL AND ACCESS TO CAPACITY BUILDING TRAINING PROGRAMMES					
		SECTION 1: BACKGROUND INFORMATION			
1	1	SCHOOL CODE:			
1	2	DATE OF FILLING IN THE QUESTIONNAIRE (DD/MM/YYYY)	DD	MM	YYYY
1	3	INTRODUCTION AND CONSENT			
		Good morning/afternoon/evening sir/madam. My name is Sasita Godwin. I am a postgraduate student at Masinde Muliro University Of Science and Technology researching teacher performance appraisal and access to teacher capacity-building training programmes. Your school was randomly sampled to participate in this study and I visit your school today to seek your consent to collect data concerning teacher performance appraisal, professional knowledge and application, teacher time management, utilization of ICT materials in the teaching and learning process and learner-friendly environment. These data are for academic purposes only. If you give consent for this interview, your responses will be held with the utmost confidentiality and will only be available to members of the research team. The study will not cause any disadvantage to you. If you accept that you participate in this research, you will be doing so professionally and voluntarily and there will not be any monetary returns. Any benefits of the research will largely be to contribute to research knowledge and evidence to improve policy and teaching and learning in our schools. You are free to ask questions as we proceed and you are also at liberty not to respond to questions you don't feel comfortable answering. This filling in will take about 30 minutes.			
1	4	Would you like to participate in this study? 1=Yes; 2=No			
		[IF 1=YES, THANK AND PROCEED TO SECTION 2.0]			
1	5	Kindly let me know the reason why you would not wish to participate in this research			
		1=AM BUSY/DON'T HAVE TIME; 2=TIRED OF RESEARCH; 3=RESEARCH NOT BENEFICIAL; 4=NOT INTERESTED			
		96=Other [specify]			
		[IF 2=NO IN 1.4 SKIP THE REST OF THE SECTIONS] SECTION 2: TRAINING			

2	1	From Jan to Dec 2017, how many courses (Whether short, medium or long-term) did you attend in the following areas? Indicate the number of times, 00 (Zero) if NONE
		(a) Professional knowledge and application
		(b) Innovation and creativity in teaching
		(c) Learner protection, safety, discipline and teacher conduct
[IF NONE IN ALL THE SECTIONS IN 2.1, SKIP TO SECTION 3]		

2	2	Indicate the total number of days it took for the respective training that you attended
		(a)Professional knowledge and application
		(b) Innovation and creativity in teaching
		(c) Learner protection, safety, discipline and teacher conduct
2	3	What was the main theme covered in the course?

1=SUBJECT MASTERY; 2=TEACHING METHODS; 3= LEGAL AND PROFESSIONAL DOCUMENTS GOVERNING EDUCATION; 4=IDENTIFICATION OF TALENTS; 5=INTERPERSONAL SKILLS;

6= INNOVATION AND CREATIVITY; 7=LEARNER PROTECTION, SAFETY, DISCIPLINE AND TEACHER CONDUCT;

96=Others (Specify).....

2	4	What was the main reason why you were trained in this area?
		1= PERFORMANCE APPRAISAL GAPS; 2= JOB PROMOTION; 3=A LOT OF EXPECTED MONETARY RETURNS; 4= POLICY OF THE SCHOOL; 5=ORGANIZED ANNUALLY BY THE MINISTRY EDUCATION SUCH AS SMASSE; 98=I DON'T KNOW;
		96=Other (specify)

SECTION 3: TEACHER EVALUATION PROCESS

3	1	How many times were you evaluated in the year 2017?
---	---	---

[IF NONE WRITE 00 AND SKIP TO SECTION 3.6]

3	2	Who evaluated you in the following school terms in the year 2017				
		<table border="1"> <thead> <tr> <th>TERM</th> <th>APPRAISER</th> </tr> </thead> <tbody> <tr> <td>Term 1</td> <td></td> </tr> </tbody> </table>	TERM	APPRAISER	Term 1	
TERM	APPRAISER					
Term 1						

Term 2	
Term 3	

Codes for question 3.2 1=H.O.S; 2=H.O.D; 3=D.O.S; 4=DEPUTY PRINCIPAL;5=PRINCIPAL; 6=TSC OFFICER; 7=ARBITRATOR;8=MINISTRY OFFICERS;

96=Other (specify).....

3	3	What was the main performance gap identified in your evaluation in the year 2017?	
---	---	---	--

1=SUBJECT MASTERY; 2=TEACHING METHODS; 3=INADEQUATE KNOWLEDGE OF LEGAL AND PROFESSIONAL DOCUMENTS GOVERNING EDUCATION; 4=IDENTIFICATION OF TALENTS; 5=INTERPERSONAL SKILLS; 6=INADEQUATE SKILLS IN INNOVATION AND CREATIVITY; 98=I DON'T KNOW;

96=Other(specify)
.....

3	4	What was the recommended support programme in the year 2017?	
---	---	--	--

1=MENTORSHIP PROGRAMME; 2=INDUCTION PROGRAMME; 3=COACHING PROGRAMME; 4=PEER SUPPORT/TEAM TEACHING; 5=SCHOOL BASED PROFESSIONAL DEVELOPMENT COURSES, SEMINARS AND WORKSHOP; 6=SUBJECT SYMPOSIUMS; 7=PROFESSIONAL SUPPORT BY FIELD OFFICERS AND OTHER EDUCATIONIST; 98=I DON'T KNOW;

96=Other (specify).....

3	5	How many marks did you score in each of the following areas of performance appraisal in the year 2017?
---	---	--

PERFORMANCE AREAS	SCORES PER TERM		
	T1	T2	T3
Professional knowledge and application			
Innovation and creativity in teaching			
Learner protection, safety, discipline and teacher conduct			
TOTALS			

3	6	What was the main reason why you were not evaluated?	
---	---	--	--

--	--

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1=INTERDICTION; 2= ON LEAVE; 3= I WAS NOT PREPARED; 4=AWAY FOR AN OFFICIAL DUTY; 5=NO ONE WAS THERE TO EVALUATE ME; 6= SICKNESS; 7=LEAVE; 98=I DON'T KNOW;

96= Other (specify).....

SECTION 4: TIME MANAGEMENT

4	1	(a) For the last working day prior to today, what time did you clock in?	(HH	MM)
		(b) As at what time did you clock out for that day? (HH:MM)	(HH	MM)
4	2	How many teachers are absent from school today with or without permission?		
4	3	How many of your lessons were not attended to the last working day prior to today?		
4	4	If you didn't attend all of your lessons, give the main reason why?		

1=AWAY FOR AN OFFICIAL DUTY; 2= SICKNESS; 3= I WAS NOT PREPARED; 4=PERFORMANCE ASSESSMENT; 5=STUDENTS WERE NOT IN THE CLASSROOM; 98= I DON'T KNOW;

69= Other (specify)

4	5	(a) Out of the lessons missed in 4.3 how many did you recover?	
		(b) At what time of the year did you complete the Form 4 syllabus in the year 2017?	

1=JANUARY; 2= FEBRUARY; 3=MARCH; 4=APRIL; 5=MAY; 6=JUNE; 7=JULY; 8=AUGUST; 9=SEPTEMBER; 10=OCTOBER; 11=NOVEMBER; 12=DECEMBER; 13=I DIDN'T COMPLETE; 98=I DON'T KNOW;

69= Other (specify).....

(c)	Give the main reason why you completed it at such a time	
-----	--	--

1=SUBJECT IS VERY WIDE; 2=UTILIZED REMEDIALS; 3=NEVER MISSED ANY LESSON; 4=TEAM TEACHING; 5=STUDENTS ARE MOTIVATED TO LEARN ON THEIR OWN; 6=AWAY MOSTLY ON OFFICIAL DUTIES MOST OF THE TIMES; 98= I DON'T KNOW;

96=Other (specify).....

SECTION 5: AVAILABILITY OF ICT MATERIALS

5	1	Does your school have: [CIRCLE YOUR ANSWER]
---	---	---

--	--

	Yes	No
(a) Computers	1	2
(b) Radios	1	2
(c) Televisions	1	2
(d) Projectors	1	2
(e) Cameras	1	2

IF NO SKIP TO 5.5

5	3
---	---

How many of the following ICT materials do you have in your school?

(a) Computers

(b) Radios

(c) Televisions

(d) Projectors

(e) Cameras

96=Other (specify).....

5	4
---	---

What is the main use of the following ICT materials?

(a) Computers

(b) Radios

(c) Television

(d) Projector

(e) Camera

Codes for question 5.3

1=NOT IN USE; 2= ADMINISTRATIVE

PURPOSE;3=LEARNING AND TEACHING; 4= ENTERTAINMENT AND RECREATIONAL;

96=Other (specify).....

5	5	Who mainly keeps these ICT-related materials in your school?	
---	---	--	--

1=STORE; 2=SUBJECT TEACHER; 3=H.O.S; 4=H.O.D; 5=D.O.S; 6= DEPUTY PRINCIPAL; 7=PRINCIPAL;

96=Other (Specify).....

5	6	On average how many times did you use ICT materials in your last week teaching?	
5	7	On a scale of 0-10 where 0 is NON-EXISTENCE and 10 is the FULLY EXISTING rate the following statements	

[WRITE 00 IF NOT EXISTING AT ALL]

(a) The link between the utilization of ICT materials in teaching and capacity building

(b) The link between performance appraisal and utilization of ICT materials

6	1	(a) Have you been observed in the classroom while teaching in the first term of 2018? 1=Yes; 2=No	
---	---	---	--

[IF 2=No SKIP TO 6.2]

(b) How many times have you been observed in the classroom while teaching in the year 2017?

6	2	Which date was your professional documents signed and endorsed by the deputy principal in the year 2018 term 1 to be used?	D D	MM	YYYY
---	---	--	--------	----	------

6	3	How many lesson plans have you prepared since the start of this year up to today?	
---	---	---	--

6	4	When did you last update your lesson notes?	
---	---	---	--

6	5	Indicate your subject target for term 1 in the year 2018 and your current performance in the following table
---	---	--

	SUBJECT	SUBJECT TARGET (MEAN SCORE)	CURRNT MEAN SCORE	DEVIATION
1				
2				

	3				
	4				
SECTION 7: CHILD-FRIENDLY ENVIRONMENT					
7	1	How many times in February 2018 have you had guiding and counseling programmes running in your school?			
7	2	How many students have you guided since the start of this term up to today?			
7	3	Do you have a Life skills lesson on your timetable? 1. Yes; 2. No			

[IF 2=No SKIP TO 7.6]

7	4	How many times have you taught Life skills lessons in your class since the start of this year?			
7	5	How many textbooks do you have in your school for teaching Life skills lessons?			
7	6	Do you have a functional red cross club in your school? 1=Yes; 2=No			
7	7	On a scale of 0-10 where 0 is VERY POOR and 10 is EXCELLENT rate the condition of the following facilities on the safety of learners			

[ENTER 00 IF THE FACILITY DOESN'T EXIST IN YOUR SCHOOL]

(a)	Classrooms	
(b)	Kitchen	
(c)	Toilets	
(d)	Library	
(e)	Staff room	
(f)	Administration Block	
(g)	School bus/ Van	

SECTION 8: CONTROL VARIABLES					
8	1	What is your gender? 1= Male; 2=Female			
8	2	What is your religion?			

1= Roman CATHOLIC; 2=PROTESTANT/ OTHER CHRISTIAN; 3=MUSLIM;
4=NO RELIGION

96= Others [specify].....

8	3	Which subject(s) do you teach in this school?	Major Subject:.....	Minor Subject:...
---	---	---	---------------------	-------------------

1=MATHEMATICS;2=ENGLISH;3=KISWAHILI;4=CHEMISTRY;5=BIOLOGY
;6=PHYSICS;7=GEOGRAPHY;8=HISTORY;9=CRE;10=AGRICULTURE;11=B
U SINESS;12=HOMESCIENCE;13=COMPUTER
STUDIES;14=FRENCH;15=ART AND DESIGN; 16=DRAWING AND
DESIGN; 17=MUSIC; 96=Other (specify)
.....

8	3	(a) When were you posted to your current work station?	DD	MM	YYYY
---	---	--	----	----	------

		(b) When were you first appointed by the Teachers Service Commission?	DD	MM	YYYY
--	--	---	----	----	------

8	4	How many years of schooling do you have? Don't count the year when you repeated a class
---	---	---

8	5	What is your date of birth?	DD	MM	YYYY
---	---	-----------------------------	----	----	------

THANK YOU FOR YOUR RESPONSES

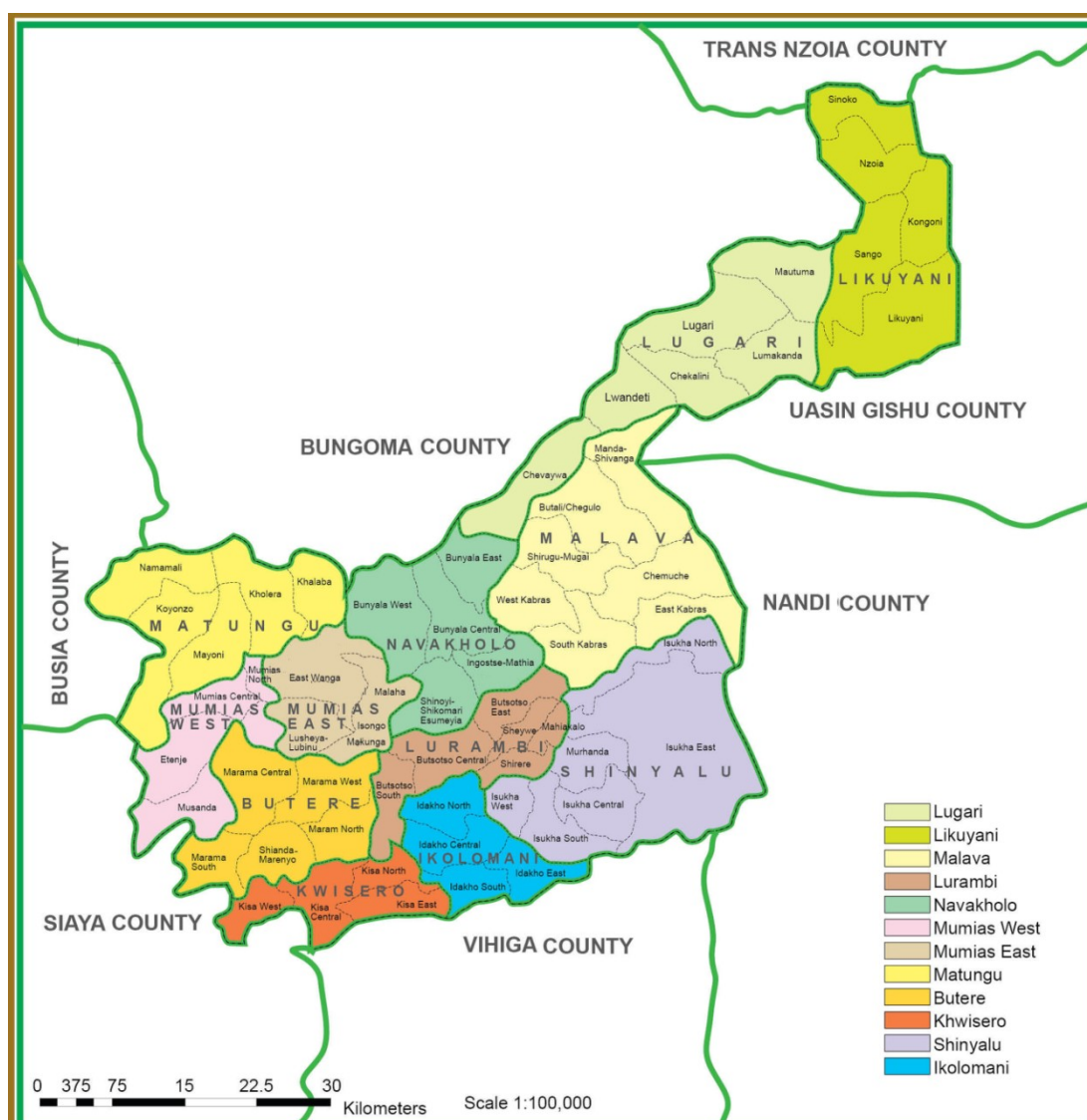
APPENDIX B: PRINCIPAL'S QUESTIONNAIRE

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY DEPARTMENT OF EDUCATION PLANNING AND MANAGEMENT PRINCIPAL'S QUESTIONNAIRE TEACHER PERFORMANCE APPRAISAL AND ACCESS TO CAPACITY BUILDING TRAINING PROGRAMMES					
SECTION 1: BACKGROUND INFORMATION					
1	1	SCHOOL CODE			
1	2	DATE OF FILLING IN THE QUESTIONNAIRE (DD/MM/YYYY)	DD	MM	YYYY
1	3	INTRODUCTION AND CONSENT			
		Good morning/afternoon/evening sir/madam. My name is Sasita Godwin. I am a postgraduate student at Masinde Muliro University Of Science and Technology researching teacher performance appraisal and access to teacher capacity building training programmes. Your school was randomly sampled to participate in this study and I visit your school today to seek your consent to collect data concerning teacher performance appraisal, professional knowledge and application, teacher time management, utilization of ICT materials in the teaching and learning process and learner-friendly environment. These data are for academic purposes only. If you give consent for this questionnaire, your responses will be held with the utmost confidentiality and will only be available to members of the research team. The study will not cause any disadvantage to you. If you accept that you participate in this research, you will be doing so professionally and voluntarily and there will not be any monetary returns. Any benefits of the research will largely be to contribute to research knowledge and evidence to improve policy and teaching and learning in our schools. You are free to ask questions as we proceed and you are also at liberty not to respond to questions you don't feel comfortable answering. This questionnaire filing in will take about 30 minutes.			
1	4	Would you like to participate in this study?	1=Yes;	2=No	
		[IF 1=YES, THANK YOU AND PROCEED TO SECTION 2.0]			
1	5	Kindly let me know the reason why you would not wish to participate in this research			
		1=AM BUSY/DON'T HAVE TIME; 2=TIRED OF RESEARCH; 3=RESEARCH NOT BENEFICIAL; 4=NOT INTERESTED			
		96=Other [specify].....			
		[IF 2=NO IN 1.4 SKIP THE REST OF THE SECTIONS]			
CHILD FRIENDLY					
2	1	How many days were the following TSC teachers absent from school with or without permission in the			
		TEACHERS CODE	NO. OF DAYS ABSENT FROM SCHOOL		
			T1	T2	T3
		1			
		2			
		3			
		4			

[illegible]

3	1	(a) What is the current total enrolment of students in your school?			
		(b) How many classes are in this school?			
3	2	Is your school, 1= BOYS ONLY; 2= GIRLS ONLY;3=MIXED			
3	3	What is the type of school you teach?			
1= DAY; 2= BOARDING; 3=DAY/BOARDING					
3	4	What is the date of this school's establishment (DD/MM/YYYY)	DD	MM	YYYY
[ENTER 01 FOR DD AND 01 FOR MM RESPECTIVELY IF THE MONTH AND DATE ARE UNKNOWN]					
3	5	How many teachers are employed by TSC at the moment in your school?			
PERSONAL DETAILS					
4	1	What is your gender?	1= Male;	2=Female	
4	2	What is your religion?			
1= ROMAN CATHOLIC; 2=PROTESTANT/ OTHER CHRISTIAN; 3=MUSLIM; 4=NO RELIGION 96= Other [specify]					
4	3	Which religions are allowed in your school to carry out their religious activities?			
1=ALL RELIGIONS; 2=CATHOLICS; 3=CHRISTIANITY; 4=SDAs; 5=MUSLIMS; 6=HINDU 96= Other [specify]					
4	4	Which subject(s) do you teach in this school?	Major Subject: ...	Minor Subject:....	
1=MATHEMATICS; 2=ENGLISH; 3=KISWAHILI; 4=CHEMISTRY; 5=BIOLOGY; 6=PHYSICS; 7=GEOGRAPHY; 8=HISTORY; 9=CRE; 10=AGRICULTURE; 11=BUSINESS; 12=HOMESCIENCE; 13=COMPUTER STUDIES; 14=FRENCH; 15=ART AND DESIGN; 16=DRAWING AND DESIGN; 17=MUSIC; 96=Other (specify).....					
4	5	(a) When were you posted to your current work station?	DD	MM	YYYY
		(b) When were you appointed as a principal/deputy?	DD	MM	YYYY
		(c) When were you first appointed by the Teachers Service Commission?	DD	MM	YYYY
4	6	How many years of schooling do you have? Don't count the year when you repeated a class			
4	7	What is your date of birth?	DD	MM	YYYY
THANK YOU FOR YOUR RESPONSES					

APPENDIX C: MAP KAKAMEGA SHOWING MATETE SUB-COUNTY



APPENDIX D. RESEARCH AUTHORIZATION AND PERMIT



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/19/55531/26955**

Date: **12th March, 2019**

Sasita Godwin Musungu
Masinde Muliro University of Science and Technology
P. O Box 190-50100
KAKAMEGA

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Teacher performance appraisal and access to teacher capacity building programmes in public secondary schools in Matete Sub County-Kakamega County, Kenya”* I am pleased to inform you that you have been authorized to undertake research in **Kakamega County** for the period ending **11th March, 2020**.

You are advised to report to **the County Commissioner and the County Director of Education, Kakamega County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

DR. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Kakamega County.

The County Director of Education
Kakamega County.

THIS IS TO CERTIFY THAT: **Permit No : NACOSTI/P/19/55531/26955**
MR. SASITA GODWIN MUSUNGU **Date Of Issue : 12th March, 2019**
of MASINDE MULIRO UNIVERSITY, **Fee Recieved : Ksh 1000**
0-50205 WEBUYE, has been permitted to
conduct research in Kakamega County

on the topic: TEACHER PERFORMANCE
APPRAISAL AND ACCESS TO TEACHER
CAPACITY BUILDING PROGRAMMES IN
PUBLIC SECONDARY SCHOOLS IN
MATETE SUB-COUNTY-KAKAMEGA
COUNTY, KENYA

for the period ending:
11th March, 2020

Applicant's Signature **Director General**
Signature **National Commission for Science,**
Technology & Innovation