

**INFLUENCE OF SELECTED FACTORS ON EFFECTIVE COVERAGE OF  
KENYA CERTIFICATE OF SECONDARY EDUCATION BIOLOGY  
SYLLABUS IN RONGAI SUB-COUNTY, KENYA**

**BENARD KIPRONO BETT**

**A Thesis Submitted to the Institute of Postgraduate Studies of Kabarak University  
in Partial Fulfillment of the Requirement for the Award of Master of Education  
(Curriculum Studies)**

**KABARAK UNIVERSITY**

**DECEMBER 2020**

## DECLARATION

1. I do by declare that:

- i. This proposal/project/thesis is my own work and to the best of my knowledge it has not been presented for the award of a degree in any university or college.
- ii. That the work has not in-cooperated material from other works or a paraphrase of such material without due and appropriate acknowledgement
- iii. That the work has been subjected to processes of anti-plagiarism and has met Kabarak University 15% similarity index threshold

2. I do understand that issues of academic integrity are paramount and therefore I may be suspended or expelled from the University or my degree may be recalled for academic dishonesty or any other related academic malpractices

Signed:

\_\_\_\_\_ Date: \_\_\_\_\_

**Name of Student:** Bett Benard Kiprono    **Admission Number:** MED/NE/0034/01/16

## RECOMMENDATION

To: the Institute of Post Graduate Studies:

This research thesis entitled ‘Influence of Selected Factors on effective Coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya.’ and written by **Benard Kiprono Bett**, is presented to the Institute of Post Graduate Studies and Research of Kabarak University. We have reviewed it and recommend that it be accepted in partial fulfillment of the Degree of Master of Education in Curriculum Studies.

Signed \_\_\_\_\_

Date: \_\_\_\_\_

Prof. Frederick B. J. A. Ngala, Ph.D.

Department of Education

School of Education

Kabarak University

Signed \_\_\_\_\_

Date: \_\_\_\_\_

Dr. Bernard Chemwei, Ph.D.

Department of Education

School of Education

Kabarak University

## **COPY RIGHT**

@ 2020

Bett Benard Kiprono

All rights are reserved. No part of this Thesis may be reproduced or transmitted in any form by any means either mechanical, including photocopying, recording or any other information storage or retrieval system without permission written from the author or Kabarak University.

## **ACKNOWLEDGMENT**

My heartfelt appreciation goes to my supervisors Prof. Frederick B. J. A. Ngala, Ph.D., MBS and Dr. Bernard Chemwei, PhD for their meticulous guidance and patience in shaping this work. Your great sacrifice in guiding me through this work is remarkable, may God immensely bless you. Many thanks go to Prof. Gladys J. Kiptiony, Fellow of the Higher Education Academy and Dr Betty Tikoko, Ph.D., for their counseling that enabled me to complete this work. I sincerely thank Dr Daniel Ngeno (Egerton University), Dr Lydia Kobiah and Dr Daniel Achola in the school of Education for your immense review of the thesis. Finally, I wish to thank all respondents who enabled me to collect data. I thank you all.

## **DEDICATION**

I dedicate this Thesis to my wife Anjellah for her patience and support. I also dedicate this work to my children, Ashley and Bradley as well as my siblings Mercy and Kipkoech. I also dedicate this to my parents who have been instrumental in guiding me since childhood. Finally, to my late Grandmother, Obot Chepkurui Tesot.

## ABSTRACT

The need for effective coverage of secondary school syllabi is crucial in Kenya and the world at large. This study sought to determine effective coverage of KCSE Biology syllabus in secondary schools in Rongai Sub County. The study objectives include to determine the influence of student related factors, teacher related factors, availability of instructional resources and Time management on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. The study was grounded on curriculum implementation theory and espoused correlational design. The study was conducted in Nakuru Rongai Sub-County secondary schools. The target population of this study encompassed 151 Biology teachers, 60 principals and 120 form four class secretaries. Census method was used to sample Biology teachers and class secretaries while purposive sampling technique was used to sample head teachers. In this study, content validation of the questionnaire was determined by research supervisors from Kabarak University who read the content, look at the items and ensured that they reflect the actual content area. This study used test retest method of determining reliability of research instrument. The instruments were piloted in Ndongeri Mixed secondary, Upper hill mixed and Njoro day secondary school. Data was obtained using a questionnaire and an interview schedule. Data was first analyzed using descriptive statistics while Pearson Correlation coefficient was run to determine the existence and significance of the relationship between independent and dependent variables. Also, Regression statistics was used to determine the influence of independent variables on dependent variable. Equally, interview data was analyzed systematically by organizing the responses into themes which was then presented in prose form. Hypothesis was tested at 0.05 alpha level. Data was then presented in form of pie charts and tables. The findings revealed that student related factors significantly influence effective coverage of Biology syllabus ( $\beta = 0.290$ ;  $p < 0.05$ ). Similarly, teacher related factors significantly influence on effective Coverage of Biology Syllabus ( $\beta = 0.390$ ;  $p < 0.05$ ). Furthermore, availability of instructional resources significantly influences effective coverage of Biology Syllabus ( $\beta = 0.44$ ;  $p < 0.05$ ). Finally, time management influence negatively effective coverage of Biology Syllabus ( $\beta = -0.14.8$ ;  $p > 0.05$ ). The study concludes that students' perception towards Biology, students' participation in class especially in extra research on topics learnt influence effective syllabus coverage. Moreover, teacher transfers and negative perception towards some topics influence effective syllabus coverage. Besides, availability of science laboratory equipped with reagents and materials, adequate textbooks and physical classrooms influence effective syllabus coverage. Finally, it was noted that adequate time allocated in the timetable for teaching influence significantly effective syllabus coverage. It is herein recommended that Teacher transfers should be managed appropriately in order to improve effective coverage of Biology Syllabus. In-service training of teachers as well as adequate equipping with new technologies, pedagogical techniques and appropriate instructional resources should be underscored in order to achieve effective coverage of Biology syllabus. Finally, school management should emphasize on strategies geared towards management of instructional time in order to boost effective coverage of KCSE Biology Syllabus.

*Keywords: Effective Coverage, Biology syllabus, Student -related factors, Teacher-related factors, Instructional-resources and time management.*

## TABLE OF CONTENTS

<b>DECLARATION</b> .....	<b>ii</b>
<b>RECOMMENDATION</b> .....	<b>iii</b>
<b>COPY RIGHT</b> .....	<b>iv</b>
<b>ACKNOWLEDGMENT</b> .....	<b>v</b>
<b>DEDICATION</b> .....	<b>vi</b>
<b>ABSTRACT</b> .....	<b>vii</b>
<b>LIST OF TABLES</b> .....	<b>xii</b>
<b>LIST OF FIGURES</b> .....	<b>xiii</b>
<b>LIST OF ABBREVIATIONS AND ACRONYMS</b> .....	<b>xiv</b>
<b>OPERATIONAL DEFINITIONS OF KEY TERMS</b> .....	<b>xv</b>
<b>CHAPTER ONE</b> .....	<b>1</b>
<b>INTRODUCTION</b> .....	<b>1</b>
1.1. Introduction.....	1
1.2. Background to the Study .....	1
1.3 Statement of the Problem.....	13
1.4. Purpose of Research .....	14
1.5. Research Objectives.....	14
1.6. Research Hypotheses .....	15
1.7. Significance of the Study .....	15
1.8. Scope of the Study .....	16
1.9. Limitations of the Study .....	16
1.10. Assumptions of the Study .....	17
<b>CHAPTER TWO</b> .....	<b>18</b>
<b>LITERATURE REVIEW</b> .....	<b>18</b>
2.1. Introduction.....	18
2.2. Effective Coverage of Biology Syllabus .....	18
2.3. Student Related Factors and Coverage of Biology Syllabus .....	20
2.4. Teacher Related Factors and Coverage of Biology Syllabus .....	27
2.4.1. Instruction Selection and Coverage of Biology Syllabus .....	27
2.4.2. Workload and Coverage of Biology Syllabus .....	29
2.4.3. Teachers' Absenteeism and Coverage of Biology Syllabus.....	29
2.4.4 Teacher Transfer .....	32



2.4.5 Knowledge of Subject Matter .....	33
2.4.6 Teachers' Experience.....	34
2.5. Availability of Instructional Resources and Coverage of Biology Syllabus .....	34
2.6. Time Management and Coverage of Biology Syllabus .....	47
2.7. Theoretical Framework.....	49
2.7.1. Curriculum Implementation Theory .....	49
2.8. Conceptual Framework.....	50
<b>CHAPTER THREE.....</b>	<b>52</b>
<b>RESEARCH DESIGN AND METHODOLOGY .....</b>	<b>52</b>
3.1. Introduction.....	52
3.2. Research Design .....	52
3.3. Location of Study .....	52
3.4. Population of the Study .....	53
3.5. Sampling Procedure and Sample Size .....	54
3.5.1 Sampling Procedure .....	54
3.5.2. Sample Size.....	54
3.6. Instrumentation .....	55
3.6.1 Questionnaire for Teachers .....	55
3.6.2 Questionnaire for Students .....	56
3.6.3 Interview Schedule.....	56
3.6.4 Piloting of Study Instrument. ....	56
3.6.5 Validity of the Research Instrument. ....	57
3.6.6. Reliability of Research Instruments .....	57
3.6.7 Test-Re-test Reliability .....	58
3.6.8 Measures of Internal Reliability .....	59
3.7 Data Collection Procedure .....	59
3.8 Data Analysis.....	60
3.9 Ethical Considerations .....	63
<b>CHAPTER FOUR .....</b>	<b>64</b>
<b>DATA ANALYSIS, PRESENTATION AND DISCUSSION .....</b>	<b>64</b>
4.1. Introduction.....	64
4.2. Response Rate.....	64
4.3.General and Demographic Information .....	64

4.3.1 Gender of Respondents (Teachers) .....	65
4.3.2 Respondents Gender (Students) .....	66
4.3.3 Respondents Gender (Principals) .....	66
4.3.4. School Category .....	67
4.3.5 Type of School .....	68
4.3.6. Zonal Locality .....	68
4.4 Main Findings .....	69
4.4.1. Student Related Factors Influencing Effective Coverage of Biology According to Teachers .....	69
4.4.2 Correlation Between Student-Related Factors and Effective Syllabus Coverage (Data From Teachers) .....	73
4.5. Teacher Related Factors (Data From Teachers) .....	73
4.5.1. Percentages of Teacher Related Factors (Data From Teachers) .....	74
4.5.2 Correlation Between Teacher-Related Factors and Effective Syllabus Coverage .....	77
4.6 Availability of Instructional Resources .....	78
4.6.1. Percentages of Availability of Instructional Resources .....	78
4.6.2 Correlations Between Availability of Instructional Resources and Effective Coverage of Biology Syllabus .....	83
4.7. Time Management .....	84
4.7.1. Percentages Time Management .....	84
4.7.2 Correlation Between Time Management and Effective Coverage of Biology Syllabus .....	86
4.8. Effective Coverage of Biology Syllabus .....	86
4.9 Combined Regression Analysis .....	88
4.9.1. Multicollinearity Analysis .....	89
4.9.2. Model Summary .....	90
4.9.3. The Strength of the Model .....	91
4.9.4 Predicting Effective Coverage .....	92
4.9.5. Hypotheses Testing .....	93
<b>CHAPTER FIVE .....</b>	<b>96</b>
<b>SUMMARY, CONCLUSION AND RECOMMENDATIONS .....</b>	<b>96</b>
5.1 Introduction.....	96

5.2. Summary of Key Findings .....	96
5.2.1. Student Related Factors and Effective Coverage of KCSE Biology Syllabus .....	96
5.2.2. Teacher Related Factors and Effective Coverage of KCSE Biology Syllabus .....	97
5.2.3. Availability of Instructional Resources and Effective Coverage of KCSE Biology Syllabus .....	98
5.2.4. Time Management and Effective Coverage of KCSE Biology Syllabus ..	100
5.3. Conclusion .....	101
5.4. Recommendations.....	101
5.5. Recommendations for Further Study .....	102
5.6. Recommendations for Policy.....	102
<b>REFERENCES .....</b>	<b>104</b>
<b>APPENDICES.....</b>	<b>119</b>
<b>Appendix I: Introduction Letter .....</b>	<b>119</b>
<b>Appendix II: Teachers' Questionnaire .....</b>	<b>120</b>
<b>Appendix III: Students Questionnaire .....</b>	<b>123</b>
<b>Appendix IV: Principals' Interview Schedule.....</b>	<b>125</b>
<b>Appendix V: University Letter .....</b>	<b>128</b>
<b>Appendix VI: NACOSTI Research Authorization Letter .....</b>	<b>129</b>
<b>Appendix VII: NACOSTI Research Permit.....</b>	<b>130</b>
<b>Appendix VIII: County Director of Education Research Permit.....</b>	<b>131</b>
<b>Appendix IX: Nakuru County Commissioner Research Permit .....</b>	<b>132</b>
<b>Appendix X: A List of Public Secondary Schools in Rongai Sub-County .....</b>	<b>133</b>
<b>Appendix XI: Map of Rongai Sub-County .....</b>	<b>135</b>
<b>Appendix XII: List of Publication.....</b>	<b>136</b>

## LIST OF TABLES

<b>Table 1:</b> Candidates' Performance in KCSE Biology Between 2012-2017.....	10
<b>Table 2:</b> Rongai Sub-County KCSE Biology Analysis (2012-2017) .....	13
<b>Table 3:</b> Target Population .....	53
<b>Table 4:</b> Sample Size .....	55
<b>Table 5:</b> Test-Re-test reliability statistics .....	58
<b>Table 6:</b> Cronbach's Alpha Reliability Analysis .....	59
<b>Table 7:</b> Statistical Analyses of Variables. ....	61
<b>Table 8:</b> Hypothesis Testing .....	62
<b>Table 9:</b> Response Rate.....	64
<b>Table 10:</b> A Crosstabulation of Teachers' Gender and School Category.....	67
<b>Table 11:</b> Type of School.....	68
<b>Table 12:</b> Zonal Locality.....	68
<b>Table 13:</b> Student Related Factors Influencing Effective Syllabus Coverage (Data From Teachers) .....	70
<b>Table 14:</b> Correlation Between Student-Related Factors and Effective Syllabus Coverage (Data From Teachers).....	73
<b>Table 15:</b> Teacher Related Factors (Data From Teachers) .....	74
<b>Table 16:</b> Correlation between Teacher-related Factors and Effective Syllabus Coverage (Data From Teachers).....	77
<b>Table 17:</b> Percentages of Availability of Instructional Resources (Data From Teachers) .....	79
<b>Table 18:</b> Correlations Between Availability of Instructional Resources and Effective Coverage of Biology Syllabus (Data From Teachers).....	83
<b>Table 19:</b> Time Management Influencing Effective Syllabus Coverage (Data From Students) .....	84
<b>Table 20:</b> Correlation Between Time Management and Effective Coverage of Biology Syllabus (Data From Teachers) .....	86
<b>Table 21:</b> Effective Syllabus Coverage (Teachers' Data) .....	87
<b>Table 22:</b> Multicollinearity Statistics.....	90
<b>Table 23:</b> Model Summary .....	90
<b>Table 24:</b> ANOVA Analysis <sup>a</sup> .....	91
<b>Table 25:</b> Coefficients <sup>a</sup> of Independent Variables .....	92

## LIST OF FIGURES

<b>Figure 1:</b> Conceptual Framework on Selected Factors on Effective Coverage of Biology Syllabus .....	50
<b>Figure 2:</b> Respondents Gender (Teachers) .....	65
<b>Figure 3:</b> Students Gender Representation .....	66
<b>Figure 4:</b> Respondents Gender (Principals).....	67

## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>ANOVA</b>	Analysis of Variance
<b>CEB</b>	County Education Board
<b>CEMASTE</b>	Centre for Mathematics, Science and Technology Education
<b>ICT</b>	Information Communication Technology
<b>DQASO</b>	District Quality Assurance and Standard Officer
<b>KCSE</b>	Kenya Certificate of Secondary Education
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>KICD</b>	Kenya Institute of Curriculum Development
<b>KNEC</b>	Kenya National Examination Council
<b>NACOSTI</b>	National Commission for Science, Technology and Innovation
<b>SCDE</b>	Sub - County Director of Education
<b>SL</b>	Scientific Literacy
<b>SMASSE</b>	Strengthening Mathematics and Science Subjects Education
<b>SPSS</b>	Statistical Package for Social Science.
<b>TLP</b>	Teaching and Learning Process
<b>TSC</b>	Teachers Service Commission
<b>TPAD</b>	Teacher Performance Appraisal and Development
<b>UPE</b>	Universal Primary Education
<b>USE</b>	Universal Secondary Education

## OPERATIONAL DEFINITIONS OF KEY TERMS

**Biology Syllabus:** Is a part of curriculum that includes learning goals, layout, content sequence as well as assessment (Nation and Macalister, 2010). In this study it will mean a document showing learning goals, and method of teaching the content of KCSE Biology subject.

**Teacher Related Factors:** Factors stemming from teachers and which influence teaching Biology in Secondary Schools in Rongai Sub County, Kenya. These include teachers' workload, absenteeism, knowledge of subject matter, teaching methods, transfer and their perception towards some topics.

**Student Related Factors:** Factors arising from students which influence teaching of Biology in Secondary Schools in Rongai Sub County, Kenya. This includes student's student absenteeism, participation in lessons, students' perception towards Biology, peer pressure and students' discipline.

**Instructional-Resources:** It is all that students read, listen to, control, observe or encounter as part of the educational process (Aseem, 2014). In this study, it means teaching and learning materials, used in Secondary Schools in Rongai Sub County, Kenya. This includes science laboratory, reagents and equipment, physical classrooms, textbooks, computer-based resources, and library.

**Time Management:** Refer to cluster of behavioral skills and activities performed by academic and non-academic staff such as planning in advance, lectures preparations and prioritizing (Eid, Nermin et al., 2015). In this study, it means ways by teachers employ to manage available time to accomplish specific instructional tasks in teaching and learning. This includes timely preparation of schemes, lesson plan, lesson notes, punctuality in lesson attendance.

**Effective Coverage of Syllabus:** Refer to all theory topics in Biology are taught; Biology projects developed and implemented; all taught topics are revised, and all practical lessons are taught

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1. Introduction**

This section presents the background of the study, problem statement, and purpose of the study, research objectives, research questions, scope, justification, limitations and assumptions of the study.

#### **1.2. Background to the Study**

A syllabus is an outline of what will be covered in the course; a test date schedule and the due dates for assignments; the course grading policy and basic learning system (Ponnusamy & Pandurangan, 2014). According to Okoth and Ndaloh (2013), syllabus is described as an outline of topics that are supposed to be covered in a subject for a given level. Moreover, Nation and Macalister (2010) The syllabus, as part of the curriculum, involves learning objectives, material content and series, layout, and assessment. In addition, Standardized objectives and materials to be learned in a certain framework are described. The emphasis of the Syllabus is on selected and particular contents. Thus, syllabus is subordinated to curriculum.

Syllabus is important in an educational setting. Firstly, it delineates the responsibilities of students and the instructors. It offers information about what was discussed, what students were supposed to do, and how these results and results were evaluated (Okoth & Ndaloh, 2013). In striving to assess both individual teachers and whole systems, Syllabi can be very valuable. In addition, a properly-planned syllabus will offer information to help learners become more active students (Okoth & Ndaloh, 2013).

According to Kenya Institute of Curriculum Development syllabus (2017) effective syllabus coverage refers to adequate completion of topics in the syllabus as per the time



allocated. Similarly, Wiles and Bondi (2014) affirm that effective syllabus coverage This includes how teachers provide guidance and evaluation using unique tools in a curriculum. Generally, the syllabus presents instructional ideas, number of lessons, scripts, and evaluation choices relevant to a set of goals. These prototypes concentrate on continuity to help teachers better incorporate and sustain the curricular structure to achieve different goals.

Teaching of topics in Biology as a measure of effective syllabus coverage has been recognized. According to Yanimu and Pagelio (2008) The biology teacher must assure that the material stated in the syllabus is fully covered. Even before teacher teaches what students ought to know, it is vital that they should be capable of evaluating students' material in a manner that makes it essential to them and allows them to continue to develop analytical and problem-solving skills that will facilitate extra teaching as well as learning.

Effective syllabus coverage also entails implementing Biology projects. Yanimu and Pagelio (2008) further assert that a project may be an evaluation assignment on a subject relevant to the topic that is provided to an individual learner or a cohort of learners. The project leads to a 'product' which is evaluated. Moreover, the project might require research and development in both out-of-class and in-class. The project must mainly be a learning experience, not just an evaluation assignment.

There seems to be a shifting focus on science teaching, especially the teaching of biology. According to National Research Council (2006) a biology instructor is required to provide learners with opportunities to carry out laboratory experiments which are more open-ended types of study. Laboratory research is not limited to following

guidelines and gaining pre-determined expertise but involves discovering issues and problems in real life and seeking solutions through the scientific process.

To ensure that syllabus is covered with steadfastness, teaching methods should be consistent with the basic learning objectives set out in the curriculum (Phillips, Ingrole, Burris, & Tabulda, 2017). Syllabus coverage includes numerous elements, particularly resource delivery and instructional methods. Instructional activities must comply with the curriculum and support the needs of individual students to incorporate syllabi with effectiveness (Causarano, 2015).

Biology, comprising structure, function, development, origin, evolution, and distribution, is the science of life and living things and encompassing various fields such as Mycology, Zoology, Botany and Microbiology (American Heritage Dictionary, 2016). According to Nyaga (2016) Biology subject as outlined by the KCSE syllabus aims at providing the student with the skills and perceptions required for environmental control and preservation and appreciating individuals as part of the wider community of living things and a core subject for entry into various professions for example genetic engineering medicine, agriculture among others. According to Owiti (2009) Biology education modifies the habitual perception of imagination, creativity, feelings and purposes of life. Therefore, complete coverage of Biology syllabus is essential for sustainable development. In other countries, Biology is variously referred to as biological science, nature study and life sciences (Bagley, 2017).

Student related factors play a crucial role in effective coverage of syllabus. With rapid global scientific and technological growth, the decreasing interest of students in science courses and careers is a global issue that has prompted international efforts to reform science education (Darling-Hammond et al., 2020). In Iran, Nasr and Soltani (2011)

carried out a research to investigate the relationship between the perceptions of students towards science in teaching and biology lessons. The research showed that the perception of students towards biological science greatly influences the subject's teaching. This implies that learners with a positive perception towards learning will participate during teaching. This promotes effective coverage of the syllabus.

Mukhwana (2013) examined the student-related factors affecting biology student learning in Kenya in the municipality of Eldoret Certificate of Secondary Education. It was established that the interest of students in biology (theory and practical) provides a power to engage in the learning process for learners; their ability to effectively conduct the practical. In particular, the study found that an interest in biology affects effective teaching because it gives students the drive to engage in the learning process.

Teacher related factors is critical in syllabus coverage. A close study of teacher demand and supply situations in Nigerian schools appears to show a discrepancy in the distribution of instructors to schools (Gbore, 2013). Ndioho and Chukwu (2017) carried out a review to assess the workload of teachers and the academic success of secondary school students in biology. It was clear that there was a difference in the availability of educators to colleges. This led teachers to reduce teaching methods to one, decrease the number of evaluations and mutilate the delivery of lessons to allow them to cope with the intensity of the workload. Even though the study examined the relationship between workload and academic performance, it presents a novel gap in knowledge relating to whether the objectives of the syllabus is effectively covered. The present analysis sought fill that gap by determining the influence of teachers' workload on effective syllabus coverage.

A classroom teacher is an essential requirement for teaching to take place. Teacher absenteeism is a major problem, particularly on a global scale, across jurisdictions. A survey of six developing nations, Bangladesh, Ecuador, India , Indonesia, Peru, and Uganda, showed that on any given day, an average of 19% of teachers were absent (Lee et al., 2015). The study by Lee et al (2015) concentrated on factors underlying teacher absenteeism while the present research sought to establish the influence of teacher absenteeism on effective syllabus coverage in Biology.

In Australia, it was reported by Hackling (2010) that the science instructor conducted the roles of technicians in certain situations. Specifically, it can be argued that given the burden on instructors' time, it is possible that they will merely organize minimal resources for practical work under these situations, and the consistency of the curriculum is undermined. Thus, implying that there is a problem with effective coverage of syllabus for Biology.

Teacher transfer could affect effective syllabus coverage. Onsomu (2014) declares that teacher transfers raise the workload on the current staff when replacements are not completed quickly, and their suitability remained in question when they finally arrived. This jeopardized the standard of education and caused students to report to administrators as they found it impossible to deal with the substitution. The research by Onsomu (2014) concentrated on the effect of the movement of teachers on student academic achievement while the current study sought to emphasized on influence of teacher transfer on effective syllabus coverage.

According to Mbalaka (2016), effective syllabus coverage influences learners' accomplishment in the culmination of high school course examinations. It also influences selection of professions in institutes of higher learning. The researcher further

argued that the achievement of effective syllabus coverage is accomplished predominantly by instructors. The management of high schools ought to therefore contemplate placing more focus on relational factors for instructors. No research has been conducted to determine the influence of teacher related factors on effective coverage of Biology syllabus in Rongai Sub County.

In a classroom, successful instructions require extensive preparation aimed at individualizing learning. The approach to the need to individualize teaching is resource-based learning (Ondigi & Omariba, 2017). A study by Osu and Etokebe (2015) found that Akwa Ibom State has competent biology teachers in schools for successful biology instruction. However, more attention needs to be provided by the State to the field of instructional resources. The availability of these materials in schools were perceived to be insufficient for successful teaching of the subject.

In order to teach, instructional materials are extremely necessary. Teachers often require these materials to test their students' knowledge. By assigning assignments, designing projects and conducting tests, teachers also evaluate students. For all these operations, instructional materials are essential. Using equipment and educational materials, fundamental science is best taught. If standard facilities are not available, teachers can source material for successful teaching. Teachers should use teaching materials to optimize learning outcomes at any stage of the learning process (Arop et al., 2019).

In Saudi Arabia, research by Alsharari (2016) suggests that the three main learning obstacles faced by science teachers, the shortage of sufficient school equipment and facilities and the absence of resources for classrooms and teaching resources. Consequently, the three most behavioral problems faced were persistent student absenteeism, student inability to study science and student lack of interest in science.

In Madagascar, there has been a problem of non-completion of curriculum in school. Variables such as teaching time have been significantly decreased by the frequent coupled with prolonged absences of both educators and learners, prolonged distances separating schools from the nearest cities, climate threats and family responsibilities (Razafimbelo & Rajonhson, 2009). Studies by Alshehry (2014) as well as Razafimbelo and Rajonhson (2009) did not inquire into the influence of student-related factors on effective coverage of Biology syllabus.

According to Muhamad, Nabilah, Nor, and Mohamad (2014), the National Philosophy of Science Education in Malaysia stressed the promotion of a culture of science and technology by concentrating on the growth of people who are competitive, dynamic, efficient and reliable and able to acquire scientific knowledge and technological skills. Nevertheless, the same scholars argue that the way Biology syllabus is covered in institutions of learning has been asserted as the foundation of the failure to accomplish the goals and objectives of Malaysian science instruction. The scholars further revealed that some aspects of curriculum such as psychomotor development are not covered effectively. The study by Muhamad, Nabilah, Nor, and Mohamad (2014) did not concentrate on the effect of utilization instructional resources on effective coverage of Biology syllabus.

Time is a resource that impacts all facets of human activities. It is an extremely scarce supply resource and is a factor that affects all educational sector stakeholders-students, teachers, administrators, supervisors, etc. Therefore, teachers who managed their time were biased towards improved delivery of teaching and thereby affected their students' academic success (Usman, 2016).

Ekundayo, Konwea and Yusuf (2010) assert that there are still abundant cases of teachers moaning about the lack of time to do such tasks they would have done. To have time for anything they plan to do, a good teacher must make productive use of their time.

Abdinoor (2012), reports that laxity of teachers in class attendance is typical in poor performing schools. The researcher additionally notes that in such classrooms, persistent teacher absenteeism was rampant, as teachers were similarly de-motivated to use their teaching time effectively. They lagged the coverage of the syllabus, a condition that created tension and fear of failing examinations amongst students.

The influence of teacher time management is explicitly linked to effectiveness of both student as well as instructors. It is believed that effective time management could support instructors to generate more intelligent minds for the nation's future development in the future. The important relationship between the time management of teachers and the effective teaching is evident (Sahito, Khawaja, Panhwar, Siddiqui, & Saeed, 2016).

A study by Vasconcelos, Torres, Mountinho, Martins and Costa (2015) on discovering the difficulties of Portuguese teachers in implementing the science curriculum showed that the key problems faced by science teachers when realizing the curriculum include length of curriculum, lack of time, inappropriate laboratory equipment, inadequate means and resources for experimental research. It can be inferred that covering the syllabus is a problem.

In Nigeria, ensuing the failure to establish reliable science education in schools, it was reported that significant setbacks were endured by science school curriculum including non-coverage of science schemes of work (Ajaja, 2009). In Zambia, a study by Chabalengula and Mumba (2008) to determine the essence and depth of the coverage of

scientific literacy (SL) topics in the Zambian National Secondary School Biology syllabus showed that inadequate coverage of the subject matter of science, technology plus societal themes in curricular resources can be an obstacle to improved grounding for systematically literate people. The research by Ajaja (2009) as well as that of Chabalengula and Mumba (2008) did not show what influences effective coverage of syllabus that was the main emphasis of the current review.

In Kenya, a study was carried out by Mbalaka (2016) to assess the degree to which the perceived teachers' aspects (communication, dispute resolution, teamwork and perception) affect effective coverage of the syllabus in high schools within the sub-county of Migwani, Kitui County. The findings revealed that the relational variables of teachers have a positive impact on effective syllabus coverage. However, this study never investigated the case of Biology syllabus which is the focal point of this current research. In another study, Wawira (2012) revealed that major challenges influencing Biology learning and teaching via the SMASSE framework include pressure to cover the syllabi among others. This clearly demonstrates that syllabus coverage faces problems in most parts of secondary schools in Kenya.

In another study, Makori and Onderi (2013) affirm that there were problems with insufficient coverage of the syllabus and overwork or overloading of qualified teachers in Nyamira County. Similarly, Mutegi (2014) argues that during regular learning time, events such as music festivals, sports and drama festivals were held, it results in loss of instruction time, consequently, compromises effective coverage of school syllabus. Studies by Makori and Onderi (2013) as well as that of Mutegi (2014) did not investigate the influence of teachers' workload and school schedules on effective syllabus coverage.



Furthermore, Kananu (2011) found that in Kenyan schools there was insufficient coverage of the syllabus and that all that was covered was not done effectively hence leading to inadequate achievement in the subject. It appears that there is a problem of ineffective coverage of KCSE Biology syllabus. Ineffective coverage of Biology syllabus may lead to poor academic performance as is illustrated in Table 1.

**Table 1: Candidates' Performance in KCSE Biology Between 2012-2017.**

<b>Year</b>	<b>Candidature</b>	<b>Mean score (%)</b>	<b>Standard deviation</b>
2012	389,523	26.205	29.43
2013	397,319	31.63	32.06
2014	432,977	31.83	32.57
2015	465,584	34.79	31.55
2016	509,982	29.19	35.16
2017	545,663	19.43	23.45

Source: Kenya National Examination Council Report (2017)

Table 1 shows inconsistent Biology percentage mean scores for the sampled years (2012 to 2017). When the syllabus is not covered on effectively, it could lead to poor academic achievement in national exams. The finding in Table 1 is supported by that of Konyango, Ogeta, Otieno and Orodho (2018) who reported that the variables that contributed to poor performance were categorized into two: direct factors, including teaching methods, awareness and understanding of content; indirect factors comprising motivation and interest, use of the laboratory and non-completion of the syllabus.

Mbito (2013) also explains that the syllabus is not finalized in most schools before the start of the KCSE evaluations. Mbito (2013) reported the KCSE syllabus is not covered sufficiently in most educational institutions in Thika West Sub County and this could result to the poor achievement as earlier noted.

TSC Policy framework on Performance appraisal and promotion of teachers (2014) developed Teacher Performance Appraisal and Development (TPAD) which is an integrated performance evaluation framework for teachers to improve supervision and regularly track their performance at institutional level in curriculum implementation. According to this policy, teachers are expected to effectively cover the syllabus within the limits of the syllabus before rating themselves using a scale provided in the instrument. The TPAD tool discusses seven performance evaluation metrics, including: technical expertise and practice, innovation and teaching innovation, time management, learner protection, safety and discipline and teacher conduct, development of co-curricular activities, teacher training and collaboration among parents and stakeholders. This policy therefore provides a rubric of assessing teachers' performance regarding coverage of syllabus. This policy requires teachers to effectively cover various syllabi.

Kenya Institute of Curriculum Development (2017) defines effective syllabus coverage as adequately completion of topics in the syllabus as per the time allocated with Kenya Institute of Curriculum Development (KICD). To assist the teacher in lesson planning, a suggested guideline on time allocation per topic was included in the syllabi. However, this can be changed to satisfy the requirements of the individual class.

As per the Teachers Service Commission Code of Regulations for Teachers (2015), all teachers shall comply with the performance requirements set out in the Act and this Code and shall perform the teacher's duty during the course such as coverage of syllabi for the relevant cycle of education approved by Kenya Institute of Curriculum Development. This shows that syllabus coverage is important in achievement of educational goals. It shows that teachers are supposed to cover the syllabus.

Furthermore, TSC (2017) developed a circular which instructed all the tutors to complete the syllabus ahead of the national examinations. According to TSC (2017) the TSC Chief Executive Officer emphasized in the policy document that since the examination timetable was out, all children must be adequately prepared. Specifically, the circular inquired teachers to ensure full coverage of third term syllabus for all classes. It implies that teachers must cover syllabus.

A research was conducted by the Centre for Mathematics, Science and Technology Education in Africa (2018) to understand the amount and the nature of interactions in schools between teachers and students. The results revealed that there is discrepancy between the time available for teaching as directed by the MOE and the time suggested for content coverage in the syllabus. Whereas the MOE indicates that educational institutions have 35 weeks of learning time available, the syllabus as drawn up by the Kenya Institute of Curriculum Development (KICD) specifies a span of up to 40 weeks for coverage of the syllabus. On average, up to 29.5% of the school time each year was spent on activities other than subject coverage as defined in the syllabus by secondary schools participating in the report. A research has not been carried out to establish the association between time management and syllabus coverage.

In Rongai Sub County, CEB status report (2017) indicated that little has improved over the years, despite the efforts and ambitions of the SMASSE project to enhance the output of science subjects. The report further highlights that syllabus coverage with respect to science subjects in majority of high schools in the sub county remains uncompleted. This view was corroborated by Rongai DQASO report (2018) which specified that despite the explosion of trained teachers in the last decade, sufficient syllabus coverage in Biology has continued to suffer from completion in the Sub County.

Table 2 shows performance of Biology in Rongai sub-county for the sampled years (2012-2017).

**Table 2: Rongai Sub-County KCSE Biology Analysis (2012-2017)**

Year	Candidature	Mean score (%)
2012	2429	30.83
2013	2632	35.66
2014	2876	36.44
2015	2988	36.91
2016	3015	23.34
2017	3810	22.59

Source: Rongai sub-county education reports (2019)

According to the results in Table 2, performance of Biology in Rongai sub-county was below the average mark of 50%. Similarly, when compared to the National mean grade, Biology was underperforming. This could be attributed to challenges related to effective syllabus coverage.

Few studies have been carried out on status of syllabus coverage but not on determining factors influencing effective coverage of KCSE Biology syllabus in Rongai Sub County, Kenya. Therefore, this research concentrated on influence of selected factors on effective coverage of KCSE Biology syllabus in Rongai Sub-County, Kenya.

### **1.3 Statement of the Problem**

This study seeks to examine influence of student, teacher related factors, availability of instructional resources and time management factors on effective coverage of Biology Syllabus in Secondary Schools in Rongai Sub-County. In Rongai Sub County, there appears to be inadequate of effective coverage of KCSE Biology syllabus in some of secondary schools in the Sub County (CEB, 2017; DQASO, 2018). Teachers should

properly cover the syllabus in order to encourage students to understand the content clearly (TSC Policy framework on Performance appraisal and promotion of teachers, 2014; Kenya Institute of Curriculum Development syllabus, 2017; Teachers Service Commission Code of Regulations for Teachers, 2015). Nevertheless, the background to this study also shows that ineffective coverage of Biology syllabus persists in some secondary schools in Kenya. Inadequate coverage of Biology syllabus poses a challenge which is may lead to poor performance in National examinations as shown in Table 2. Moreover, incomplete coverage of the syllabus may affect achievement of educational goals. This problem led the researcher to investigate influence of selected factors on effective coverage of Biology Syllabus in Secondary Schools in Rongai Sub-County.

#### **1.4. Purpose of Research**

The purpose of this study was to establish influence of student related factors, teacher related factors, availability of instructional resources and time management on effective coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya.

#### **1.5. Research Objectives**

The objectives of this study were:

- i. To determine the influence of student related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.
- ii. To establish the influence of teacher related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.
- iii. To find out the influence of availability of instructional resources on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.

- iv. To determine the influence of time management on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.
- v. To establish the predictive capacity of student related, teacher related factors, availability of instructional resources and time management on effective coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya using regression analysis.

### **1.6. Research Hypotheses**

The following hypothesis directed the research.

**H<sub>05</sub>:** Among student and teacher related factors, availability of instructional resources in addition time management, none has a statistically significant predictive capacity on effective coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya.

### **1.7. Significance of the Study**

The output of the research will provide useful data to curriculum implementers in secondary schools on how to cover Biology syllabi in good time. In addition, the conclusions of this study will offer a foundation for improving existing policies on how to cover Biology syllabus. Specifically, existing policies could be relooked at concerning provision of adequate instructional resources that could fast-track effective coverage of Biology syllabus.

The findings could influence Kenya Institute of Curriculum Development (KICD) to develop syllabi that allows learners to have maximum time to interact with the content in order to improve their experiences. Additionally, Teachers Service Commission (TSC) could find this study useful in solving the problem of poor academic achievement in KCSE Biology. Furthermore, TSC could formulate policies that permit proper

management of instruction time. This could effectively improve effective coverage of the syllabus. Finally, this study will provide data for further research in areas such as curriculum implementation in schools.

### **1.8. Scope of the Study**

This research was carried in secondary schools in Rongai sub-county. Rongai sub-county is located in Nakuru County. It has four divisions namely Kampi ya Moto, Ngata, Rongai and Solai where the target schools are based. The study sought to look at effective syllabus coverage in relation to teacher related factors which include teachers' workload, teachers' absenteeism and teacher transfers. Furthermore, student related factors which were investigated include student participation during lesson, student absenteeism and students' discipline. Instructional-resources and time management factors were investigated. The study was carried out between March 2018 to July 2019. Finally, the study limited itself to teachers of Biology, head teachers and form four class secretaries in Rongai Sub-County schools who were the source of primary data.

### **1.9. Limitations of the Study**

The researcher used questionnaires to collect data. Close-ended questionnaires restrict the responses from the respondents. Very detailed items were used to address this limitation. Finally, the study limited itself to teachers of Biology, head teachers and form four class secretaries in Rongai Sub-County schools who were the source of primary data. The study limited itself to correlational research design. This design was chosen because it supported in measuring the influence of the selected factors on effective syllabus coverage.

### **1.10. Assumptions of the Study**

The study assumed that participants provided honest responses to items on factors which influence effective coverage of Biology syllabus. Furthermore, the study assumed that natural phenomena such as flooding will not alter the condition of the problem being investigated. moreover politics, drought, strikes is also assumed to influence syllabus coverage.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

This chapter involves various literature reviewed in relation to the objectives of the study. The chapter further reviews the theoretical framework and conceptual framework. The literature reviewed covers effective coverage of syllabus, student related factors, teacher-related factors, availability of instructional resources and time management.

#### **2.2. Effective Coverage of Biology Syllabus**

Effective coverage of the syllabus is critical for learners in terms of performance at the end of high school exams (KCSE) and thus the choice of which colleges and universities to join and which career paths to choose. Mwangi (2015) maintains that the coverage of the syllabus influences the success of students in the exam since students are normally evaluated from every subject in the syllabus. In addition, if any institution does not complete all the areas in the syllabus; its learners would be compromised. Magoma (2017) avers that inadequate syllabus coverage, inability to comprehend questions and inadequate method of instruction as some of the shortcomings noted in many schools. Moreover, coverage of the syllabus would rely on time management by the head teacher, teachers as well as learners in the school. This will increase the coverage of the syllabus if there is minimal teacher nonattendance and a high degree of group participation in curriculum and instruction preparation.

Njoroge (2012) avers that concerns comprising insufficient completion of the syllabus, the perception that education no longer guarantees jobs, mismanagement and waste of quality teaching time by teachers besides lack of efforts by parents, teachers, leaders and

the community to build an enabling learning atmosphere are drawn back from efforts to increase performance in education.

In West Africa, a study by Olusegun (2017) revealed that around one million students who sat for West African Examination Council (WAEC) in 2016 failed. The researcher further argues that the cause of massive failure in WAEC was attributed to inadequate coverage of syllabus and students' lack of strong reading spirit, lack of knowledge of common pitfalls, coupled with and non-familiarity with test format. This view is in line with that of Khatete, Eunice and Ondigi (2014) who indicated that the key factors reason for the low academic performance of students in biology were large class size, insufficient time to schedule biology lessons, low entry behaviour of students, broad biology syllabus and insufficient educational resources. The study by Olusegun (2017) and that of Khatete, Eunice and Ondigi (2014) focussed on academic performance and did not show the effect of selected factors on effective coverage of biology syllabus.

In Kenya Okode (2013) conducted a research to establish the influence of strategic planning by secondary schools on the students' academic performance in the Rachuonyo North District. The finding indicated that majority of the Head of Departments and principals specified that they set targets for syllabus coverage by mid of June. The Study further revealed that teachers use syllabus in lesson preparation and teaching. This shows that effective coverage of syllabus is central to students' performance of exams. The study by Okode (2013) did not show the influence of the selected factors on effective coverage of biology syllabus.

According to Sequeiria (2004) students of form 3 are on the threshold of Kenya School Certificate Examinations (KCSE). The teaching and learning time in form 4 is relatively shorter than in the other years since KCSE begins around the end of September or early

October. The teacher therefore has to plan to cover the whole biology syllabus at least by the end of second term of form four. Early school syllabus coverage gives time to focus on the self-efficacy as well as mathematical self-concept of the learners, which are really essential for fostering self-confidence and enhancing particular learners' success (Ferla Valcke & Cai, 2009).

### **2.3. Student Related Factors and Coverage of Biology Syllabus**

Student related factors were reviewed and presented in the subsequent subsections' which include the students' perception, absenteeism, peer influence, discipline, and finally participation.

#### **2.3.1. Students' Perception and Coverage of Biology Syllabus**

It has been acknowledged that in curriculum implementation, learners remain a vital factor. Although teachers are the arbiters of teaching practices, students hold the key to what is ultimately passed on and adapted from the official program (Gautam, 2015). Perception will affect any component of the life of an individual, as well as their education. Learner perceptions to learning assess their desire and capacity to learn. If adverse behaviors are not changed, it is implausible that a student will pursue his education beyond what is needed. The perception of learner in relation to learning has influenced not just their level of learning but their motivation for training (Ministry of Education, 2016). It can be inferred that negative perception by students towards a subject may reduce their ability to understand hence making the teacher to spend a lot of time in the area not understood thereby influencing time of coverage of the syllabus to be covered. The study by Gautam (2015) Ministry of Education (2016) did not show the influence of students' perception on effective coverage of Biology syllabus which is why the researcher would like to conduct an academic inquiry.

Cimer (2012) affirms that the design of teaching of teachers, the nature of the subject, the learning patterns of learners, the adverse feelings and opinions of students regarding the subject matter and a shortage of teaching materials were the key reasons for learning problems. Furthermore, Mukhwana (2013) reports that the student-related factors affecting biology success in Eldoret Municipality have been found to include motivation in biology (theory and practical) providing learners with a power to engage in the learning process.

One of the most significant objectives of the program is the establishment of a positive perception towards scientific knowledge (Hacieminoglu, 2016). According to Mamalanga and Awelani (2014) students are seen to play a major role in affecting the success of Biology 5090 in high schools in Lesotho. They were stated to neglect the work given to them and display little interest in their schoolwork. Awelani (2014) further demonstrated that lack of discipline among learners influences achievement seriously. Some students are poorly behaved, uncontrollable, and challenging in class to deal with. These students intentionally disregard orders from teachers, leave the classroom during lectures, go to school late or vanish until school closes. It can be inferred that indiscipline among students make teaching difficult and to a large extent cause teachers not to cover syllabus because instead they spend most of instructional time on solving discipline cases. The study by Hacieminoglu (2016) and Awelani (2014) did not demonstrate influence of student indiscipline on effective coverage of Biology syllabus which the present study seeks to undertake.

### **2.3.2. Students' Absenteeism and Coverage of Biology Syllabus**

In USA, almost 1 in 5 high school students are "chronically absent" from lessons, and also the percentage of students missing at least 15 days in an academic year only

increases among students of color (Camera, 2016). In the state of Detroit, it is reported that the highest rate of chronic absenteeism was in the 100 largest school districts. In the 2013-2014 school year, almost 58 per cent of students were chronically absent. On the other hand, Florida had the lowest rate of chronic absenteeism with 4.5 percent in the 2013-14 school years (Kerr & Hoyer, 2016). When students are absent, teachers will be forced to repeat the topics learnt when the absentees were away thus influencing time of coverage of prescribed content. The study by Camera (2016), Kerr and Hoyer (2016) did not show effect of student absenteeism on effective coverage of syllabus which the present study seek to achieve.

In Uganda, a research was carried out by Komakech and Osuu (2014) regarding the delinquency of learners as a silent universal secondary education (USE) killer. It revealed that the overall absence rate of students in day schools is 23.18 percent, equated to 3.25 percent in boarding schools. In Kenya, students' absenteeism continues to influence academic performance. The intervention strategies suggested included completing the syllabus in time among others (Mwenda, Gitaari, Nyaga, Muthaa, & Reche, 2013). It can be deduced that since syllabus is a sequenced document, teachers may not continue with new topics when previous ones have not been adequately covered. Harvey (2018) It notes that the syllabus is part of a curriculum that comprise with the design and structure of the lessons in the scheme. The studies conducted by Komakech and Osuu (2014) and Mwenda, *et al* (2013) did not focus on the influence of student absenteeism on effective syllabus coverage, which is why this research study is carried out.

Musasia, Nakhanu and Wekesa (2012) aimed at determining the proportion of the syllabus covered as well as associate it with learner achievement in Kakamega South

district. The analysis revealed that delinquency contributed a substantial role in the lack of coverage of the syllabus by both the instructor and the learners. Many students suggested that absenteeism was just a pattern that had been made. This means that when students are absent, meaningful coverage of the syllabus could be threatened.

### **2.3.3. Peer Influence and Coverage of Biology Syllabus**

According to Ahn and Trogdon (2016) the influence of peers can be both beneficial and harmful. On the positive hand, the study showed that it can act as a major motivation for adolescents to do well in school. On the negative side, both within and outside school, peer influence can contribute to disciplinary issues and delinquent behaviors. The values of peers can thus play an essential position in the educational experiences and outcomes of learners. It can be inferred that negative behaviors exhibited by learners may influence the time of coverage of activities for learning as teachers may spend much of instructional time solving cases associated with students deviant behaviour. The study by Ahn and Trogdon (2016) did not show influence of students' peer influence on effective coverage of Biology syllabus which the present study seeks to unravel.

According to Balsa, Gandelman and Roldán (2017) in shaping value systems, peer groups are more influential than parents. Teenagers are believed to divide themselves into peer groups that differ in their perceptions to academic attainment, and they will typically find anti-intellectual groups even in middle-class communities. It implies that when some students organize themselves into anti-intellectual groups, it may hinder them in understanding topics being taught. Teachers may be unable to meet the learning objectives as outlined by the syllabus since they spend a lot of instruction time repeating topics not clearly understood. The study by Balsa, Gandelman and Roldán (2017) did not

delve into the influence of students' peer groups on time of coverage of Biology syllabus which will be the emphasis of the current research.

According to Chambers work (as cited in Chepkorir, 2013) the expectations and principles of a specific peer group make a difference to the success and engagement of students in school. A student whose colleagues work hard is likely to work hard and conform to the principles of the teacher. It can be inferred that hardworking students may assist an instructor to organize the learning experiences on time to facilitate early time of coverage of the prescribed learning outcomes. Studies by Chepkorir (2013) did not show how peer group influences time of coverage of Biology syllabus which will be the concern of the present study.

In another study, Erinosh (2013) asserts that Learners understand better what they find intuitive and their views on a topic affect their performance. Erinosh (2013) further reported that a significant reason for the involvement of students in a learning process is their perception of whether the topic is interesting/boring, or easy/difficult. It can be inferred that students' failure to understand concepts may influence time taken by teachers to demystify the problem. This influences their understanding of succeeding topics since syllabus is a sequenced document. The study by Erinosh (2013) did not show influence of students' misconceptions on time of coverage of Biology syllabus which the present study seek to investigate.

In Kenya, a study by Chepkorir (2013) demonstrates that the study of mathematics and Biology is affected by peer groups. The study further showed that low achievement in Sciences and Mathematics is due to peer pressure as well as students' negative perceptions. It is assumed that once a learner is inspired and encouraged by colleagues, they will do well at school and have excellent results. Student peer pressure in school

typically affects the academic performance of students (Moldes, Biton, Gonzaga, & Moneva, 2019).

#### **2.3.4. Student Discipline and Coverage of Biology Syllabus**

Disciplinary problems are among the most critical issues made by teachers worldwide. Maphosa and Mammen (2011) claim that, both globally and nationally, the question of learner indiscipline has long taken center stage. Maphosa and Mammen (2011) have further stated that there are several cases of classroom disorders in the United Kingdom. They furthermore argue that a lesson relies on several variables to achieve an appropriate level of success; discipline in the classroom is among them. Classroom discipline is a requirement for any effective biology syllabus coverage. It can be inferred that undisciplined students may hinder teachers' resilience in teaching. Consequently, it may reduce teachers' ability to continue teaching a planned activity in the syllabus. Breen (1984) asserts that A syllabus could be seen as a roadmap for what to do through the teaching of teachers and as children learn. The study by Maphosa and Mammen (2011), did not show influence of students' indiscipline on time of coverage of Biology syllabus which the present study seek to reveal.

In several schools around the world, the prevalence of violence among students is prevalent. Zandile (2013) observe that within United Kingdom, students are typically disruptive, rowdy as well as discourteous to teachers. In addition, they further argue that the There is also evidence of the use of inappropriate language and contempt towards teachers in the United States of America. The problem of students misbehavior appears to be no different in the Caribbean. It can be inferred that when students become rowdy and disrespectful to teachers, teachers may get discouraged during teaching of important concepts. This may influence the time of coverage of goals and learning outcomes of



topics that was to be covered in the Biology syllabus. The study by Zandile (2013) did not show influence of students' indiscipline on effective coverage of Biology syllabus which the present study seek to reveal.

Disruptive classroom behaviors cause damage in classroom learning. Marciniak (2015) is of the belief that they learn less and prevent their peers from learning when students misbehave. When more time is dedicated to handling misconduct rather than teaching, teaching interaction time is reduced. In another study, Finn, Fish and Scott (2008) A study of 805 American Federation of Teachers Union members cited and estimated that 17 percent of teachers lost disruptive behavior over 4 hours a week, while another 19 percent of teachers lost disruptive behavior between 2 and 3 hours a week. It can be inferred that the time and energy taken to deal with certain disruptive students can be physically taxing and emotionally stressful leading to non-coverage of plan of activities meant for learning of Biology. The study by Marciniak (2015) did not indicate the influence of students' disruptive behavior on effective coverage of Biology syllabus, which the present study seek to undertake.

Rongai sub-county has had its share of problems regarding student indiscipline. Tallam, Tikoko, Sigei and Chesaro (2015) conducted study to examine the school disciplinary committee's contribution to learner discipline management in public high schools in Rongai Nakuru subcounty, Kenya. The study indicated that the main disciplinary problems faced in Rongai county schools were boycotts, strikes and protests. The researchers indicated that indiscipline in most schools was very high and bullying is a major problem of indiscipline in schools. The study by Tallam, Tikoko, Sigei and Chesaro (2015) did not show the influence of students' disruptive behavior on effective coverage of Biology syllabus, which the present study seek to carry out.

### **2.3.5 Students Participation**

Yawe (2011) recognizes that the involvement of students in the learning process involves contributing ideas, analyzing the ideas-related variables, creating potential answers to the challenges posed in the class, putting the results into action, and assessing the solution's effects. Furthermore, Omodara et al. (2013) affirm that the instructor must inspire, promote and sustain the students' active participation in science lessons for instruction to be effective. For the active involvement of learners in science curricula, the use of teaching aid materials is important since learners have the ability to touch, measure, test, sort or modify teaching aid resources.

## **2.4. Teacher Related Factors and Coverage of Biology Syllabus**

Teacher related factors regarding coverage of biology syllabus were reviewed and presented. The key variables reviewed includes instruction selection, workload, teachers' absenteeism, teacher transfer, knowledge of subject, teachers' experience

### **2.4.1. Instruction Selection and Coverage of Biology Syllabus**

Teachers need a broad range of different skills and perceptions if they are to help their students achieve high grades, these should include student relationships, knowledge of the subject matter and also an understanding of pedagogical processes in order to establish the necessary understanding. According to Takbir (2012) teachers should make teaching choices from a range of choices that include teaching approaches in addition to models, teaching acts and teaching practices such as realistic work , group work or pair work experiences, lectures, entire class conversation, knowledge use, use of innovative tools, challenging and incorporating problem solving or inquiry-oriented. It can be inferred that appropriate instructional selection will promote attainment of what is to be

learnt in a lesson. The study by Takbir (2012) did not show the influence of instruction selection on effective coverage of Biology syllabus necessitating the present study.

In Nigeria, a study by Abe and Owoeye (2014) carried a research on opinion of difficult topics by teachers in the Biology Program in Ondo State Secondary Schools, revealed that complexity of biology themes, insufficient, lack of equipped laboratories for practical teaching, unavailable instructional materials and lack of students understanding of the subject in the class were identified as hindering teaching of Biology. It implies that teachers' perception of complexity of Biology coupled with lack of instructional resources such as laboratory may influence what was intended for learning. Therefore, some areas in the syllabus may not be covered totally. Abe and Owoeye (2014) in their research did not show the influence of teachers' perception of complexity of Biology on effective coverage of syllabus. This study intends to investigate this problem.

In Mozambique, a study by Amália and Cossa (2015) revealed that educators protested concerning the length of syllabuses in biology and chemistry and proposed a comprehensive analysis whether the Ministry of Education requires them to do laboratory work as seen in the syllabus. Across most of their schools, teachers indicated that the lack of well-equipped labs was a great challenge for them to do experimental work of any sort in their classrooms. This revelation is important in understanding how coverage of biology syllabus could be achieved via practical lessons. It can be implying that when teachers fail to conduct practical lessons there shall be no coverage of the intended syllabus. The study by Amália and Cossa (2015) did not determine influence of instructional allocation on effective coverage of syllabus. That is precisely the aim of the present study.

### **2.4.2. Workload and Coverage of Biology Syllabus**

In United Kingdom, a report by Dickens (2017) revealed that On average, teachers work 54.4 hours a week, about 11 hours a day. In fact, senior high school administrators worked 62-hour shifts, equivalent to 12.4 hours a day. Dickens (2017) further reports that a third of part-time teachers noted that 40% of their overall classroom time was outside of school hours. It was also disclosed that teachers and head teachers struggle on a regular basis with unrealistic requests for workloads, and that much of their time is expended on tasks that are either needless or that could be carried out by workers rather than teachers. It can be construed that unsustainable work load may hinder a teacher from fully covering the prescribed syllabus because a lot of instruction period is devoted on activities which are of least importance. The report by Dickens (2017) did not investigate influence of teachers' workload on effective coverage of Biology syllabus, which present study endeavors to examine.

### **2.4.3. Teachers' Absenteeism and Coverage of Biology Syllabus**

The secret to raising student achievement is to optimize instructional time. Teacher absenteeism and the use of replacement teachers have long been issues faced by every classroom, reducing educational time (Riddile, 2014). The presence of students in learning institutions and the influence that chronic learner absence has on student achievement have gained a great deal of coverage. Parents can face criminal charges in certain cases if their children miss a particular number of school days (Taylor, 2014). The same emphasis, however, should be on the participation of instructors who also are responsible for educating these students (Finlayson, 2009). When instructors are absent from teaching, students may not be able to cover the syllabus.

In lower income schools, teacher absenteeism has been shown to be more widespread. Clotfelter and Ladd (2007) observed in a report conducted at Duke University in 2007 that schools with lower socio-economic and marginal learners have had greater instructor absentee rates and lower pupil test scores. Comparably, the investigators found that tutors in North Carolina 's poorest schools have an average of one additional sick day a year relative to affluent schools. It implies that teachers' absenteeism from school leads to wastage of instruction time in make-up classes leading to lack of coverage of prescribed syllabus objectives. Nonetheless, Clotfelter and Ladd (2007) in their research did not show influence of teaches' absenteeism on effective coverage of Biology syllabus. This therefore was being the attention of the current survey.

A report by Branley (2016) reveals that every year, Australia losses hundreds of teaching professionals because the work shortages. This is attributed to their inability to complete their study. Figures collected from the Board of Research , Teaching and Educational Standards of New South Wales reveal that 521 trainee teachers struggled to meet the criteria of a new national accreditation scheme in 2015, primarily because they were unable to find adequate employment over a span of three to five years. Perennial absenteeism of tutors in schools may hinder effective coverage of Biology syllabus since students are unable to continue learning in the absence of teachers. The study by Branley (2016) did not determine the influence of teachers' absenteeism on effective coverage of Biology syllabus, which the present study endeavors to find out.

In Pretoria, South Africa, it was reported by Ndaba (2017) that Many as 30,000 teachers have reportedly been away from work since the beginning of 2017 in all of Gauteng 's 15 district schools. More surprising, though, is that of the 31731 delinquent teachers, 110 of whom were missing from January until May without leave. Furthermore, the study

reveals that teachers operate under tremendous managerial strain, in particular the marking of scripts, while facing constant appraisal that contributes them to burn out. Prolonged teacher non-attendance can result in inadequate coverage of the academic syllabus. Ndaba (2017) did not to determine the influence of teachers' absenteeism on effective coverage of Biology syllabus, which the present study seeks to examine.

According to Clotfelter and Ladd (2007) Instructor absence is also a issue in developed countries, where absence rates in Kenya and India have been found to range from 20 to 44 percent. The finding of the research illustrated a sound inference, maintained by statistical evidence, indicating that learners whose tutors takes extra days off of work have problems of effective coverage of syllabus. It can be inferred therefore that that teacher's absenteeism may have a negative influence on time of coverage of Biology syllabus. This is because teachers use the available instruction time in making up of the lost instruction time. The study by Clotfelter and Ladd (2007) did not show the influence of teaches absenteeism on effective coverage of Biology syllabus, which the present study attempt to investigate.

According to Kenya GPE Secretariat (2017), instructor absenteeism in Kenya has been an growing problem and that up to 20% teacher absenteeism occur due to the fact that they miss classes because of Sickness, a crisis in the home or for government work other than instruction. The effect remains the same, though, in that their students neglect their schooling. Teachers spend more time going back to uncovered material with limited time thus influencing time of coverage of topics to be studied later in the term. Kenya GPE Secretariat (2017) did not focus on the influence of teachers' absenteeism on effective coverage of Biology syllabus, which this present study strives to investigate.

According to Njaramba (2017), in Kenya, The implementation of tough laws to curtail teacher absenteeism was long overdue and the exclusion of teachers from private and business classes was a persistent issue in public schools, upsetting school authorities, parents and education officials. Njaramba (2017) further asserts that the attempt by the Teacher Service Commission (TSC) to optimize teaching will expectantly Reduce situations in which students take national exams prior to completing the syllabus. Learners are therefore not able to study without the proper guidance from a teacher which could influence time of coverage of Biology syllabus. The study by Njaramba (2017) did not revealed the influence of teachers' absenteeism on effective coverage of Biology syllabus, which this present study attempts to examine.

#### **2.4.4 Teacher Transfer**

Regular educator transitions interrupt instruction and obstruct strong syllabus coverage (Noor, Ishaque, Lodhi, & Memon, 2012). Wekesa, Simatwa and Okwach (2016) accept that the shortage of transition instructors leads greatly to the low success of the student as the syllabus is not covered adequately.

Gatemi and Thinguri (2018) report that transfers may be optional or compulsory and they can cause shortages in either situation. Temporary steps that include novice or low-skilled teachers could be put in place. In addition, other teachers present are assigned to work overburdening them and often classes are merged, and both of these steps impair the syllabus coverage.

Noor, Ishaque, Lodhi (2012) states that the repeated movements of teachers that contribute to the success of weak students in their academics are a challenge to schooling in our schools. In addition, instructor availability means that the syllabus is well covered. In order to take advantage of social services available, the majority of teachers chose to

work in cities and their peripheral and reasonably motivated areas (Mutegi, 2014). This then needs several transition applications, and this is often achieved in the middle of a school term. It takes time to substitute teachers, so transitions from one school to another repeatedly leave students unattended for a while.

#### **2.4.5 Knowledge of Subject Matter**

A classroom teacher's subject matter expertise is important and highly crucial. In this new world, the effectiveness of teaching related to the qualifications and abilities of educators has been debated at different stages of education. Barry (2010) noted that the efficacy of teaching requires several teaching preparation practices, teaching methods and teaching tools in the learning phase of students. It is assumed that constructive teaching strategies can not only boost the cognitive ability of the pupil, but also influence their learning perception. Student perceptions towards schooling are one of the most critical outcomes (Seidel & Shavelson, 2007).

Intellectual resources and arrangements for teachers largely decide their ability to involve the minds and hearts of students in the learning process. The study of subject matter is assumed to provide the teacher with an appreciation of the content he or she is teaching (Anderson, 1988). The understanding of the teacher's subject matter can be shaped by the behaviors and aspirations their students carry to the classroom. The comprehension of subject matter by instructors influences their ability to simplify material to help students understand the subject matter. Jadama (2014) suggests that a teacher who is incompetent or uninformed about subject matter will pass on correct ideas to students, uncritically use messages, and even change them improperly. He also claims that it would be exceedingly difficult for a teacher to answer different questions from students about a subject if the teacher has no understanding of it. Understanding the



subject of a discipline helps teachers to prepare their lessons and determine their assignments as well.

#### **2.4.6 Teachers' Experience**

The experience of teachers applies to the amount of years a teacher has served in a school as a teacher. Several studies indicate a strong correlation between teacher experience and student achievement (Wayne & Youngs, 2003). Acquiring more years of experience in the first five years of a teacher's career appears to be more closely linked to successful teaching (Rice, 2003). In addition, in another study, Rockoff (2004) showed that teacher experience was positively linked to student mathematics achievement by comparing teacher productivity (understood as value-added) with student test scores in reading and mathematics; however, after teachers had acquired two years of teaching experience, those favorable associations levelled off.

According to Kini and Podolsky (2016) teaching experience during a teacher's career is favorably correlated with student performance gains. Experience-related teacher productivity increases are more prominent in the initial years of teachers but appear to be significant as teachers hit the second, and sometimes third, decades of their careers. Not only do their students learn more as teachers gain expertise, as measured by standardized assessments, they are much more likely to do well on other successful steps, such as school attendance.

#### **2.5. Availability of Instructional Resources and Coverage of Biology Syllabus**

Literature related to availability of instructional resources were duly reviewed and presented. The key variables reviewed include science laboratory, textbooks, ICT resources, library resource.

### **2.5.1. Availability of Science Laboratory and Coverage of Biology Syllabus**

Udo (2010) reports that the importance on science instruction and learning is on understanding that instructors are not only able to teach the method of science, but also to apply scientific concepts to the learners' sensory experience. Moreover, laboratory is an integral aspect of teaching science, as has been noted, and without practical skills, no effective education system can exist. The researcher, Udo (2010), further argued that Laboratory activities rely on the level of the laboratory's equipment with appropriate educational materials and the teacher's ability to use them efficiently and effectively. It can be inferred that lack of such instructional materials in science laboratories may hinder learners from acquiring set of learning activities. Time spent by teachers looking for alternative resources influences the time of coverage of Biology syllabus may be affected. The study by Udo (2010) did not demonstrate influence of laboratory resources on effective coverage of Biology syllabus which the present study seek to investigate.

According to Katcha and Wushishi (2015), there is a substantial difference between the output of biology learners exposed to adequately equipped laboratories and those subjected to insufficiently equipped laboratories. The disparity was in support of those who were subjected to properly equipped laboratories. It can be inferred that lack of vital laboratory resources for given topics will deny learners skills prescribed in the syllabus. This may influence their understanding of subsequent topics. This may further influence time of coverage of syllabus. The study by Katcha and Wushishi (2015), never delved on the influence of availability of laboratory resources on time of coverage of Biology syllabus.

In Nigeria a study by Musah and Umar (2017) on the impacts of the accessibility and use of biology laboratory amenities and the academic achievement of high school learners in

Yobe State have shown that laboratory facilities are either not fully accessible or insufficient therefore not used by the huge group of learners in the populace. In view of this revelation, it can be inferred that inadequacy of laboratory resources, prompt teachers to skip the practical lessons which then compromises achievement of intended learning outcomes of a given topic. The study by Musah and Umar (2017) did not investigate effect of accessibility and application of Biology laboratory resources on effective coverage of Biology Syllabus.

Ngozi and Halima (2015) performed a research on the accessibility and application of laboratory facilities. The study revealed that the provision and usage of laboratory equipment in senior high schools is insufficient at Zaria metropolis of Kaduna State. They further revealed that insufficient laboratory equipment impact effective school learning and teaching and impede academic success in schools. When laboratory resources are lacking, attainment of what is prescribed in the syllabus may not be easy. The Northeast Texas Network Consortium (2002) supports this view, stating that Syllabus is a comprehensive overview of the course with topics to be discussed, mandatory reading and completion dates. The research by Ngozi and Halima (2015) did not examine the effect of availability and application of Biology laboratory facilities on effective coverage of Biology syllabus, thus requiring the present study to investigate.

Chirimi (2016) observed that issues that influence syllabus coverage comprise of the unavailability of teaching and learning resources, including the absence of equipment for practice laboratories. The other perceived scenario, however, was the inability of academic teachers to divide the workload amongst science subjects-teachers because of few biology teachers. Therefore, that lack of laboratory equipment may retard the manner in which teaching and learning of certain topics may be achieved hence

influencing effective coverage of Biology syllabus. The study by Chirimi (2016) did not show how utilization of laboratory resources influences on effective coverage of Biology syllabus. The present study therefore seek to fill this gap.

Some schools in Lesotho doesn't have fitted science laboratories and this has a detrimental effect on biological results (Mamalanga & Awelani, 2014). On the other hand, effective coverage of intended syllabus will be disadvantaged due to inadequacies of these physical resources. It can be inferred that effective coverage of syllabus can be achieved when there is a clear interaction between teachers, students and adequate learning resources. The study by Mamalanga and Awelani (2014) did not show the influence of utilization of laboratory resources on effective coverage of Biology syllabus which this study try to find out.

A research by Rutto and Kapingei (2014) in Kenya indicated that during science lessons, learners are less exposed to practical work. On the other hand, In Ghana, for example, numerous teachers have not performed much more than rudimentary reiteration of theoretical work that is a prerequisite for evaluations on any occasion (Perry, 2015).

In general, there must be adequate physical infrastructure for schools to run as planned, allowing the transition process to occur easily. The equipped science laboratory, classes and the library include material resources. Biology is presumed to be mastered effectively by engaging students, but this is accomplished by allowing learners to practice on their own.

### **2.5.2. Utilization of Textbooks and Coverage of Biology Syllabus**

The elements of the educational process are teachers, teaching materials, classrooms, desks, and pupils. A research by Ngala, Sang and Odebero (2005) on tutor utilization and

its effect on learners' academic performance showed that the association of these inputs in the education system translates into effective teaching and learning. It can be inferred that when textbooks are not properly utilized, time of coverage of Biology syllabus may be affected. The study by Ngala, Sang and Odebero (2005) did not show the influence of utilization of instructional resources on effective coverage of Biology syllabus which the present study seeks to investigate.

In Mbeere South, Embu County, Kenya, a study by Mucai (2013) on the accessibility and use of learning resources to influence the output of students in secondary schools showed that the textbooks were not adequate, nevertheless there was no insufficient supply as a textbook could be shared by a huge number of learners in all school categories. Nevertheless, the lack of textbooks affected schooling in mixed day schools in particular. The shortage of libraries and insufficient learning resources has impeded the use of library facilities. Syllabus coverage is a function of availability of instructional resources. It can be inferred that insufficiency of instructional resources such as textbooks could influence the way content and other learning activities is delivered by teachers thereby influencing effective coverage of the syllabus. The study by Mucai (2013) did not show the influence of instructional resources on effective coverage of Biology syllabus. This therefore prompted this present study.

Sigilai (2013) concludes that effective curriculum implementation factors such as adequate teachers and physical facilities aid in achieving better learning outcomes. The researcher in addition recommended that the Practical work should be done either in laboratories or in classrooms by individual learner. It can be inferred that practical experience is more essential at school level, since it allows learners to do so by doing. Therefore, lack of these resources may adversely influence effective coverage of a

syllabus. The study by Sigilai (2013) did not examine the influence of availability of instructional resources on effective coverage of Biology syllabus which is the emphasis of the current research. Similarly Makori and Onderi (2014) reported that Shortage of textbooks has been correlated with problems of syllabus coverage because it has a negative effect on the process of instruction and similarly influences the extent and rate of homework teacher's offer to learners.

### **2.5.3. Utilization of ICT Resources and Coverage of Biology Syllabus**

Beukes-Amiss and Chiware (2006) aver that today's technology used in schools varies from basic tool-based tools such as word processors to online science data repositories. Others include primary ancient documents, personal computers, closed-circuit television channels and classrooms with two-way online learning.

In Slovenia, Šorgo, Verčkovnik and Slavko (2010) assert that at least at the fundamental level, biology teachers know how to use computers and use them at least regularly. In addition, the researchers maintained that schools are typically well equipped with computers for computer science and informatics instruction, but not for biology teaching. Teachers are not reported to use ICT because of the overloaded curriculum, lack of equipment and insufficient preparation. It can be inferred therefore that inability of teachers to use ICT in teaching make learners to continuing with subsequent topics without having clear grasp of previous concepts which ICT could have provide better method of comprehension. The study by Šorgo, *et al* (2010) did not investigate the influence of teachers' use of ICT resource on effective coverage of Biology Syllabus, thus necessitating the present research to investigate.

Senthilkumar, Sivapragasam and Senthamaraikannan (2014) affirm that because of the simple comprehension and attractive experience for the students, the use of ICT is the

best way to transmit the data to the students in biology. ICT is thought to simplify the teaching section as a visual presentation. Senthilkumar, *et al.*, (2014) further maintains that 80% of learning is achieved through visual aids. Therefore, the student teachers could easily understand the visual presentations of the relevant subject. It would be more beneficial for student teachers to learn how to incorporate ICT into their classroom teaching. It can be construed that ICT use may assist learners understand concepts that might have been difficult and time consuming. However, Senthilkumar, *et al.*, (2014) did not show influence of teachers' integration of ICT classroom instruction on effective coverage of Biology Syllabus. This revelation therefore necessitated the present study.

Technology enables tutors in biology in simulations of the blood circulatory system, hence educators become more imaginative in customizing their own content (Hinostroza, Guzmán, & Isaacs, 2012). It is clear that time of syllabus coverage may be effectively enhanced when students are involved in the creation of meaningful materials as part of a learning activity, the development of practical resources is a means of making learning more interesting for learners. It implies that using ICT during instruction encourages student's creativity and participation which will not be possible in its absence. The study by Hinostroza, Guzmán and Isaacs (2012) did not delve into the influence of integration of ICT Resource on effective coverage of Biology syllabus. The centrality of the present study rests on determining the influence of teachers' ICT integration on time of coverage of biology syllabus.

In summary, Rafid and Rahimullah (2015) also argue that academic researchers are concerned in how technical instruments can boost the quality of school learning and teaching. Rafid and Rahimullah (2015) further points out that ICT tools help learners to achieve better outcomes especially through effective coverage of syllabus. The above

study did not demonstrate influence of ICT tools on effective coverage of Biology syllabus which the present study seek to reveal.

Akram, Sufiana and Malik (2012 ) carried a study to compare the views of public and private biology teachers on the use of audio-visual support in biology teaching in Pakistan at secondary school level. They noted that biology teachers in secondary schools understand the value of using audio visual aids in biology teaching. The results, nevertheless, showed that public sector teachers were more familiar with the importance of using audio visual aids for biology teaching than teachers in the private sector. Audio-visual aids enhance teaching pace while ensuring student participation during learning (Garzón, 2013). The study by Akram, Sufiana and Malik (2012) did not determine the influence of use of audio-visual resources on effective coverage of Biology syllabus, which the present study seeks to unravel.

The use of ICTs is rising and growing rapidly in Nigeria and African countries in general. Nevertheless, although there is a significant amount of awareness on the use of ICTs in developed countries, there is not much research about the implementation of ICTs into schools in developing countries. The study by Beukes-Amiss and Chiware (2006) did not inquired into the influence of utilization of ICT Resources on time of coverage of Biology syllabus. The present study seek to determine influence of availability of ICT resources and time of coverage of Biology syllabus.

In Nigeria, most private secondary school teachers have access to ICT resources. Research conducted by Adeyinka, Adedeji, Majekodunmi, Adika and Adeyinka (2010) on teachers' uses of ICTs among private secondary school disclosed that in their different schools, teachers normally have access to ICTs excluding e-mail and the Internet since their school systems are not interconnected. Adeyinka *et al* (2010)



maintain that there is a shortage of technological support in schools and teacher's shortage the expertise to use ICT. The researchers noted that this problem impedes the preparation and trust of teachers in the use of ICTs during lesson. Therefore, it can be inferred that when teachers lack proficiency in using ICTresources, therefore some topics which can only be taught using ICT tools remain uncovered.The study by Adeyinka, *et al.* (2010) did not investigate the influence of availability of ICT resources on effective coverage of Biology syllabus which the present study seek to unearth.

In Anambra State, the situation is different in public secondary school regarding availability of ICT resources. A research by Nwana (2012) on Problems faced by high school educators in integrating e-learning documented that e-learning materials such as online, e-mail services, interactive television, interactive computers and digital libraries are acutely missing. It was also discovered that the few available machines, such as scanners, offline / ordinary computers, printers and ready-made courseware, are not used because teachers lack computer application of skills and knowledge. The telephone is the only device known as usable and in operation. It can be inferred that benefits that accrue as a result of using ICT during teaching may diminish time of coverage of biology syllabus as teachers spend time using traditional teaching aids during learning. The research by Nwana (2012) did not determine influence of availability of ICT resources on effective coverage of Biology syllabus which is the focal point of the present study.

In Kenya, syllabus coverage has been influenced by several factors. Wakori (2014) found out that in Kirinyaga west district, teaching and learning materials such as teaching aids were not adequate. Wakori (2014) further revealed that there was no comprehensive coverage of the syllabus and the lack of ability of the school governing board was a significant obstacle. Teaching aids may play a vital role in time of coverage

of syllabus. It is also obvious that coverage of the syllabus must go hand in hand with the use of materials for teaching and learning. Some subjects, such as science , especially biology, require a realistic approach which could only be achieved with sufficient materials. The study by Wakori (2014) did not show the influence of teaching aids on effective coverage of biology syllabus. The present study seeks to fill this gap.

According to Bitok (2012) the accessibility of infrastructure in information communication and technology does have a major influence on biology learning and teaching. Bitok (2012) further argues that technology makes it likely for learning to take place anywhere at any time, not just in one specific place. Via immersive simulations and diagrams, ICTs also include learning in depth. They also encourage collaboration; by using computer resources such as electronic mail, students may work together on projects with those who may not be physically near. It can be inferred from this finding that the pace of syllabus coverage using ICT tools may increase allowing students to interact with the prescribed content on time and consequently enabling teachers to prepare adequately for teaching and learning. Bitok (2012) did not show the on influence of use of ICT resources on time of coverage of Biology syllabus. The present study therefore strives to provide specifics on impact of use of ICT materials on effective coverage of Biology syllabus.

In Kisumu County, Ochieng's (2013) research on the elements of incorporation of information and communication technology in science teaching in public high schools in Kisumu East district found that most science educators were not well equipped with ICT skills and knowledge, restricting their capacity to incorporate ICT in their lessons. Ochieng' (2013) further avers that on the frequency of use to deliver lessons, it was established that Science teachers rarely use ICT to deliver their lessons. It can be

deduced that lack of use of ICT by teachers may reduce their ability to integrate new dimension of concept delivery during teaching. The study by Ochieng' (2013) did not examine the influence of lack of utilization of ICT resources on effective coverage of Biology Syllabus which the present study seeks to achieve.

A study by Mbugua, Gori and Tanui (2015) on the incorporation of information communication technology in instruction in public high schools in Nakuru County in Nakuru County disclosed in Nakuru County that ICT facilities were insufficient as well as that tutors had barely fundamental or no ICT skills. Some of the difficulties faced by teachers in incorporating ICT into teaching have been financial constraints and lack of facilities and equipment. It can be inferred that lack of ICT integration in teaching may hinder exposure of students to contents that can be understood using ICT tools such as topic of genetics. The study by Mbugua, Gori and Tanui (2015) researchers did not investigate influence of use of ICT resources on effective coverage of Biology syllabus which is the purpose of the present study.

Atieno's (2017) research on classroom instruction that hinder the effective integration of information communication and technology in biology education in high schools in Migori County disclosed that teachers and students did not use ICT. It also found out that teachers were ICT illiterate, Limited ICT infrastructure, insufficient resources and a lack of a streamlined ICT usage guide have been reported. ICT will alter the speed of classes, and learners in modern society need to cultivate adequate capacity and skills to take full advantage of the new opportunities provided by ICT. It can be inferred that lack of ICT integration in teaching could hinder learners understanding of complex topics which such technology is equipped to solve. The study by Atieno (2017) did not focus on effect of

integration of Information Communication and Technology on effective coverage of Biology Syllabus, which the present study seeks to unravel.

Muyaka (2012), states that the benefits of ICT integration don't just stop with the learners. For an instructor, it improves different items, including but not limited to more motivated students, better job information and input, team teaching, extended student time, more leadership positions and an emphasis on learning experiences. It also motivates kids, it offers new teaching opportunities at home, more earning capacity, and personalized career development strategies.

#### **2.5.4. Library Resource and Effective Syllabus Coverage**

Worldwide, a solid, sufficiently staffed, resourced and supported library program can contribute to higher student performance (Crawford, 2015). Wimolsittichai (2017) performed a research on the views of principals of public primary school libraries, library features and efficacy, this study found that limited public primary school libraries in general lack funding for their physical facilities, collections as well as employees. The study recommends the need for efficient administration, adequate resources and ample physical infrastructure for libraries to address library limitations.

Ayenigbara and Seidu (2017) make it apparent that a library should be new and have older materials at the same time. He suggested that a well-equipped library has a substantial potential to improve good learning and meet the standards of secondary school education. The secondary school library helps learners to do their assignments, particularly those who require extra assistance beyond the hours in school.

Adeyemi (2010), notes that the creation of library services in high schools in Ekiti State has been at a minimal level. The results also led the investigator to suggest that there was

a difference amongst the usage of library services in schools and the learning results of students in schools.

Mahwasane (2017 ) reports that the library is the bedrock of all academic institutions, providing a broad variety of information materials and the correct type of data resources that empowers educational institutions to generate highly resourceful people to gradually impact national development. In this sense, students would be encouraged to build the habit of doing their schoolwork at school during the day rather than studying at home at night.

Chipana (2018) explored the impact of the use of library services on the learners' academic accomplishment in public schools in the municipality of Dodoma. The results showed that the position of the few prevailing school libraries was not adequate to enable successful student learning because the situation of the school libraries was deficient in terms of space for the library users to place the books and space. The results further showed that students most often used school libraries to acquire knowledge by lending and using books for private research. Insufficient tables and chairs, lack of present and up to date reading materials and lack of skilled librarians were the issues that affect school libraries.

In Kenya, Muendo (2016) carried out a study in the Kibauni division to determine the influence of the school infrastructure environment on the academic performance of the Kenya secondary education certificate for learners. From the study findings it was seen that secondary schools in Kibauni division do not have sufficient physical facilities. Such physical facility includes 74 classrooms, laboratories, dormitories, library, desks, washrooms and other devices that adversely contribute to success.

## **2.6. Time Management and Coverage of Biology Syllabus**

Time management is described as a cluster of sets of psychosocial abilities that are essential in an institution. Moreover, time management capabilities include tasks carried out by academic and non-academic workers, such as advance planning, scheduling of seminars, and prioritization. Effective time management in an organization has a positive effect on an employee's productivity (Eid, Safan, & Diab, 2015).

It is possible to consider time as a resource and as such, the average time spent in children's education is frequently discussed in the educational process as a separate and central resource (Baker, Fabrega, Galindo, & Mishook, 2004). Time is a resource affecting all aspects of human endeavors. It is a resource that is highly restricted in supply and affects all stakeholders in the education sector-students, administrators and supervisors and teachers (Kayode & Ayodele, 2015).

According to Ekundayo, Konwea and Yusuf (2010), there are now abundant cases in which teachers speak of a lack of time to do such tasks they may have done. A good teacher must use his or her time wisely to provide time with what they want to do. Abdinoor (2012), reports that laxity of teachers in class attendance is typical in poor performing schools. The researcher additionally notes that in such classrooms, persistent teacher absenteeism was rampant, as teachers were similarly de-motivated to use their teaching time effectively. They lagged behind the coverage of the syllabus, a condition that created tension and fear of failing examinations amongst students.

The influence of teacher time management is explicitly linked to student effectiveness, instructors at public secondary schools are intelligently and actively planning then they may be able to generate more knowledgeable minds for the nation's future development in the future. The important relationship between the time management of teachers and

the academic achievement of students was reported (Sahito, Khawaja, Panhwar, Siddiqui, & Saeed, 2016).

Furthermore, Wahab and Oshinyadi (2017) observe that for a long time, many school leaders and supervisors have failed to accept time as a valuable opportunity for education. Time is, therefore, a rather significant educational opportunity. Each practice in school is driven by time. Educational executives spend a lot of time planning, organizing controls, holding meetings and communicating every day. Time management skills must be implemented in order to handle and monitor the classroom efficiently.

Marcella (2017) reports that the coverage of the syllabus in Kenya's schools varies to a substantial degree on how tutors handle the teaching time allotted by the Ministry of Education for various subjects in the curriculum. Nevertheless, the use of school time has become a public issue in Kenya. Teachers argue that the syllabus is overloaded; that it will encourage them to teach, engage with learners more and complete the syllabus by adding more in school.

Marcella (2017) further reports that there is a condition in which some of Kenya's secondary schools complete their syllabus in the second term, while others barely complete their syllabus before the third term. Does the teaching time allotted by the Ministry of Education mean that it is insufficient?

Manaseh (2016) analyzed the teaching management methods of secondary school heads to strengthen teaching in the classroom and learning for students. The results revealed that the training program was not adequately handled because the heads of departments did not share in the coordination of the curriculum; syllabi were not covered on schedule.

## **2.7. Theoretical Framework**

### **2.7.1. Curriculum Implementation Theory**

This study was guided by the curriculum implementation theory advocated by Gross, Guacuinta and Berstein (1971). This theory posits that the implementation of any educational programme encompasses availability of facilities, teachers' capability, management support and compatibility with organizational arrangement and clarity of the implementer of what is to be done. This theory was used to guide the study, because the factors that Gross, Guacuinta and Berstein (1971) propounded are also relevant in the implementation of Biology syllabus. This theory advocate four major elements that influence curriculum implementation: clarity of the innovation to implementers, capability of the implementers (teachers), availability of resources and provision of management support. It can be argued that clarity of innovation to the implementer necessitates teachers to be aware of changes in the curriculum. In addition, resources meant for the new curriculum or existing curriculum should be available. Furthermore, competence of the implementer must be trained to be in a position to dispense the curriculum. Finally, principals and head of departments must be involved in the entire process of curriculum implementation, which is in this case, effective coverage of Biology syllabus.

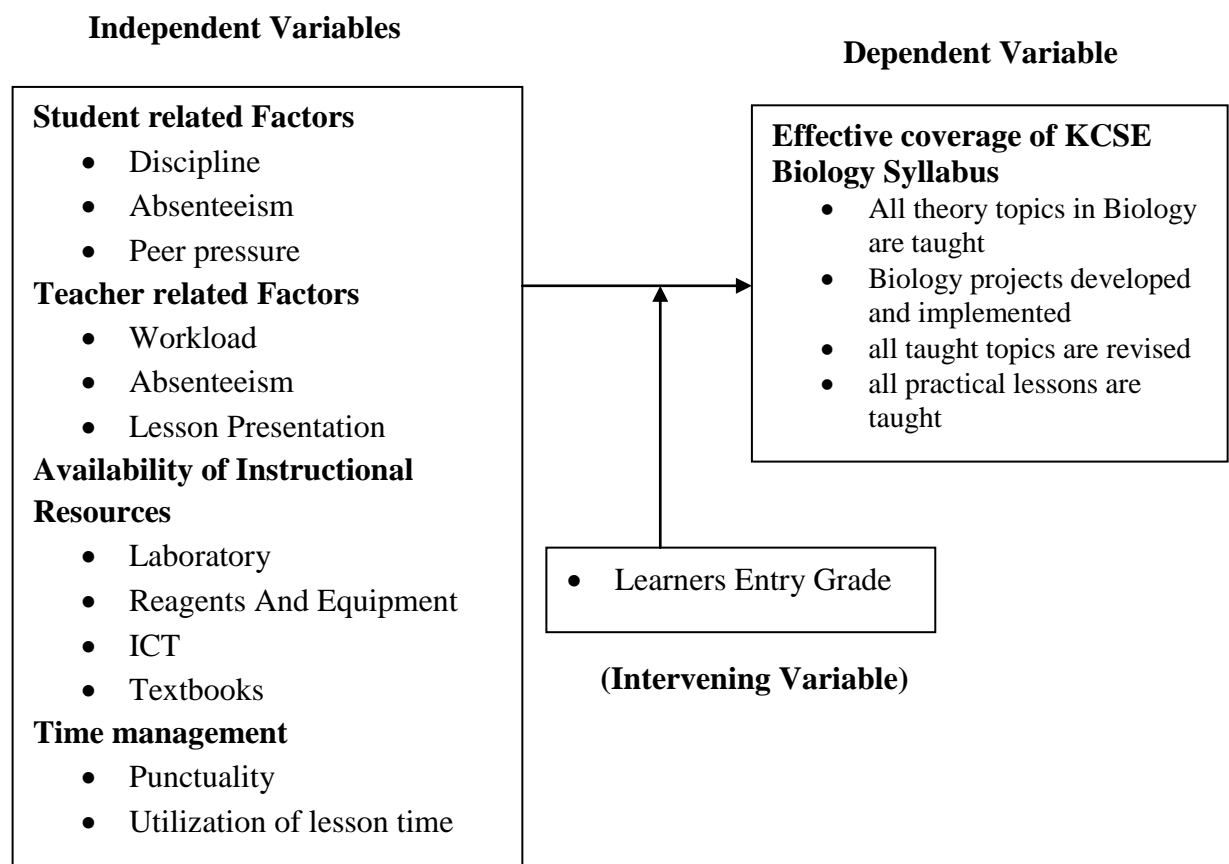
Obasi (2014 ) indicated that Gross, Guacuinta and Berstein (1971) highlighted the importance of viewing organizational innovation execution not as a case, but as a mechanism requiring an interrelated collection of requirements that can change over time, such as the adoption or clarification of a plan for change. The strengths of this theory rest in the provision of a conceptual foundation of implementation of a curriculum. However, this theory has a weakness in that it omitted learners who ought to



be the focus in the implementation process of a curriculum. The present study will overcome the Limitation by providing data on the role of learners on effective syllabus coverage.

## 2.8. Conceptual Framework

A conceptual framework is a methodical tool used to make conceptual distinctions and establish ideas. Figure 1 illustrates the relationship between independent, intervening and dependent variables of the study.



**Figure 1: Conceptual Framework on Selected Factors on Effective Coverage of Biology Syllabus**

Figure 1 illustrates the conceptual framework that the study adopted. The framework shows the relationship between independent, dependent and intervening variable. The student-based factors comprise discipline, absenteeism and peer influence. Secondly, the

teacher-based factors that comprise workload, absenteeism, knowledge of subject matter and transfer. Thirdly, instructional resources include ICT resources, laboratory and equipment, textbooks and teaching aids. Finally, time management includes punctuality, effective lesson time utilization. The indicators of dependent variable include: all theory topics in Biology are taught, Biology projects developed and implemented, all taught topics are revised, and all practical lessons are taught.

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1. Introduction**

This section describes procedures that were used in obtaining data from the field. It includes research design, location of study, target population, sampling procedures, sample size, research instruments, pilot study, reliability and validity of research instruments, data collection procedure, and data analysis.

#### **3.2. Research Design**

Kumar (2011 ) notes that a research design is a methodological plan that researchers follow to respond critically, correctly, economically and validly to questions. Asamoah (2014 ) notes that the design of correlational research is a form of method of quantitative science within the framework of positivism. It requires describing phenomena by the compilation of numerical (quantitative) data evaluated using techniques focused on statistical methods. It is also known as associational research, in which relationships between two or more variables are studied without attempting to affect them. This study adopted correlation research design. This design is appropriate when testing the influence of independent variables on dependent variable. The independent variables include student as well as teacher related factors, availability of instructional resources and time management factors while the dependent variable is the effective coverage of syllabus.

#### **3.3. Location of Study**

The study was carried out in Secondary Schools in Rongai Sub-County. Rongai Sub County is one of nine Sub counties in Nakuru County. It consists of five wards namely Menengai west, Soin, Visoi, Mosop and Solai. It is estimated that the current population

is 130,132 people covering an area of 1,049.10 Sq. Km (KNBS, 2010). Rongai Sub-County has four divisions namely Kampi ya Moto, Ngata, Rongai and Solai where the target schools are based. Rongai Sub-County lies within a Latitude of 0° 10' 23.99" N and a Longitude of 35° 51' 49.75" E. This Sub-County was chosen because there are schools which do well while others do poorly consistently and therefore the researcher will be able to draw comparison as regards to effective coverage of Biology syllabus.

### 3.4. Population of the Study

The target population for a survey, according to Lavrakas (2011), is the entire set of elements for which the survey data can be used to draw conclusions. Moreover, the target population therefore defines those units for which the results of the survey are intended to be generalized. The target population of this study comprised 151 Biology teachers, 60 principals and 120 form four class secretaries in Rongai sub-County (SCDE, 2017). Teachers were targeted in this study because they implement the Biology syllabus through classroom instruction and evaluation of students. Head teachers were chosen because they supervise curriculum implementation. While form four class secretaries were chosen because they participate in keeping records of class management.

**Table 3: Target Population**

<b>Zone</b>	<b>No of schools</b>	<b>Principals</b>	<b>No. of Biology Teacher</b>	<b>No. of form four class secretaries</b>
Kampi ya Moto	10	10	25	22
Ngata	18	18	47	26
Rongai	18	18	44	43
Solai	14	14	35	29
<b>Total</b>	<b>60</b>	<b>60</b>	<b>151</b>	<b>120</b>

**Source: SCDE (2017)**

### **3.5. Sampling Procedure and Sample Size**

#### **3.5.1 Sampling Procedure**

Fielding et al., (2012) maintains that sampling is a mechanism or method of selecting a sub-group from a population to take part in the research. It is the practice of choosing a number of participants for a sample in such a way that the selected individuals reflect the large population from which they were chosen. This study adopted census method in order to obtain the teachers and form four class secretaries. This is because the researcher wanted to get the best picture of what influences effective coverage of Biology syllabus. Finally, the Head teachers were purposively chosen to take part in the survey.

#### **3.5.2. Sample Size**

The sample size for the study was 151 Biology teachers and 120 form four student class secretaries who were picked through census method. Four Head teachers were purposively selected. Arguably, that of saturation is the most used theory for assessing sample size and evaluating its sufficiency. The idea of saturation derives from grounded theory Glaser and Strauss (1967), a qualitative methodological methodology primarily concerned with the development of empirically derived theory, which is inextricably related to theoretical sampling. According to Vasileiou et al (2018) sample size cannot be determined a priori in grounded theory as it depends on the emerging theoretical categories. Table 3 represents the sample size of the study. This implies that in qualitative data, a sample size is attained when saturation point it's attained.

**Table 4: Sample Size**

<b>Zone</b>	<b>No of schools</b>	<b>Principals</b>	<b>No of teachers</b>	<b>No of students</b>
Kampi ya Moto	10	1	25	20
Ngata	18	1	47	36
Rongai	18	1	44	36
Solai	14	1	35	28
<b>Total</b>	<b>60</b>	<b>4</b>	<b>151</b>	<b>120</b>

### **3.6. Instrumentation**

Research institutions are measuring techniques designed to collect data from research subjects on a topic of interest. Accurate and systematic data collection is critical to conducting scientific research (Karim, 2013). This study employed a questionnaire and interview schedule to collect data from the respondent.

#### **3.6.1 Questionnaire for Teachers**

When performing a research, questionnaires are a valuable choice to explore because they can be cheaper than personal interviews and easier if the sample is big and broadly distributed (Navarro-Rivera & Kosmin, 2013). Teachers' questionnaire was structured type and comprised of the Likert type with a 4-point scale. Moreover, the instrument was then divided into five sections namely; A, B, C, D and E. Section A dealt with respondents' basic information. Section B collected data concentrating on student related factors. Moreover, section C focused on teacher-related factors which were then followed by section D that collected data on availability of instructional resources. Finally, section D gathered data on effective syllabus coverage. It is worth noting that the data from teachers was quantitative.

### **3.6.2 Questionnaire for Students**

In this research, the students' questionnaire comprised of a structured 4-point Likert scale that entailed two sections A and B. Section A entailed respondents basic information while section B focused on items that was meant to analyze time management variable. This instrument collected data which was quantitative.

### **3.6.3 Interview Schedule**

Interviews are the most common format of data collection in qualitative research. Qualitative interview is a type of framework in which the practices and standards be not only recorded, but also achieved, challenged and as well as reinforced (Oakley, 1998). An interview schedule that was structured was designed and given to the principals. The interview schedule consisted five sections section namely A to F. Section A entailed respondents' basic information while section B was items that captured student related factors. Section C and D consisted of items that focused on teacher related factors and availability of instructional resources, respectively. Finally, section E and F gathered data on time management as well as effective syllabus coverage, respectively. This instrument was used to collect qualitative data.

### **3.6.4 Piloting of Study Instrument.**

A pilot project is a mini-version of a full-scale study or a test run performed in preparation for the full study. Existing literature indicates that a pilot research survey should be 10 percent of the survey expected for the larger parent study (Connelly, 2008). The pilot study was carried out in three Secondary schools which were outside the Sub-County and did not participate in the main study. This includes Ndongeri Mixed Secondary, Upper Hill Mixed and Njoro Day Secondary Schools. According to De Vellis (2003) the purpose of piloting is to investigate for any possible weaknesses in the

research instrument and to determine whether or not the instrument will enable collection of accurate data for the study. This enabled the researcher to correct the instrument appropriately.

### **3.6.5 Validity of the Research Instrument.**

Validity applies to the precision of the measurement and shows how accurately the evaluation instrument genuinely calculates the underlying effect of interest. Validity is the extent to which a measurement measures what it is intended to measure (Oladimeji, 2015). A researcher should be concerned with establishing the content validity of the instrument (Osuala, 1987). The development and evaluation method of a test instrument focuses mainly on eliminating errors in the measuring process. In this study, content validity of the instrument was determined by research supervisors from Kabarak University who read the content, look at the items and ensured that they reflect the actual content area. Validity of content refers to the degree of which the items on a questionnaire are equally descriptive of the whole domain that the questionnaire aims to assess (Salkind, 2012). Corrections were made with respect to items which were not valid.

### **3.6.6. Reliability of Research Instruments**

The precision and quality of the measurement tool is explained by the reliability of the test instrument. Reliability estimates assess the stability of measurements, the internal consistency of measurement instruments and the interrater reliability of instrument scores. According to Sauro (2015) the reliability of any measure is estimated in numerous ways. Fundamentally, reliability estimates are employed to evaluate the constancy of measure, and internal consistency. Reliability coefficients differ between



0.00 and 1.00, with higher coefficients suggesting greater degrees of research instrument reliability.

This analysis used the process of test retesting to assess the efficacy of the research tool. Reliability of test-retest refers to the degree to which test findings are stable over time. The same assessments were given on two occasions to the same people in order to assess test-retest reliability and the scores were associated. In correlating the ratings, Pearson Product Moment Correlation Coefficient was used. In this study, a coefficient value of at least to 0.7 was considered reliable (Sauro, 2015).

### 3.6.7 Test-Re-test Reliability

The following Table 5 represents test-re-test reliability statistics that was used to test external reliability of the instrument.

**Table 5: Test-Re-test reliability statistics**

<b>Variable</b>	<b>No. of Items</b>	<b>Pearson correlation <i>r</i>)</b>	<b>Decision</b>
Student Related Factors	8	0.769	Reliable
Teacher Related Factors	7	0.856	Reliable
Availability of Instructional Resources	8	0.862	Reliable
Time Management	6	0.759	Reliable
Effective coverage of KCSE syllabus	4	0.802	Reliable

From the analyzed data, it was noted that all the variables surpassed the benchmark value of a coefficient of 0.7. This indicates that the instruments were reliable. This type of reliability is a form of external reliability.

### 3.6.8 Measures of Internal Reliability

Internal reliability was measured using Cronbach's alpha test (Tavakol, & Dennick, 2011). The threshold for internal reliability is a coefficient of 0.7. The following results show the Cronbach's alpha reliability analysis. The finding is presented in Table 6.

**Table 6: Cronbach's Alpha Reliability Analysis**

<b>Variable</b>	<b>No of items</b>	<b>Cronbach Alpha</b>	<b>Decision</b>
Student related factors	7	0.70	Reliable
Teacher related factors	7	0.72	Reliable
Availability of instructional resources	8	0.70	Reliable
Time management	6	0.70	Reliable
Effective coverage of KCSE syllabus	4	0.72	Reliable

Since all the variables had a Cronbach's alpha above the 0.7, it suggested that internal consistency was observed.

### 3.7 Data Collection Procedure

The researcher obtained authorization to conduct research from the Institute of Postgraduate Studies of Kabarak University and afterwards from National Commission for Science, Technology and Innovation (NACOSTI). The researcher sought permission from the office of the County Director of Education; Nakuru County to collect data from secondary schools in Rongai sub-County. In a similar manner, approval from school principals was also sought to collect data. Subsequently, self-administered questionnaires were issued directly to the respondents and later collection was done. Once the principal gave permission for data collection both teachers and students were given separate questionnaires to be filled. Data was then collected once the questionnaires were fully filled for data analysis and presentation of results.

### **3.8 Data Analysis**

The main data generated using the questionnaires was collated, sorted, edited, classified and coded. Statistical package for social science (SPSS) version 20 was used in data processing and analysis. Data was first analyzed descriptively in form of percentages. Pearson Correlation coefficient was run to determine the existence and significance of the relationship between student related factors, teacher related factors, availability of instructional-resources, time management and effective coverage of KCSE Biology syllabus. Finally, Regression analysis was used to determine the influence of independent variables on dependent variable. Similarly, interview data was analyzed systematically by organizing the responses into themes which was then presented in prose form. Hypothesis was tested using the criteria such that when the p value is less than 0.05 alpha levels, the null hypothesis was rejected. Data was then presented in form of pie charts and tables.

**Table 7: Statistical Analyses of Variables.**

<b>Research Objective</b>	<b>Independent Variable</b>	<b>Dependent Variable</b>	<b>Statistical Tools</b>
<b>Objective 1</b>	To determine the influence of student related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.	effective coverage of KCSE Biology Syllabus	Regression analysis
<b>Objective 2</b>	To establish the influence of teacher related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya	effective coverage of KCSE Biology Syllabus	Regression analysis
<b>Objective 3</b>	To find out the influence of availability of instructional resources on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.	effective coverage of KCSE Biology Syllabus	Regression analysis
<b>Objective 4</b>	To determine the influence of time management on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.	effective coverage of KCSE Biology Syllabus	Regression analysis
<b>Objective 5</b>	To establish the predictive capacity of student related, teacher related factors, availability of instructional resources and time management on effective coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya using regression analysis.	effective coverage of KCSE Biology Syllabus	Regression analysis

**Table 8: Hypothesis Testing**

Hypotheses	Hypothesis Test	Regression Model
<b>H<sub>01</sub></b> : There is no statistically significant influence of student related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.	H <sub>0</sub> : $\beta_1 = 0$ vs H <sub>a</sub> : $\beta_1 \neq 0$ Reject H <sub>0</sub> if $p < 0.05$ , otherwise fail to reject the H <sub>0</sub>	Y = $\beta_0 + \beta_1 X_1 + \epsilon$ Where: Y = effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. $\beta_0$ = Constant (Co-efficient of intercept) $\beta_1$ = Regression co-efficient of X <sub>1</sub> . X <sub>1</sub> = student related factors $\epsilon$ = Error Term
<b>H<sub>02</sub></b> : There is no statistically significant influence of teacher related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya	H <sub>0</sub> : $\beta_2 = 0$ vs H <sub>a</sub> : $\beta_2 \neq 0$ Reject H <sub>0</sub> if $p < 0.05$ , otherwise fail to reject the H <sub>0</sub>	Y = $\beta_0 + \beta_2 X_2 + \epsilon$ Where: Y = effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. $\beta_0$ = Constant (Co-efficient of intercept) $\beta_2$ = Regression co-efficient of X <sub>2</sub> . X <sub>2</sub> = teacher related factors creation, $\epsilon$ = Error Term
<b>H<sub>03</sub></b> : There is no statistically significant influence of availability of instructional resources on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.	H <sub>0</sub> : $\beta_3 = 0$ vs H <sub>a</sub> : $\beta_3 \neq 0$ Reject H <sub>0</sub> if $p < 0.05$ , otherwise fail to reject the H <sub>0</sub>	Where: Y = effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. $\beta_0$ = Constant (Co-efficient of intercept) $\beta_3$ = Regression co-efficient of X <sub>3</sub> . X <sub>3</sub> = availability of instructional resources $\epsilon$ = Error Term
<b>H<sub>04</sub></b> : There is no statistically significant influence of time management on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.	H <sub>0</sub> : $\beta_4 = 0$ vs H <sub>a</sub> : $\beta_4 \neq 0$ Reject H <sub>0</sub> if $p < 0.05$ , otherwise fail to reject the H <sub>0</sub>	Y = effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. $\beta_0$ = Constant (Co-efficient of intercept) $\beta_4$ = Regression co-efficient of X <sub>4</sub> X <sub>4</sub> = Time management $\epsilon$ = Error Term
<b>H<sub>05</sub></b> : Among student related, teacher related factors, availability of instructional resources and time management, none has a statistically significant predictive capacity on effective coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya using regression analysis.	H <sub>0</sub> : $\beta = 0$ vs H <sub>a</sub> : $\beta_1, \beta_2, \beta_3 \text{ \& } \beta_4 \neq 0$ Reject H <sub>0</sub> if $p < 0.05$ , otherwise fail to reject the H <sub>0</sub>	Y = $\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$

### **3.9 Ethical Considerations**

According to Emory and Coopers (1991) ethical consideration are central to all parties associated with research as they influence the merits of individuals and ultimately the quality of data obtained. Informed consent and permission to participants was sought at the school level. Silverman (2011) affirms that informed consent involves getting information about the research which is related to the respondents by allowing them to make a decision about whether to participate or not. In this study, respondents were informed of their right to provide data without being coerced. It was also clarified that the respondent had a right to withdraw from participation when they felt to do so.

When the researcher is unable to distinguish the person or topic from the information given, a study participant is considered anonymous (Cohen, Manion, & Morrison, 2010). To ensure anonymity, participants were given research instruments with a serial number without indicating their names. The respondents were allowed to provide data under assurance that their information will be treated with anonymity.

Regarding allowances, the respondents were informed that the study had no stipends in terms of allowance for participating in the research. It was further explained that the willingness to participate was based on voluntary and mutual trust.

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND DISCUSSION

#### 4.1. Introduction

This chapter explores analysis and interpretation of data related to effective coverage of KCSE Biology Syllabus. It covers the response rate, respondent's basic information, and descriptive statistics. Further, inferential statistics are computed, and relevant hypothesis testing is also presented.

#### 4.2. Response Rate

The study envisioned a sample size of 151 teachers and 120 class secretaries of form 4. After administration of the instrument, a total of 137 and 106 instruments were dully filled and returned. Similarly, after administering 4 interview schedule to 4 principals, all were collected. This represented a response rate of 90.7%, 88.3% and 100% respectively, which was considered sufficient in providing adequate data. According to Fosnacht et al. (2017), it is better for a small, random sample to get a high response rate (80 percent or higher) rather than a low response rate from a broader pool of possible respondents. The return rate was therefore acceptable. Table 9 presents the response rate.

**Table 9: Response Rate**

Category	Sample size	Returned	Response Percentage
No. of Biology Teachers	151	137	90.7%
No. of form four class secretaries	120	106	88.3%
Principals	4	4	100%
<b>Total</b>	<b>275</b>	<b>243</b>	

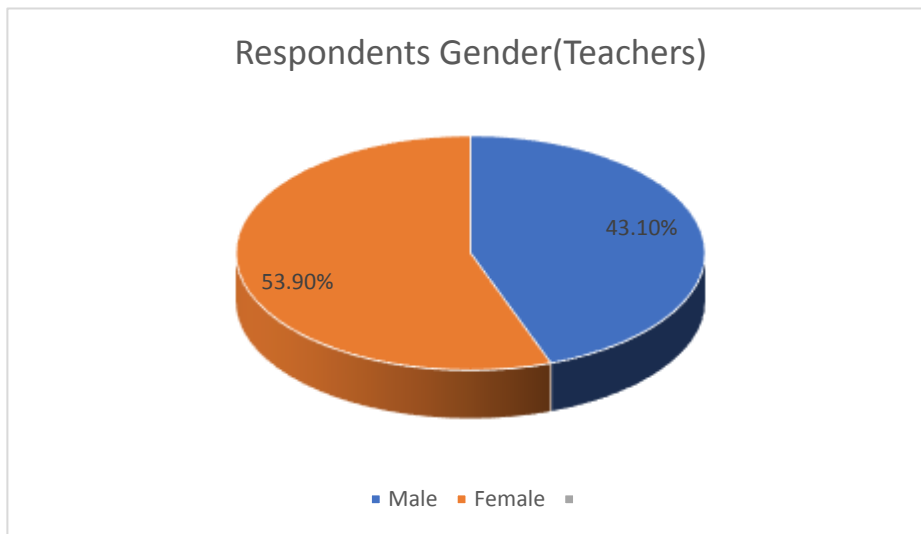
#### 4.3. General and Demographic Information

The respondents' demography which includes gender, school category, type of school (public and private) and zone was analyzed descriptively. The importance of this

demographic data is that it provides basic information which assists in explaining similarities or differences in the study variables.

#### 4.3.1 Gender of Respondents (Teachers)

The basic information of teachers concerning gender, were duly analyzed and presented subsequently in Figure 2.



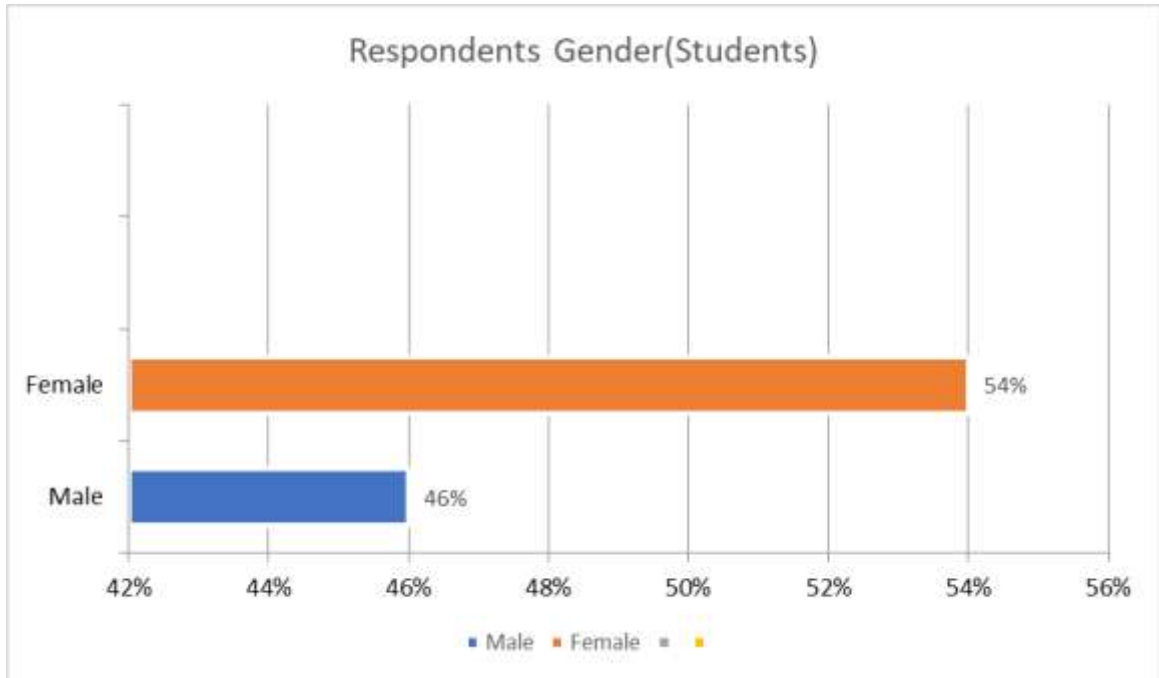
**Figure 2: Respondents Gender (Teachers)**

The data presented in figure 2 shows that female respondents were 56.9% while male respondents were 43.1% of the total sampled population. Therefore, there were more female respondents. This shows that there are more female teachers teaching of Biology subject in the location of the study. According to Tašner et al. (2017), international data for EU countries shows that women continues to (numerically) dominate primary education in most European countries. In the EU as a whole, in lower secondary education (ISCED level 2), the vast majority of teachers are still female, with less than one third being male.



### 4.3.2 Respondents Gender (Students)

The basic information of students concerning gender, were duly analyzed and presented subsequently in Figure 3.

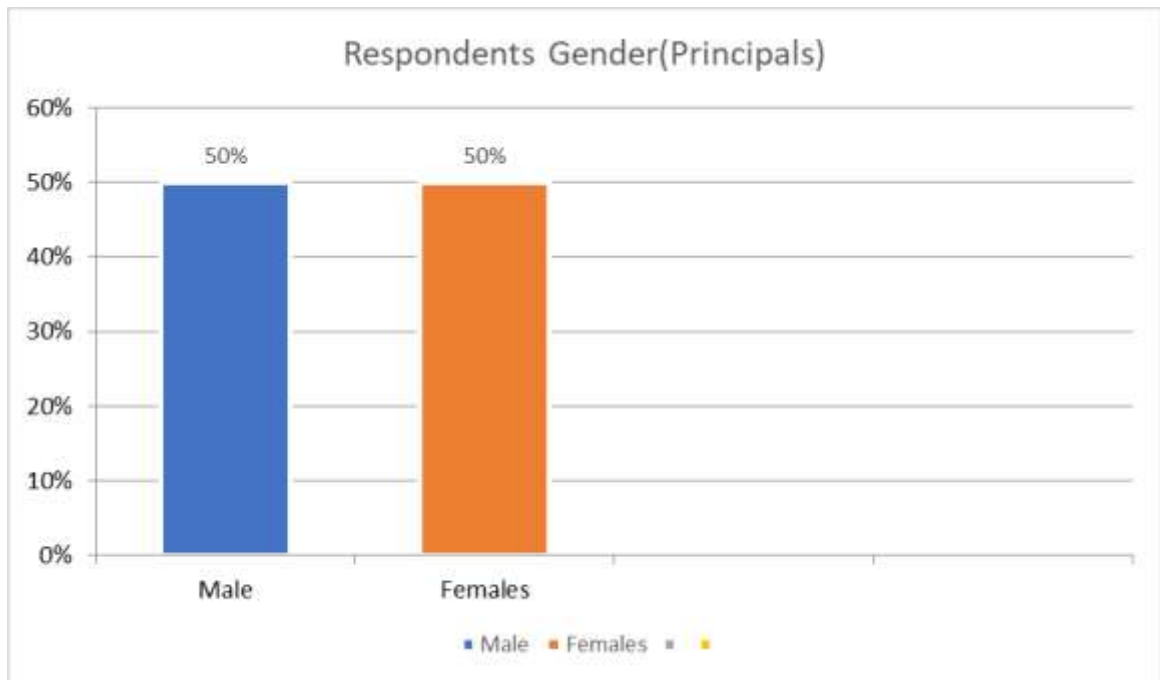


**Figure 3: Students Gender Representation**

From the findings, it was observed that 54% of students were female while 46% were males. This shows that the student distribution was not substantially different.

### 4.3.3 Respondents Gender (Principals)

The basic information of principals concerning gender, were duly analyzed and presented subsequently in Figure 4.



**Figure 4: Respondents Gender (Principals)**

According to figure 4, the male and female respondents who were interviewed were equally distributed (50%).

#### 4.3.4. School Category

A Cross tabulation was conducted to determine dispersion pattern of gender on school category. Table 10 shows the results.

**Table 10: A Crosstabulation of Teachers' Gender and School Category**

		Category of the school			
		Boy school	Girl school	Mixed school	
Male	Count	13	15	31	59
	% of Total	9.5%	10.9%	22.6%	43.1%
Female	Count	9	22	47	78
	% of Total	6.6%	16.1%	34.3%	56.9%
Count		22	37	78	137
% of Total		16.1%	27.0%	56.9%	100.0%

The finding reveals that there were extra female teachers in mixed schools (34.3%) as compared to purely boy and girl schools represented by 6.6% and 16.1% respectively. On the other hand, girl schools had 5.2% more female teachers than Male teachers. Generally, across the three schools, mixed schools had more Biology teachers with 56.9%, followed by girl schools (27.0%) and finally boy schools with 16.1%. This means that female teachers were more in girl schools while male teachers were more in boy schools. This finding is in contrast with that of Mezieobi *et al.* (2011) who found that there is a gender balance than gap in the implementation of the curriculum.

#### 4.3.5 Type of School

Type of school whether public or private entities was analyzed. Table 11 presents the results.

**Table 11: Type of School**

<b>Variable</b>	<b>Frequency</b>	<b>Percent</b>
Public School	97	70.8
Private School	40	29.2
<b>Total</b>	<b>137</b>	<b>100.0</b>

It was noted that 70.8% of Biology teachers were in public schools while 29.2% were employed in private schools.

#### 4.3.6. Zonal Locality

**Table 12: Zonal Locality**

<b>Zone</b>	<b>Frequency</b>	<b>Percent</b>
Kampi ya Moto	19	13.9
Ngata	47	34.3
Rongai	40	29.2
Solai	31	22.6
<b>Total</b>	<b>137</b>	<b>100.0</b>

The Table 12 shows that Ngata zone had the majority of Biology teachers with 34.3%, followed by Rongai (29.2%). Kampi Ya Moto zone and Solai were represented by 13.9% and 22.6% of all Biology teachers respectively. This shows that Ngata zone had more Biology teachers as compared to other zones. The significance of this finding is that some zones had more teachers when compared to other zones. This was because it had the highest number of schools.

#### **4.4 Main Findings**

This section presents data regarding the influence of student related factors, teacher related factors, availability of instructional resources and time management on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.

##### **4.4.1. Student Related Factors Influencing Effective Coverage of Biology According to Teachers**

The first objective for this study was to establish the influence of student related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. Descriptive analysis was conducted in order to establish respondents' responses concerning student related factors under investigation. Percentages were used. The finding is presented in Table 13.

**Table 13: Student Related Factors Influencing Effective Syllabus Coverage (Data From Teachers)**

<b>Statement</b>	<b>SD (%)</b>	<b>D (%)</b>	<b>A (%)</b>	<b>SA (%)</b>	<b>Total (%)</b>
My students enjoy learning Biology	3.6	32.8	47.4	16.1	100.0
My students participate in class during biology lesson	2.2	14.6	35.0	48.2	100.0
My students complete assignments in Biology	8.8	27.0	47.4	16.8	100.0
My students do extra research on topics learnt in Biology	2.9	13.9	37.2	46.0	100.0
My students attend class regularly	5.8	29.9	29.2	35.0	100.0
Peer pressure influence syllabus coverage	16.1	24.1	48.9	10.9	100.0
Students' discipline influence syllabus coverage	5.1	19.7	43.8	31.4	100.0

Key: SA = Strongly Agree; A = Agree; D=Disagree; SD = Strongly Disagree; %=Percentages.

Learners' perception towards a subject is essential in its effective teaching. From the study, it was noted that a total of 63.5% were of the view that their students enjoy learning Biology. Nevertheless, a total of 36.4% disagreed and strongly disagreed that their students their students enjoy learning Biology. This suggests that when learners lack some value towards the subject, they would be less eager to learn. This implies that effective coverage of the syllabus could be influenced adversely when learners lack positive perception towards the subject as they will show reluctance in participation of the subject. This finding concurs with that of Cimer (2012) who found out that the nature of the topic and students' negative feelings and perceptions towards a topic are the main reasons for learning difficulties among students. This could influence effective syllabus coverage. If students do not learn properly, effective coverage of the syllabus may be influenced. Mukhwana (2013) also maintains that Interest in biology (theory and

practices) offers a motivation to engage in the learning process for learners. This could promote effective syllabus coverage.

Student involvement during lesson influences effective syllabus coverage. The study results revealed that a total of 83.2% of participants were of the opinion that their students participated during Biology lesson. On the other hand, a total of 16.2% disagreed and strongly disagreed that their students participated throughout Biology lesson. This could influence effective coverage of the syllabus since there is aspect of student participation as prescribed in the syllabus.

Student participation especially in further research on the topics taught is essential facet of effective syllabus coverage. The findings showed that a total of 35.8% disagreed and strongly disagreed that their students completed assignments in Biology. This means that lack of learner participation in further research could influence effective coverage of the syllabus. This finding agree with that of Abdullah, Bakar and Mahbob (2012) who reported that Learners are supposed to be available on time and actively engaged in the absorption, pursuit and development of the expertise and information exchanged in the classroom for syllabus coverage to be realized.

Student absenteeism is a factor that could influence effective teaching and learning process. This research established out that a total of 64.2% of participants were of the assessment that their students attend school regularly. Nevertheless, a total of 35.8% disagreed and strongly disagreed that their students attend school regularly. Whenever students are absent from school, they will not be in a position to grasp the concepts taught by their teachers. This could influence effective syllabus coverage. These findings concur with that of Musasia, Nakhanu, and Wekesa (2012) who assert that the nonattendance by both the students as well as teachers played a significant part in non-

completion of the syllabus. A significant number of learners suggested that absenteeism was only a pattern that had been created.

Peer influence could influence syllabus coverage. This was affirmed by a total of 59.8% who were of the viewpoint that peer influence affect syllabus coverage. It can be noted that students who positively influence others to cooperate and participate during the lesson could enhance effective coverage of the syllabus. The finding is in line with that of Moldes, Biton, Gonzaga and Moneva (2019) who notes that when students are affected and inspired by colleagues they will achieve excellently at school and get good grades.

Students' discipline in the classroom is a requisite factor in effective coverage of Biology syllabus. It was observed that a total of 75.2% of participants were of the opinion that students' discipline influence syllabus coverage. This means that well-disciplined learners facilitate positive learning environment which could in turn influence effective syllabus coverage. This study agrees with Parsonson (2012) who asserts that student indiscipline in a classroom increases both teacher and student stress levels, disrupts the flow of lessons and conflicts with both learning goals and learning processes. This could influence effective syllabus coverage.

In corroborating the findings from the interview data, the headteachers who were interviewed affirmed that negative perception towards the subject, absenteeism from school e.g lack of school fees as well as students' indiscipline which leads to missed lessons and failure to report on time when schools reopen.

#### 4.4.2 Correlation Between Student-Related Factors and Effective Syllabus Coverage (Data From Teachers)

In this study Pearson Correlation was computed in order to determine the strength and existence and significance of the relationship between student-related factors and effective coverage of Biology syllabus. Table 14 shows the results of the analyses.

**Table 14: Correlation Between Student-Related Factors and Effective Syllabus Coverage (Data From Teachers)**

		Student Related Factors
Effective Syllabus Coverage	Pearson Correlation	.579**
	Sig. (2-tailed)	.000
	N	137

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The findings showed that there exists a positive and statistically significant relationship between Student Related Factors and Effective Coverage of Biology Syllabus ( $r=0.579^{**}$ ;  $p<0.01$ ). This implies that when Student Related Factors are addressed, it influences positively Effective Coverage of Biology Syllabus. Conversely, when Student Related Factors being investigated increases, it leads to ineffective coverage of the syllabus. In other words, the unwillingness of students to learn Biology coupled with disruptive classroom behavior lead to an increase in time required to complete syllabus content. Makori and Onderi (2014) affirm that aspects that could influence the coverage rate of the syllabus comprise the perception of students with regard to learning.

#### 4.5. Teacher Related Factors (Data From Teachers)

The second objective for this study was to establish the influence of teacher related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai



Sub-County, Kenya. This section presents quantitative statistics as well as qualitative data of the respondents' opinions concerning teacher related factors.

#### 4.5.1. Percentages of Teacher Related Factors (Data From Teachers)

Descriptive analysis was conducted in order to establish respondents' opinion concerning Teacher Related Factors under investigation. The findings are presented in Table 15.

**Table 15: Teacher Related Factors (Data From Teachers)**

<b>Statement</b>	<b>SD (%)</b>	<b>D (%)</b>	<b>A (%)</b>	<b>SA (%)</b>	<b>Total (%)</b>
Knowledge of subject matter influence syllabus coverage	5.1	28.5	51.8	14.6	100.0
Teachers workload influence syllabus coverage	3.6	19.7	19.7	56.9	100.0
Teachers' absenteeism influence syllabus coverage	2.2	16.1	35.0	46.7	100.0
Lesson presentation influence syllabus coverage	3.6	13.9	52.6	29.9	100.0
Teacher transfers influence syllabus coverage	1.5	15.3	33.6	49.6	100.0
Experience influence syllabus coverage	1.5	22.6	57.7	18.2	100.0
Teachers' perception towards some topics influence syllabus coverage	0.7	50.4	43.1	5.8	100.0

Key: SA = Strongly Agree; A = Agree; D=Disagree; SD = Strongly Disagree; %=Percentages.

A classroom teacher's subject matter expertise is important and highly crucial. From this study, a total of 66.4% of respondents were of the view that knowledge of subject matter influence syllabus coverage. This is because, the comprehension of subject matter by instructors influences their ability to simplify material to help students understand the subject matter This findings concur with that of Jadama (2014) who suggests that a teacher who is uninformed about subject matter will pass on correct ideas to students. This is seen to affect the way syllabus is covered.

Teachers should only be allocated the prescribed teaching workload in order to be effective teaching Biology. From this study, a total of 76.6% of respondents were of the perspective that teacher's workload influence syllabus coverage. This could be because, when teachers have more lessons than those recommended, they will not be able to effectively prepare and teach all the topics in the syllabus. This finding concurs with that of Chirimi (2016) who observes that the increased crisis in the allocation of teacher workload to science teachers has resulted in total syllabus failure. Among the major possible causes of the workload of teachers is the lack of science teachers in the school visited, where the number of science tutors was extremely limited contrasted to arts educators. Gatemi and Thinguri (2018) also avers that factors such as persistent transfers of tutors from one school to another, the movement of teachers from one stage of education to another, early retirement, the resignation of tutors because of impoverished work environment and the pursuit of aspects of career growth and promotion contribute to poor coverage of the syllabus.

Teachers' availability in schools is crucial in teaching and learning. The findings of this study indicated that a total of 81.7% of the respondents were of the perception that teachers' absenteeism influence syllabus coverage. This is because when a teacher misses a lesson, learners will lag behind in syllabus coverage. This finding agrees with that of Kenya GPE Secretariat (2017) that reported that teacher absenteeism has been an increasing problem in Kenya and that up to 20% teacher absenteeism has been reported. Teacher absenteeism could influence effective syllabus coverage.

Teachers need to make appropriate instructional selection for effective syllabus coverage. From the study findings, a total of 82.5% agreed and strongly agreed that lesson presentation influence syllabus coverage. For example, dependence on lecture

methods alone could hinder development of problem-solving skills by learners. This influences effective syllabus coverage. This finding concurs with that of Namasaka, Mondoh and Wasike (2017) who aver that when used successfully in teaching, Sequential Teaching Methods (STM) increase retention of biology understanding more successfully than the lecture system primarily used in Kenyan high schools. In an attempt to achieve objectives of the Secondary School Biology syllabus, Kenya Institute of Education (2006) suggested several methods of teaching. The methods include practical work, class discussions, demonstrations, excursion/field trips and project work. It implies that when these methods are not used, effective coverage of the syllabus could be hampered.

Recurrent transfer of teachers disrupts effective learning. From the findings, a total of 83.2% agreed that teacher transfers influence syllabus coverage. This implies that when teachers are transferred from one school to another, learners may not cover some critical and examinable topics. This therefore influences effective syllabus coverage. These finding agrees with that of Gatemi and Thinguri (2018) who concluded that frequent teacher transfer influences syllabus coverage. This could also impact on students' performance in National exams.

Teachers experience influence syllabus coverage. Up to a total of 75.9% of respondents were of the view that teachers' experience influence syllabus coverage. Experienced teachers have additional skills on how a given topic can be covered in different ways. The findings support Rice's (2003) findings who aver that accumulating more years of experience seems to be more strongly related to effective teaching in teacher's career.

The perception of a teacher towards teaching Biology influences coverage of the syllabus. From the study, a total of 48.9% of participants were of the view that negative

perception by teachers towards some topics influence syllabus coverage. This is because, when some topics are perceived to be difficult, teachers may fail to adequately prepare hence influencing effective syllabus coverage. According to Omolara and Adebukola (2015) tutors with negative perceptions towards teaching Biology may not be as approachable to students as they find it difficult to ask such teachers questions on difficult topics in the syllabus. Therefore, teachers need to be highly interested in the subjects and topics they teach for effective syllabus coverage. Headteachers' interview confirmed that teacher's workload may affect syllabus coverage especially when teachers lack time for effective preparation and to take care of learner's individual differences. Moreover, they noted that drilling students to pass exams and slow pace of teaching due to the learners' ability in understanding could also affect syllabus coverage.

#### **4.5.2 Correlation Between Teacher-Related Factors and Effective Syllabus Coverage**

In this study Pearson Correlation was computed in order to determine the existence and significance of the relationship between teacher-related factors and effective coverage of Biology syllabus. Table 16 shows the results of the analysis.

**Table 16: Correlation between Teacher-related Factors and Effective Syllabus Coverage (Data From Teachers)**

		<b>Teacher Related Factors</b>
<b>Effective Syllabus Coverage</b>	Pearson Correlation	.621 <sup>**</sup>
	Sig. (2-tailed)	.000
	N	137

<sup>\*\*</sup>. Correlation is significant at the 0.01 level (2-tailed).

According to Table 16, there exists a positive and statistically significant relationship between Teacher Related Factors and Effective Coverage of Biology Syllabus ( $r=0.621$ ;

$p < 0.01$ ). This means that factors such as teacher workload and reduced teacher transfers will promote effective syllabus coverage. This finding agrees with that of Mbalaka (2016) who tried to assess the degree to which the relational influences of teachers affect successful coverage of the syllabus. The researcher found that teachers' relational issues have substantial impact on effective syllabus coverage  $F(dfB, dfW) = F(4, 113)$ , ( $p < 0.05$ ). This implies that teacher-related factors such as ICT skills, workload and teacher transfers when not managed well in schools could influence syllabus coverage negatively in Biology.

#### **4.6 Availability of Instructional Resources**

The third objective was to find out the influence of availability of instructional resources on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.

##### **4.6.1. Percentages of Availability of Instructional Resources**

Descriptive examination was conducted to establish respondents' analysis concerning availability of instructional resources under investigation. The finding is given in Table 17.

**Table 17: Percentages of Availability of Instructional Resources (Data From Teachers)**

<b>Statement</b>	<b>SD (%)</b>	<b>D (%)</b>	<b>A (%)</b>	<b>SA (%)</b>	<b>Total (%)</b>
We have adequate science laboratory for conducting practical lessons in Biology	8.8	39.4	49.6	2.2	100
The laboratory is adequately equipped with reagents and materials for practical lessons in Biology	6.6	24.8	57.7	10.9	100
We have adequate textbooks for teaching Biology	4.4	20.4	33.6	41.6	100
We have adequate Physical classrooms for teaching Biology	2.2	25.5	54.7	17.5	100
I access ICT resources for teaching Biology	1.5	45.3	40.9	12.4	100
Revision materials for Biology are available	3.6	40.9	38.7	16.8	100
We have library for research on topics in Biology	6.6	60.6	21.9	10.9	100
We have adequate tables in the laboratory	8.8	32.1	38.0	21.2	100

Key: SA = Strongly Agree; A = Agree; D=Disagree; SD = Strongly Disagree; %=Percentages.

Availability of science laboratory is crucial for effective coverage of Biology syllabus. From the findings, the study found that a total of 40.2% believed they had adequate science laboratory. Furthermore, a total of 31.4% of respondents disagreed and strongly disagreed that the laboratory is adequately equipped with reagents and materials for practical lessons in Biology. This implies that lack of these resources could retard the process of teaching and learning and consequently influencing effective syllabus coverage. The results of this survey concurs with Musah and Umar's (2017) finding who showed that in Nigerian secondary schools, especially in Yobe State, Biology laboratory facilities were either not completely accessible or were insufficient when accessible and were not used by the high number of students in the school. Ngozi and Halima (2015)

confirms the finding of this study by reporting Inadequacy of laboratory facilities in the Zaria metropolis of Kaduna State Senior Secondary Schools.

However, a total of 51.8% of respondents were of the view that they have adequate science laboratory for conducting practical lessons in Biology. Similarly, a total of 68.6% of respondents agreed and strongly agreed that the laboratory was adequately equipped with reagents and materials for practical lessons in Biology. This means that availability of laboratory and more, so the reagents supply enhances effective coverage of the syllabus.

Laboratory ought to be adequately equipped with facilities such as tables and chairs for efficient instruction and learning. The findings further showed that a total of 40.8% disagreed that they have adequate tables in the laboratory. This implies that when laboratory lacks enough tables will impact negatively to the practical lessons being planned or carried out. This will influence effective syllabus coverage in Biology. This finding is consistent with that of Chirimi (2016) who observes that issues that influence syllabus coverage comprise of lack of teaching and learning resources, including the absence of equipment in the laboratory to practice.

Classrooms and instructional materials such as textbooks are essential in effective syllabus coverage. The study found that a total of 24.8% were of the belief that textbooks were adequate while a total of 27.8% disagreed and strongly disagreed that physical classrooms were adequate. Moreover, a total of 44.5% disagreed and strongly disagreed that revision materials for Biology were available. This means that when these instructional materials are lacking, it could impede learner-teacher effective implementation of the prescribed syllabus. Some of these findings concurs with that of Mucai (2013) who studied on existence and use of resources for education in Mbeere

South, in Kenya. The finding by Mucai established that textbooks were not adequate, and that there was no acute shortage as the textbooks could be shared by a large number of students in all school groups. However, it was noted that the lack of textbooks affected learning, especially in mixed day schools. Syllabus coverage is a function of availability of instructional resources. It can be inferred that insufficiency of instructional resources such as textbooks could influence the way content and other learning activities is delivered by teachers thereby influencing effective coverage of syllabus. Furthermore, Mutegi (2014) investigated factors influencing coverage of syllabus in secondary schools in Langata District schools in Nairobi County. The study found out those appropriate resources, such as libraries, tools for teaching, classrooms and laboratories enhances coverage schools Syllabus. This implies that availability of instructional materials influences effective syllabus coverage.

In teaching and learning biology, the availability of information and communication technology resources is critical. The study found that a total of 53.3% of respondents were of the belief that they access ICT resources for teaching Biology. This could imply that learners could be able to comprehend topics that lack a clear practical basis such as cell division and evolution. Despite this view, up to a total of 46.7% disagreed and strongly disagreed that they accessed ICT resources for teaching. This implies that learners may not understand topics that require simulations. Therefore, absence of ICT resources could influence effective syllabus coverage. This finding concurs with that of a research by Mbugua, Gori and Tanui (2015), which conducted research in public secondary schools in Nakuru County on the integration of information communication technology in teaching, found that ICT amenities were insufficient and tutors had only basic or no ICT skills. Similarly, Sivapragasam and SenthamaraiKannan (2014) affirms



that Due to the extreme easy understanding and attractive experience for students, the use of ICT is the best way to transmit information to the students in biology. Sivapragasam and Senthamaraikannan (2014) further maintain that 80 percent of learning is learned through visual aids. Thus, the student teachers could easily understand the visual presentations of the relevant subject. This therefore influences effective syllabus coverage.

Library is an important resource in a learning institution. According to the findings, a total of 67.2% disagreed and strongly disagreed that they have library for research on topics in Biology. When library facility is lacking, it will influence the way learners do their assignments. This will also influence the effective syllabus coverage. This findings agree with that of Chipana (2018) explored the impact of the use of library services on the academic achievement of learners in public high schools in the municipality of Dodoma. The results showed that the location of the few established school libraries was not sufficient to promote successful student learning because the condition of the school libraries was poor in terms of room for the library users to place the books and room. Head teachers' interview revealed that constant reviews of the syllabus that brings about changes in editions of textbooks used as well as re-alignment of topics some being taken to agriculture affect syllabus coverage. The respondents affirmed that lack of instructional materials like charts and ICT resources in some schools has led to no proper demonstrations of concepts leading to poor syllabus coverage.

#### 4.6.2 Correlations Between Availability of Instructional Resources and Effective Coverage of Biology Syllabus

In this study Pearson Correlation was computed in order to determine the existence and significance of the relationship between availability of Instructional Resources and effective coverage of Biology syllabus. Table 18 shows the results of the analysis.

**Table 18: Correlations Between Availability of Instructional Resources and Effective Coverage of Biology Syllabus (Data From Teachers)**

	Effective Syllabus Coverage	Availability of instructional Resources
Pearson Correlation	1	.655 <sup>**</sup>
Effective Syllabus Coverage Sig. (2-tailed)		.000
N	137	137

<sup>\*\*</sup>. Correlation is significant at the 0.01 level (2-tailed).

Table 18 shows that there exists a strong positive and statistically significant relationship between availability of instructional resources and effective Coverage of Biology Syllabus ( $r=0.655^{**}$ ;  $p<0.01$ ). This indicates that when instructional resources are available effective coverage of biology syllabus will be enhanced. Moreover, absence of instructional resources will hinder effective coverage of biology syllabus. This finding agrees with that of Makori and Onderi (2014) who reported that a shortage of textbooks has been correlated with problems with the coverage of the syllabus because it has a negative effect on the instruction process and similarly influences the amount and rate of assignment teachers offer to learners.

#### 4.7. Time Management

The fourth objective was to investigate the influence of time management on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. Percentages were computed.

##### 4.7.1. Percentages Time Management

Descriptive analysis was conducted in order to establish respondents' opinion concerning the influence of time management on effective coverage of KCSE Biology syllabus. The finding is presented in Table 19.

**Table 19: Time Management Influencing Effective Syllabus Coverage (Data From Students)**

<b>Statement</b>	<b>SD %</b>	<b>D %</b>	<b>A %</b>	<b>SA %</b>	<b>Total %</b>
Some teachers leave class before the end of the lesson in Biology	17.9	9.4	28.3	44.3	100.0
Teachers utilize all the lesson minutes in Biology	6.6	16.0	48.1	29.2	100.0
Teachers are punctual when attending the lesson in Biology	9.4	10.4	40.6	39.6	100.0
Teachers waste time on irrelevant stories in Biology	57.5	26.4	5.7	10.4	100.0
There is adequate time allocated in the timetable for teaching theory lessons	6.6	16.0	29.2	48.1	100.0
There is adequate time allocated in the timetable for teaching practical lessons	17.9	26.4	25.5	30.2	100.0

Key: SA = Strongly Agree; A = Agree; D=Disagree; SD = Strongly Disagree; %=Percentages

The study revealed that a total of 72.6% believed some teachers leave class before the end of the lesson in Biology. This view was supported by 16.1% who agreed that teachers waste time on irrelevant stories in Biology. This implies that when instructional time is not utilized appropriately, it could influence effective syllabus coverage.

Abdinoor (2012), reports that laxity of teachers in class attendance is typical in poor performing schools. The author further states that in those schools, persistent teacher absenteeism was rampant, as teachers were similarly de-motivated to use their teaching time effectively. They lagged behind the coverage of the syllabus, a circumstance that caused tension and fear of failing examinations among learners.

Lesson punctuality is important in effective syllabus coverage. From the study, it was found that a total of 22.6% disagreed and strongly disagreed that teachers utilize all the lesson minutes in Biology while a total of 19.8% also disagreed and strongly disagreed that teachers were punctual when attending the lesson in Biology. This could hamper effective syllabus coverage. Marcella (2017) asserts that the coverage of the syllabus in Kenya schools depends to a large extent on how teachers handle the teaching time allocated to various subjects in the curriculum by the Ministry of Education. This shows that when teachers observe punctuality in class and as well as adequate utilization of instructional time, effective syllabus coverage could be attained.

Additionally, a total of 22.6% disagreed that there is adequate time allocated in the timetable for teaching theory lessons while a total of 44.3% of respondents disagreed that there is adequate time allocated in the timetable for teaching practical lessons. This means that when instructional time is inadequate, effective coverage of the syllabus will be disadvantaged. A research by Rutto and Kaptengei (2014) in Kenya revealed that during science lessons, students are less exposed to practical work. In Ghana, multiple teachers have carried out much more than rudimentary repetition of theory work, which is a prerequisite for examinations, on no occasion (Perry, 2015). This could affect efficient coverage of the syllabus. The headteachers' interview affirmed that the time management related issues that affect effective syllabus coverage include the lack of

timely lesson preparation wider content to be acquired in less time and sometimes disruptions by co-curricular activities.

#### **4.7.2 Correlation Between Time Management and Effective Coverage of Biology Syllabus**

In this study Pearson Correlation was computed in order to determine the existence and significance of the relationship between Time Management and effective coverage of Biology syllabus. Table 20 shows the results of the analysis.

**Table 20: Correlation Between Time Management and Effective Coverage of Biology Syllabus (Data From Teachers)**

		<b>Time Management</b>
<b>Effective Syllabus Coverage</b>	Pearson Correlation	.265 <sup>**</sup>
	Sig. (2-tailed)	.006
	N	106

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 20 shows that there exists a positive and statistically significant relationship between Time management and effective coverage of Biology Syllabus ( $r=0.265^{**}$ ;  $p<0.01$ ). This means that proper management of instructional time will enhance Effective Syllabus Coverage. This view agrees with that of Marcella (2017) asserts that the coverage of the syllabus in Kenya schools depends to a large extent on how teachers handle the teaching time allocated to various subjects in the curriculum by the Ministry of Education.

#### **4.8. Effective Coverage of Biology Syllabus**

Regarding` effective coverage of Biology syllabus, an analysis was done to illustrate the extent in which syllabus was covered. Table 21 shows the analysis.

**Table 21: Effective Syllabus Coverage (Teachers' Data)**

<b>Statement</b>	<b>ND</b>	<b>ID</b>	<b>ED</b>	<b>Total</b>
Teaching of Topics by the time students sit for KCSE examinations	2.9	37.7	59.4	100.0
Development and Implementation of Biology Projects	12.2	59.1	28.7	100.0
Revision of Topics by the time students sit for KCSE examinations	0.7	42.4	56.9	100.0
Teaching of all Practical lessons by the time students sit for KCSE examinations	2.2	29.0	68.8	100.0

Key: ND-Not Done; ID-Ineffectively Done; ED-Effectively Done

Syllabus should be effectively covered in order to achieve the national goals of education. According to Kenya Institute of Curriculum Development syllabus (2017) the syllabus for biology should be covered effectively within the allotted time. To assist the teacher in lesson planning, a suggested guidance on time allocation per subject has been given. From the study results, it was noted that 59.4% of participants had effectively done all the topics by the time students sit for KCSE examinations while 37.7 of respondents had ineffectively done. Furthermore, 2.9% of respondents had not done all the topics by the time students sit for KCSE examinations respectively. A Research was carried out by CEMASTEIA (2018) to understand the quantity and nature of teacher-student interactions in schools. The results show that secondary schools involved in the study spent an average of 29.5% of school time each year on events other than subject coverage as prescribed in the syllabus. This shows that when the syllabus somehow completed, it may not be effectively covered.

On the other hand, 59.1 % reported that they had ineffectively done with the development and implementation of Biology projects while 12.2% had not done with development and implementation of Biology projects. Phillips, Ingrole, Burris and Tabulda (2017) emphasizes that to ensure that syllabus is covered with dedication, learning activities should be consistent with the basic objectives of learning presented in the curriculum.

Moreover, 42.4% of respondents reported that they had ineffectively done with revision of topics by the time students sit for KCSE examinations while 29.0% of respondents aver that they had ineffectively done with Teaching of all Practical lessons by the time students sit for KCSE examinations. It was also noted that 2.2% had not completed all the practical lessons which could be explained in terms of inadequacy of instructional resources. This could be the reason for ineffective syllabus coverage. Some of these finding agrees with that of County Education Board status report (2015) who specified that syllabus coverage in science subjects in majority of secondary schools in the sub county remains uncompleted in Rongai Sub County.

#### **4.9 Combined Regression Analysis**

The effect of combined independent variables on the dependent variable was presented using the regression model. The independent variables include student related factors, teacher related factors, availability of instructional resources and time management. Moreover, the dependent variables include effective coverage of the syllabus. The following section presents results of regression analysis: Multicollinearity, Model Summary, ANOVA and Coefficients tables.

#### **4.9.1. Multicollinearity Analysis**

When two or more of the predictor variables in a regression model are moderately or strongly correlated, multicollinearity occurs. Therefore, it may wreak havoc on the study as it occurs and therefore restrict the research conclusions (Stephanie, 2015). This test is used to investigate the presence of multicollinearity indicators in the model. The variance inflation factor (VIF) is one way of estimating multicollinearity, which measures how much the variance of an assumed regression coefficient increases when predictors are associated. It is accepted that VIF should be less than 10 (Akinwande, Dikko, & Agboola , 2015).

In relation to the multicollinearity, the independent variables comprising student related factors, teacher related factors, availability of instructional resources and time management returned a Variance Inflation Factor (VIF) value of 2.010, 3.081, 1.698 and 1.571 respectively. This indicates that the VIF values obtained is within the acceptable range of 1 to 10. It can be concluded that there are no multicollinearity symptoms in the model involving the four independent variables. This means that the independent variables independently influence effective coverage of Biology syllabus. Table 22 presents the results of Collinearity statistics. It is accepted that VIF should be less than 10 (Akinwande, Dikko, & Agboola , 2015). It therefore means that when the VIF is less than 10, it suggests that the independent variables are truly independent of each other while predicting effective syllabus coverage.



**Table 22: Multicollinearity Statistics**

Model	Collinearity Statistics	
	Tolerance	VIF
Student related factors	.498	2.010
Teacher related factors	.325	3.081
Availability of instructional Resources	.589	1.698
Time Management	.637	1.571

*a. Dependent Variable: Effective Syllabus Coverage*

#### 4.9.2. Model Summary

The model summary shows the predictors including constant, time management, teacher related factors, utilization of instructional resources and student related factors is shown in Table 23.

**Table 23: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.747 <sup>a</sup>	.558	.541	.388

*a. Predictors: (Constant), Time Management, Availability of instructional Resources, Student related factors, Teacher related factors*

Table 23 is a model summary which shows an R Square value of 0.558. This means that 54.1% variation in effective coverage of the syllabus is explained in the variation of student related factors, teacher related factors, utilization of instructional resources and Time management with a standard error of the estimate of 0.388. The unexplained variation is 44.2% which might be explicated by other factors outside the study variables. In this study, the coefficient of determination (R-Square) resulting from the linear regression was used to determine the goodness of fit. It is estimated that an R-square greater than 0.4 is preferred in social science (Flom, 2016). This means that since the R-

square was above the threshold, then the independent variables were able to predict a greater percentage of the dependent variable.

#### 4.9.3. The Strength of the Model

To determine the significance of the regression model, the analysis used f-statistics. The statistical significance was deemed important in measuring the significance level if the p-value was less or equal to 0.055 (Filho, Paranhos, Rocha, Batista, Silva & Santos, 2013).

The Finding is illustrated in Table 24.

**Table 24: ANOVA Analysis <sup>a</sup>**

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	19.247	4	4.812	31.911	.000 <sup>b</sup>
Residual	15.229	101	.151		
<b>Total</b>	<b>34.476</b>	<b>105</b>			

*a. Dependent Variable: Effective Syllabus Coverage*

*b. Predictors: (Constant), Time Management, Availability of instructional Resources, Student related factors, Teacher related factors*

According to Table 24 the value of F-Statistic is 31.911 indicating that the model is highly significant at 95% confidence level;  $r^2 = 0.558$ .,  $F(4,101) = 31.911$ ;  $p < 0.05$ . This shows that the model is efficient at 95% in predicting the effect of independent variables on dependent variable. In other words, Effective Coverage of Biology Syllabus can be explained by the effect of student related factors, teacher related factors, utilization of instructional resources and time management.

According to Karen (2018) the f-test statistic determines whether the suggested relationship between the response variable and the set of predictors is statistically reliable and can be useful when the research objective is either prediction or explanation.

A significant F-test indicates that the observed R-squared is reliable and is not a spurious

result of oddities in the data set. In this study, the independent variables are seen to be reliable in predicting Effective Coverage of Biology Syllabus.

#### 4.9.4 Predicting Effective Coverage

In order to show the predictive capacity of each independent variable on dependent variable, regression analysis was run. The unstandardized beta coefficients for the independent variables under examination are shown in Table 25. Therefore, only significant predictors are interpreted. The predictors are usable for the model if their significance is  $<0.05$  (Schendera, 2014).

**Table 25: Coefficients<sup>a</sup> of Independent Variables**

Model	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	.130	.285	.454	.651
Student related factors	.290	.100	2.908	.004
Teacher related factors	.390	.136	2.868	.005
Availability of instructional Resources	.440	.115	3.825	.000
Time Management	-.148	.089	-1.663	.099

*a. Dependent Variable: Effective Syllabus Coverage*

On the basis of unstandardized coefficients, the model indicates that student related factors influence 29% of positive variation on effective coverage of Biology Syllabus. Teacher related factors influences up to 39% positive variation on effective coverage of Biology Syllabus. Availability of instructional resources influences 44% positive variation on effective coverage of Biology Syllabus. Time management influences 14.8% negative variation on Effective Coverage of Biology Syllabus. This means that the best predictor of Effective Coverage of Biology Syllabus is the variable Availability of instructional resources influences (44%) while Time management was the least with (17.6%) non-significant influence. The unstandardized beta coefficient for each variable

shows how strong the effect of the independent variable is on the dependent variable. This statistic lies between zero and one and can be either negative or positive. A positive beta value conveys a positive effect from the independent variable, which means that when the factor increases, the dependent variable increases as well (Vold, 2018).

#### **4.9.5. Hypotheses Testing**

The benchmark for this study for failure to reject or failure to accept the null hypothesis is at 0.05 alpha level, that is; Reject  $H_0: \beta_x = 0$ ; if  $p < 0.05$ , otherwise fail to reject the  $H_0: \beta_x = 0$ . The following hypotheses were tested following the above criteria.

The hypothesis that was stated as follows:

**H<sub>01</sub>**: There is no statistically significant influence of Student related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.

From Table 25, the Unstandardized Beta coefficient for the first variable has a corresponding  $p=0.004$  which is less than 0.05 alpha, leading to a rejection of the null hypothesis. Accordingly, a decision is made that student related factors such as positive perception towards Biology, students' participation in class during biology lesson and participation in extra research on topics learnt significantly influence effective syllabus coverage ( $p < 0.05$ ) in Secondary Schools in Rongai Sub-County, Kenya. This view was supported by Abdullah, Bakar and Mahbob (2012) who reported that Students are supposed to be available on time and actively engaged in the absorption, pursuit and development of the expertise and information exchanged in the classroom for syllabus coverage to be realized.

The second hypothesis was stated as:

**H<sub>02</sub>:** There is no statistically significant influence of Teacher related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.

Since its p value=0.005 is less than 0.05 alpha level, the null hypothesis was rejected and a conclusion made that teacher related factors such as teacher transfers, topics that are too wide in Biology and Negative perception towards some topics influence significantly effective syllabus coverage ( $p < 0.05$ ). Wekesa, Simatwa and Okwach (2016) accept that the shortage of transition instructors leads greatly to the low success of the learner as the syllabus is not adequately covered.

The third hypothesis was as follows:

**H<sub>03</sub>:** There is no statistically significant influence of availability of instructional resources on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.

It was noted that the p value for the variable availability of instructional resources is 0.000. This is less than 0.05 Alpha Level. Consequently, a decision was made that availability of instructional resources such as adequate textbooks for teaching Biology, adequate Physical classrooms, access to ICT resources and audiovisual materials for teaching Biology influence significantly effective syllabus coverage. Mwangi and Sibanda (2017) observed that teachers have faced numerous difficulties in teaching practical lessons in biology due to a shortage of tools, equipment, time and huge classes. This means that effective coverage of Biology syllabus will not be realized in the absence of essential instructional resources.

The fourth hypothesis was as follows:

**H<sub>04</sub>:** There is no statistically significant influence of time management on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.

According to Table 25, the equivalent p value is 0.099 which is greater than 0.05 Alpha. This led to the failure in rejection of the null hypothesis and conclusion made that time management such as adequate time allocated in the timetable for teaching theory lessons influence effective syllabus coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. Halim (2013) opines that constrained lesson time and administration activities adversely influenced the teaching of Biology. This implies that effective syllabus coverage could be hindered when there is inadequate scheduled time for teaching and learning. A research by Rutto and Kaptingei (2014) in Kenya showed that during science classes, students are less exposed to realistic work.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents summary of key findings, conclusions and recommendations suggested with regard to the findings of this study.

#### **5.2. Summary of Key Findings**

The objectives of the study were to establish the influence of student related factors, teacher related factors, availability of instructional resources and time management on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya.

##### **5.2.1. Student Related Factors and Effective Coverage of KCSE Biology Syllabus**

The indicators of student related factors that was analyzed include students' perception towards Biology, student's participation in class, students' completion of assignments, do extra research on topics learnt, students' attendance of school regularly, Peer influence and Students' discipline. The main factors that influence effective syllabus coverage include Student participation during lesson, Student absenteeism and Students' discipline.

Student participation during lesson is important aspect of syllabus coverage. The study findings show that a total of 16.8% disagreed that their students participated during Biology lesson. This implies that lack of students' participation in lesson may influence affective and psychomotor domains in learning. This could influence effective coverage of the syllabus. Student participation especially in further research on the topics taught is essential facet of effective syllabus coverage. The findings showed that a total of 35.8% of respondents argued that their students completed assignments in Biology.

Furthermore, about a total of 16.8% opposed that their students participated in extra research on topics learnt. This implies that lack of learner's participation in further research could influence effective coverage of the syllabus.

Student absenteeism is a factor that could influence effective teaching and learning process. The study found that a total of 35.8% of respondents differed that their students attend school regularly. This mean that when students are absent from school, they will not be in a position to grasp the concepts taught by their teachers. This could influence effective syllabus coverage.

Students' discipline in the classroom assists in meaningful coverage of Biology syllabus. It was observed that a total of 75.2% of respondents were of the view that students' discipline influence syllabus coverage. This means that well-disciplined learners facilitate positive learning environment which could in turn influence effective syllabus coverage.

### **5.2.2. Teacher Related Factors and Effective Coverage of KCSE Biology Syllabus**

The indicators of teacher related factors that was analyzed include teachers' experience, teacher's workload, teachers' lesson presentation, teacher transfers, some topics are too wide and negative perception towards some topics. It was observed that teachers' workload, teachers' absenteeism, teacher transfers and negative perception towards some topics were the major factors that influence effective syllabus coverage.

Teachers should work within prescribed teaching workload in order for effective teaching and learning. From the study, it was agreed and strongly agreed by a total of 76.6% of respondents were of the opinion that teacher's workload influence syllabus



coverage. This is because, when teachers have more lessons than those recommended, they will not be able to effectively cover the syllabus.

Teachers' presence in schools is crucial in teaching and learning. The findings of the study indicated that a total of 81.7% were of the view that teachers' absenteeism influence syllabus coverage. This means that when a teacher misses the lessons, learners will lag behind in syllabus coverage.

A recurrent transfer of teachers disrupts effective learning. From the findings a total of 83.2% were of the belief that teacher transfers influence syllabus coverage. This implies that when teachers are transferred from one school, learners may not cover some critical and examinable topics. This therefore influences effective syllabus coverage.

The perception of a teacher influences teaching and learning. From the study, a total of 48.9 of respondents were of the viewpoint that negative perception towards some topics influence syllabus coverage. This is because, when some topics are perceived to be difficult, teachers may fail to adequately prepare hence influencing effective syllabus coverage. Therefore, teachers need to be interested in the topics they teach for effective syllabus coverage.

### **5.2.3. Availability of Instructional Resources and Effective Coverage of KCSE Biology Syllabus**

The adequacy and conditions of facilities and resources as well as other infrastructures are critical to a school performance especially in Syllabus coverage. It is believed that variation in resources distribution may lead to inequality both in learning and in performance. The indicators of availability of Instructional Resources that were analyzed include adequate science laboratory, the laboratory which is adequately equipped with

reagents and materials, adequate text-books for teaching Biology, adequate physical classrooms, ICT resources, Revision materials, audiovisual materials, library and adequate tables in the laboratory.

According to analysis, it was noted that, adequate science laboratory, textbooks, ICT resources, Revision materials and a library for research were the major instructional resources influencing effective coverage of Biology syllabus.

Availability of science laboratory is crucial for effective coverage of Biology Syllabus. From the findings, a total of 40.2% of respondents disagreed that they have adequate science laboratory for conducting practical lessons in Biology. Similarly, a total of 31.4% of respondents disagreed that the laboratory was adequately equipped with reagents and materials for practical lessons in Biology. This implies that lack of these resources could retard the process of teaching and learning and consequently influencing effective syllabus coverage.

Classrooms and instructional materials such as textbooks are essential in effective syllabus coverage. The study found that a total of 24.8% of respondents opposed that textbooks were adequate while a total of 27.8% disagreed that physical classrooms were adequate. Furthermore, up to 44.5% also disagreed that revision materials for Biology were available. This means that when these instructional materials are lacking, it could impede learner-teacher effective implementation of the prescribed syllabus. It can be inferred that insufficiency of instructional resources such as textbooks could influence the way content and other learning activities is delivered by teachers thereby influencing effective coverage of syllabus.

Availability of Information and Communication Technology resources is important during teaching and learning of Biology. The study found that up to a total of 46.7% disagreed that they accessed ICT resources for teaching. This implies that learners may not understand topics that require simulations especially topics that lack a clear practical basis such as cell division and evolution. Therefore absence of ICT resources could influence effective syllabus coverage.

Library is an important resource in learning institution. According to the findings, a total of 67.2% of the respondents disputed that they have library for research on topics in Biology. When library facility is lacking, it will influence the way learners do their assignments. This will also influence effective syllabus coverage.

#### **5.2.4. Time Management and Effective Coverage of KCSE Biology Syllabus**

The indicators of time management include teachers' punctuality, time utilization and time allocation for theory and practical lessons. Lesson punctuality is important in effective syllabus coverage. From the study, it was found that a total of 22.7% of the respondents disagreed that teachers utilize all the lesson minutes in Biology while a total of 19.8% of the respondents opposed that teachers were punctual when attending the lesson in Biology. This could impede effective syllabus coverage. Additionally, a total of 22.6% of respondents disagreed that there was adequate time allocated in the timetable for teaching theory lessons while a total of 44.3% of respondents that there was adequate time allocated in the timetable for teaching practical lessons. This means that when instructional time is inadequate, effective coverage of the syllabus will be disadvantaged.

### **5.3. Conclusion**

It was concluded that student related factors influences significantly effective coverage of Biology syllabus ( $\beta = 0.290$ ;  $p < 0.05$ ). Specifically, students perception towards Biology, students' participation in class especially in extra research on topics learnt significantly influence effective syllabus coverage.

Furthermore, teacher related factors influence significantly on effective coverage of Biology Syllabus ( $\beta = 0.390$ ;  $p < 0.05$ ). Precisely, teacher transfers, teacher experience and perception towards some topics influence significantly effective syllabus coverage.

Moreover, availability of instructional resources significantly influences positively effective coverage of Biology Syllabus ( $\beta = 0.44$ ;  $p < 0.05$ ). Certainly, science laboratory adequately equipped with reagents and materials, adequate textbooks, Physical classrooms, ICT resources and adequate tables in the laboratory influence significantly effective syllabus coverage.

Time management influence negatively effective coverage of Biology Syllabus ( $\beta = -0.148$ ;  $p > 0.05$ ). Adequate time allocated in the timetable for teaching influence significantly effective syllabus coverage.

### **5.4. Recommendations**

The study recommends that:

- i. Students' participation especially in research on topics learnt should be enhanced in order to promote effective coverage of KCSE Biology Syllabus.
- ii. Teacher transfers should be managed appropriately in order to improve coverage of KCSE Biology Syllabus.

- iii. In-service training of teachers should be enhanced by Ministry of education in order to resolve negative perception towards some topics.
- iv. Teachers should be adequately equipped with new technologies, pedagogical techniques and appropriate instructional resources in order to achieve effective coverage of Biology syllabus.
- v. School management should emphasize on strategies geared towards management of instructional time in order to boost effective coverage of KCSE Biology Syllabus.

### **5.5. Recommendations for Further Study**

The study recommends:

- i. A further research into the extent to which Biology syllabus coverage influences students' academic performance.
- ii. Further study should be carried out on factors influencing curriculum implementation in Biology in Rongai Sub County

### **5.6. Recommendations for Policy**

- i. A policy on student discipline should be improved in order to promote good learning environment which consequently influence coverage of syllabus.
- ii. The existing policy on in-service training of science teachers should be enhanced with technological pedagogies in order to improve their pedagogical skills. This will enhance syllabus coverage
- iii. The study recommends that policy on information communication technology (ICT) integration in teaching and learning should be improved especially in content areas where actual practical cannot be conducted such as cell division and evolution in order to promote effective syllabus coverage.

- iv. A policy on Time management training should be developed to include all the teaching staff and other non-teaching departments in order to enhance syllabus coverage.

## REFERENCES

- Abe, T. O., & Owoeye, P. O. (2014). Teachers' Perception Of Difficult Topics In Biology Curriculum In Secondary Schools In Ondo State. *Journal of Research in Science Education*, 114-127.
- Abdinoor, I. (2012). *Socio-Economic, Socio-Cultural and School-Based Factors That Are Influencing the Performance in Kenya Certificate of Secondary Education (KCSE) in Isiolo County*. (Research Project). Kenyatta University, Nairobi.
- Abdullah, M. Y., Bakar, N. R. A., & Mahbob, M. H. (2012). Student's Participation in Classroom: What Motivates them to Speak up?. *Procedia-Social and Behavioral Sciences*, 51, 516-522.
- Adeyemi, T. O. (2010). The school library and students' learning outcomes in secondary schools in Ekiti state, Nigeria. *Asian Journal of Business Management*, 2(1), 1-8.
- Adeyinka, T., Adedeji, T., Majekodunmi, T. O., Adika , L. O., & Adeyinka, A. A. (2010). *An Assessment Of Secondary School Teachers Uses of ICT: Implications For Further Development Of Ict'S Use In Nigerian Secondary Schools*. University of Ibadan, Nigeria: Working paper.
- Ahn, T., & Trogdon, J. G. (2016). *Peer Delinquency and Student Achievement in Middle School*. University of Kentucky: Research Project.
- Ajaja , P. O. (2009). Evaluation of Science Teaching in Secondary Schools in Delta State 2 -Teaching of the Sciences. *International Journal of Education*, 1(2), 119-129.
- Akinwande, M. O., Dikko, H. G., & Agboola , S. (2015). Variance Inflation Factor: As a Condition for the Inclusion of Suppressor Variable(s) in Regression Analysis. *Open Journal of Statistics*, 5, 754-767.
- Akram, S., Sufiana , & Malik , K. (2012). Use of audio visual aids for effective teaching of biology at secondary schools level. *Elixir Leadership Mgmt*, 50(1), 10597-10605.
- Alsharari, S. (2016). *The Challenges Faced by New Science Teachers in Saudi Arabia - ProQuest* (Doctoral dissertation, West Virginia University). Retrieved from <https://search.proquest.com/docview/1794166862>
- Alshehry, A. T. (2014). Investigating Factors Influencing Science Teachers' Performance and Satisfaction toward Their Teaching Process at Najran University for Girls' Science Colleges. *International Journal of Higher Education*, 3(2), 73-82.
- Amadalo , M. M., Shikuku , B. N., & Wasike , D. W. (2012). Investigation of Factors That Influence Syllabus Coverage in Secondary School Mathematics in Kenya. *International Journal of Humanities and Social Science*, 2(15), 51-59.

- Amália, A. U., & Cossa, E. R. (2015). Effects of an In-service Program on Biology and Chemistry Teachers' Perception of the Role of Laboratory Work. *Procedia - Social and Behavioral Sciences*, 167, 152-160.
- American Heritage Dictionary. (2016). *Definition of Biology*. Retrieved August 11, 2017, from The Free Dictionary: <http://www.thefreedictionary.com/biology>
- Anderson, C. (1988). *The role of education in the academic disciplines in teacher preparation*. In *Rutgers Invitational Symposium on Education: The Graduate Preparation of Teachers*. Woolfolk.
- Arop, B. A., Umanah, F. I., & Effiong, O. E. (2019). Effect of instructional materials on the teaching and learning of basic science in junior secondary schools in Cross River State, Nigeria. *Global Journal of Educational Research*, 14(1), 67. <https://doi.org/10.4314/gjedr.v14i1.9>.
- Asamoah, M. K. (2014). Re-examination of the limitations associated with correlational Research. *Journal of Educational Research and Reviews*, 2(4), 45-52, July 2014.
- Atieno , E. O. (2017). Teacher Practices that Hamper Effective Integration of Information Communication and Technology in Biology Instruction in Secondary Schools in Migori County, Kenya. *nternational Journal of Inovative Education research*, 5(1), 9-15.
- Ayenigbara, G. O., & Seidu, Y. H. (2017). Factors Militating Against Quality of Academic Performance of Secondary School Students: A Case Study of Secondary School Student in Ondo State, Nigeria. *International Journal of Advanced Research*, 5(2), 2179-2184.
- Bagley, M. (2017, August 9). *What is Biology?* Retrieved August 3, 2017, from Live science: <https://www.livescience.com/44549-what-is-biology.html>
- Baker, D. P., Fabrega, R., Galindo, C., & Mishook, J. (2004). Instructional time and national achievement: Cross-national evidence. Prospects:. *Quarterly Review of Comparative Education*, 34(3), 311-334.
- Balsa, A., Gandelman , N., & Roldán, F. (2017). *Peer and parental influence in the development of cognitive skills and predispostion to risky Behaviour*. Universidad de Montevideo: Research Project.
- Barry, R. A. (2010). *Teaching Effectiveness and Why It Matters*. Chalkboardproject.Org. <https://chalkboardproject.org/resources/chalkboard-reports/teaching-effectiveness-and-why-it-matters>.
- Beukes-Amiss, C. M., & Chiware, E. T. (2006). *he impact of diffusion of ICTs into educational practices, how good or how bad? A review of the Namibia situation*. Retrieved september 7, 2017, from Dspace: <http://www.dspace.unam.na:8443/dspace/bitstream/1995/244/impact+diffusionICTedupdf>.



- Bitok, E. B. (2012). Availability of Information and Communication Technology Resources in Teaching and Learning of Biology by Secondary Schools in Uasin Gishu County, Kenya. *International Journal of Science and Research*, 2279-2285.
- Branley, A. (2016, February 3). *eaching job shortage leaves hundreds of graduates unable to complete qualifications*. Retrieved September 4, 2017, from ABC news: <http://www.abc.net.au/news/2016-02-03/job-shortage-leaves-teachers-unable-to-complete-qualifications/7136722>
- Breen, M. P. (1984). *Process Syllabuses for the Language Classroom" in Brumfit, C.J. (ed.) General English Syllabus Design*. Pergamon Press Ltd. and The British Council.
- Camera, L. (2016, June 7). *Millions of U.S. Students Chronically Absent*. Retrieved September 3, 2017, from US news: <https://www.usnews.com/news/articles/2016-06-07/millions-of-us-students-chronically-absent>.
- Causarano, A. (2015). Preparing literacy teachers in an age of multiple literacies: A selfreflective approach. *Reading Matrix: An International Online Journal*, 15(2), 196-209.
- CEB. (2017). *Nakuru County Education Status Report*. Nakuru: Unpublished Resport.
- Centre for Mathematics, Science and Technology Education in Africa. (2018). *CEMASTEAs Research and Development Bulletin*. Nairobi: Ministry of Education.
- Chabalengula, V. M., & Mumba, F. (2008). Curriculum and Instructional Validity of the Scientific Literacy Themes Covered in Zambian High School Biology Curriculum. *International Journal of Environmental & Science Education*, 3(4), 207-220.
- Chepkorir, S. (2013). The Impact Of Students' Perceptions On Teaching And Learning Of Chemistry In Secondary Schools In Bureti District, Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies*, 4(4), 618-626.
- Chipana, B. R. (2018). *The Influence of Library Resources Utilization on Secondary School Students' Academic Performance in Tanzania: A Case Study of Public Secondary Schools in Dodoma Municipality*. The Open University of Tanzania: A Dissertation.
- Chirimi, D. O. (2016). *The Impacts Of Teachers' Workload Allocation On Teaching And Learning Effectiveness Of Science Subjects In Secondary Schools: The Case Of Hanang District, Tanzania*. Mzumbe University, Tanzania: unpublished thesis.
- Cimer, A. (2012). What makes biology learning difficult and effective: Students' views. *Educational Research and Reviews*, 7(3), 61-71.
- Clotfelter, C. T., & Ladd, H. F. (2007). *"Are Teacher Absences worth Worrying about in the U.S.?"*. Cambridge: National Bureau of Economic Research.

- Cohen, L., Manion, L., & Morrison, L. (2010). *Research Methods In Education* (5th ed.). London: Taylor Publishers.
- Common, D. (1978). *A Theoretical Model For Curriculum Implementation*. Otawwa, Ontario: UMI Microform.
- Connelly, L. M. (2008). Pilot Studies. *Medsurg Nursing*, 17(6), 411-415.
- Crawford, G. A. (2015). The academic library and student retention and graduation: An exploratory study. *portal: Libraries and the Academy*, 15(1), 41-57.
- Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, 24(2), 97–140. <https://doi.org/10.1080/10888691.2018.1537791>.
- De Vellis, R. (2003). *Scale Development: Theory and applications* (2nd ed.). Thousand oaks, CA: Sage Publications.
- Dickens, J. (2017, February 24). *Teachers work nearly 11 hours a day, landmark workload survey reveals*. Retrieved August 2, 2017, from SCHOOLS WEEK: <http://schoolsweek.co.uk/teachers-work-nearly-11-hours-a-day-landmark-workload-survey-reveals/>
- DQASO. (2018). *Rongai Subcounty Quality Assesment Report: Executive Summaey*. Nakuru: Unpublished Report.
- Ekundayo, H. T., Konwea, P. E., & Yusuf, M. A. (2010). Towards effective time management among lecturers in Nigerian universities. *Journal of Emerging Trends in Educational Research and Policy Studies*, 1(1), 22–24.
- Emory, K., & Coopers, T. (1991). *Business Research Methods* (8th ed.). Hampshire, UK: Cengage Learning EMEA.
- Erinosho, S. Y. (2013). How Do Students Perceive the Difficulty of Physics in Secondary School? An Exploratory Study in Nigeria. *International Journal for Cross-Disciplinary Subjects in Education*, 3(3), 1510-1515.
- Ferla, J., M. Valcke, and Y. Cai. 2009. "Academic self-efficacy and academic self-concept: Reconsidering structural relationships." *Learning and Individual Differences*, 19 (4):499-505.
- Fielding, N., Lee, R., & Blank, G. (2012). The SAGE Handbook of Online Research Methods. *The SAGE Handbook of Online Research Methods*, 195–216. <https://doi.org/10.4135/9780857020055>
- Filho, D. B., Paranhos, R., Rocha, E. C., Batista, M., Silva, A. J., Santos, M. W., et al. (2013). When is statistical significance not significant? *Brazilian political sciencereview*, 7(1), 31-55.

- Finlayson, M. (2009). The Impact of Teacher Absenteeism on Student Performance: The Case of the Cobb County School District. *Dissertations, Theses and Capstone Projects*, Paper 4.
- Finn, J. D., Fish, R. M., & Scott, L. A. (2008). Educational sequelae of high school misbehavior. *The Journal of Educational Research*, *101*(5), 259-274.
- Flom, P. (2016, April 7). *What is an acceptable range for r-squared in real-world environments?* Retrieved June 12, 2018, from Quora: <https://www.quora.com/What-is-an-acceptable-range-for-r-squared-in-real-world-environments>.
- Fosnacht, K., Sarraf, S., Howe, E., & Peck, L. (2017). How Important are High Response Rates. *The Review of Higher Education*, *40*(2), 245–265.
- Garzón, S. A. (2013). *The Impact of The Audiovisual Aids In The Teaching Learning Process At The Technical University of Cotopaxi During The Academic Period March- July 2012*. Technical University of Cotopaxi : Unpublished Thesis.
- Gatemi, N. M., & Thinguri, R. W. (2018). A critical Analysis of The Impact of Frequent Teachers Turnover On The Syllabus Coverage In Schools In Kenya. *European Journal of Education Studies*, *4*(2), 245-256. doi: 10.5281/zenodo.1175302.
- Gautam , K. C. (2015). Factors influencing curriculum implementation for teachers. *International Journal of Applied Research*, 1-3.
- Gbore, L. O. (2013). Relative contributions of selected teachers' variables and students' perceptions toward academic achievement in biology among senior secondary school students in Ondo State, Nigeria. *Mediterranean Journal of Social Sciences*, *4*(1), 243–250. <https://doi.org/10.5901/mjss.2013.v4n1p243>.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: strategies for qualitative research*. Aldine.
- GPE Secretariat. (2017, August 8). *Transforming teaching in Kenya*. Retrieved September 5, 2017, from Global Partnership For Education: <http://www.globalpartnership.org/blog/transforming-teaching-kenya>
- Gross, N., Guacuinta, J. B., & Berstein, M. (1971). *Implementing Organisational Innovations: A sociological analysis of planned educational change*. New York: Harper International.
- Hacieminoglu, E. (2016). Elementary School Students' Perception toward Science and Related Variables. *International Journal of Environmental & Science Education*, *11*(2), 35-52.
- Hackling, M. (2010). *The Status of School Science Laboratory Technicians in Australian Secondary Schools*. Joondalup: Research report prepared for the Department of.
- Halim, H. A. (2013). *Creativity In The Malaysian Esl Curriculum: Policy And Implementation*. Imperial College London : A Thesis .

- Harvey, L. (2018). *Analytic Quality Glossary*. Retrieved September 19, 2018, from Qualityresearchinternational:  
<http://www.qualityresearchinternational.com/glossary/>
- Hinostroza, J. E., Guzmán, A., & Isaacs, S. (2012). Innovative Uses of ICT in Chilean Schools. *Journal Of Computer Assited Learning, 18*, 459-469.
- Jadama, L. M. (2014). Impact of Subject Matter Knowledge of a Teacher in Teaching and Learning Process. *Middle Eastern & African Journal of Educational Research, 7*(1), 20–29.
- Kananu , S. B. (2011). *Factors contributing to poor performance in Mathematics at KCPE in public primary schools in Isiolo District, Eastern province*. Nairobi: Unpublished Thesis of Kenyatta University .
- Karen , G. M. (2018). *Assessing the Fit of Regression Models*. Retrieved September 28, 2018, from Theanalysisfactor: <https://www.theanalysisfactor.com/assessing-the-fit-of-regression-models/>
- Karim , A. (2013). *Data Collection Instruments (Questionnaire & Interview)*. Geneva:: Geneva foundation for medical education and research.
- Katcha, M. A., & Wushishi, D. I. (2015). Effects of laboratory equipment on secondary school students' performance and perception change to biology learning in federal capital territory, Abuja, Nigeria. *Journal of Education Research and Behavioral Sciences, 4*(9), 250-256.
- Kayode, G. M., & Ayodele, J. B. (2015). Impacts of Teachers' Time Management on Secondary School Students' Academic Performance in Ekiti State, Nigeria. *International Journal of Secondary Education, 3*(1), 1.
- Kenya Institute of Curriculum Development syllabus. (2017). *Curriculum Designs*. Nairobi: KICD.
- Kenya Institute of Education (2006). *Secondary Education Syllabus*, Nairobi: KLB
- Kenya National Examination Council report. (2017). *Examination Report*. Nairobi: KNEC.
- Kerr, J. C., & Hoyer, M. (2016, June 9). *Report: DPS has highest rate of chronic absenteeism in U.S.* Retrieved August 5, 2017, from Detroit Free Press: <http://www.freep.com/story/news/education/2016/06/09/dps-detroit-public-schools-absenteeism/85639200/>
- Khatete, D. W., Eunice , O. A., & Ondigi, S. R. (2014). Pedagogical Practices that Hamper Effective Teaching and Learning of Biology in Secondary Schools in Migori District, Kenya. *North American Open Educational Research Journal, 1*(1), 1-12.
- Kini, T., & Podolsky, A. (2016). *Research Report: Does Teaching Experience Increase Teacher Effectiveness? A Review of the Research*.

- KNBS. (2010). *“Counting Our People for the Implementation of Vision 2030”*. Nairobi: Government of Kenya press.
- Komakech, R. A., & Osuu, J. R. (2014). Students’ Absenteeism: A Silent Killer Of Universal Secondary Education (Use) In Uganda. *International Journal of Education and Research*, 2(10), 417-436.
- Konyango, B. O., Ogeta, N. O., Otieno, M., & Orodho, J. A. (2018). Influence of Resources on Students’ Academic Performance in Physics at Secondary Schools in Ugenya Sub-County, Siaya County, Kenya. *Greener Journal of Educational Research*, 8(5), 111–118. <https://doi.org/10.15580/GJER.2018.5.072118101>
- Kumar, R. (2011). *Research Methodology: A step-by-step guide for beginners*. New Delhi: SAGE.
- Lavrakas, P. J. (2011). *Target population*. Retrieved from I. Retrieved April 7, 2017, from SAGE Research Methods: <http://methods.sagepub.com/reference/encyclopedia-of-survey-research-methods/n571.xm>.
- Lee, M., Goodman, C., Dandapani, N., & Kekahio, W. (2015). *Review of international research on factors underlying teacher absenteeism At Mid-continent Research for Education and Learning At Mid-continent Research for Education and Learning*. <http://ies.ed.gov/>
- Magoma, T. (2017). *Assessment of academic performance in secondary schools in Tanzania: a case of secondary schools in Dodoma municipality* (Doctoral dissertation, The University of Dodoma).
- Mahwasane, N. P. (2017). The Roles of Libraries in Sustaining Quality Education in Secondary Schools: A Concept Paper. *Journal of Social Sciences*, 51(1-3), 42-46.
- Makori, A., & Onderi, H. (2013). Evaluation of Secondary School Principals’ Views on the Use of Untrained Teachers in Lesson Delivery in a Free Secondary Education System Era in Kenya. *Journal of Education and Practice*, 4(24), 119-133.
- Makori, A., & Onderi, H. (2014). Examining the teaching and learning resources related challenges facing small and medium-sized public secondary schools in Kenya: A comparative analysis. *African Educational Research Journal*, 2(2), 72-84.
- Mamalanga , L. C., & Awelani , V. M. (2014). Exploring factors influencing performance in Biology 5090 at Selected High Schools in Lesotho. *Mediterranean Journal of Social Sciences*, 5(8), 271-278.
- Manaseh, A. M. (2016). Instructional Leadership: The Role of Heads of Schools in Managing the Instructional Programme. *International Journal of Educational Leadership and Management*, 4(1), 30–47. <https://doi.org/10.17583 /ijelm.2016.1691>
- Maphosa, C., & Mammen, K. J. (2011). How Chaotic and Unmanageable Classrooms have become: Insights into Prevalent forms of learner indiscipline in South African schools. *anthropologist*, 13(3), 185-193.

- Marcella, M. (2017). Principal's Role in Effective Time Management: Key Component in Enhancing Syllabus Coverage in the Kenyan Schools in the 21st Century and Beyond. *International Journal of Current Research*, 9(11), 61759–61766.
- Marciniak, A. (2015). Effective ways of dealing with discipline problems when teaching adolescent learners. *World Scientific News*, 7, 53-72.
- Mbalaka, P. M. (2016). *Teachers' Relational Factors Influencing Effective Syllabus Coverage In Public Secondary Schools Within Migwani Sub-County, Kitui County, Kenya*. Kenyatta University: Project Report.
- Mbito , J. K. (2013). *Challenges Facing Teachers And Students In The Process Of Teaching And Learning Kiswahili In Public Secondary Schools In Kiambu District In Kiambu County, Kenya*. Kenyatta University: Research Project.
- Mbugua, S. N., Gori , J. M., & Tanui, E. (2015). Integration of Information Communication Technology in Teaching in Public Secondary Schools in Nakuru County, Kenya. *International Journal of Education and Research*, 3(8), 271-282.
- Mezieobi, D. I., Oyeoku, E. K., Ezegbe, B. N., & Igbo, J. (2011). Gender Issues in the Implementation of Social Studies Curriculum in Nigerian Universities. *Online Submission*, 12(1), 1044–1052. <http://eric.ed.gov/?id=ED539353>
- Ministry of Education. (2016). *About Student Perceptions on Learning*. Retrieved August 3, 2017, from Ministry of education, Guyana: <http://education.gov.gy/web/index.php/teachers/tips-for-teaching/item/2192-about-student-perceptions-on-learning>
- Moldes, V. M., Biton, C. L., Gonzaga, D. J., & Moneva, J. C. (2019). Students, Peer Pressure and their Academic Performance in School. *International Journal of Scientific and Research Publications*, 9(1), 300-312.
- Mucaï , E. W. (2013). *Availability and utilization of educational resources in Influencing students performance in secondary schools in Mbeere south, Embu county, kenya*. Kenyatta University: Unpublished Thesis.
- Muendo, J. K. (2016). *Influence of School Infrastructural Environment on Performance in Kenya Certificate of Secondary Education in Kibauni Division of Machakos Count, Kenya*. University of Nairobi: Doctoral dissertation.
- Muhamad , F. M., Nabilah , A., Nor, A. A., & Mohamad , H. I. (2014). *Malaysian and Steiner Waldorf Science Curricular Practices: A Comparative Study and Implications for The Design of Science Teacher Education*. Retrieved August 2, 2017, from University Education/ Science Education Research: <https://s3.amazonaws.com/academia.edu.documents/>
- Mukhwana, W. J. (2013). The Role of Student-Related Factors in the Performance of Biology Subject in Secondary Schools in Eldoret Municipality , Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)*, 4(1), 64–73.

- Musah, A., & Umar, A. A. (2017). Effects of Availability and Utilization of Biology Laboratory Facilities and Students' Academic Achievements in Secondary Schools in Yobe State, Nigeria. *International Journal of Innovative Social & Science Education Research*, 5(2), 1-8.
- Musasia, A. M., Nakhanu, S. B., & Wekesa, W. D. (2012). Investigation of factors that influence syllabus coverage in secondary school mathematics in Kenya. *International Journal of Humanities and Social Science*, 2(15), 51-59.
- Mutegi, T. (2014). *Factors Influencing Coverage Of Syllabus in Secondary Schools in Kenya: A Case Study of Langata District Schools in Nairobi County*. Master thesis: The Management University of Africa.
- Muyaka, J. (2012). *ICT Infrastructure and Teacher Preparedness in Integration of ICT in teaching and learning in science subjects. A study of secondary schools in Muranga district, Kenya*. Masters Thesis: Unpublished .
- Mwangi , P. M. (2015). *Administrative Factors Influencing Students Performance In Kenya Certificate Of Secondary Education In Public Day Secondary Schools In Thika West District, Kenya*. University of Nairobi: Unpublished Research Project.
- Mwangu , E. C., & Sibanda , L. (2017). Teaching Biology Practical Lessons in Secondary Schools: A Case Study of Five Mzilikazi District Secondary Schools in Bulawayo Metropolitan Province, Zimbabwe. *Academic Journal of Interdisciplinary Studies*, 6(3), 47-55.
- Mwenda, E., Gitaari, E., Nyaga, G., Muthaa, G., & Reche, G. (2013). Factors Contributing to Students Poor Performance in Mathematics in Public Secondary Schools in Tharaka South District, Kenya. *Journal of Education and Practice*, 4(7), 93-100.
- Namasaka, F. W., Mondoh, H. O., & Wasike, C. B. (2017). Effects of Sequential Teaching Methods on Retention of Knowledge in Biology by Secondary School Students in Kenya. *European Journal of Education Studies*, 3(5), 716-735
- Nasr, A., & Soltani, A. (2011). Perception towards Biology and Its Effects on Student's Achievement. *International Journal of Biology*, 3(4), 100–104. <https://doi.org/10.5539/ijb.v3n4p100>
- Nation, P., & Macalister, J. (2010). *Language Curriculum Design* . New York,: Routledge.
- National Research Council. (2006). America's lab report: Investigations in high school science. National Academies Press.
- Navarro-Rivera, J., & Kosmin, B. A. (2013). Surveys and questionnaires. *The Routledge Handbook of Research Methods in the Study of Religion*, 395–420. <https://doi.org/10.4324/9780203154281-35>

- Ndaba, B. (2017, July 22). *Alarm over AWOL teachers*. Retrieved September 2, 2017, from IOL-NEWS: <https://www.iol.co.za/news/south-africa/gauteng/alarm-over-awol-teachers-10418582>
- Ngala, F. B., Sang, A., & Odebero, S. O. (2005). Teacher utilization and its influence on pupils academic achievement: the case of primary schools in Eldoret Municipality, Kenya. *Egerton Journal*, 3(2), 82-91.
- Ngozi, D. I., & Halima, S. (2015). Inadequate Laboratory Facilities And Utilization:Pedagogical Hinderances To Students Academic Performamce In Biology In Senior Seondary Certificate Examination In Zaria Metropolis,Kaduna State,Nigeria. *International Business Research*, 8(9), 124-134.
- Njaramba, G. (2017, February 3). *Opinion:Enforce rules to curb teacher absenteeism*. Retrieved August 5, 2017, from Standard Digital: <https://www.standardmedia.co.ke/article/2001228161/opinion-enforce-rules-to-curb-teacher-absenteeism>.
- Njoroge, D. (2012). Education Players In Bid to Improve Performance. *Education News*, 084, 23-25.
- Northeast Texas Network Consortium. (2002). *Distance Learning College Glossary*. Retrieved August 2, 2017, from Netnet.Org: <http://www.netnet.org/students/student%20glossary.htm>,
- Noor, F., Ishaque, M., Lodhi, F., & Memon, A. (2012). Effects of teacher transfer on school system. *Interdisciplinary Journal of contemporary Research in Business*, 4(2), 593-617.
- Nwana, S. (2012). Challenges In The Application of E-Learning By Secondary School Teachers In Anambra State, Nigeria. *African Journal Of Teacher Education*, 2(1), 1-5.
- Nyaga, S. J. (2016). *Influence Of Utilisation And Design Of Curriculum Digital Content On Biology Instructional Process Among Secondary Schools In Nairobi County, Kenya*. Kenyatta University: Unpublished Thesis.
- Oakley, A. (1998). Gender, methodology and people's ways of knowing: Some problems with feminism and the paradigm debate in social science. *Sociology*, 32(4), 707-731.
- Obasi, V. A. (2014). *Implementation: A Critical Variable In Curriculum Development*. Retrieved January 2, 2018, from Global Academic Group: <http://www.globalacademicgroup.com/journals/nact/Obasi.pdf>
- Ochieng' , J. O. (2013). *Determinants Of Information And Communication Technology Integration In The Teaching Of Sciences In Public Secondary Schools In Kisumu East District –Kenya*. University of Nairobi: unpublished thesis.



- Okode, G. O. (2013). *Influence Of Secondary Schools' Strategic Planning On Students' Academic Performance In Rachuonyo North District, Kenya*. University of Nairobi: Unpublished Thesis.
- Okoth, A., & Ndaloh, A. (2013). *Social Studies For Primary Schools*. Nairobi: East African Educational Publishers Limited.
- Oladimeji , A. B. (2015). Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. *Nigerian Post Graduate Medical Journal*, 22(4), 195-201.
- Olusegun, F. (2017, September 6). *WAEC Latest Syllabus By Subject 2017*. Retrieved August 17, 2017, from Just naira blog: <http://www.justnaira.com/west-african-examination-council-waec/>
- Omolar, S. R., & Adebukola, O. R. (2015). Teachers' Perceptions: A Great Influence on Teaching and Learning of Social Studies. *JL Pol'y & Globalization*, 42, 131.
- Ondigi, S. R. O., & Omariba, A. (2017). Effect of Utilization of Biology Teaching and Learning Resources on Students ' Academic Performance in Secondary Schools in Siaya District – Kenya. *International Journal of Education and Research*, 5(1), 2–20. [www.ijern.com](http://www.ijern.com).
- Onsomu, W. M. (2014). *Influence of Teachers' transfer on student academic performance in Public Secondary schools in Kenya* [University of Nairobi]. <http://erepository.uonbi.ac.ke/handle/11295/76831> [http://erepository.uonbi.ac.ke/bitstream/handle/11295/76831/Onsomu\\_Influence\\_of\\_Teachers%27\\_transfer\\_on\\_student\\_academic\\_performance\\_in\\_Public.pdf?sequence=1&isAllowed=y](http://erepository.uonbi.ac.ke/bitstream/handle/11295/76831/Onsomu_Influence_of_Teachers%27_transfer_on_student_academic_performance_in_Public.pdf?sequence=1&isAllowed=y)
- Osuala, E. C. (1987). *Introduction to Research Methodology*. Nairobi: Morrison Publishers.
- Osu, S. ., & Etokebe, I. . (2015). Teachers And Instructional Resources Availability For Effective Biology Education In Schools In Akwa Ibom State - Nigeria. *International Journal of Research Development*, 9(1), 1–13.
- Owiti, E. A. (2009). *Factors that Contribute to Student's Poor Achievement in KCSE Biology in Secondary schools of Migori District, Kenya*. Unpublished Thesis: Kenyatta University.
- Parsonson, B. S. (2012). Evidence-Based Classroom Behaviour Management Strategies. *Kairaranga*, 13(1), 16-23.
- Perry, E. (2015). Developing practical work in Ghana. Ghana Science Resource Centres.
- Phillips, B. M., Ingrole, S., Burris, P., & Tabulda, G. (2017). Investigating predictors of fidelity of implementation for a preschool vocabulary and language curriculum. *Early Child Development and Care*, 187(3/4), 542-553. doi: 10.1080.03004430.2016.1251428

- Ponnusamy, R., & Pandurangan, J. (2014). *A Handbook on University System*. New Delhi: Allied Publishers.
- Rafid, K., & Rahimullah, J. (2015). The impacts of ICT on the students' Performance: A Review of Access to Information. *Research on Humanities and Social Sciences*, 5(1), 85-94.
- Razafimbelo, J., & Rajonhson, L. (2009). Analysis of the Factors that Explain the Non-Completion of the Curriculum: A Study of the Teaching Time in Primary Schools in Madagascar. *Journal of International Cooperation in Education*, 12(1), 89-105.
- Rice, J. . (2003). Teacher Quality: Understanding the Effectiveness of Teacher Attributes Economic Policy Institute. In *Economic policy institute*. [https://www.epi.org/publication/books\\_teacher\\_quality\\_execsum\\_intro/](https://www.epi.org/publication/books_teacher_quality_execsum_intro/)
- Riddle, M. (2014, August 10). *Teacher Attendance and School Culture – Revisited*. Retrieved August 7, 2017, from Nationa Association Of Secondary School Principals: <http://blog.nassp.org/2014/08/10/teacher-attendance-and-schoolculture-revisited/>
- Rockoff, J. E. (2004). The impact of individual teachers on student achievement: Evidence from panel data. *American Economic Review*, 94(2), 247–252. <https://doi.org/10.1257/0002828041302244>
- Rongai Sub-County Education Reports (2019). *KCSE analysis*. Nakuru: Unpublished Report
- Rutto, K.P., & Kaptingei, P. (2014). Challenges facing laboratory practical approach in physics instruction in Kenya District Schools. *International School of Achievements in Research and Technology*, 3 (4), 650- 675.
- Sahito, Z., Khawaja, M., Panhwar, U. M., Siddiqui, A., & Saeed, H. (2016). Teachers' Time Management and the Performance of Students: A Comparison of Government and Private Schools of Hyderabad, Sindh, Pakistan. *World Journal of Education*, 6(6), 42–50. <https://doi.org/10.5430/wje.v6n6p42>
- Salkind, N. J. (2012). Content Validity. *Sage Research Methods*, 239.
- Sauro, J. (2015, April 7). *How To Measure The Reliability of Your Methods and Metrics*. Retrieved September 19, 2018, from Measuringu: <https://measuringu.com/measure-reliability/>
- Schendera, C. F. (2014). *Regressions analysis in SPSS*. Berlin, Boston: De GruyterOldenbourg.
- Seidel, T., & Shavelson, R. J. (2007). Teaching Effectiveness Research in the Past Decade: The Role of Theory and Research Design in Disentangling Meta-Analysis Results. *Review of Educational Research*, 77(4), 454–499. <https://doi.org/10.3102/0034654307310317>.

- Senthilkumar, R., Sivapragasam, C., & SenthamaraiKannan, B. (2014). Role of ICT in Teaching Biology. *International Journal of Research*, 1(9), 780-788.
- Sequeira, L. (2004). *Certificate Biology Form 3 Teachers' Guide*. Nairobi: East Africa Educational Publishers.
- Sigilai, R. M. (2013). A Review of Curriculum-Related Factors Influencing Academic Achievements Among Students in Public Secondary Schools in Kenya. *International Journal of Advanced Research*, 1(3), 219-230.
- Silverman, H. (2011). Protecting vulnerable research subjects in critical care trials: Enhancing the informed consent process and recommendations for safeguards. In *Annals of Intensive Care* (Vol. 1, Issue 1, p. 8). Springer Verlag. <https://doi.org/10.1186/2110-5820-1-8>
- Šorgo, A., Verčkovnik, T., & Slavko, K. (2010). Information and Communication Technologies (ICT) in Biology Teaching in Slovenian Secondary Schools. *Eurasia Journal of Mathematics, Science & Technology Education*, 6(1), 37-46
- Stephanie, M. (2015, September 22). *Multicollinearity: Definition, Causes, Examples*. Retrieved September 28, 2018, from statisticshowto: [https://www. Statistic showto.datasciencecentral.com/multicollinearity/](https://www.Statisticshowto.datasciencecentral.com/multicollinearity/)
- Takbir, A. (2012). A Case Study of the Common Difficulties Experienced by High School Students in Chemistry Classroom in Gilgit-Baltistan(Pakistan). *SAGE Journals*, 1-13.
- Tallam, E. K., Tikoko, B. J., Sigei, J., & Chesaro, D. K. (2015). Contribution of school disciplinary committee to the managementmanagement of students' discipline in public secondary schools in Rongai district, Nakuru County, Kenya. *International Research Journals*, 6(5), 109-112.
- Tašner, V., Mihelič, M. Ž., & Čeplak, M. M. (2017). Gender in the teaching profession: University students' views of teaching as a career. *CEPS Journal*, 7(2), 47–69.
- Tavakol, M., & Dennick, R. (2011). Making sense of cronbach's alpha. *International journal of medical education*, 2, 53.
- Taylor, A. (2014). Community service-learning and cultural-historical activity Theory. *Canadian Journal of Higher Education*, 44(1), 9-107.
- Teachers Service Commission (2014). Policy framework: Performance appraisal and promotion of teachers. Nairobi, Kenya.
- Teachers Service Commission Act. (2015). *Teachers Service Commission Code of Regulations for Teachers*. Nairobi: Government of Kenya.
- TSC. (2017). *TSC issues circular on completion of syllabus before national examinations*. Retrieved September 2, 2019, from <https://kenyayote.com/tsc-issues-circular-completion-syllabus-national-examinations/>

- Udo, M. E. (2010). Effects of integrating practical work with theory on students' achievement in secondary school chemistry. *Niger. J. Sci. Sci. Educ*, 8(2), 103-116.
- Usman, Y. D. (2016). Educational Resources: An Integral Component for Effective School Administration in Nigeria. *Research on Humanities and Social Sciences*, 6(13), 27–37. [www.iiste.org](http://www.iiste.org)
- Vasconcelos, C., Torres, J., Mountinho, S., Martins, I., & Costa, N. (2015). Faculdade de Ciências, Ins. *Cogent Education*, 2(1), 1-12.
- Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: Systematic analysis of qualitative health research over a 15-year period. *BMC Medical Research Methodology*, 18(1), 148. <https://doi.org/10.1186/s12874-018-0594-7>
- Vold, M. (2018). *Factors that Predict Vocabulary and Selfassessment in English as a Foreign Language*. university of Stavanger: Masters Thesis.
- Wahab, Shamsideen. A., & Oshinyadi, Peter. O. (2017). Educational Resources and Teachers' Time Management as Predictors of Students' Academic Performance in Ogun State Public Secondary Schools. *International Journal of Educational Planning and Administration*, 2(3), 51–59
- Wakori, S. K. (2014). Factors Influencing Performance in the Kenya Certificate of Primary Education a Case of Kirinyaga West District Kenya. *Mediterranean Journal of Social Sciences*, 5(5), 273-295.
- Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains: A review. In *Review of Educational Research* (Vol. 73, Issue 1, pp. 89–122). American Educational Research Association. <https://doi.org/10.3102/00346543073001089>
- Wekesa, E. L., Simatwa, E., & To, O. (2016). Influence of teacher factors on students' academic performance in secondary school education. A case study of Kakamega County, Kenya. *Greener Journal of Educational Research*, 6(4), 151-169.
- Wawira, Z. N. (2012). *Teaching and learning of Biology by SMASSE project approach in secondary schools in Mbeere South district*. Kenyatta University: Unpublished Thesis.
- Wiles, J. W., & Bondi, J. C. (2014). Curriculum development: A guide to practice. Boston, MA: Pearson.
- Wilkins, D. A. (1981). Notional Syllabuses Revisited. *Applied Linguistics*, 2, 83-89.
- Wimolsittichai, N. (2017). *School libraries and their roles in rural Thailand: Perceptions of public primary school principals* (Doctoral dissertation, Queensland University of Technology).

- Yanimu, J., & Pagelio, E. (2008). *Biology:Upper Secondary Teacher Guide* . Papua New Guinea: Department of Education, Papua New Guinea .
- Yawe, A.A (2011). Impact of demonstration and discussion methods instruction on Junior Secondary Schools achievement in Business studies in Makurdi Metropolis, Benue State. *Nasher Journal*, 9(1), 70-73.
- Zandile , F. N. (2013). *The Challenges Of Managing Learner Discipline: The Case Of Two Schools In Pinetown District*. University Of Kwazulu-Natal: A Dissertation .

## APPENDICES

### Appendix I: Introduction Letter

Benard Kiprono Bett

Kabarak University

P. o Box 20157

Kabarak

10/01/2019

Dear Respondent,

I am a student at Kabarak University in the School of Education pursuing Masters of Education in curriculum studies. I am carrying out a research on **“Influence of Selected Factors on effective Coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya.”**

Since you are among the group targeted for the study, I invite you to participate in this research study by completing the attached questionnaire. In order to ensure that all information will remain confidential, please do not include your name. The information provided will be treated with utmost confidentiality and not for any other purpose other than research. Thank you for taking the time to provide information and your willingness to participate in this study.

Sincerely,

Benard Kiprono Bett

## Appendix II: Teachers' Questionnaire

- ✓ Kindly provide the correct information by ticking where applicable.
- ✓ Do not write your name anywhere in this instrument.

### Section A: Basic Information

1. Indicate your gender  
 a) Male       b) Female
  
2. Indicate the category of your school  
 a) Boy school     b) Girl school     c) Mixed school
  
3. Indicate the Type of school you teach  
 a) Public                       b) Private
  
4. Which zone is your school located? (*tick appropriately*)

Kampi ya Moto	
Ngata	
Rongai	
Solai	

### Section B: Student Related Factors

Please rate the tabulated statements using the scale of 1 – 4 below by ticking it appropriately.

**(1 – Strongly Disagree; 2 – Disagree; 3 – Agree; 4 – Strongly Agree)**

No	Statement	1	2	3	4
1.	My students enjoy learning Biology				
2.	My students participate in class during biology lesson				
3.	My student's complete assignments in Biology				
4.	My students do extra research on topics learnt				
5.	My students attend school regularly				
6.	Peer pressure influence syllabus coverage				
7.	Students' discipline influence syllabus coverage				

### Section C: Teacher Related Factors

Please rate the tabulated statements using the scale of 1 – 4 below by ticking it appropriately.

(1 – Strongly Disagree; 2 – Disagree; 3 – Agree; 4 – Strongly Agree)

No	Statement	1	2	3	4
1.	Knowledge of subject matter influence syllabus coverage				
2.	Teachers workload influence syllabus coverage				
3.	Teachers' absenteeism influence syllabus coverage				
4.	Lesson presentation influence syllabus coverage				
5.	Teacher transfers influence syllabus coverage				
6.	Teacher experience influence syllabus coverage				
7.	Negative perception towards some topics influence syllabus coverage				

### Section D: Availability of Instructional Resources

Please rate the tabulated statements using the scale of 1 – 4 below by ticking it appropriately.

(1 – Strongly Disagree; 2 – Disagree; 3 – Agree; 4 – Strongly Agree)

No	Statement	1	2	3	4
1.	We have adequate science laboratory for conducting practical lessons in Biology				
2.	The laboratory is adequately equipped with reagents and materials for practical lessons in Biology				
3.	We have adequate textbooks for teaching Biology				
4.	We have adequate Physical classrooms for teaching Biology.				
5.	I access ICT resources for teaching Biology				
6.	Revision materials for Biology are available				
7.	We have library for research on topics in Biology				
8.	We have adequate tables in the laboratory				



### Section E: Effective Syllabus Coverage

Please rate the tabulated statements using a scale of 1 - 3 by ticking.

**(1-Not Done; 2-Ineffectively Done; 3-Effectively Done)**

<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>
Teaching of Topics by the time students sit for KCSE examinations			
Development and Implementation of Biology Projects			
Revision of Topics by the time students sit for KCSE examinations			
Teaching of all Practical lessons by the time students sit for KCSE examinations			

End

Thank you for participating!

### Appendix III: Students Questionnaire

Benard Kiprono Bett  
Kabarak University  
P. O. Box 20157  
Kabarak

24<sup>th</sup> June 2019

Dear Respondent,

I am a student at Kabarak University in the School of Education pursuing Masters of Education in curriculum studies. I am carrying out a research on **“Influence of Selected Factors on Effective Coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya.”** Since you are among the group targeted for the study, I invite you to participate in this research study by completing the attached questionnaire. Thank you for taking the time to provide information and your willingness to participate in this study.

Sincerely,

Bett.

#### Section A: Basic Information

1. Indicate your gender

a) Male       b) Female

#### Section B: Time Management

Please rate the tabulated statements using the scale of 1 – 4 below by ticking it appropriately.

**(1 – Strongly Disagree; 2 – Disagree; 3 – Agree; 4 – Strongly Agree)**

<b>No</b>	<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1.	Some teachers leave class before the end of the lesson in Biology				
2.	Teachers utilize all the lesson minutes in Biology				
3.	Teachers are punctual when attending the lesson in Biology				
4.	Teachers waste time on irrelevant stories in Biology				
5.	There is adequate time allocated in the timetable for teaching theory lessons				
6.	There is adequate time allocated in the timetable for teaching practical lessons				

Thank You for Participating!

## Appendix IV: Principals' Interview Schedule

Benard Kiprono Bett  
Kabarak University  
P. o Box 20157  
Kabarak

24<sup>th</sup>.June.2019

Dear Respondent,

I am a student at Kabarak University in the School of Education pursuing Masters of Education in curriculum studies. I am carrying out a research on **“Influence of Selected Factors on Effective Coverage of Kenya Certificate of Secondary Education Biology Syllabus in Rongai Sub-County, Kenya.”** Since you are among the group targeted for the study, I invite you to participate in this research study by completing the attached questionnaire. Thank you for taking the time to provide information and your willingness to participate in this study.

### Section A: Basic Information

1. Indicate your gender

a) Male       b) Female

### Section B: Student Related factors

a, List elements that influence syllabus coverage and are classified as student related factors

.....  
.....  
.....  
.....

b, In what way does student related factors affect effective syllabus coverage?

.....  
.....  
.....  
.....

**Section C: Teacher Related Factors**

a, List elements that influence syllabus coverage that are classified as teacher related factors

.....  
.....  
.....  
.....

b, In what way does teacher related factors affect effective syllabus coverage

.....  
.....  
.....  
.....

**Section D: Availability of Instructional Resources.**

a. List instructional materials available for teaching Biology

.....  
.....  
.....  
.....

b. In what way does availability of instructional resources affect effective syllabus coverage?

.....  
.....  
.....  
.....

**Section E: Time Management**

a. What are some of the time management related issues that affect effective syllabus coverage?

.....  
.....  
.....  
.....

b. In what way does availability of instructional resources affect effective syllabus coverage

.....  
.....  
.....  
.....

**Section F: Effective Syllabus Coverage**

a. What are the strategies have you laid down to ensure Effective syllabus coverage is achieved?

.....  
.....  
.....  
.....

*Thank you for your participation!*

## Appendix V: University Letter



### INSTITUTE OF POST GRADUATE STUDIES

Private Bag - 20157  
KABARAK, KENYA  
E-mail: [directorpostgraduate@kabarak.ac.ke](mailto:directorpostgraduate@kabarak.ac.ke)

Tel: 0773265999  
Fax: 254-51-343012  
[www.kabarak.ac.ke](http://www.kabarak.ac.ke)

5th February 2018

Ministry of Higher Education Science and Technology,  
National Council for Science, Technology & Innovation,  
P.O. Box 30623 -- 00100,

Dear Sir/Madam,

**RE: RESEARCH BY BETT BERNARD KIPRONO- MED/NE/0034/01/16**

The above named is a student at Kabarak University taking Masters Degree in Curriculum studies. He is carrying out research entitled .“ Influence of selected factors on timely coverage of Kenya Certificate of Secondary Education Biology syllabus in Rongai sub-county, Kenya.”

The information obtained in the course of this research will be used for academic purposes only and will be treated with utmost confidentiality.

Please provide the necessary assistance.

Thank you.

Yours faithfully



  
**Dr. Esther J. Kibor**  
**AG.DIRECTOR - (POST-GRADUATE STUDIES)**

---

#### Kabarak University Moral Code

*As members of Kabarak University family, we purpose at all times and in all places, to set apart in one's heart, Jesus as Lord. (1 Peter 3:15)*

## Appendix VI: NACOSTI Research Authorization Letter



### NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: 020 400 7000,  
0713 788787, 0735404245  
Fax: +254-20-318245, 318249  
Email: [dpi@nacosti.go.ke](mailto:dpi@nacosti.go.ke)  
Website: [www.nacosti.go.ke](http://www.nacosti.go.ke)  
When replying please quote

NACOSTI, Upper Kabete  
Off' Wanyuki Way  
P.O. Box 30623-00100  
Nairobi-KENYA

Ref. No. **NACOSTI/P/18/84323/21293**

Date: **20<sup>th</sup> February, 2018**

Benard Kiprono Bett  
Kabarak University  
P.O. Private Bag 20157  
**KABARAK.**

#### **RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on "*Influence of selected factors on timely coverage of Kenya Certificate of Secondary Education Biology syllabus in Rongai Sub-County, Kenya*" I am pleased to inform you that you have been authorized to undertake research in **Nakuru County** for the period ending **20<sup>th</sup> February, 2019**.

You are advised to report to, **the County Commissioner and the County Director of Education, Nakuru 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.

**GODFREY P. KALERWA MSc., MBA, MKIM**  
**FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner  
Nakuru County.

The County Commissioner  
Nakuru County.




## Appendix VII: NACOSTI Research Permit


**THIS IS TO CERTIFY THAT:**  
**MR. BENARD KIPRONO BETT**  
of **KABARAK UNIVERSITY, 3270-20100**  
**NAKURU**, has been permitted to conduct  
research in **Nakuru County**


Permit No : **NACOSTI/P/18/84323/21293**  
Date Of Issue : **20th February, 2018**  
Fee Received : **Ksh 1000**

on the topic: **INFLUENCE OF SELECTED  
FACTORS ON TIMELY COVERAGE OF  
KENYA CERTIFICATE OF SECONDARY  
EDUCATION BIOLOGY SYLLABUS IN  
RONGAI SUB-COUNTY, KENYA**

for the period ending:  
**20th February, 2019**





  
**Applicant's  
Signature**

  
**Director General  
National Commission for Science,  
Technology & Innovation**

**CONDITIONS**

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

  
**REPUBLIC OF KENYA**

  
**National Commission for Science,  
Technology and Innovation**

**RESEARCH CLEARANCE  
PERMIT**

Serial No.A **17526**  
CONDITIONS: see back page

**Appendix VIII: County Director of Education Research Permit**

**MINISTRY OF EDUCATION  
STATE DEPARTMENT OF BASIC EDUCATION**

Telegrams: "EDUCATION",  
Telephone: 051-2216917  
When replying please quote



COUNTY DIRECTOR OF EDUCATION  
NAKURU COUNTY  
P. O. BOX 259,  
NAKURU.

Ref.CDE/NKU/GEN/4/21/VOL.V/16

8<sup>th</sup> March, 2018

TO WHOM IT MAY CONCERN

**RE: RESEARCH AUTHORIZATION –BENARD KIPRONO BETT  
PERMIT NO. NACOSTI/P/18/21293**

Reference is made to letter NACOSTI/P/18/8432/21293  
Dated 20<sup>th</sup> February, 2018.

Authority is hereby granted to the above named to carry out research on  
*"Influence of selected factors on timely coverage of Kenya Certificate of  
Secondary Education Biology syllabus in Rongai Sub-County, Kenya"* for a  
period ending *20<sup>th</sup> February, 2019.*

Kindly accord him the necessary assistance.

A handwritten signature in blue ink, appearing to read 'J. Maki'.

**JOSEPH L.K MAKI  
FOR: COUNTY DIRECTOR OF EDUCATION  
NAKURU COUNTY**

Copy to:  
Kabarak University  
P. O. Box Private Bag 20157  
KABARAK.

**Appendix VIII: Nakuru County Commissioner Research Permit**



**THE PRESIDENCY  
Ministry of Interior and Coordination of  
National Government**

Telegram: "DISTRICTER" Nakuru  
Telephone: Nakuru 051-2212515  
When replying please quote

COUNTY COMMISSIONER  
NAKURU COUNTY  
P.O. BOX 81  
NAKURU

Ref No CC.SR.EDU.12/1/2 VOL.111/43

9<sup>th</sup> March 2018

TO WHOM IT MAY CONCERN

**RE:- RESEARCH AUTHORIZATION  
BENARD KIPRONO BETT**

The above named has been authorized to carry out research on "*influence of selected factors on timely coverage of Kenya Certificate of Secondary Education Biology syllabus*" in Rongai Sub County, Nakuru County for a period ending 26<sup>th</sup> February 2019

Please accord him all the necessary support to facilitate the success of his success.

**VICTOR GITONGA  
FOR COUNTY COMMISSIONER  
NAKURU COUNTY**

## Appendix IX: A List of Public Secondary Schools in Rongai Sub-County

### A: List of Public Secondary Schools

NO	Kampi Ya Moto Zone	
1	A.I.C Morop S.S	
2	A.I.C Tulwobmoi Sec Sch	
3	Athinai Secondary School	
4	Barina Sec Sch	
5	Bright Hope Lomolo Secondary	
6	Kampi Ya Moto Sec. School	
7	Kipsyenani Mixed Day Secondary School	
8	Koisamo Mixed Secondary School	
9	Lenginet Secondary School	
10	Ol Rongai Sec School	
	<b>Ngata Zone</b>	
1	Kiamunyi Sec Sch	
2	Kirobon S.S.	
3	Kirobon Girls Secondary School - Rongai	
4	Mema Secondary School	
5	Mercy Njeri Secondary School	
6	Ngata Secondary School	
7	Ogilgei Sec. School	
8	Piave Sec Sch	
	<b>Rongai Zone</b>	
1	Bomasan Sec. Sch.	
2	Boror Mixed Secondary School	
3	Burgesi Mixed Day Secondary School	
4	Kandutura Day Secondary School	
5	Kimangu Day Secondary School	
6	Leldet Secondary School	
7	Mama Ngina Kenyatta	
8	Matuiku Sec Sch	
9	Mawe Mixed Sec Sch	
10	Mimwaita Secondary School	
11	Springs High Secondary School	
12	Tuiyotich Sec School	
	<b>Solai Zone</b>	
1	Akuisi Sec. School	
2	Banita Sec Sch	
3	Chemasis Mixed Secondary School	
4	Lake Solai Sec. School	
5	Majani Mingi Secondary School	
6	Muhigia Sec. School	
7	Patel Day Sec	
8	Ruiru Secondary School	
9	Set Kobor Baptist Sec	
10	Solai S.S.	
11	Solai Day Mixed Sec	
12	Solai Kale Sec Sch	

**B. List of Private Secondary Schools**

1.	School	
2.	Kabarak High School	
3.	Rongai Boys Secondary	
4.	Vanessa Grant Girls	
5.	Bridgewater Girls	
6.	Sacred Heart Boys Sec.	
7.	Arutani Girls Sec.	
8.	Almumin Secondary School	
9.	Njoro Precious Girls	
10.	Boenix High School	
11.	Mustard Seed Seondary	
12.	Wheat Fields Girls	
13.	Ufanisi Peace Secondary	
14.	Kimangu High School	
15.	St. Maria Gorretti	
16.	Rongai Precious Girls	
17.	Lampstand Academy Sec.	
18.	Pleasant View Secondary	
19.	Rongai High School	
20.	Njoro Academy	

**Appendix XI: Map of Rongai Sub-County**





## Appendix XII: List of Publication



ISSN 2278 – 0211 (Online)

### Influence of Teacher Related Factors on Effective Coverage of Kenya Certificate of Secondary Education Biology Syllabus in Secondary Schools in Rongai Sub-County, Kenya

**Benard Kiprono Bett**

Tutor, Department of Computer Science, Kabarak University, Kenya

**Frederick Ngala, B. J. A**

Dean, School of Education, Department of Education, Kabarak University, Kenya

**Dr. Bernard Chemwei**

Lecturer, Department of Education, Kabarak University, Kenya

#### **Abstract:**

*The need for effective coverage of secondary school syllabi is crucial in Kenya and the world at large. The problem which this study sought to determine was ineffective coverage of Kenya Certificate of Secondary Education (KCSE) Biology syllabus in secondary schools in the Sub County. The objective of this study was to establish the influence of teacher related factors on effective coverage of KCSE Biology syllabus in Secondary Schools in Rongai Sub-County, Kenya. The study was grounded on curriculum implementation theory and adopted correlational design. The study was based in Nakuru Rongai Sub-County secondary schools. The target population of this study comprised of 151 Biology teachers and 120 form four class secretaries. Census method was used to sample Biology teachers and class secretaries. In this study, content validity of the instrument was determined by research supervisors from Kabarak University who read the content, look at the items and ensured that they reflect the actual content area. This study used test retest method of determining reliability of research instrument. Data was collected using a questionnaire. The findings revealed that teacher related factors significantly influence an effective Coverage of Biology Syllabus ( $\beta = 0.390$ ;  $p < 0.05$ ). The study concludes that factors such as teacher transfers, topics that are too wide in Biology and negative attitude towards some topics influence significantly effective syllabus coverage. It is herein recommended that teacher transfers should be managed appropriately in order to improve coverage of KCSE Biology Syllabus. Moreover, in-service training of teachers should be enhanced by Ministry of education in order to resolve negative attitude towards some topics. Finally, teachers should be adequately equipped with new technologies, pedagogical techniques and appropriate instructional resources in order to achieve effective coverage of Biology syllabus.*

**Keywords:** Biology syllabus, effective coverage, teacher-related factors

#### **1. Introduction**

Syllabus is important in an educational setting. Firstly, it delineates the responsibilities of students and the instructors. It provides details of what was covered, what students were expected to do, and how these outcomes and performances were assessed (Okoth & Ndaloh, 2013). According to Kenya Institute of Curriculum Development syllabus (2017) effective syllabus coverage refers to adequately completion of topics in the syllabus as per the time allocated by the Kenya Institute of Curriculum Development. On the other hand, Wiles and Bondi (2014) affirm that effective syllabus coverage entails to how teachers deliver instruction and assessment through the use of specified resources provided in a curriculum. Teaching of topics in Biology as a measure of effective syllabus coverage has been recognized. According to Yanimu and Pagelio (2008) the teacher of Biology needs to ensure that the content specified in the syllabus is covered adequately.

In Australia, it was reported by Hackling (2010) that in some cases the science teacher performed the duties of technicians. Given the pressures on teachers' time, it is likely that teachers in these circumstances can only prepare limited resources for practical work and the quality of the curriculum is compromised. This implies that there is a problem with effective coverage of syllabus for Biology.

In Madagascar, Razafimbelo and Rajonhson (2009) assert that there has been a problem of non-completion of curriculum in school. This was explained by factors such as teaching time have seriously been curtailed by the repeated and extended absences of both teachers and students; long distances that separate schools from the nearest towns, climatic hazards