

**EFFECT OF TRAINER COMPETENCE ON STUDENTS' ACADEMIC
PERFORMANCE IN DIPLOMA OF THE SET COURSES: A CASE OF
NATIONAL POLYTECHNICS IN WESTERN KENYA**

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DECLARATION

Declaration by the student

This thesis is my original work and has not been submitted for any other award in this or any other university or institution and shall not be reproduced in part or full or in any format without prior written permission from the author and/or University of Eldoret.

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DEDICATION

I honestly dedicate this academic attribute unto the academic hands of my very beloved children who I hope will naturally pass this same legacy to my very generational Grand Children at that futuristic time.

. . . May God bless . . .

ABSTRACT

Trainers are important in the technical vocational education and training system as they are fulcrums upon which wheels of education rotate in delivering competence needs that convert global labour-oriented economy to a knowledge and innovation-based economy. For the past five years, there has been poor academic performance in Diploma of the Science Engineering and Technology (SET) courses in the National Polytechnics in western Kenya in the final national examinations. The specific objectives of the study included determining the relationship between trainer academic competences on students' academic performance, determining the relationship between trainer pedagogical competencies on students' academic performance, determining the relationship between trainer experience competencies on students' academic performance and determine the relationship between trainers' industrial linkages on students' academic performance. The study was guided by two theories; the Capital Theory of School Effectiveness and Improvement which was advanced by David H. Hargreaves in 2001. The theory is built around four distinct concepts: intellectual capital, social capital, leverage, and outcomes. A second theory was the education Production Function which was carried out by the sociologist, James S. Coleman in 1966. The Coleman Report, published in 1966, relates various inputs affecting student's learning such as families, peers, neighborhoods, and the school. Stratified, purposive and random sampling methods were used in the sampling procedure at the polytechnic levels to get to the correct respondents required. The research instruments for the study included interview schedule for Principals and County Directors of technical education, questionnaires were for the Heads of departments, trainers, and students. Document analysis and observation was used. All the research instruments were pre-tested before the research commencement at the Eldoret National Polytechnic. A test-retest result of 0.78 was obtained and was in range acceptable as recommended by Mutindi, M. J. (2018). Data was analysed by use of descriptive means: tables, percentages bar charts, and pie charts. The study adopted a descriptive research design to establish the effect of the predictor variable on the dependent variable. The target population consisted of the 3 principals, 21 Heads of departments, 3 County directors of technical education, 386 students, and 150 trainers a total population of 563. The sample size was determined by the Role (2013) formula that yielded 3 principals, 18 Heads of departments, 109 trainers, 196 students and 3 County directors of technical education to give a total of 329 respondents. The findings revealed that trainer academic competencies, pedagogy, experience and industrial linkage competences were present and had positive and significant effect on students' academic performance in the national polytechnics. Recommendations on the analysis of effect of trainer competences on academic performance in SET courses of the National Polytechnics require that the government through the public service commission employ trainers in the National polytechnics who have high level of academic competencies, high level of pedagogical competencies, have long training experience competences and have industrial linkage competences to improve students' academic performance in the National Polytechnics in western Kenya.

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LIST OF ACRONYMS

BOM	Board of Management
CBET	Curriculum Based Establishment and Training
COMESA	Common Market of East and South Africa
CKT	Content Knowledge for Teaching
EAC	East African Community
GOK	Government of Kenya
IGAD	Inter Governmental Authority on Development
ILO	International Labour Organization
KANU	Kenya African National Union
KNEC	Kenya National Examinations Council
MOHEST	Ministry of Higher Education Science and Technology
NACOSTI	National Commission for Science, Technology and Innovation
NEPAD	New Partnership for African Development
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
SET	Science, Engineering & Technology
TEP	Technical Education Programme
TTI	Technical Training Institutes
TVET	Technical Vocational Education and Training
TVT	Technical and Vocational Training
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter provides an analysis of pertinent sections which include; background to the study, statement of the problem, purpose of the study, specific objectives, research questions, justification of the study, significance of the study, basic assumptions of the study, limitations of the study, scope of the study, theoretical framework of the study, conceptual framework of the study, and finally operational definition of terms.

1.2 Background of the Study

Workforce in the 21st century has been marked by the acceleration of jobs that require human resources with new competencies different from the traditional ones. Consequently, the world demands vocational education that is able to facilitate future human resource to learn competencies that meet the needs of future market changes (Satria, Muhammad Rizal, 2017). Competence reflects whether the job performance of an employee in an organization is excellent or represents a performance indicator set for the development of professionalism (Shippmann & Mulder, 2000). A competent employee is one who possesses the individual skills and abilities to efficiently and successfully execute the assigned tasks (Klieme, E., Hartig, J., & Rauch, D. 2014) and also demonstrates excellent job performance.

Consequently, trainers have been challenged to enhance the new abilities that can implement pedagogical approaches and improve the human capital development especially those in the field of technical and vocational education which are a critical factor in generating and maintaining economic growth specifically in the formation of skilled workers (Paryono, 2015). The production of human capital that are knowledgeable, skilled and who possess positive attitudes to develop the global

economy and foster continuous transformation of labour-oriented economy is a recent priority (Paivi, & Hakkinen, 2017). One of the concerns raised in the development of 21st century workers had been whether trainers training in different learning institutions preparing workers have the competences needed to ensure inculcation of the necessary skills to foster national growth.

In line with a study by Satria, Muhammad Rizal (2017), a competent worker should have diverse competences namely psychomotor skills, cognitive intelligence, behaviour, personality and social skills. Therefore, competence becomes an indicator of one's capacity of performing the assigned job. On the other hand, Sultan and Shafi (2014) define competences as particular and self-evident qualities that teachers should possess. Scholars have emphasized the importance of education in all human societies. For instance, Muzeda (2013) portrays education as the process by which children or young adults develop the abilities, attitudes and other forms of behaviour that are of positive value to the society in which they operate. Education is seen as an instrument of social mobility, as a potent factor in national development, and in social engineering, as a key that unlocks the potentials of a people; empowers and equips the individuals in society to be active participants in, and beneficiaries from society, an apparatus that facilitates development and as well providing for the basis for societal transformation (Sultan, S. & Shafi, M. 2014).

Educational achievements should produce individuals who are not only knowledgeable but who can also churn knowledge into action for their own use as well as that of the society at large. Thus, an educated person should have acquired the skills for self-confidence, wealth creation, employment generation, social mobility, and value addition (Oluwasola, A. J. 2014). In order to ensure that, all trainers should be able to plan, organize, design, direct, motivate, and inspire students to learn, using standard training

techniques to impact knowledge (Okolocha & Onyeneke, 2015). Equally, a competent trainer applies experiences and knowledge to provide hands- on guidance; establishes good relationship with the students; motivates the students' (Allais, S. 2022) plans and conducts lessons well with adequate knowledge on the curriculum and proficiency in the training and learning process, including the subject content; and skilfully conducts research for self-development. Academic competencies are many and may include the trainer's knowledge of his subject mastery, types of training methods and use of instructional media (Spöttl, G., & Steinbeis, B. 2016).

A competent trainer must therefore relate to academic growth, professional training skills, has experience and industrial linkage competencies. The Technical Vocational Education and Training, trainer is expected to possess competencies in their core technological area of work (Paryono, P. 2015). Professional competencies are both academic and pedagogical. Pedagogical competence includes the art of training the subject, observing such principles as training from known to unknown, concrete to abstract and from simple to complex by earlier planning and preparing teaching tools, finally assess the learners.

Table 1.1 KNEC Mean grades of performance since 2016 to 2020 for Sigalagala Kisumu and Kisii National Polytechnics

Department / Course	2016	2017	2018	2019	2020
Mechanical Engineering	Pass	Pass	Pass	Refer	Credit
Building Construction	Pass	Credit	Pass	Pass	Refer
Automotive	Refer	Pass	Pass	Refer	Credit
Electrical	Refer	Pass	Refer	Pass	Pass
Mathematics	Credit	Pass	Credit	Pass	Pass
Applied Biology	Pass	Refer	Pass	Pass	Refer
Applied Chemistry	Pass	Pass	pass	Credit	Pass
Computer Department	Credit	Credit	pass	Pass	Pass
Clothing and textiles	Pass	Credit	Credit	Pass	Pass
Beauty therapy	Credit	Pass	Credit	Credit	Pass
Leather works	Pass	Pass	Pass	Pass	Pass

Source: County Technical Education Officers: Kakamega, Kisumu and Kisii (2021)

Performance is the learners' output in the form of knowledge, practical skills, and values that enable those citizens grow to their fullest potential as human beings (Lee, M. F., & Lai, C. S. 2016), There could be many other factors that affected students' academic performance whilst still in their places of study at the Polytechnics, but this study intended to confine itself and find out if trainer competences also contributed to attainment of this low academic performance. Available data for the study area shows that in the period 2016 to 2020, performance of SET courses in Kenya National Examinations of the Polytechnics mean grades for every course per year, had been that dwindling as shown in Table 1.1. From the table, 76.4% of the students graduated with a pass and below. Only 23.6 percent had quality grades of credit performance mean score for all the three National Polytechnics in western Kenya.

It was therefore, in the interest of this study to find out the strengths of these trainers' competencies, if there were any, in the National Polytechnics in Western Kenya that had

been posting these results as in the table 1.1.

1.3 Statement of the Problem

The government of Kenya has laid great emphasis on TVET as the main vehicle for socio-economic and technological development particularly for the achievement of Vision 2030 (Kerre, 2010). However, there is a trend in the students' academic performance which is causing concern to the public and the public doubts the competency of the student grandaunts from the National Polytechnics who are expected to engage well in positions of world-of-work or peruse further studies. There has been consistently poor students' academic performance in the Science Engineering and Technology courses in the diploma of the KNEC examinations from the National Polytechnics over the whole consecutive past five years. One would expect that Polytechnics are properly staffed with well qualified trainers, who should exhibit the required variety of recent 21st century work competence for instruction. Little empirical evidence exists on the level of effect of trainer competence as institutional factors that influence students' academic performance. It was against this gap that the study had to determine and asses the level of effect of trainer academic, pedagogical, experience and industrial linkage competences leverage that influenced acquisition of such students' academic performance in the National Polytechnics in Western Kenya.

1.4 Purpose of the Study

The main aim of this study was to establish the influence of trainer competences on academic performance of the diploma SET courses in the National Polytechnics in Western Kenya.

1.5 Objectives of the study

The specific objectives of the study were:

1. To determine the effect of trainer academic competence on students' academic performance in Diploma of Science, Engineering and Technology courses in the National Polytechnics in Western Kenya.
2. To determine the effect of trainer' pedagogical competence on students' academic performance in Diploma of Science, Engineering and Technology courses in the National Polytechnics in western Kenya.
3. To determine the effect of trainers' experience competence on students' academic performance in Diploma of Science, Engineering and Technology courses in the National Polytechnics in western Kenya
4. To determine the effect of trainers' industrial linkage competences on students' academic performance in Diploma of Science, Engineering and Technology courses in the National Polytechnics in Western Kenya.

1.6 Research questions

The study was guided by the following research questions:

- i. What was the effect of trainers' academic competence on students' academic performance in Diploma of the SET courses in the National Polytechnics in Western Kenya?
- ii. How does trainer pedagogical competence affect students' academic performance in Diploma of SET courses in national Polytechnics in western Kenya?
- iii. What was the effect of trainers' experience competence on student s' academic performance in Diploma of SET courses in National Polytechnics in western

Kenya?

- iv. What was the effect of trainers' industrial linkage competence affect students' academic performance in Diploma of SET courses National Polytechnics in Western Kenya?

1.7 Justification of the Study

The Government of Kenya is committed to improving the quality of technical vocational education and training by improving its relevance at all levels of study (Musyimi, C. M., Malechwanzi, J., & Heng, L. 2018). For Kenyan's industry to compete in the world market, it must adapt to new technologies and new work methods to enhance its productivity as well as to improve the quality of its products and services. This can be achieved through National Polytechnics whose trainers are more competent. Trainer competences are trainer inherent qualities that are self-evident for production of excellent work performance. Trainer competences can enhance the students' skills to meet the job market requirements in the job dynamic changing environment (Paivi, & Hakkinen, 2017).

Technical education is important development tool because it is through it that the society can have skilled personnel as craftsmen, technicians and engineers who handle a variety of TVET skills at various levels. The country requires these competences to accelerate her national economic growth and deliver Kenya's industrialization programme as envisaged in vision 2030. Examinations in education have an important role as indicators of efficiency in the Kenyan education system by categorising performance at different levels of achievement. Competent trainers are expected to have a high influence on students' academic performance in national examinations. Mean performance in examinations in the SET courses varied steadily from high to low performance from one year to the following year for the consecutive five years in record.

However some courses were scoring better performance, while others registered poorly that stired a lot of concern within the stakeholders' fraternity in education.

1.8 Significance of the Study

The study is significant in a number of ways. First, it has contributed to the body of knowledge of the scholars. Secondly, the findings may enhance improvement of the trainer competence among Polytechnics through training on the most appropriate knowledge. The study has increased the body of knowledge on the effect of trainer competencies on students' academic performance and therefore it would be a useful point of reference for further studies by other scholars. The study is also useful to the government ministries and other stakeholders dealing with the policy formulation by giving them insights on the effect of trainer competencies on academic performance. The findings can also guide the government on how to build trainers' capacity to meet the competencies required.

1.9 Basic Assumptions of the study

- i. Trainers were available and adequately utilized in all the science, engineering and technology courses in the National Polytechnics in western Kenya.
- ii. All the trainers had the minimum qualifications required to trainer the science, engineering and technology courses in the National Polytechnics in western Kenya.
- iii. All Students in the science, engineering and technology courses had the minimum academic requirements for the study in the National Polytechnics in western Kenya.
- iv. The Government funding had enhanced adequacy of supply of basic physical and instructional resources in science, engineering and technology courses in the National Polytechnics in western Kenya.

1.10 Limitation of the study

The theoretical and methodological limitations in the current study offers opportunities for further work for investigating the effect of learning resources on various educational outputs.

For instance, the conceptualization of school outputs as academic performance leaves room for further work that may define such output to include subsequent labor market success, college attendance, graduation and attrition rates. Room for further research is in the input for specific courses and output in terms of industrial worker performance. This conceptual limitation not only indicates the scope to which study findings can be safely generalized but also identifies the point to the population that shares similar characteristics to which the conclusions and recommendations of the study can be generalized. Since respondents were drawn from the same area of study, in national Polytechnics in western Kenya, the effects would probably reflect the situation in the counties alone; hence the findings of the study will not be representative to all the other National Polytechnics elsewhere or in Kenya.

1.11 Scope of the Study

The study was confined to Science, Engineering and Technical course at diploma level study disciplines. It was also done on trainer competences and academic performance of the students in the National polytechnics. The Science and technical disciplines under diploma specialization areas included Mechanical engineering, Automotive engineering, Electrical engineering, building construction, Civil engineering, and Applied chemistry and Biology, Leather work, Clothing and textiles and beauty therapy in the National Polytechnics in Western Kenya.

1.12 Theoretical Framework for the Study

This study was guided by two theories; (Bharwani, S., & Talib, P. 2017). The Capital Theory of School Effectiveness and Improvement as it was advanced by David H. Hargreaves (2001), also, by a education production functions theory which is an application of economic concepts to the field of education that relates various inputs affecting student's learning such as families, peers, neighborhoods, and the school. The measured outputs may include subsequent labor market success, college attendance, graduation rates, and, most frequently, standardized test scores. The original study that prompted interest in the idea of education production functions was carried out by the sociologist, James S. Coleman. The Coleman Report, published in 1966, concluded that the marginal effect of various school inputs on student achievement was small compared to the impact of families and friends. However, later work, by Eric A. Hanushek, Richard Murnane (1981), and other economists introduced the structure of "production" to the consideration of student learning outcomes. The theory suggests that inputs are converted into outputs as defined in an input output model. Psacharopoulos and Woodhall (1985) provide a typical, input-output model of the form: $Q = f(X_n)$ where X_n represents independent variables or inputs Q is the dependent variables representing outputs. A business, which serves as the fundamental unit of production, uses a range of inputs ($k \times y \times z \dots$) to generate output (Q). This has the form $Q = f(k \times y \times z \dots)$ when expressed as a production function, where f is a function of operation, while k, x, y, z, \dots .. Would be the teacher competences in the study (Diep, P. C., & Hartmann, M. 2016).

The Capital Theory of School Effectiveness and Improvement was built around four distinct concepts: intellectual capital human capital, social capital, leverage, and outcomes. Hargreaves argues that education should bring about intellectual and moral outcomes in the youth in order for them to make sound intellectual and moral judgments

and choices.

The theory asserts that intellectual capital grows by two important processes: the creation of new knowledge and the capacity to transfer knowledge between situations and people. Finally, the theory holds that schools rich in social capital will exhibit strong networks and collaborative relations among its members and stakeholders and a strengthened intellectual capital. Hargreaves maintained that high leverage could be achieved only by developing strong combinations of trainers' classroom practices and enhancing the participation of trainers in school-based professional development groups. School-based professional development, he contends, necessitates the mentoring of trainers and provides them an opportunity to develop and test new training strategies. Thus, high social capital is realized if mentoring becomes part of trainers' social learning. He advances the view that trainer effectiveness results in knowledge transfer, knowledge creation and innovation thereby ensuring high cognitive outcomes. Studies have shown that social capital impacts the teaching effectiveness, trainer professionalism, continuous professional development of trainers, and students' performance.

In this study, the independent variables constituted a combination of the leverage, intellectual capital and social capital concepts. For instance, inclusion of trainer links in industry represents the leverage concepts of a motivated and innovative training force, while trainer professional competencies and trainer experiences competencies are aspects of the intellectual capital of the trainer, in the national polytechnics. Finally, performance in SET courses, was the informed dependent variable, and it was measured by the outcome concept of score grades.

1.13 Conceptual Framework

The literature on effect of trainer competences on academic performance was synthesized into a conceptual framework as shown in this Figure 2.1.

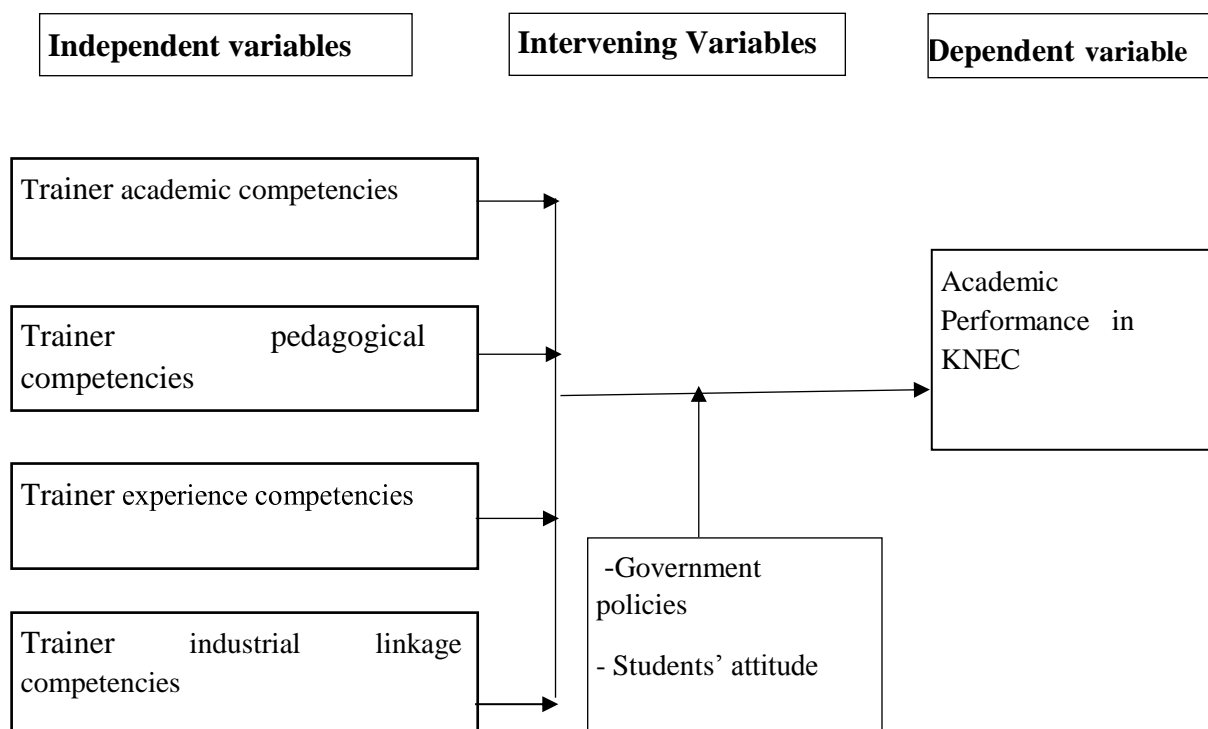


Figure 2.1 Conceptual framework

The conceptual framework in Figure 2.1 provides a general idea of how interaction between trainer competences and students' academic performance variables in national polytechnics in western Kenya are considered in this study, in the medium of intervening variables (Noor Rosmawati, Abdul Razaq, & Mohd Mahzan, 2016) produce the desired academic performance of technical courses in National Polytechnics. Intermediate between the independent variables which are the inputs and the dependent variable the outputs are the intervening variable whose influence is felt on the independent variable and manifested in the dependent variable that informs the performance. It suggests that trainer competencies, if manipulated in the

National Polytechnics results into the desired academic performance as output. The arrow line represents the link between the independent variables and the dependent variable. Trainers' academic competencies were considered in their two sets: the skills competencies and the enablers competencies as they effect on students' performance. The pedagogical competencies included aspects such as training methods, preparation of training tools and evaluation techniques used by trainers. Trainer experience considered aspects of classroom management, and trainer attitudes while industrial linkages considered trainer industrial links, considered involvement in industry and innovation of the outcomes in class room learning on students 'academic performance. Outcomes in terms of performance was seen in terms of distinctions, credits, passes refers and possible failures.

However, there are the intervening variables which were left unaltered due to their complexes and partly the study aim was on trainer competences. Also, the chosen study design has to leave the variables unaltered and the study phenomenon to remain natural. Their influence is felt on the final out-put which is the dependent variable (Yusuf, N. R., Ahmad, A. R., and Awang, M. M. 2016). The government policies may include students joining the SET courses regardless of the entry performance, that any student can join any course and perform well provided the student had a minimum mean grade of C-. Another government policy is the 100% transition, which allows a student to move into the next class expressly without considering any entry strength. Students' attitudes are many and may include student notion that they should have been in university studying degree work and not in National polytechnic studying diploma work.

1.14 Operational definition of terms

Academic Performance:	Refers to examination results as graded by KNEC that places the candidate employable or be able to advance in the same career.
Competency:	Refers to the holistic system of education
Competencies:	Defines the applied knowledge skills and attitudes that enable teacher or students to successfully perform their work over a period of time.
County:	A region of a state governed by a head of a council.
Diploma:	Level of study credible and certification above Certificate course.
Human Capital:	Is a measure of the skills, education, capacity and attributes of labour which influence their productive capacity and earning potential.
Human Capital Theory:	Emphasizes how education increases the productivity and efficiency of work by increasing the level of cognitive stock of economically productive human capability.
Knowledge:	is information developed or learned through experience, study or investigation.
Leverage:	Is the ability to influence a system, or an environment, in a way that multiplies the outcome of one's efforts without a corresponding increase in the consumption of resources. In other words,

leverage is the advantageous condition of having a relatively small amount of cost yield a relatively high level of returns.

Polytechnic: It's an establishment where higher technological skills training for employability and advancement take place.

SET courses: they include the Science, Engineering and Technological courses

Skill: is the result of repeatedly applying knowledge or ability.

Social theory: Are ideas, arguments, thoughts hypotheses, experiments and explanations speculations about how and why human societies or elements or structures of such societies-come evolved, and develop over time or disappear.

Trainer industrial links: this involves trainers and industries through social partnerships to offer situated learning opportunities in the workplace so that learners and (TVET) practitioners have access to practical experiences.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides an analysis of related literature on trainer competencies and performance. The chapter is organized along the following sub themes; effect of trainers' academic competence on students' academic performance, effect of trainers' pedagogical competence on students' academic performance, effect of trainers' experience on students' academic performance, and effect of trainer industrial linkages on students' academic performance in diploma of the Science Engineering and Technical courses, in the National Polytechnics in Western Kenya.

2.2 Effect of trainer academic competencies on students' academic performance

Trainer academic competence is a multidimensional characteristic which include knowledge, skills, attitudes, and behaviours that factor into their academic success (Okoye, R., & Arimonu, M. O. 2016). These characteristics can be separated and considered in one of two primary domains: academic skills and academic enablers. Academic skills are both the basic and complex skills. They include reading, writing, calculating, and critical thinking as needed to access and interact with content-specific knowledge. Academic enablers, however, are the attitudes and behaviours which include; interpersonal skills, motivation, study skills, and engagement, that a trainer needs in order to take advantage of education (Musyimi, C. M., Malechwanz, J., & Heng, L. 2018). The present study intended to determine if there was any effect of trainer academic competence arising from the skills and the enablers on students' academic performance in the diploma of the SET courses in national Polytechnics in western Kenya.

Academic competencies include the trainer's knowledge of his/her subject mastery. Trainers in technology with quality academic competencies are considered to be those who bring about positive student learning (Klieme, E., Hartig, 2014). Mastery means command or authority in any particular field of study 'Subject Mastery' is the possession or display of great skill, technique or knowledge that makes one master of a subject. Subject mastery is the trainers' knowledge of his subject. The mastery of subject matter empowers the trainer with knowledge for critical thinking and the capacity to help their learners to grasp the appropriate knowledge, skills, attitudes and values. The trainer's knowledge of the subject matter should go beyond the limits of the curriculum for them to be able to explain to the learners. It is of necessity that trainers master the subject matter before imparting it to learners since it enables the trainer to adequately prepare for content delivery. Trainer qualifications range from doctorate, masters' degrees, Bachelor, Diplomas to Certificates. In particular, a number of studies including that of Klieme, E., Hartig, (2014), trainer qualifications to have a significant impact on student learning. The present study intended to determine if there was any effect of trainer academic competence on students' academic performance in the diploma of the SET courses in national Polytechnics in western Kenya.

Studies carried out in Florida State, U.S.A by Diep & Hartmann, (2016), on trainer academic qualification and student academic performance in Mathematics found out that there was positive association between students' academic performance in middle and high school mathematics. Diep & Hartmann, (2016) found that in 15% of the 60 studies they reviewed, trainers who had masters' degree produced better student performance than trainers without the masters' degree, but in 13% of the studies trainers with masters' degrees had a negative effect on student performance. Yara and Otieno (2010) study on academic performance in mathematics in secondary schools in

Bondo District revealed that performance in mathematics was below mean and cited the limitation for academic qualifications of mathematics teachers as the main cause of the situation. These two previous studies in mathematics, one in middle and high schools in America and the other in secondary schools in Bondo Kenya, revealed similar results that trainers' academic performance enhanced students' academic result. The present study intended to find out if there was any effect of trainers' academic competence on the students' academic performance in national polytechnics in western Kenya.

In Europe, studies carried out by Karpati (2009) in 25 countries found out that the academic qualification of the trainers was the most important factor in an educational system among the variety of factors influencing student performance. The researcher further stated that an education system could not exceed the quality of its trainers. The German trainers who handle technology are highly qualified and this is in accordance with the country's set standard of vocational education trainers. The previous studies were carried out in Europe, an advanced continent compared to Africa where the present study was carried out to determine if there was any effect of trainer academic competences on students' academic performance in national polytechnics in western Kenya.

A study by Jeffrey, S. (2020), in Nigeria, equally found that the academic qualification of any education system depended on the academic qualification of trainers. Moreover, the same study in Nigeria found that lack of academically qualified trainers led to consistently poor academic performance of students in science mathematics and Technology subjects. Abe. O. (2014) revealed that the dramatic effects of trainers' academic competences impact a lot on students' academic performance. The way to assess trainers,' performance was to look at their job performance including

what they did in the classroom and how much progress their students made on performance tests. The previous study was carried out in Nigeria on trainer academic qualifications and concluded that trainers' academic qualifications were important for student achievement. This present study intended to determine if there existed any trainer academic competence that brought about these known students' academic performance in national polytechnics in western Kenya.

A study by Okeyo, D. A., & Kanake, L. K. (2021), on factors influencing students' skill acquisition in national Polytechnics highlighted trainer academic competence as one of the factors affecting students' skill acquisition. Trainer academic competences and their training resource as witnessed in the study by Cumberland, D. M., Herd, A., Alagaraja, M., & Kerrick, S. A. (2016), show that the academic, knowledge of the trainer is the most important factor influencing students' performance.

The most interesting part is that that previous study was similar to this present one, as all were held in Polytechnics. Also, both considered the aspect of students' academic performance in the background of trainer academic qualification. The present one on the effect of trainer academic competence on students' academic performance in national polytechnics in western Kenya

Kinuthia K. (2018) stated that trainers who did not have the proper academic requirements could not teach their subjects effectively. The researcher opined that, high academic qualifications made the trainers have the confidence of handling their subjects and in turn serve as a source of academic encouragement to the learners. Kinuthia K. (2018) revealed in his study that a trainer's academic qualification matters when it comes to effective training. He further observed that certification measures trainer qualification; and, that the certification process combines aspects of knowledge

on a subject matter taught and aspects of knowledge learnt. Abe, O. (2014) said that academic qualification of trainers influences the quality of instructional delivery.

In Kenya, a lot of studies carried out on teacher academic qualification as those conducted by Agwanda (2002) on student academic performance in Kisumu Municipality which showed that teacher academic qualifications had positive correlation with student performance. The analysis showed that the higher the percentage of qualified teachers, the higher the candidates' scores in examinations. Teachers' educational qualifications were the prime predictors of the learners' academic performance (Budhrani, M. F., & Wang, C. 2019). Anita (2013) carried out a study on influence of teacher characteristics on student's academic performance in Biology in schools in Nandi south district, Kenya; the findings revealed that teacher's academic qualifications did not influence students' academic performance. The previous study by Anita (2013) in Nandi south district Kenya, in biology and students' academic results did not show that teacher academic qualification was any important for students' academic performance, contrary to what Agwanda (2002) got in Kisumu municipality. The present study was to determine if there was any effect of trainer academic competence on students' academic performance in the SET courses of diploma in the national polytechnics in western Kenya.

However, trainers' academic qualification is important as depicts the literature review in attainment of students' academic performance, yet trainers with proper qualifications are linked to better results (Kamis, A., Mohamed, S., Hanapi, Z., Che Kob, C. G., & Jamaluddin, R. 2016). All the same, there is lack of proper data on trainer academic qualification in the National Polytechnics in western Kenya, and more lacking is how their academic qualifications influence students' academic performance. It is therefore the intention of this study to find out the level of the trainers' academic qualification and

how these qualifications affect the students' academic performance in these national Polytechnics in western Kenya. For instance, studies on trainer qualification and academic performance in Kenya have been conducted in secondary and primary schools alone. There are few studies targeting TVET/ national polytechnics. There were studies on secondary schools on the influence of teacher competence on students' performance. This present study was on the effect of trainer academic competences on students' academic performance. The study intended to determine if there was any effect of trainer academic competences on students' academic performance in the diploma of the science engineering and technological courses that were carried out in national Polytechnics in western Kenya.

2.3 Effect of trainer pedagogical competence on students' academic performance.

Professional competencies are both academic and pedagogical. Pedagogical competence includes the art of training the subject, observing such principles as training from known to unknown, concrete to abstract and from simple to complex by earlier planning and preparing training tools, student motivation, training methodologies, communication skills, finally assesses the learners Klieme, E., Hartig, (2014), revealed that the ability of a trainer to train is not derived only from one's academic background but it is based upon outstanding pedagogical skill acquired. A factor that affects the quality of TVET education particularly in generating workers with qualified knowledge and skills is the quality of TVET trainers' professional qualification which remains the most prominent aspect. The quality of TVET trainers is determined by their professional skills (Kinuthia K. 2018). The present study intends to determine if these teacher pedagogical variables have any effect on students' academic performance in national polytechnics in western Kenya.

A study in Florida America, by Bohne, C., Eicker, F., & Haseloff, G. (2017), on trainer pedagogy concluded that trainers who had a standard pedagogical certification in the subject they taught had a statistically significant positive impact on student test scores relative to trainers who were not certified. Further, Cruickshank, V. (2017) explained that qualified trainers made remarkable difference and, in particular, trainers' pedagogical qualification and the amount of education and knowledge within the trainer have a direct effect on student performance. The level of training influences the performance of students by improvement in test scores of students as witnessed by Abe O. (2014). That previous study on pedagogy was carried out in Florida USA, a developed country compared to Kenya. This present study intended to determine if there was any effect of trainer pedagogical competences on students' academic performance in national polytechnics in western Kenya.

In Nigeria, a study by Adaramola and Obomanu (2015) on trainers' pedagogical competences equally found that the quality of any education system depended on the trainer pedagogical skills. Moreover, the same study in Nigeria found that trainer who didn't have any level of pedagogy led to consistently poor performance of students in technical subjects. Bhattacharya, A. (2021), concluded that during training trainers acquire pedagogical tricks of handling individual students' differences in the classroom situations. There is growing interest in the pedagogy development for trainer as the demand, expectations, and requirements of trainer education are increasingly coming under scrutiny (Louhran, 2014). Previous study was carried out in Nigeria on the same topic as the present one was being carried out in Kenya to determine the effect of pedagogy on students' performance.

There was need to make TVET trainer pedagogical development be a lifelong process so

as to provide learners with up-to-date skills to fit the job market (Yusof, Roddin, & Awang, 2015). Also, researchers have acknowledged TVET trainer as agents of successful improvements in TVET education (Louhran, 2014). Lack of professionally qualified trainers significantly contributes to poor student performance. Training and learning, (Kinuthia K. 2018) is a complex work process, which involves classroom management, lesson preparation, organization of training and learning activities, evaluation and feedback. Students' success in the classroom is largely dependent on effective classroom instruction and adequate preparation by trainers. Planning should be the first thing a trainer need to do before starting to teach and meeting a group to teach for the first time, which is also an indicator to achieve educational goals (Bohne, C., Eicker, F., & Haseloff, G. 2017). The trainer requires the training documents which are the items trainers must have to be able to develop and use them in instruction (Klieme, E., Hartig, 2014). The required documents to achieve this, is the use of the syllabus book that guides a trainer to plan for effective classroom instruction, where they should use it to identify the objectives, write the scheme of work, lesson plans, lesson notes and be ready to assess the learners. Suleman, Q., Aslam, H.D., & Hussain, I. (2014) required that all trainer should read the official syllabus description of the subject, select the broad content areas, which the subject trainer is to cover, that is planned in such a way to fit the content description of the subject, and the trainer to consider whether the amount of content will be achieved within the allocated time. Yusof, Roddin, & Awang, (2015), added that the learners equally with the trainer should know the content they are to learn with the guidance of the syllabus book which should be at their disposal. Planning for instruction requires related documents and records for use in the instructional development stages. All these forgoing literature requires that teachers be trained and retrained to be well versed with the latest in their technological environment.

This current study intends to find out if teachers in the national polytechnics are trained or follow up with in-service training programmes.

In Kenya, research done by Okeyo, D. A., & Kanake, L. K. (2021), revealed that trainer characteristics after pre- service training could be improved through in-service programmes whose aim should be to enable a practicing trainer improve on instructional and pedagogical knowledge, interests and skills. Therefore, to them, improvement in quality of learning depended on improvement of trainer competence through pedagogy since they were at the centre of training and learning process and moreover, the quality of Technical Vocational Education and Training to a great extent depended on the pedagogical competence of the trainer. The higher the professional training in relevant subject, the better the performance of the students due to acquired pedagogy (Diep, P. C., & Hartmann, M. 2016). He also observed that the training of trainers had obvious impact on the students' academic performance in examinations. noted that most schools in Kenya lacked properly trained trainers and therefore schools had to deploy untrained trainers who were not aware of modern training methods and curriculum interpretation. Training enables the trainers to have the full skills of imparting knowledge to students more effectively.

In the Kenyan context, a research study established that majority of the TVET trainers in Kenya possessed Diploma certificate and degree (37% and 33% respectively), about 20 % and 10 % held a certificate and a Master's degree respectively as their highest qualifications. This finding showed that TVET trainers had the requisite minimum qualifications to teach in TVET programs. The pedagogical skills competences of TVET trainers constitute a crucial factor in determining the success of the trainer processes (Falsario H.N., Muyong, R.F., Nuevaespaña, J.S. 2014). There are perhaps trainers who don't have the training hence have no pedagogy, or have not been in-serviced at all to

enable them cope with the requirements of the dynamics of TVET curriculum coverage (Rofiah, Anik Ainur 2016). Trainer pedagogy attainment might perhaps be one of the levers missing to improve the quality of vocational trainer to raise the level of the qualifications needed and the education performance in the national Polytechnics in western Kenya. This study intended to determine the percentages of these trainers in their levels of pedagogy in the national polytechnics in western Kenya.

Lots of these studies on trainer pedagogical competences on students' performance were carried out from places far away from Western Kenya. Some of these places are outside Kenya in developed states, although those studies carried in Kenya were not done in western Kenyan national Polytechnics. Previous studies done on trainer pedagogy (Cruikshank, V. 2017) looked at its practice and especially among primary and secondary schools. Very few studies have been done in tertiary institutions besides, Technical and training institutes in Kenya. Besides, there is difference in characteristics in the institutional setting between technical training institutions and others such as secondary and primary. This made it necessary to carry out a study on to establish if trainer pedagogy affects students' academic performance in Science Engineering and Technology courses at diploma level in the Kenya national examination results in the National Polytechnics in Western Kenya.

2.4 Effect of trainer experience competences on students' academic performance

Certain elements that are brought about by experience include trainers' attitudes that will facilitate a caring and supportive classroom environment, trainer efficacy, democratic practices to promote students' responsibility, effective use of training, constructive interaction with students and high expectation to promote students' motivation (Zulkifli, R. M. 2016). Muzenda (2013) argues that these trainers'

experience elements are associated with increase in students' academic performances as recorded in studies from developed states.

A study in USA by Ladd H., (2014) observed that trainers learn to train by training. A trainer gets further understanding from experience that is not included in the professional training especially social insights that require understanding of the classroom. Trainers' experience influences students' academic performance in several ways. Trainers with long experience use better classroom management approaches and adequate training methods that encourage students' autonomy and reduce custodial control, thus taking responsibility for students learning needs, managing classroom problems and keeping students on task (Schwab, K. 2016). This, perhaps could mean that, if the trainers lacked the required experience, self-confidence would be low and would in turn led to worsen performance. Students' performances are improved by trainer due to the capability of many years' strong instructional skills. However, this is from a point of view study from USA – a much more developed state than Kenya. The current study is on effect of trainers' experience competences to influence students' academic performance in diploma in national polytechnic in western Kenya.

A study in Europe by Gibbons, (2015) showed that experience of a trainer had significant effect on students' performance in TVET at National Polytechnics level. Long serving trainers had a richer background of experience to draw from and could contribute insightful ideas to the course of training and learning. Such teachers are open to correction and are less dictatorial in classroom. Students taught by more experienced trainers achieved at a higher level, because their trainers had mastered the content and acquired classroom management skills to deal with different types of classroom problems. Studies on the influence of trainer experience on student academic

performance has found a positive relationship between trainer effectiveness and their years of training experience, but not always significant or an entirely linear one (Falsario H.N., Muyong, R.F., Nuevaespaña, J.S. 2014). However, this could be true as the previous study was carried out in Europe, while this one is to be carried out in developing country, in the national Polytechnics in western Kenya.

Experience is one of the main vocational trainers qualification that policy makers and researchers hypothesize may have substantial effect on vocational student learning (Nsengimana, V. 2020.; OECD 2019). In particular, a number of studies in TVET have identified trainer experience to have a significant effect on student learning, (Mitchell, R. 2015). In the Kenyan situation, training experience for majority of trainer has remained inadequate in TVET institutions. Ferej et al (2012) established that the majority of the TVET trainers had inadequate work experience. Additionally, trainer experience in TVET has generally shown to be positively related to student achievement when other variables are controlled. The rationale is that vocational trainers with enterprise experience are able to convey up-to-date, real- world vocational knowledge and experiences to their students. The current study intended to determine if there were any trainer experience competences that affects the students' academic performance in national polytechnics in western Kenya.

Trainers' experience competences were the prime predictors of students' academic performance. Mokoro, D. (2020), asserted that a lot of training was experience not training that added value on academic performance. He concluded that of all the trainer characteristics, there was good evidence that trainers gain in influence with additional years on the job. This gained influence with the additional years gained of experience is very effective for curriculum implementations as it also natures trainer attitude (Mokoro,

D. 2020). Majority of the previous studies concentrated on trainer experience among primary and secondary schools. Studies that looked at trainer experience and academic performance were also carried out in both primary and secondary schools and failed to establish the nature of the relationship, based on inferential tools. It was in this view that, this study intended to investigate the effect of trainer experience competences on students' academic performance in the diploma of the Science Engineering and Technology courses in the national examinations of the national Polytechnics in western Kenya.

2.5 Effect of Trainer Industrial Linkage Competencies on students' academic performance

Industrial linkages are not only critical for trainees, but it is also important for trainers. The 'industrial links' is often used in the Kenyan TVET systems to show what the organizations term does to allow VET practitioners to update their practical skills in industry. In other countries it is called on-the-job learning for trainers like in Finland, while return or back to industry programs in Australia, and industry placements for the United Kingdom. The quest for countries to invest in technical education so as to increase the productivity of human labour is on the rise. In their study, (Noor Rosmawati, Abdul Razak and Mahzan 2018) opined that the relationship between the rate of technical advancement and the quality of human intervention had become increasingly evident as had been the need for those active in the economy to be trained to use the new technologies for innovation. Further, they emphasized that new skills would be needed, and educational institutions be required to meet needs by providing not only vocational training, but also training for scientists, innovators and technologists. The current study intended to determine, if there was any trainer industrial link competence on students' academic performance in diploma of the SET courses in national

polytechnics in western Kenya.

In Australia, VET practitioners are required to hold a Certificate IV in Training and Assessment as a minimum qualification and be able to demonstrate vocational competencies at least to the level of those being delivered. TVET practitioners help to train workplace instructors during their on-the-job learning, enabling “instructors to develop their pedagogical skills by cooperating with trainers while they benefit from instructors’ up-to-date knowledge of recent technologies and work practices” (Mokoro, D. 2020). In the United Kingdom, analysis of the Technician Engineer Career Path (TECP) demonstrates that trainers from institutes with successful education-industry relationships continually upgrade their technical and soft skills. At the same time, they are commercially orientated with the contents of the department’s programme, as well as the teaching methods for their delivery, to meet the needs of companies and learners.

In Germany’s dual VET system, training in the workplace is facilitated by workplace trainers (Mokoro 2020). The responsibility for regulating work-based training lies with the respective Industry Chambers. Trainers with a university degree and at least one year of practical experience provide the off-job component to apprentices. Off-the-job training for learners largely focuses on a whole-of-industry level whereas on-the-job learning concentrates on the immediate practices and products to meet the business outcomes. Industrial links was practiced in Mauritius for technical skills, Malawi for in-service trainers. The main barriers included time constraints for trainers, industry in Malawi seeking payment, insurance/indemnity, and lack of acceptance of industrial links as a formal mode of staff development. Weak industry links in Zambia widened the gap between the knowledge of trainers and the technology level in industry. To improve industrial linkages, Zulkifli, R. M. (2016) recommended proper planning, cost sharing between industry and the training system, continuous upgrading and ensuring it is an

accepted mode of staff development. Trainers TVET institutions who lack necessary industry-based technology skills should update through industrial linkages (Likisa, 2018).

For a country to succeed in skills development, there has to be matching of the skills supplied with demand in the labour market is very important (Ferej, Kitainge, & Ooko, 2012,). Technical and vocational education is fundamental to the world of work because it links the classroom and labour market in society. For most people, work is the desired outcome of their education and it is through their work that people achieve self-fulfilment. Industrial linkage is seen as an effective professional development activity for TVET practitioners to maintain the standard of their vocational knowledge and expertise including their knowledge of technologies and practices commonly used in contemporary workplaces (Falsario H.N., Muyong, R.F., Nuevaespaña, J.S. 2014). This ongoing development is necessary because the role of TVET practitioners is constantly changing. The quality of TVET graduates as indicated by GoK, (2007) decline due to poor instructional methods, outdated/inadequate training equipment. It further notes trainers lack necessary industry-based technological skills updated through industrial attachment and hence lack meaningful work experience and supervision. Collaborating with the industry, TVET institutions are a major rising concern in many developing countries like Ghana. For the improvement of TVET systems, there is a need to forge closer links with training and the labour market (Noor Rosmawati, Abdul Razak and Mahzan 2018). Adequate collaboration between these two will lead to the provision of relevant practical skills for industrialization. Industry is the primary consumer of graduates. Therefore, industry participation in the curriculum and workplace training opportunities is the primary way of achieving this. If employers are not involved in the process of imparting the specific skills, attitudes and behaviours required

by graduates they are less likely to see any relevance to the institutions and their skill needs.

However, to fulfil their role in linking the training provided in the institutions to the needs of industry, TVET practitioners must maintain expertise in VET pedagogy as well as industry linkages and workforce developments. Suleman, et al. (2014) proposed that educational practitioners assess the effectiveness of their own skills and competencies and improve self-development through direct and indirect activities in both learning places - the institution and the workplace. The skills developed in TVET institutions should be in a position to bring about self-employment in the event that one failed to get salaried employment. Similarly, the UNESCO National Education Sector Support Strategy (UNESS) for the Republic of Kenya 2010-2011 reiterates that the lack of adequately industry linked trainers to train at the TVET institutions in Kenya encourages skills mismatch in the system, and little does it help the TVET grandaunts.

Innovation is the adoption of market response to TVET gaining popularity all over the world, for instance, Finland, is ranked as an example in global excellence for TVET, and was ranked fifth in the world's most innovative economies according to Bloomberg's (2017) index. This therefore means that in order to achieve industrialization which will lead to economic growth, developing countries should strengthen the link between the local industries and TVET. At the dawn of the 21st century, societal, technological, economic, demographic and educational contexts in which vocational education is practiced have changed and this poses a great challenge to the delivery of TVET education. To uphold the spirit of vocational education, the TVET system requires trainers who are competent, skilful, enthusiastic and motivated to execute the plan (Ramlan, Abdullah, & Hussin, 2017). To develop urgently needed skills in today's ever-changing working environment, the TVET system should partner with industry to

ensure that the TVET curriculum accommodates changes in the work environment.

Industrial linkage for trainers seems to have competences that have effect on students' academic performance. It's the intention of this current study to therefore investigate if trainers in the national polytechnics participate in industry linkages, and have innovations, and find out how the trainers industrial links affect students' academic performance in the Science, Engineering and technical courses in the national Polytechnics in Western Kenya. It is also clear that majority of the studies done did not look at the technical and training settings hence the need for the current study.

2.6 Summary of Literature Review and Gaps

The reviewed Literature involved studies at international, regional and national levels. The studies focused on factors that influence quality performance in TVET institutions, vocational training centres inclusive. Institutional factors are critical since they determine the quality of training in given institution. Githinji and Kigwilu (2015), pointed out that most of trainers in TVET institutions lacked technology awareness, or even, never had in-service training, therefore some lacked pedagogical skills while some were not trained at all. The chapter has reviewed empirical and theoretical literature relating to influence of trainer competencies and students' academic performance in primary schools, secondary schools, technical training institutes and national polytechnics. In the event of these reviews a number of methodological, contextual and conceptual gaps have been identified. Several researchers have investigated the link between trainer's competences and students' academic performance, particularly those ones carried out in primary and secondary schools' education, with little carried out in the national TVET system. A research by Sultan and Shafi (2014) in Pakistan included rural areas in their study only and therefore, the

results could not be generalised to the population of urban areas. Akiri (2013) research was conducted in Nigeria on the influence of trainers' competencies on school effectiveness while this research focused on the effect of trainer competencies on students' academic performance in national polytechnics.

Several researchers have investigated the link between trainer's competences and students' academic performance, particularly those ones carried out in primary and secondary schools' education, with little carried out in the national TVET system. This study was on effect of trainer competence on students' academic performance in the diploma of the Science Engineering and technology (SET) courses in the Kenya national examinations in National Polytechnics in Western Kenya. There were a number of such similar studies on trainer competencies that had been carried out in developed countries; some were, while some were carried out in Africa but outside Kenya. Those studies that were carried out in Kenya, were not carried out in western Kenyan National Polytechnics. This present study on trainer academic competence, trainer pedagogical competence, trainer experience competences and trainer industrial Link competence, and using qualitative approaches, sought to determine to what extent, if any, the said competences effected students' academic performance in national Polytechnics in western Kenya, had not been carried out in this covered area of this study. This was a gap to fill. Such and other related studies may have been carried out in western Kenya but at other levels of education sectors and disciplines. Also, a gap this study intended to cover was to find out if there existed trainer academic competencies.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the research design and the methodology that was used to conduct the study. It includes the research design, the location of study, study population, sampling techniques, sample size, pilot study, instruments of data collection, procedure of data collection and finally data analysis.

3.2 Research design

Research design is the framework of research methods and techniques chosen by the researcher to conduct a study (Mutindi, M. J. 2018). This present study adopted a Correlational descriptive research design that was able to collect both qualitative and quantitative data that was used to determine the relationship between the two variables whether they were positive, negative, or neutral with the researcher having no control over them. That is, if two variables, were directly proportional, inversely proportional or were not related to each other.

This research method used random variables that could not be controlled by the researchers. This is because descriptive research aimed at understanding the natural behaviour of the research subject (Creswell, J. W., & Poth, C. N. 2016). There are numerous advantages to using a descriptive survey design. First of all, it is cheap and easy to conduct. The descriptive survey research design uses both quantitative and qualitative research methods. However, it could also provide qualitative data that would help describe and understand the research subject even through observational methods. The researcher adequately described the state of trainer academic competence, trainer pedagogical competences, trainer experience competences and trainer industrial linkages.

Furthermore, it allowed the researcher to describe teacher competencies, using descriptive statistics such as means and standard deviations and facilitated an explanation through inferential analysis on how it affected the academic performance of students.

3.3 The Study area

The study was conducted in three National Polytechnics namely; Sigalagala, Kisumu and Kisii in Western Kenya. The region covers three counties in western Kenya. The specific location of the three national polytechnics is shown in map of western region of Kenya in Figure 3.1 appendix 7 page 120. This is the region with such a cluster of National Polytechnics and vast number of 55 technical training institutes which includes institutes of technology among other vocational training centres in this western Kenya that stimulates the interest to carryout research in the region.

Sigalagala National Polytechnic is located in Kakamega County. Kakamega is a town in western Kenya lying about 30 KM North of the Equator. It is the headquarters of Kakamega County that has a population of 1,867,579 according to the 2019 Kenya Population and Housing Census (KPHC). Kisumu National Polytechnic is located in Kisumu County. Kisumu is 52 KM South of Kakamega. Kisumu is the third largest city in Kenya after Nairobi, Mombasa and Nakuru. It's a port city on Lake Victoria. It has a population of 1,155,574 according to the 2019 Kenya Population and Housing Census (KPHC). The land area of Kisumu County totals 2085.9 km². Kisii National Polytechnic is located in Kisii County. Kisii is the main town in Kisii County, with a population of 1,260,509 as was in the 2019 Kenya Population and Housing Census (KPHC) and an area of 1,317.90 Km².

3.4 Target Population

Target population as all the members of the real or hypothetical set of people, events and objects to which a researcher wishes to generalize the results of the study (Maryudi & Fisher 2020). Population is a well-defined set of people, services, elements, and group of things or households that are being investigated (Role 2013). The target population for this study were 563, with 385 students, 150 trainers, 21 heads of departments 3 principals and 3 County Directors of technical education for the three national Polytechnics in western Kenya as captured in Table 3.1. The study considered only diploma courses of Science, Engineering and Technology in the departments of the three National Polytechnics in the study area.

Table 3.1: Target Population

	Sigalagala	Kisii	Kisumu	Total
	N	N	N	N
Principals	1	1	1	3
HoD	6	7	8	21
County Director TT	1	1	1	3
Trainers	39	44	67	150
Students	103	126	157	386
Total	150	179	234	563

Source: County Director Technical Education: Kakamega, Kisii & Kisumu (2021)

3.5 Sample size and Sampling techniques

3.5.1 Sampling Techniques

Sampling was the method or the technique of selecting the small set of population with a view to drawing conclusions about the larger population sample (Maryudi & Fisher 2020). A census is a study of every unit, everyone or everything, in the main population. This study applied census sampling technique. The sample size of the participants HODs, trainers and students was determined using statistical formula provided

by Role (2013). The three national polytechnics were purposefully selected as they are the only ones in the study area. Purposive sampling is characterized by use of judgment to obtain a representative sample (Maryudi & Fisher 2020). All the three principals, the 3 county directors of technical education were purposely included in the sample. This was because they were either in charge of the institutions, departments or the regions in the case of county directors and therefore they identified to have sufficient information on trainer competence and academic performance. Purposive, stratified, and random sampling methods could be used to select respondents in a manner that ensured that they contained common characteristic elements representative of the entire group (Maryudi & Fisher 2020). Stratified and simple random sampling ensured that students across the years of study from the Science, Engineering and Technology courses in their departments were included in the study. In addition, stratified sampling helped the researcher spread the sample of students across different years of study which was important. Simple random sampling was used to get the specific students at different levels of study in their courses.

3.5.2 The sample Size

Studying the entire population in research gave more weight to the findings (Maryudi & Fisher 2020). However, a sample if chosen with a scientific formula ensures the findings mirror the actual findings if the entire population was used. The sample size was determined in accordance with the statistical formula provided by Role (2013). The Role formula required that the sample to be selected needed to be representative of the population. A sample size for the students was taken to act as a representative of the whole population based on a formula:

$$\text{Sample (n)} = \frac{N}{1+(Nk^2)} \text{ Hence, } n = \frac{386}{1+(386 \times 0.05^2)}, \text{ Where } n = \text{sample size, } N =$$

population size, and $k =$ margin of error ($k \leq 0.05$), therefore, $n = 196$

Trainers' sample size calculation also followed the same method. Hence,

$$n = \frac{150}{1 + (150 \times 0.05^2)} \quad n = 109$$

Table 3.2 shows that there were total sample size 3 principals across the three Polytechnics, 18 heads of departments, 3 county directors, 109 trainers and 196 students.

Table 3. 2: The Sample Size

	Sigalagala	Kisii	Kisumu	Total
	N	N	N	N
Principals	1	1	1	3
HoD	5	6	7	18
County	1	1	1	3
Director TT				
Trainers	28	32	49	109
Students	52	64	80	196
Total	87	104	138	329

Source: Field data (2016).

The 3 principals and 3 county directors were purposively included in the sampled size, while 18 Heads of departments were randomly selected. Trainer and students were subjected to stratified sampling method to enhance representation of the populations in the sample.

3.6 Data Collection Instruments

The study utilized several data collection instruments. A diversity of research instruments helped in getting a holistic view of the research situation. Thus, the variety of tools for data collection were used for triangulation. This was important in eliminating any discrepancy. The researcher used questionnaires, interviews, and observation checklist to collect primary data required to answer the

research questions. The questionnaire contained both closed and open-ended items. Closed- ended items were structured to facilitate tabular analysis. Five-point Likert scale item questionnaires were designed. The study utilised questionnaire because they were cost effective way to collect data from trainers, heads of departments and students. County directors of technical education and, principals were subjected to interview schedules.

Questionnaires were appropriate for survey design since they collected information that was not directly observable (Mutindi, M. J. 2018). This information was on trainer competences that went along sides with trainer academic qualifications, trainer professional training, experience and trainer industrial links as they impinge on students' academic performance in the Diploma results of the SET courses in the National Polytechnics in western Kenya.

3.6.1 Principals Interview Schedule

The principals' interview schedule was used to collect principals' bio data and probed principals on the number of trainers on the staff establishment and their trainer competences. Maryudi and Fisher (2020) explain that interviews are suitable for obtaining qualitative and in-depth data as they afford an opportunity to obtain explanations from respondents. In the current study, the principals interview schedule was used to collect data on the effect of trainer competences which included trainer academic competences, trainer pedagogical competences, trainer experience competences, and trainer industrial link competences on students' academic performance in the Science Engineering and Technology diploma course in the national polytechnics in western Kenya.

3.6.2 Heads of Departments' Questionnaire

The Heads of Departments' questionnaire were used to collect bio-data for the department and concerns of their trainer-supervision roles. HODs were confirming the same information given by trainer by also answering the similar questionnaire items. Suleman, Q., Aslam, H.D., & Hussain, I. (2014) confirmed that repeated information was considered and accepted with strength of consistency. The questionnaire contained closed and open structured items on students' and trainers' enrolments. There was a five-point Likert scale procedure which provided a quick method of collecting data (Mutindi, M. J. (2018) on trainer competencies on academics, pedagogy, experience, industrial linkages and students' performance. These questionnaires were administered by the researcher himself to the various heads of departments, and collected them back shortly after they went through them to administer high rate of return.

3.6.3 Trainers' Questionnaire

The questionnaire for the National Polytechnics trainers comprised of structured, and open and closed ended items which were divided into sections. Section *A*, sought to obtain trainers demographic information such as age, sex, experience, level of education, professional qualifications, while Section *B* obtained information on training and learning processes which revealed their competencies related to trainer academic qualifications, trainer pedagogy, trainer experience, trainer industrial links and section *C* had items on student academic performance that contained a five-point Likert scale. These questionnaires were administered by the researcher himself to the various trainer of the various departments, and collected them back immediately after going through them to achieve a high rate of return. A five-point Likert scale item questionnaire provided a quick method of collecting data (Mutindi, M. J. 2018) for analysis.

3.6.4 The Students' Questionnaire

The students' questionnaires were divided into sections to carry variety of information (Mutindi, M. J. 2018). Section *A* was used to gather background information which included; sex, age, year of study, course and name of department. Section *B* was obtaining information that confirmed what their trainers and learning characteristics entailed as far as trainer competences were concerned. The students' questionnaires were used to confirm information on learning methods and processes depending on the research objective items in the questionnaire. These questionnaires were administered by the researcher himself to the various selected students in the various departments, and collected them back immediately after going through them to maintain a high rate of return. The questionnaires comprised of closed and open-ended questions; some parts had a five-point Likert scale on the trainer competences that affected students' academic performance in their National Polytechnics in the Diploma of the SET courses in western Kenya.

3.6.5 The County Directors Interview Schedule

The County Directors Technical Training Officers' interview schedule was used to gather background information on each of the three National polytechnics and on trainer academic qualification, pedagogy, trainer experience and trainer industrial linkages. The County Director of Technical Training was witnessing on the effect of trainer competences in the National Polytechnics in connection with students' academic performance. Mitchell, R. (2015) explains that interviews are suitable for obtaining qualitative and in-depth data as they afford an opportunity to obtain explanations from respondents. The current study focused on the effect of trainer competences on student academic performance.

3.7 Reliability and Validity of the instruments

Questionnaires were pre-tested at the Eldoret National Polytechnic as an institute with similar characteristics to the other National Polytechnics to undertake research, before use and also retested to ascertain their validity and reliability before subjecting them on data collection. Also, the instrument was subjected to peer criticism, and my supervisors for moderation to improve the accuracy of reliability and validity before actual use.

3.7.1 Validity

Validity indicates the degree to which an instrument measures what it was supposed to measure; which includes the accuracy, soundness and effectiveness with which an instrument measures what it is intended to measure (Mutindi, M. J. 2018). Content validity is the extent to which the measuring tool provides adequate coverage of the investigative questions posed in the study (Ekawati Mardiana 2017). To ensure content validity of the instruments, the questionnaires, interview and observation schedules were presented to the experts, including supervisors. They scrutinized the instruments for use of simple language in formulating questions, the use of side notes to guide the respondents while filling the questionnaires, and gave suggestions, which helped refine the questionnaires before preparing the final copy. These measuring tools to a large extent determined the variables in this study of trainers' competencies on student academic performance in the diploma in the Science Engineering and Technology courses in the National Polytechnics in western Kenya.

3.7.2 Observation Schedule

The observation schedule was used as one of the research instruments. It was used to supplement information, which was obtained from the questionnaires. This was done by examining and recording data on the availability of training and learning physical

resources, indicators of training overall timetable loading and sample documents to reveal trainer competences in the study in the National Polytechnics. Mutindi, M. J. (2018) reported that observations are much better in overcoming the weaknesses of self-reported evidence. This observation was the trainers' previous work done on paper and in the environment. The technique enabled the researcher to collect direct information about human behaviour in terms of trainer competences that enable preparedness to achieve students' academic performance in Science Engineering and Technology diploma examinations. The training environment included tools and equipment upkeep, maintenance, infrastructure hygienic conditions and the related logistical training records.

3.7.3 Document Analysis

This involved the systematic assessment of documented communication for the purposes of identifying characteristics of message. In the study, a document analysis checklist was used to obtain information from the polytechnics on teacher competencies which were obtained from trainers' confidential assessment and students' academic performance. Use of documents as a method of collecting data was a valuable tool for understanding and explaining phenomenon Michael, K., & O'Connell, A. A. (2014). They stated that documents can be revisited as often as they are desired and contain the exact names, references, and details with broad coverage spanning a long time. Records from the institutions were also used to collect data, on student attendance register, training staff data, examination results, record of learning materials, and graduation records. This follows as Ekawati Mardiana (2017) stated that document analysis was the best method of determining important secondary information as it could not waiver or withhold information.

In this study, each principal was required to avail the requested documents for analysis

as per the checklists. Where the information sought was available in the principals' office, arrangements were made for the officer in charge to avail the data on the checklist provided. Data collected on SET courses in diploma for student performance was for the past consecutive five years up to 2021 examinations. It was valuable in confirming the information collected using these other tools such as questionnaires.

3.7.4 Reliability of the Instruments

Reliability is a measure of the degree to which a research instrument yields consistent results after repeated trials (Michael, K., & O'Connell, A. A. 2014). An accuracy of validity of 0.75 was good enough for data collection as accepted by Mutindi, M. J. (2018) Pilot study which was used to test and to check the reliability of the instruments was carried out at two different times in a time span of two weeks to the same group of students at the Eldoret National Polytechnic, to calibrate measuring tools for reliability. The two-set scores obtained from the same students at these two different times were correlated to determine the reliability of the measuring tool. A correlation-coefficient was calculated using the Pearson's product moment formula to establish degree of consistency of the questionnaire.

$$r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}}$$

Where: N=Number of respondents

X=the first-test scores;

Y=the second-test scores

A Test-retest reliability coefficient of 0.7 or more was sufficient enough to qualify a tool as being worthy for use in data collection for the study (Kerlinger, 2013). The calculated correlation coefficients in current study for the heads of departments'

questionnaire stood at 0.752, while coefficient for trainers was 0.761, and that of students was 0.738. This, according to Kerlinger (2013), the instruments were reliable and fit for use in the data collection process.

3.8 Piloting

Piloting is the process of subjecting the research instruments to a trial to determine its suitability in a given study area. Pilot testing was done by administering the research instruments to a sample of population. For this study, pilot testing was done at the Eldoret National Polytechnic as it's an institute with similar characteristics to the other targeted national Polytechnic in western Kenya. The instruments that were piloted included the interview schedules, documentary analysis, observation schedules and questionnaires. The pilot testing involved testing of the suitability of the instrument, from a content and language perspectives, to ensure it yields the desired response in the actual research (Michael, K., & O'Connell, A. A. (2014). In particular, the results of the test were used to correct terminologies that were difficult for the respondents to understand. This involved refining the instrument so that respondents would have no problem in answering the questions of both open and closed ended type and those ones in the five-point Likert scale.

3.9 Data Collection Procedures

An introductory letter, after preparing and qualifying the research proposal, was obtained from the University of Eldoret. The introductory letter was used to obtain a research permit from the National Commission for Science, Technology and Innovation (NACOSTI) Nairobi headquarters. The research permit, being an official document allowed the researcher carry out research in the prescribed area of study. It was used to inform the County administration of the intended study. The letter of introduction was

presented to each of the principals of the National polytechnics as the researcher explained the purpose of the study in a manner to get permission to access the respondents. The researcher made appointments with the principals for interviews and with HODs when start collecting data. The questionnaires were safely kept and taken to the national polytechnics by the researcher himself and personally distributed to the respondents. There was a total of 323 questionnaires that were administered to the respondents that included; the heads of departments, trainers and students. The questionnaires that were re-collected back were 298 making the rate of return as 92% by the researcher immediately after the respondents had gone through them, as such this was an attempt to minimize loses of the questionnaires.

3.10 Data Analysis

Data analysis started upon completion of the data collection exercise. Quantitative data was collected by using a questionnaire which were analysed by the use of descriptive statistics using the Statistical Package for Social Sciences (SPSS) and presented in the form of; percentages, means, standard deviations and frequencies. The information was displayed by use of bar charts, graphs, pie charts and computing Pearson's correlation coefficients for further analysis. This was done by tallying up responses, computing percentages of variations in response as well as describing and interpreting the data in line with the study objectives. In addition, regression analysis was used for each of the objectives of the study (Ekawati, Mardiana 2017). Students' academic performances were correlated against each of the trainer competence variables which entailed trainer academic competence, trainer pedagogical competence, trainer experience competence and trainer industrial linkage competence, and finally regression table of findings was drawn.

The data collected using interview guides which was qualitative in nature, was analysed

using conceptual content analysis which was the best suited method for the analysis. Conceptual content analysis as defined by Michael, K., & O'Connell, A. A. (2014) was the technique used for making inferences by systematically and objectively identifying specific characteristic of messages and using the same approach to relate trends. The main purpose of content analysis was to study the existing information in order to determine factors that explained specific phenomenon (Mutindi, M. J. 2018). Content analysis uses a set of categorizations for making valid and replicable inferences from data to their context. Therefore, qualitative data was transcribed and reported in emerging themes, then discussed. Verbatim reports were also used to present the qualitative data and thereafter discussed.

Table 3.3 Summary of Data Analysis and presentation

Objective	Independent Variable	Dependent Variable	Statistical tool
Examine the effect of trainer's academic competencies on students academic performance	-Academic Skills competences -Academic enablers competences	Academic performance -Quality of grades	Pearson's Correlation frequencies tables pie charts.
Asses the effect of trainer's pedagogical competencies on students' academic performance	-Training tools -Assessment	Academic performance -Quality of grades	Pearson's Correlation frequencies tables
Determine the effect of trainers' experience competencies on student academic performance	-Classroom management -Personal Attributes	Academic Performance -Quality of grades	Pearson's Correlation frequencies tables
Asses the effect of trainer's industrial link competence on students academic performance	Industrial linkage participation innovations	Academic Performance -Quality of grades	Pearson's Correlation linear regression

Source: Author, 2022

3.11 Ethical Considerations

Ethical considerations in any research should be handled with utmost importance since the manner in which the research is conducted and the findings realized have both direct and indirect consequences to people's lives (Ekawati, Mardiana 2017). Since how a study is done and the conclusions drawn have an effect on people's lives both directly and indirectly, ethical issues in research should always be treated seriously. Due to this, the respondents' complete secrecy will be guaranteed during this current study processes. Additionally, participants were informed that their confidentiality was guaranteed by the researcher. An agreement between parties that restricts others' access to private information is referred to as a confidentiality agreement (Michael, K., & O'Connell, A. A. 2014). In this regard, the surveys did not include the respondent's name in order to ensure anonymity and prevented them from being recognised after completing the questionnaires. Anonymity means that no one, not even the researcher, should be able to recognise any individuals thereafter the research exercise (Tognazzo, A., Gubitta, P., & Gerli, F. 2017). Following acceptance of the research proposal, the researcher in this study asked permission from the principals of the national Polytechnics in western Kenya to go ahead with data collection. The researcher provided each study participant a letter of permission. The researcher explained the study's objective and methodology in the letter to the research participants so they were aware of its nature and any potential effects it could have on them (Lumonya, J. S. 2020). According to that perspective, before starting to take part in the research, participants signed consent papers. They were also properly informed of their rights to stop participating in the research activities at any time without facing repercussions. Participants were also made aware that taking part in the study was completely optional and that they wouldn't be forced to do so.

CHAPTER FOUR

DATA PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter provides a summary of data presentation, analysis, interpretation and discussion of data collected from ten course in departments of the three National Polytechnics in western of Kenya. This study was to investigate the effect of trainer competences on students' academic performance in the National Polytechnics in the Diploma KNEC of the Science Engineering and Technological (SET) courses.

The study was guided by four questions:

1. What was the effect of trainers' academic competence on students' academic performance in Diploma of the SET courses in the National Polytechnics in Western Kenya?
2. To what extent did trainers' pedagogical competences affect students' academic performance in Diploma of SET courses in national Polytechnics in western Kenya?
3. What was the effect of trainers' experience competences on student s' academic performance in Diploma of SET courses in National Polytechnics in western Kenya?
4. How does trainers' industrial linkage competences affect students' academic performance in Diploma of SET courses National Polytechnics in Western Kenya?

The results were presented in the three sections which included presentations, discussions and conclusions.

4.2 Response Rate and Return of Questionnaires

A total of 196 students' questionnaires, 109 trainers' questionnaires and 18 questionnaires to the heads of departments were distributed by the researcher. The response return rate was as presented. However, 3 out of 18 HODs were reported to have gone to the field for students assessment on attachment. see Table 4.1.

Table 4.1 Response rate and return of questionnaires

Sampled Groups	Number Sampled	Percentage of Return Rate
Principals	3	100
Heads of Departments	15	83.3
County Direct. Tech. Edu	3	100
Trainers	99	90.8
Students	184	94.0
Total	304	92.0

The response return rate was 92 percent. This was arrived at by considering the total number of questionnaires that were retrieved as 298 over the total number of the questionnaires initially given out as 323 and expressed as a percentage. This was high and therefore the data was sufficient enough to provide the sample statistics that enabled tabulation on the effect of trainers' competences on students' academic performance in the area of study.

4.3 Demographic Characteristics of Respondents

Data was collected from student respondents enrolled in the courses of the three National Polytechnics found in the western region of Kenya; Sigalagala National Polytechnic, Kisumu National Polytechnic and the Kisii National Polytechnics. These polytechnics offered diversified Science Engineering and Technology (SET) courses as shown in Table 4.2

Table 4.2 Student respondents in SET Courses from departments in the study areas

Courses	Frequency	Percent
Applied Biology	20	10.9
Applied Chemistry	15	8.2
Mechanical	18	9.8
Automotive	17	9.2
Electrical	30	16.3
Building and Civil Engineering	26	14.1
Computer Department	28	15.2
Clothing and Textiles	11	6.0
Beauty therapy	10	5.4
Leather works	9	4.9
Total	184	100

Most students 16.3% were enrolled in electrical studies followed by computer department 15.2%. The third department was Building and Civil Engineering course with 14.1%. Applied Biology was represented with 10.9%. Mechanical courses were represented with 9.8%, and followed closely by automotive engineering 9.2%, then clothing and textiles course that had 6.0% of students. The least populated courses were Beauty therapy with (5.4%), and leather works course with 4.9%.

Data on the gender of students was as shown in Figure 4.1

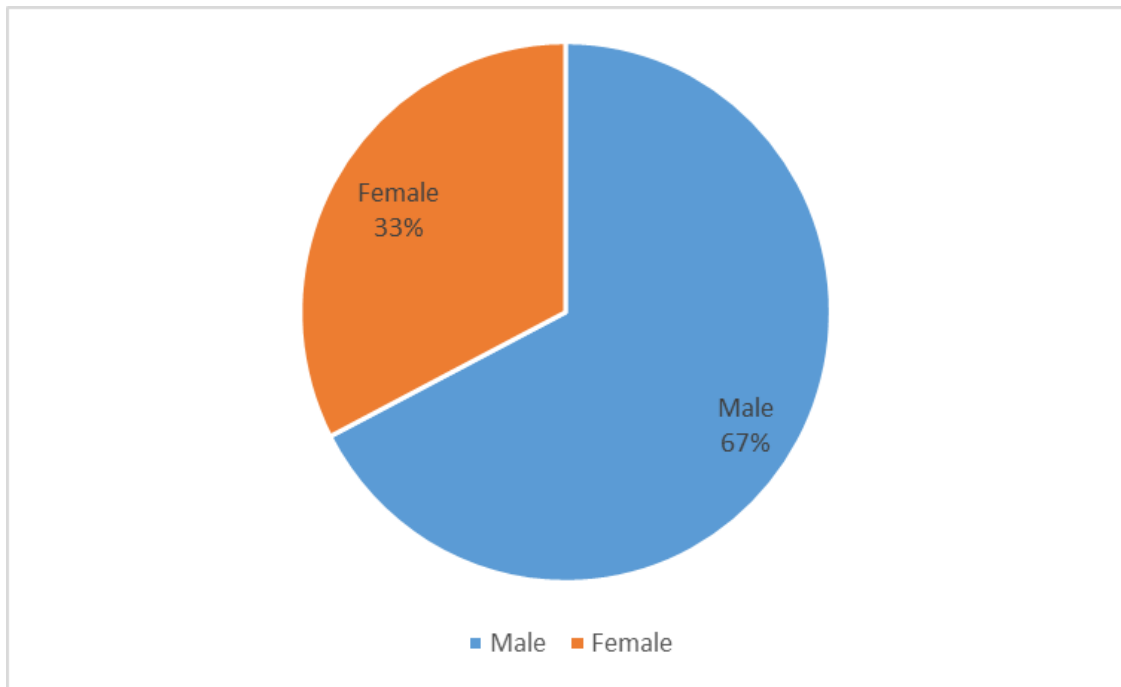


Figure 4.1: Students respondents by Gender

Male students were the majority, (67%) while the female students were (33%) in the three national polytechnics.

The majority of the student that participated in the study was in third year of study as shown in Figure 4.2

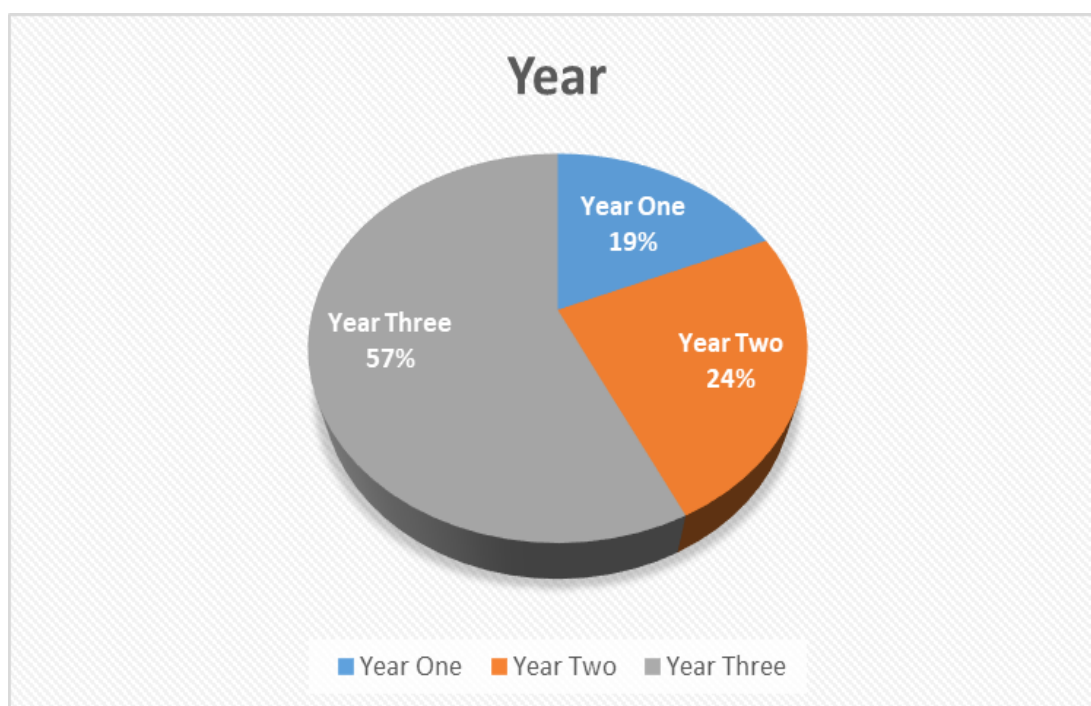


Figure 4. 2: Students year of study

Majority of the students sampled were third year students 57%, followed by second year students 24% and the first year 19%.

The study also involved a mix of trainers in terms of age as shown in Table 4.3

Table 4. 3 Ages of Trainers

Age in years	Frequency	Percentage
25-30 Years	36	36.4
31-35 Years	18	18.2
36-40 Years	12	12.1
41-45 Years	15	15.2
46-50 Years	9	09.1
51-55 Years	3	03.0
56-60 Years	6	06.1
Total	99	100

Among the majority of trainers in the sampled national polytechnics were their tender ages. For instance, the most were 36.4% and were aged between 25-30 years, followed

by the age range of 30-35 years 18.2%. Older trainers with over 40 years were 33.4%.

There were 9 trainers aged above 50 years.

The study further sought to find out trainers' academic qualification whose distribution was as indicated in Table 4.4.

Table 4. 4 Trainer Academic Qualification

Academic Qualification	Frequency	Percentage
Certificate	13	13.1
Diploma	23	23.2
Bachelors' degree	34	34.3
Masters	18	18.2
PhD	11	11.1
Total	99	100

Majority of the trainers in the sampled national polytechnics were Bachelors' degree holders, who were represented by (34.3%), followed by trainers with Diplomas (23.2%) and Master's degree holders (18.2%). The trainers with Certificate and doctorate qualification were the least at 13.1 percent and 11.1 percent respectively.

Trainers' level of training experience was also analysed and presented using frequency counts and percentages as shown in Table 4.5.

Table 4. 5 Trainer Experience

Experience in years	Frequency	Percentage
1-5	66	66.7
6-10	6	6.1
11-15	9	9.1
16-20	6	6.1
21-25	3	3.0
26-30	6	6.1
31-35	3	3.0
Total	99	100

Majority of the trainers who were at 66.7% had 1-5 years of training experience at the National Polytechnics. The rest of the trainers were 33 in number. The thirty-three

(33.4%) of the trainer had experience of at least 6 years. These findings indicated that the trainer respondents /participants had considerable and varying training experiences sufficient to inform on the influence of trainers' experience on the performance of the students.

Gender for the heads of departments was also computed and reported as shown in Figure 4.3

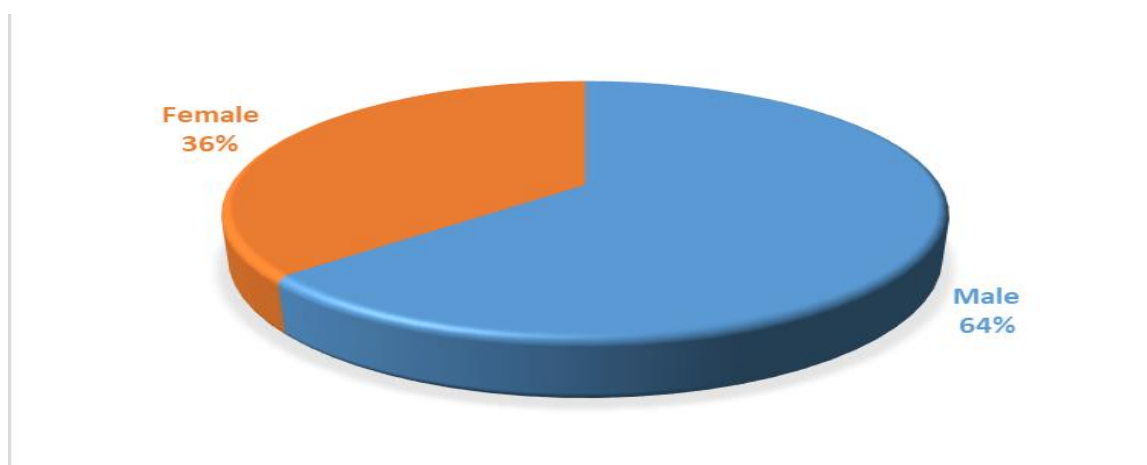


Figure 4. 3: Heads of Departments by Gender

Majority of the heads of departments were ten males represented by 67%, followed by 33% by 5 female heads of departments.

The researcher went ahead to analyse the academic qualifications of heads of departments as shown in Table 4.6.

Table 4. 6 Academic Qualifications of Heads of Departments

Highest Academic Qualification	Frequency	Percentage
Degree	10	66.7
Masters	5	33.3
Total	15	100

Majority of the heads of department were degree holders (66.7%) while the rest (33.3%) had masters as their academic qualifications.

Further findings on the distribution of heads of departments by age were also presented as shown in Table 4.7.

Table 4. 7 Distribution of Heads of Departments by Age

Age Bracket	Frequency	Percentage
30-35 Years	1	6.7
36-40 Years	3	20.0
41-45 Years	2	13.3
46- 50 Years	5	33.3
51-55 years	4	26.7
Total	15	100

Majority of the respondent heads of departments in the SET courses were aged 46-50 years and were represented by 33.3%, followed by 4 of them, who formed 26.7% in the age group of 51-55 years. The smallest group was that of age set of 30-35 years. This means that the lots of heads of departments were mature people who wailed more years of training experience.

4.4 Effect of Trainer Academic Competences on Students' Academic Performance

The first objective of the study sought to establish the effect of trainer academic competences on students' academic performance in the Diploma of SET courses in the National Polytechnics in Western Kenya. In this study, the focus was to establish the relationship between trainer academic competence and student academic performance. Trainer academic competence had several characteristics under each of the academic skills competences and the academic enablers' competence as shown in Table 4.8. There were a total of 184 students in the respondent group.

Table 4. 8 Students response on Trainer’s Academic Competencies

<i>Academic skills Competencies</i>	1	2	3	4	5	Mean	SD
Our trainer analyses problems when training	13	14	19	76	62	3.90	1.17
Our trainer synthesises problems when training	7	20	21	48	88	4.03	1.17
Our trainer have good memory recall	48	28	27	42	39	3.0	1.51
Our trainers have good communication skills	0	21	21	76	66	4.01	0.96
Our trainers have good subject mastery when training	69	28	6	35	46	2.78	1.67
Our trainers encourage critical thinking when training.	0	6	21	49	108	4.41	0.82
Our trainers have good problem-solving skills when training.	143	7	14	13	7	1.55	1.13
Academic enabler competencies	1	2	3	4	5	M	SD
Our trainers cover syllabus in time	0	0	14	73	97	4.5	0.63
Our trainers have the determination during training	20	0	28	41	95	4.0	1.29
Our trainers are good time managers	7	20	41	76	40	3.7	1.05
Our trainers are examiners in KNEC	14	0	42	69	59	3.9	1.11
Our trainers are good administrators	53	14	69	41	7	2.6	1.22
Our trainers are good mentors	7	6	27	56	88	4.2	1.04

A total of the 76 students, agreed that their trainers did problem analysis when teaching and were supported by 62 who strongly agreed. This was also shown by a high mean (M=3.9, SD=1.17). Majority of the students, 88 strongly agreed that their trainers applied problem synthesises method when training, which also had a high rating (M=4.03, SD=1.17). Furthermore, 42 of the students agreed while 39 strongly agreed that their trainers had good memory recall when training, which received a high rating (M=3.0, SD=1.51). However, it emerged from the findings, as indicated by majority of the students, 48 who disagreed that trainers did not use project method when teaching

($M=2.97$, $SD=1.51$). Additionally, 69 students disagreed that trainers used out of class methods when training ($M=2.78$, $SD=1.67$).

On academic enabler competences, majority of the students, 97 strongly agreed that their trainers covered syllabus in time, which was reflected by a high rating ($M=4.5$, $SD=.63$). Majority of the students, 95 also strongly agreed that their trainers had the determination when training which was indicated by a high mean of ($M=4.0$, $SD=1.29$). The findings show that 76 of the students agreed that their trainers were good time managers during training, which received a high rating ($M=3.7$, $SD=1.05$) whereas 69 agreed that their trainers were examiners of KNEC, and was affirmed by a high mean ($M=3.9$, $SD=1.11$). It is further clear from the findings that trainers were good mentors as revealed by majority, 88 of the students with a high mean ($M=4.2$, $SD=1.04$). However, it emerged that trainers were not good administrators according to the low rating ($M=2.6$, $SD=1.22$) although majority of the students, 69 moderately agreed that their trainers were good administrators.

Further findings of the study by trainers' response on their academic qualification competences, which included both academic skills and enablers, were presented as shown in Table 4.9 using frequency counts, percentages, means and standard deviations with a total of 33 teachers in the respondent group.

Table 4.9 Trainer response on Trainer's Academic Competencies

Academic Skills Competencies	1	2	3	4	5	M	SD
I encourage problem analyses when training	12	18	21	33	15	3.2	1.27
I encourage problem synthesises when training	6	0	9	30	54	4.3	1.07
I encourage good memory recall	12	9	36	24	18	3.3	1.23
I practice good communication skills	12	3	9	36	39	3.9	1.32
I encourage good subject mastery when training	9	6	42	18	24	3.4	1.20
I encourage critical thinking when training.	39	18	30	6	6	2.2	1.22
I encourage good problem-solving skills when training.	6	6	6	30	48	4.0	1.29
Academic enabler competencies	1	2	3	4	5	M	SD
I cover syllabus in time	6	9	18	21	45	3.9	1.26
I have the determination when training	12	18	27	24	18	3.2	1.29
I manage my time well when training	12	24	21	27	15	3.1	1.28
I am examiners of KNEC	24	12	18	24	21	3.1	1.50
I encourage good administrator ship	12	15	15	24	33	3.5	1.42
I encourage good mentorship	9	26	27	39	18	3.5	1.15

A total of 69 out 99 trainers revealed that they encouraged analysed problems-solving when training, and this was evidenced by a high mean ($M=3.2$, $SD=1.27$). They also encouraged synthesised problems-solving, according to the majority 18 coupled with high rating ($M=4.3$, $SD=1.07$). There was also a high rating on encouraging good memory recall, ($M=3.3$ $SD=1.23$). The trainers encouraged good communication skills according to majority, 13 of trainers who strongly agreed, with a high rating ($M=3.9$, $SD=1.32$), which was in line with students high rating. There was also a high rating ($M=3.4$, $SD=1.20$) on good subject mastery when training. Finally, the findings show that trainers have good problem-solving skills when training. ($M=4.0$, $SD=1.29$) rather than trainer encouraging critical thinking when training. ($M=2.2$, $SD=1.22$), which

agrees with students. Based on trainer rating, trainers have high competencies in their academics.

The findings by majority of trainers, 15 indicated that they cover syllabus in time, which also received a high rating (M=3.9, SD=1.26). This was followed by good administration and mentorship as indicated by high ratings of (M=3.5), although with high standard deviations of 1.42 and 1.15 respectively, as finding by trainers rating. Furthermore, the findings revealed a high rating on trainers having determination to train students at (M=3.2, SD=1.29). Trainers rated themselves as being good time managers during training at (M=3.1, SD=1.28) and being KNEC examiners (M=3.1, SD=1.50) as high.

The study also established trainer competence rating based on 15 heads of departments as shown in Table 4.10

Table 4.10 HODs response on Trainers' Academic Competence

Academic skills Competencies	1	2	3	4	5	M	SD
Our trainers analyses problems when training	0	3	2	9	1	3.5	0.92
Our trainers synthesises problems when training	0	0	1	8	6	4.3	0.62
Our trainers have good memory recall	0	2	3	8	2	3.7	0.90
Our trainers have good communication skills	0	1		5	4	3.8	0.94
Our trainers have good subject mastery when training	5	1	4	5	0	2.6	1.30
Our trainers encourage critical thinking when training.	4	2	7	2	0	2.5	1.06
Our trainers have good problem-solving skills when training.	1	1	3	5	5	3.8	1.21
Academic enabler Competencies	1	2	3	4	5	M	SD
Our trainers cover syllabus in time	1	2	4	5	3	3.5	1.26
Our trainers have determination to train	1	3	4	4	3	3.3	1.29
Our trainers are good time managers	1	4	3	5	2	3.2	1.28
Our trainers are examiners of KNEC	4	2	3	4	1	2.9	1.50
Our trainer are good administrators	3	3	3	4	1	2.9	1.42
Our trainers are good mentors	1	1	4	6	3	3.5	1.15

The findings show that trainers analyse problems when training, according to majority, 9 of the heads of departments, who also rated it as high (M=3.5, SD=.92). It further

emerged that trainer synthesises problems when training as agreed by majority, 8 of the heads of departments, with a high rating ($M=4.3$, $SD=.62$). The findings also show that trainers have good memory recall ($M=3.7$, $SD=.90$) and have good communication skills ($M=3.8$, $SD=.94$), which supports teachers rating but differs with students rating. It was however observed that trainers did not have good subject mastery when training as indicated by a low rating ($M=2.6$, $SD=1.30$), which agrees with students' perception but differs with trainers' views. Finally, it emerged that trainers have good problem-solving skills when training as indicated by a high rating ($M=3.8$, $SD=1.21$), a finding that agrees with both trainers and students, but do not encourage critical thinking among students ($M=2.5$, $SD=1.06$). It can thus be seen from findings that based on heads of department; trainers have average academic competence. The findings by majority of trainers, 5 indicated that they cover syllabus in time, which also received a high rating ($M=3.5$). This was followed by good administration and mentorship as indicated by high ratings of ($M=3.3$), although with high standard deviations of 1.26 and 1.29 respectively, Furthermore, the findings revealed a high rating on having determination to train at ($M=3.3$, $SD=1.29$). Contrary to the students rating, trainers being good time managers during training at ($M=3.2$, $SD=1.28$) and being KNEC examiners ($M= 2.9$, $SD=1.50$) as high.

A Pearson correlational coefficient was computer generated to reveal further characteristics relationship between trainer academic competences and students' academic performance in the study as in table 4.11

Table 4. 11 Relationship between trainers' academic competence and student's performance

Correlations			
		Trainer Academic Competence	Performance
Trainer Academic Competence	Pearson Correlation		.676**
	Sig. (2-tailed)		.000
	N	33	33
Performance	Pearson Correlation	.676**	
	Sig. (2-tailed)	.000	
	N	33	33

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

From the findings, there is a correlation between trainer academic competencies and performance ($r=.676$, $p<.05$). This implies that students' academic performance is positively associated with trainer academic competencies.

In addition to the correlation analysis, simple linear regression model was carried out to establish the effect of trainer academic competencies on students' academic performance. The findings were as shown in Table 4.12.

Table 4.12 Regression Model on effect of Trainer academic competence on students' performance

Model R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	F	Change	df1	df2	Sig. Change
1	.676 ^a	.456	.439	.801	.456	26.026			.000

a. Predictors: (Constant), trainer competency

Coefficients ^a						
Model		Unstandardized Coefficients	Standardized Coefficients	T	Sig.	
		B	Std. Error	Beta		
1	(Constant)	.830	.689		1.204	.238
1	trainer competency	1.160	.227	.676	5.102	.000

a. Dependent Variable: performance

The findings, show that trainer academic competence has a positive and significant influence on performance, ($\beta=.676$, $p<.05$) and accounts for 45.6% variance in performance, $R\text{ Square}=.456$, $F(1,31)=26.026$. This is further illustrated in the model equation that follows; $Y = .830 + 1.160x_{\text{teaching_competence}}$

This implies that trainer academic competence improves performance in National Polytechnics in Western Kenya. Hence a unit improvement in trainers' academic competence improves another unit of students' academic performance by a magnitude of 0.456 points. In addition, a graphical presentation was as shown in Figure 4.1, which shows the direction of the relationship between trainers' academic competence and performance.

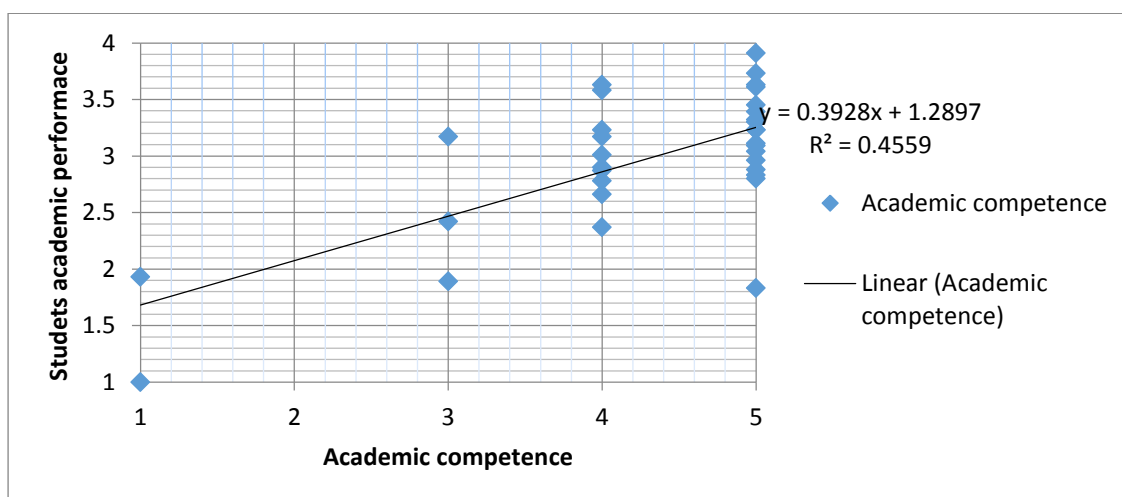


Figure 4.4 Correlation between Trainer Academic Competence and Students Performance

The graph shows linear relationship between trainer academic competence and students' academic performance. From the graph, it can be inferred that there is positive relationship between trainers' academic competencies and students' academic performance. This means that students' performance improves with trainers' academic competence. It can thus be concluded that trainer academic competence has a positive

and significant influence on students' performance. Qualitative data from interviews with institutional heads and county directors revealed that trainer competency was very important to the performance of students. They further noted that trainers' good academic competence motivates the students and challenged them to do better in their exams. In addition, they observed that more competent trainers taught well as compared to less competent trainers. Further analysis from the interview was done. One of the key informants was quoted saying,

“In some of our institutions, we have noticed that more competent trainers have a clear routine of training their students. They are well organized and deliver the content as required. This is indicated from their student's performance in Kenya national examinations”

4.5 Effect of Trainer Pedagogical Competencies on Students' Academic Performance

The second objective of this study sought to assess the effect of trainer pedagogical competencies on students' academic performance in the National Polytechnics in western Kenya. Trainers' pedagogy in this study involved the preparation of training tools, art of training and also trainer assessment of students' evaluation. The findings based on 184 students' views which are as shown in Table 4.13.

Table 4.13 Students Views on Trainer Pedagogical Competencies

Training tools methods and evaluation	1	2	3	4	5	M	SD
Our trainers prepare and use coursework outline.	7	0	21	90	66	4.13	.89
Our trainers use experiments and demonstrations	20	14	62	70	18	3.28	1.10
Our trainers prepare and give us lesson notes.	0	7	28	41	108	4.36	.876
Our trainers prepare and use class Registers	23	17	20	38	86	3.80	1.03
Our trainers prepare and use students' assessment tests mark (lists) records.	14	7	35	28	100	4.05	1.26
Trainers on Students'(assessment)	1	2	3	4	5	M	SD
Our trainers use Practical work for student evaluation.	7	21	13	49	94	4.10	1.17
Our trainers use two CATs for student evaluation.	14	7	21	42	100	4.13	1.22
Our trainers use end term exams for evaluation.	20	0	21	28	115	4.18	1.30
Our trainers use assignments for student evaluation.	21	20	28	42	73	3.68	1.39
We do group presentations for evaluations.	21	13	42	49	59	3.61	1.31

A number of 90 students noted that their trainer prepared and used coursework outlines, which also received a rating of (M=4.13, SD=.89). Teachers prepared and used experiments and demonstrations with a number of 70 students, with a rating of (M=3.28, SD=1.1). The findings further showed that our trainers prepared and gave lessons notes as indicated by majority of the students 108 and high rating (M=4.36, SD=.876). Trainers prepared and used class registers for roll call at 86 students with rating of (M=3.80, SD =1.03). Finally, the findings showed that trainers prepared and used students' assessment tests marks (list) records as agreed by majority, 100 with a high mean (M=4.05, SD=1.26). Based on students' ratings, trainers' preparedness and art of training among trainers was achieved. Further rating and views on trainers on students (assessment) evaluation was also done, where majority, 94 of students agreed that their trainers used practical work for student evaluation (M=4.10, SD=1.17). Majority, 100 of the students strongly agreed that their trainers used two CATs for student evaluation,

which was highly rated ($M=4.13$, $SD=1.22$) and that their trainers used end term exams for evaluation, 115 who strongly agreed with a high rating ($M=4.18$, $SD=1.30$). Further findings by majority, 73 who strongly agreed indicated that trainers used assignments for student's evaluation ($M=3.68$, $SD=1.39$) and they did group presentations for evaluations as revealed by majority 59 who strongly agreed with a mean of 3.61 and high standard deviation ($SD=1.31$). Overall, it is notable that trainers often used assessment for evaluations.

The findings on the same constructs were also analysed based by 99 trainers' views as presented in Table 4.14. The findings are also presented using frequency counts, percentages, means and standard deviations.

Table 4. 14 Trainers Response on Trainers Pedagogical Competencies

Preparation and use of training tools	1	2	3	4	5	M	SD
I prepare and use coursework outline.	9	0	3	21	66	4.4	1.19
I use experiments and demonstrations	9	6	9	33	42	3.9	1.27
I prepare and use lesson notes.	6	0	0	18	75	4.6	1.00
I prepare and use class Registers.	6	0	3	21	69	4.5	1.03
I prepare and use students' CAT mark records.	6	0	0	21	72	4.6	1.00
Students' (Assessment)	1	2	3	4	5	M	SD
I use Practical work for student evaluation	9	0	18	36	36	3.9	1.18
I use two CATs for student evaluation.	6	3	21	36	33	3.9	1.11
I use end of term exams for student evaluation.	9	3	0	1	72	4.4	1.24
I use assignments for student evaluation.	6	0	3	48	42	4.2	0.99
I use group presentations for students' evaluations.	3	15	18	36	27	3.7	1.13

Majority of the trainers, 66 strongly agreed that they prepared and used coursework outlines, which was also rated high ($M=4.4$, $SD=1.19$). Majority, 42 of the trainers also prepared and used experiments and demonstrations ($M=3.9$, $SD=1.27$) and lesson notes

to a high extend (M=4.6, SD=1.00) according to 75 who strongly agreed. The findings indicate that majority, 69 of the trainers prepared and used class records for roll call at (M=4.5, SD=1.03) and students CAT mark records according to 72 who strongly agreed with a high mean (M=4.6, SD=1.00).

Further views on students' assessment by trainers were also reported. From the findings, majority of the trainers, 36 strongly agreed that they used practical work for student's evaluation, with (M=3.9, SD=1.18), and 36 agreed that they used CATs for their assessment tests, with a high rating (M=3.9, SD=1.11) although different high standard deviations of 1.18 and 1.11 respectively. It was clear that trainers used end term exams for students as indicated by majority, 72 with a high rating (M=4.4, SD=1.24). Majority, 48 strongly agreed that their trainers used assignments for student's evaluation, with a high rating (M=4.2, SD=0.99) while 36 agreed that their teachers used group presentations for evaluations with (M=3.7, SD=1.13).

Whereas the use of pedagogy among trainers was not fully achieved, both in preparation and use of training tools, and students (assessment) evaluation, it can be seen that it is highly rated and therefore trainers have the pedagogical competencies as witnessed by students in the studied National Polytechnics. Further findings from the 15 heads of departments on teacher's pedagogical competence were also presented as follows in Table 4.15, using frequency counts, percentages, means and standard deviation.

Table 4.15 HOD Responses on Trainers' Pedagogical Competencies

Preparation and use of teaching tools							
	1	2	3	4	5	M	SD
Trainers prepare and use course outline.	0	0	1	4	10	4.6	0.63
Trainers prepare and use experiments and demonstrations	0	2	2		8	4.1	1.13
Trainers prepare and use lesson notes.	0	0	0	4	11	4.7	0.46
Trainers prepare and class register	0	0	1	5	9	4.5	0.64
Trainers prepare and use students' CAT mark records.	0	0	1	4	10	4.6	0.63
Students' (Assessment) Evaluation							
	1	2	3	4	5	M	SD
Trainers use Practical work for student evaluation	0	0	2	7	6	4.3	0.70
Trainers use two CATs for student evaluation.	0	1	1	4	9	4.4	0.91
Trainers use end of term exams for student evaluation.	0	0	0	5	10	4.7	0.49
Trainers use assignments for student evaluation.	0	2	2	4	7	4.1	1.10
Trainers use group presentations for evaluations.	0	2	2	7	4	3.9	0.99

According to the majority of the heads of department, 10 trainers prepared and used course outlines from schemes of work, which received a high rating ($M=4.6$, $SD=.63$). Majority, 8 further indicated that trainers used experiments and demonstrations to a great extent ($M=4.1$, $SD=1.13$) and 11 indicated that they prepared and used experiments and demonstrations during lesson work at ($M=4.7$, $SD=0.46$). Further findings from majority of the heads of departments, 9 revealed that trainers prepared and used students CAT mark records ($M=4.6$, $SD=.63$). Concerning students' evaluation, majority of the heads of departments, 7 agreed to a large extent ($M=4.3$, $SD=.70$) that trainers used practical work for student's evaluation and used two CATS for student's evaluation, 9 strongly agreed with high mean ($M=4.4$, $SD=.91$). It also emerged from the findings that trainers used end of term exams for students' evaluation, as indicated by majority, 10 of the

heads of departments with a high rating ($M=4.7$, $SD=.49$) and that they used assignments for students' evaluation as revealed by majority, 7 with a high mean ($M=4.1$, $SD=1.10$). Finally, it was revealed from majority of the heads of departments 7, who agreed that trainers used group presentation for evaluation, which received a high rating ($M=3.9$, $SD=.99$). Pearson Product moment correlation was used to establish whether a relationship existed between trainers' pedagogical competencies and students' academic performance. The results were captured as in Table 4.16.

Table 4. 16 Influence of trainers pedagogical competencies on students' academic performance

		preparation and use of training tools	Students' assessment and evaluation	Performance
preparation and use of training tools	Pearson Correlation	1	.881**	.788**
	Sig. (2-tailed)		.000	.000
	N	33	33	33
Students' assessment and evaluation	Pearson Correlation	.881**	1	.662**
	Sig. (2-tailed)	.000		.000
	N	33	33	33
Performance	Pearson Correlation	.788**	.662**	1
	Sig. (2-tailed)	.000	.000	
	N	33	33	33

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

Findings in table 4.16 show that preparation and use of training tools and students' performance had a strong positive and significant correlation ($r=.788$, $** p<.05$) ** followed by the correlation between the methods of student's assessment and evaluation and students' academic performance was also positive and significant ($r=.662$, $p<.05$).

Further findings using a simple linear regression model was presented in Table 4.17.

Table 4. 17 Effect of Trainers' Pedagogical Competence on Students Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.749 ^a	.562	.547	.719	.562	39.710			.000
a. Predictors: (Constant), pedagogical competence									
Coefficients^a									
Model	Unstandardized Coefficients		Standardized Coefficients		T	Sig.			
	B	Std. Error	Beta						
1	(Constant)	.541	.605		.894	.378			
	Trainers pedagogy	.888	.141	.749	6.302	.000			
a. Dependent Variable: performance									

The findings show that trainer pedagogical competence had a positive and significant effect on performance ($\beta=.749$, $p<.05$) and accounted for 56.2% variance in students' academic performance. This implies that for every improvement in pedagogical competencies among trainers, students' academic performance improved by a magnitude of 0.749 units. It can thus be concluded that trainer pedagogy had a positive and significant effect on student's performance. Further findings were presented using graphical scatter plots which showed linear relationship display as shown in Figure 4.2.

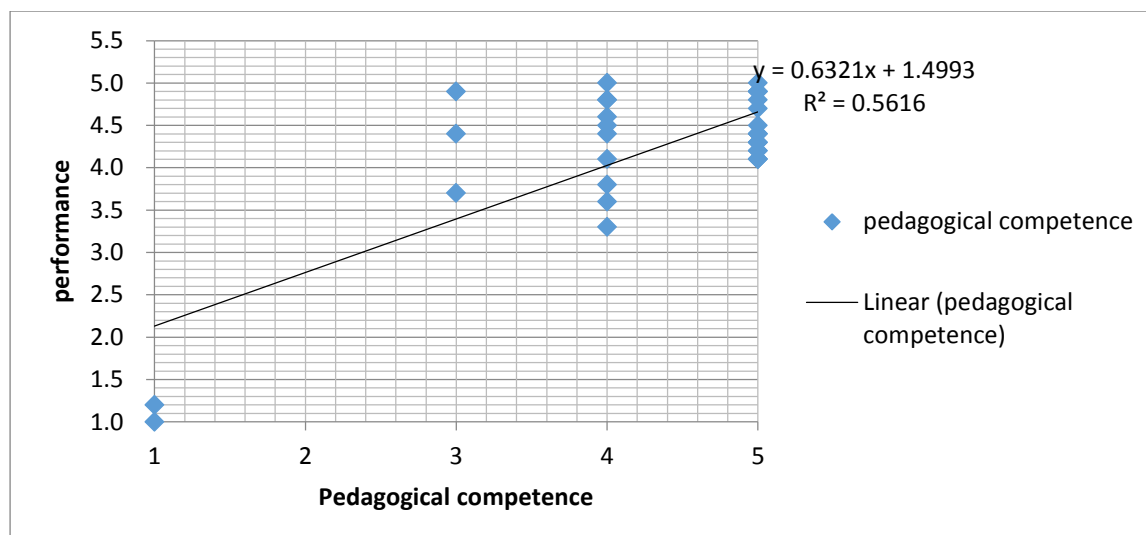


Figure 4.5 Relationship of trainers’ pedagogical competence and students’ performance

There was linear graph showing that a positive relationship exists between trainer pedagogical competencies and students’ academic performance. This means that students’ academic performance positively improves with a positive improvement in trainers’ pedagogical competence.

Further findings on qualitative interviews were also analysed from institutional principals as well as county director technical education. One of the county directors noted, ‘Pedagogical competence among trainers was very important. Trainers who prepared their lessons well and followed all the pedagogical procedures usually produce the best students’ academic performance at KNEC exams. These trainers always improved students’ academic performance’ (CDE Interview, Month, 2022).

In addition to the interview with the principals, one of the county directors for technical and vocational training revealed that, ‘in our institutions, there are always good results for students whose trainers are more pedagogically competent. These trainers knew how to handle students and even knew how to train practical courses without much difficulty’ (CDE Interview, Month, 2022).

These findings show that trainer pedagogical competence is paramount to good students' academic performance. For performance to improve, trainers must be more competent in pedagogical skills. These findings therefore support the quantitative findings that indicated a positive relationship between trainer pedagogical competencies and students' academic performance in the National Polytechnics in western Kenya.

4.6 Effect of Trainers Experience Competencies on Students' Academic Performance

The third objective of the study sought to examine the effect of trainers' experience competence on students' academic performance in Diploma of SET courses in the National Polytechnics in western Kenya. The findings of 184 students' views on trainers' experience were as shown in Table 4.18.

Table 4.18 Students Response o Trainers Experience Competencies

Experience competencies	1	2	3	4	5	M	SD
Trainers handle students in modelling manner	0	0	14	73	97	4.5	0.63
Trainers led in their students' academic performance	20	0	28	41	95	4.0	1.29
Trainers are good managers in their training work	7	20	41	76	40	3.7	1.05
Trainers provoke reason and active thinking during training	14	0	42	69	59	3.9	1.11
Training hard topics appears oversimplified for understanding	53	14	69	41	7	2.6	1.22
Trainers are sources of academic advises.	7	6	27	56	88	4.2	1.04

A number of 97 students strongly agreed that their trainers handled students in modelling manner during training, which was reflected by a rating of (M=4.5, SD=.63). Majority of the students, 95 also strongly agreed that trainers lead in their students' academic performance as indicated by a high mean (M=4.0, SD=1.29). The findings show that 76 of the students agreed that their trainers were good managers in their teaching work,

which received a high rating ($M=3.7$, $SD=1.05$) whereas 69 agreed that their trainers provoked reason and active thinking during training, and was affirmed by a high mean ($M=3.9$, $SD=1.11$). It was further clear from the findings that training complex topics appeared oversimplified for understanding that was represented by 53 students' respondents. Majority, 88 of the students saw trainers as sources of academic advices represented with a high mean ($M=4.2$, $SD=1.04$). However, it emerged true that training hard topics appeared oversimplified for understanding that was represented by low rating ($M=2.6$, $SD=1.22$) although majority of the students, 69 moderately agreed over the statement training hard topics appeared over simplified for understanding.

Further findings given by 99 trainers' response on their experience competencies on students' academic performance was as shown in Table 4.19.

Table 4. 19 Trainers' response on teacher experience competencies

Experience competences	1	2	3	4	5	M	SD
trainers handle students in modelling manner	6	9	27	36	21	3.58	1.12
trainers led in their students' academic performance	6	3	9	36	45	4.12	1.11
trainers are good managers in their training work	3	3	12	42	39	4.12	.96
trainers Provoke reason and active thinking during training	3	0	15	51	30	4.06	.86
training complex topics appears oversimplified for understanding	21	12	24	36	6	2.94	1.27
trainers are sources of academic advisers.	6	0	9	30	54	4.27	1.07

According to trainers' high rating ($M=3.58$, $SD=1.12$), trainers handled students in modelling manner, which was also affirmed by majority, 36 of the trainers. Trainers in these departments, lead in their students' academic performance were represented by ($M=4.12$, $SD=1.11$), with majority agreeing, 45. Furthermore, trainers highly ($M=4.12$, $SD=.96$) good managers in their training work as revealed by majority, 42(42.4%) who agreed. Majority of the trainers, 51 agreed to provoking reason and active thinking

during teaching were represented by ($M=4.06$, $SD=.86$), also majority of trainers represented by 54 saw trainers as sources of academic advises at ($M=4.27$, $SD=1.07$). However, it emerged that training complex topics never appeared oversimplified for understanding at ($M=2.94$, $SD=1.27$). From these findings, it can be concluded that trainers were experienced to some extent and hence could affect students' academic performance in National Polytechnics in western Kenya.

Finally, the findings on trainer experience were rated by 15 heads of departments as indicated in Table 4.20 using frequency counts, percentages, means and standard deviations.

Table 4.20 HODs Response on Trainer Experience Competencies

<i>Experience competencies</i>	1	2	3	4	5	M	SD
Trainers handle students in modelling manner	1	0	1	7	6	4.13	1.06
Trainers led in their students' academic performance	1	0	1	10	3	3.93	0.96
Trainers are good managers in their training work	1	0	4	7	3	3.73	1.03
Trainers provoke reason and active thinking during teaching	3	0	6	5	1	3.07	1.22
Training hard topics appears oversimplified for understanding	1	1	3	7	3	3.67	1.11
Trainers are sources of academic advisers.	2	2	3	5	3	3.33	1.35

From the findings, majority of the heads of departments, 7 agreed that trainers handle students in modelling manner, which was highly rated ($M=4.13$, $SD=1.06$). Trainers were also found to lead their student's academic performance in their training work ($M=3.93$, $SD=.96$). Trainers who were considered to be good managers in their training was represented by majority, 10. and with a high mean ($M=3.73$, $SD=1.03$). The majority of heads of departments who felt that trainers provoked reason and active thinking were 6 represented by ($M=3.07$, $SD=1.22$). Those trainers who agreed that

training of complex topics appeared oversimplified for understanding were 7 represented by (M=3.67, SD=1.11). There are also HODs who agreed that trainers were sources of academic advises and were represented by 5 HODs at (M=3.33, SD=1.35).

From these findings, it can be concluded that whereas trainers had experience in classroom management, they are not fully experienced to ensure good academic performance among students.

Further findings on the relationship between trainer experience and performance were presented as shown in Table 4.21 using Pearson Product Moment Correlation Coefficient.

Table 4. 21 Relationship between trainers’ experience and student performance

		Trainers experience	Performance
Trainers experience	Pearson Correlation	1	.430**
	Sig. (2-tailed)		.000
	N	33	33
Performance	Pearson Correlation	.430**	1
	Sig. (2-tailed)	.000	
	N	33	33

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

From the findings, it emerged that trainer experience was positively and significantly correlated with performance ($r=.430$, $p<.05$). This implies that trainer experience was important to students’ academic performance, such that the more they are experienced, the better their students perform.

Further findings, on the effect of trainers’ experience on students’ performance using linear regression model were as shown in Table 4.22.

Table 4. 22 Effect of Trainers Experience competencies on Students performance

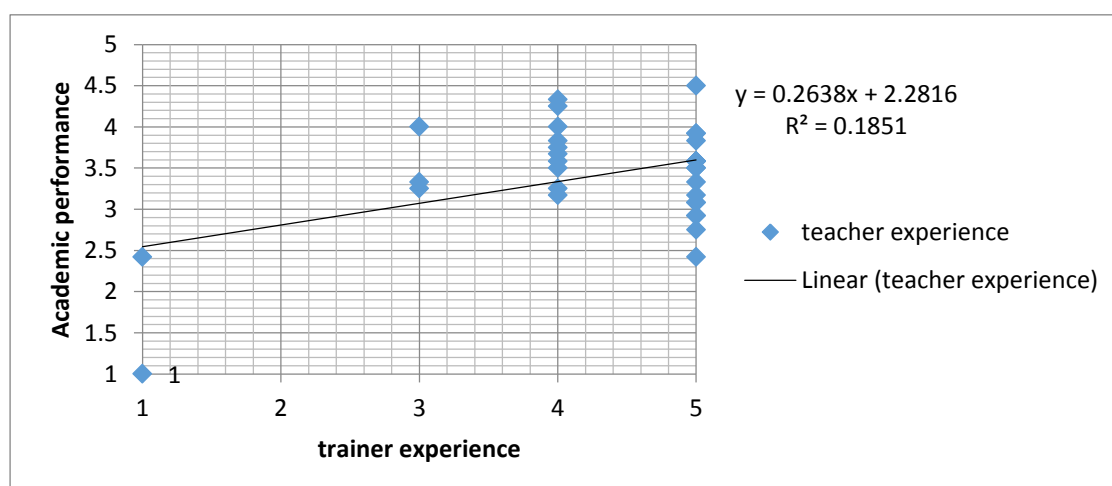
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.430 ^a	.185	.159	.980	.185	7.042			.012

a. Predictors: (Constant), trainer experience

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.883	.916		2.055	.048
	Trainers experience	.701	.264	.430	2.654	.012

a. Dependent Variable: performance

The findings show that trainer experience had a weak positive significant effect on students' performance ($\beta=.430$, $p<.05$) and accounts for 18.5% variance in students' performance. This implies that trainer experience positively influenced students' academic performance. Therefore, the more experienced the trainers are, the better their students' performance. A graphical view on the relationship between trainer experience and performance were also presented as shown in Figure 4.6 using a scatter plot which described a straight line of best fit.

**Figure 4.5 Trainer Experience competencies and students' Academic performance**

The findings showed that there was linear relationship between trainer experience and students' academic performance. Besides, the graph shows that the relationship is positive, such that students' academic performance improves with improvement in trainers' experience competencies. Therefore, the more experienced the trainers are, the better the students' academic performance.

Further findings were also sought on the effect of trainer experience on students' academic performance using views from both institutional principals and county director of technical and vocational education. It was reported that trainers who had taught for more years tended to produce the best results through their students. On the contrary, it emerged that trainers who did not have enough experience, or those still new, had little influence on students' performance. However, one principal argued that "younger' and inexperienced trainers could still produce good students academically. These findings agreed with views from one of the county directors of TVET, who indicated that

"We are in the process of getting more experienced trainers who can help our institutions. More experienced trainers support students to pass their KNEC exams, unlike less experienced trainers" (**Informant Interview, Month, 2022**)

From these findings, it can be noted that trainer experience competencies positively influenced students' academic performance. Students whose trainers are more experienced perform better than those whose trainers are less experienced. These findings are also in line with the quantitative findings, which revealed that trainers experience has a positive and significant effect on students' academic performance, such that students who perform very well are those whose trainers are more experienced.

These findings are further supported by previous studies including Muzenda (2013) who argued that these trainers' experience elements are associated with increase in students' academic performances as recorded in studies from developed states. Kaewdung (1977) observed that teachers learn to teach by training while Kasipar et al. (2009), Zhang (2009), OECD (2010) among other studies established that experience is one of the main vocational teachers qualifications that policy makers and researchers hypothesize may have substantial effect on vocational student learning. Following these findings, which are in support of the previous studies, it can be concluded that trainers experience has a positive and significant effect on students' academic performance in National Polytechnics in western Kenya.

4.7 Effect of trainers' industrial linkage competencies on students' academic performance

The final objective of the study sought to assess the effect of trainers' industrial linkages on students' academic performance in Diploma of SET courses in the National Polytechnics in Western Kenya. Students' views were as captured in Table 4.23 from 184 students in the respondent.

Table 4. 23 Student Responses on Teacher Industrial linkage competencies

Statement on industrial Links	1	2	3	4	5	M	SD
Our trainers are linked to industry	62	7	42	54	19	2.8	1.43
Our students visit local industries for out of class learning	34	42	41	41	26	2.9	1.33
Industry accepts our students on industrial attachments.	7	7	55	63	52	3.8	1.02
Attachment in industry enhances stronger relationship:	0	14	41	81	48	3.9	0.88
Involvement with industry improves students' academic Performance	0	0	21	88	75	4.3	0.66
Involvement with industry improves technological innovations	7	0	14	81	82	4.3	0.9
Has improved Robotics displays	7	7	42	62	54	2.8	1.43
Has improved mechanics and automotive	8	26	31	41	84	2.9	1.33
Improved shows, exhibitions and displays	7	7	55	63	52	3.8	1.02
Has an improved electrical and electronic gadget.	0	14	41	81	48	3.9	0.88
Has improved the use of computers	0	0	21	88	75	4.3	0.66

From the findings, 62 students disagreed that their trainers were usually linked to industries (M=2.8, SD=1.43) and they also, 42 disagreed that students visited local industries for out of class learning (M=2.9, SD=1.33). The findings show that the industries accept students on industrial attachments as revealed by majority, 63 who agreed with a high mean (M=3.8, SD=1.02) and attachment in industry enhances stronger relationship according to majority, 81 students with a high mean (M=3.9, SD=.88). Furthermore, the findings show that involvement with industries improved students' academic performance as revealed by majority, 88 of the students and a high mean (M=4.3, SD=.66). Finally, the findings show that involvement with industry improves technological innovations to a large extent (M=4.3, SD=.90) as revealed by majority, 82 of the students who strongly agreed.

From the findings, majority of the students, 62 agreed that linkage has improved their robotics displays which had rate of (M=2.8, SD=1.43) and they also, 42 disagreed that their mechanics and automotive studies had been improved (M=2.9, SD=1.33). The findings show that 63 students agreed with a high mean (M=3.8, SD=1.02) that trainer industrial linkages have improved exhibitions and displays in the national Polytechnics. Linkages with in industry enhances stronger relationship according to majority, 81 students with a high mean (M=3.9, SD=.88). Furthermore, the findings show that involvement with industries improves students' academic performance as revealed by majority, 88 students and a high mean (M=4.3, SD=.66). Finally, the findings showed that involvement with industry improved technological innovations to a large extent at (M=4.3, SD=.90) as revealed by majority, 82 students who strongly agreed. Further findings on industrial linkages were presented based on trainer and heads of departments' views. The findings based on 99 trainers' views were as shown in Table 4.24.

Table 4. 24 Trainers' response on trainers' industrial linkage competencies

Industry Linkage Competencies	1	2	3	4	5	M	SD
Our trainers are linked to industry	45	25	10	10	9	1.9	1.43
Our students visit local industries for out of class learning	9	14	22	24	30	3.5	1.33
Industry accepts our students on industrial attachments.	11	19	24	26	19	3.1	1.02
Attachment in industry enhances stronger relationships	10	12	23	36	18	3.4	0.88
Involvement with industry improves students' academic Performance	7	11	30	26	25	3.5	0.66
Involvement with industry improves technological innovations.	12	18	27	28	14	3.0	0.90
Industrial attachment							
Innovation competencies	1	2	3	4	5	M	SD
Has improved Robotics displays	24	9	30	27	9	2.9	1.32
Has improved mechanics and automotive	18	3	21	33	24	3.4	1.39
Improved shows, exhibitions and displays	12	6	21	42	18	3.5	1.23
Has an improved electrical and electronic gadget.	15	6	18	33	27	3.5	1.37
Has improved the use of computers	12	0	12	33	42	3.9	1.30

From the findings, majority of the trainers, 45 strongly disagreed that their trainers were usually linked to industries (M=1.9, SD=1.43) and also, 30 trainers agreed that students visited local industries for out of class learning (M= 3.5, SD=1.33). The findings show that the industries accept students on industrial attachments as revealed by majority, 26 trainers who agreed with a high mean (M= 3.1, SD=1.02) and links to industry enhances stronger relationship according to majority, 36 trainers with a high mean (M= 3.4, SD=0.88). Furthermore, the findings show that involvement with industries improves students' academic performance as revealed by majority, 30 trainers and a high mean (M=3.5, SD=.66). Finally, the findings show that involvement with industry improves technological innovations to a large extent (M=4.3, SD=.90) as revealed by majority, 28 trainers who strongly agreed. According to trainers, industrial linkages has not improved robotics display (M=2.9, SD=1.32) but has improved mechanics and automotive (M=3.4, SD=1.39) with majority, 30 who agreed. It is also clear that industrial linkages

had improved shows, exhibitions and display (M=3.5, SD=1.39) according to majority, 42 teachers agreed. Furthermore, the findings show that industrial linkages have improved electrical and electronic gadgets (M=3.5, SD=1.37) according to the majority, 33 trainers agreed. Finally, it was revealed that industrial linkages have improved use of computers (M=3.9, SD=1.30), also according to the majority, 42 trainers strongly agreed.

The 15 Heads of departments also shared their views on industrial linkages, which were presented as shown in Table 4.25.

Table 4.25 HODs Response on trainers' industrial linkage competencies

Industry Linkage Competencies	1	2	3	4	5	M	SD
Our trainers are linked to industries	12	1	2	0	0	1.3	1.43
Our students visit local industries for out of class learning	0	2	5	6	2	3.5	1.33
Industry accepts our students on industrial attachments.	1	3	4	5	2	3.3	1.02
Links with industry enhances stronger relationships	0	1	2	5	7	4.2	0.88
Involvement with industry improves students' academic Performance	2	1	3	6	3	3.5	0.66
Involvement with industry improves technological innovations.	0	1	1	6	7	4.3	0.90
Industry Innovation Competencies	1	2	3	4	5	M	SD
Has improved Robotic displays	0	0	9	3	2	3.3	1.03
Has improved mechanics and automotive	2	0	4	8	1	3.4	1.12
Improved shows, exhibitions and displays	2	0	2	10	1	3.5	1.13
Had improved electrical and electronic gadgets.	2	0	3	8	2	3.5	1.19
Has improved the use of computers	2	1	1	9	2	3.5	1.25

From the findings, the HODs, 12 strongly disagreed that their trainers were usually linked to industries (M=1.3, SD=1.43) and they also, 2 HODs disagreed that students visited local industries for out of class learning (M= 3.5, SD=1.33). The findings show

that the industries accepted students on industrial links as revealed by majority, 5 HODs agreed with a high mean ($M= 3.3$, $SD=1.02$) and links in industry enhances stronger relationship according to majority, 7 HODs with a high mean ($M= 4.2$, $SD=.0.88$). Furthermore, the findings show that involvement with industries improves students' academic performance as revealed by majority, 6 HODs and a high mean ($M=3.5$, $SD=.66$). Finally, the findings show that involvement with industry improved technological innovations to a large extent ($M=4.3$, $SD=.90$) as revealed by majority, 7 HODs who strongly agreed.

According to the heads of departments, trainer industrial linkages has improved robotics display with majority of 9 HODs at rate of ($M=3.3$, $SD=1.03$), finding that differs with teachers rating. It emerged that industrial linkages have improved mechanics and automotive courses ($M=3.4$, $SD=1.12$) with majority, 8 of respondents agreeing. It had also improved shows, exhibitions and displays ($M=3.5$, $SD=1.13$) according to majority who agreed, 10 and improved electrical and electronic gadgets as indicated by majority, 8 HODs who agreed to a large extent ($M=3.5$, $SD=1.19$). Finally, the findings show that industrial linkages have improved the use of computers as revealed by majority, 9 heads of departments with a high mean ($M=3.5$, $SD=1.25$) affirming the findings. Finally, the study sought to assess the effect of trainers' industrial linkages on students' academic performance in Diploma of SET courses in the National Polytechnics in Western Kenya. The findings found that there were too few trainers who ever went out on linkages, but the involvement with industry enhanced a lot of improvement in the students' academic performance and the relationship between the two variables were as shown in Table 4.26.

Table 4.25 Correlation between trainer industrial linkage competencies and student performance

		Industrial ompetencies	linindustrial nnovations	Performance
industrial link competenci	Pearson Correlation	1	.542**	.552**
	Sig. (2-tailed)		.001	.001
	N	33	33	33
industrial involvement nnovations	Pearson Correlation	.542**	1	.387*
	Sig. (2-tailed)	.001		.026
	N	33	33	33
Performance	Pearson Correlation	.552**	.387*	1
	Sig. (2-tailed)	.001	.026	
	N	33	33	33

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

The findings show that there was a positive and significant correlation between students' academic performance and trainer industrial linkage competencies ($r=.552$, $p<.05$) and performance, while, industrial involvements on innovations ($r=.387$, $p<.05$). This implies that performance is positively associated with industrial linkages. Further findings using simple linear regression model were as presented in Table 4.27.

Table 4.26 Effect of trainer industrial linkage competencies on students' academic performance

Model	R	R Squar	Adjusted R Square	Std. Error o the Estimate	Change Statistics				
					R Square Change	F Chang	df1	df2	Sig. F Chang
1	.526 ^a	.277	.254	.923	.277	11.884	31		.002

a. Predictors: (Constant), mean of industrial linkages

Model	Coefficients ^a				T	Sig.
	Unstandardized Coefficient:		Standardized Coefficients			
	B	Std. Error	Beta			
1	(Constant)	2.043	.667		3.06	.004
	mean of industrial linkage	.627	.182	.526	3.44	.002

a. Dependent Variable: performance

The findings using simple linear regression model revealed that trainer industrial linkage competencies had a positive and significant effect on students' performance ($\beta=.526$,

$P < .05$) and accounted for 27.7% variance in students' academic performance. This means that whenever there is trainer industrial linkage and performance will improve by a magnitude of 0.526 units. It can thus be concluded that trainer industrial linkages will improve students' academic performance. A graphical view on the relationship between trainer industrial linkages and performance was also presented as shown in Figure 8 below that follows, using a scatter plot and linear line of best fit.

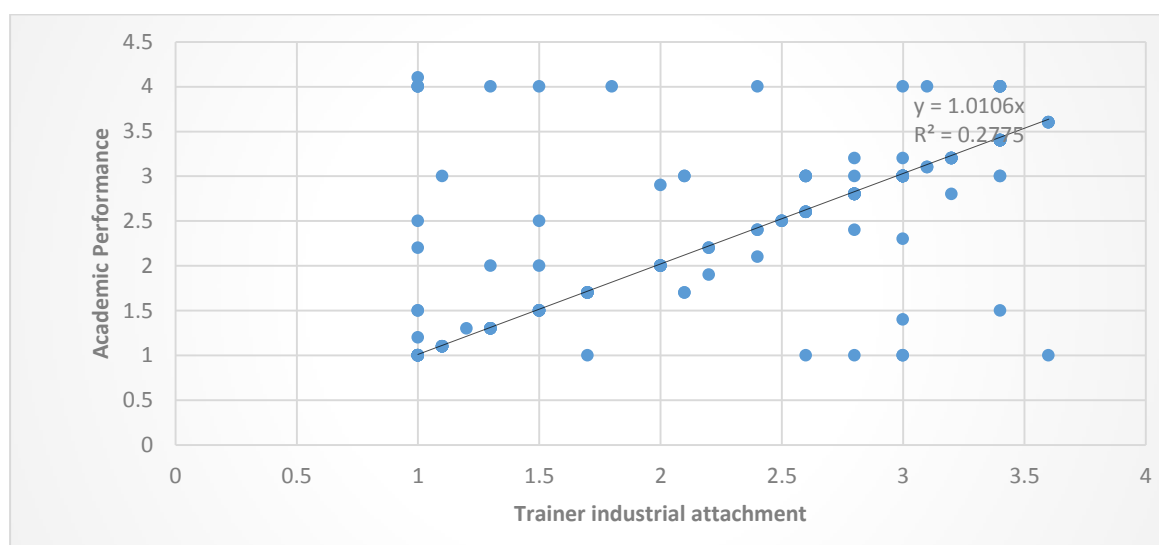


Figure 4.7 Relationship between trainers' industrial linkage competences and performance

It was also noted from the linear graph of student academic performance against trainer industrial link competences in years had positive determinants.

Drawing views from one of the principal views and records of document analysis, it was found that trainers' industrial linkage competences impacted positively on students' practical knowledge, which was well applied for their innovations in their areas of study. Therefore, trainer industrial linkages enhanced students to perform well in their exams.

In addition to the aforementioned findings, standard multiple regression model was carried out to establish the effect of trainers' competence on students' academic performance using all the four predictors. Therefore, students' academic performance was regressed against trainer academic competence, pedagogical competence, trainer experience competence and trainer industrial linkage competences.

The findings were presented as shown in Table 4.28

Table 4.27: Overall effect of trainer competencies on students' academic performance

Model Summary ^b										
Model	R	R Square	Adjusted Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F	Change	df1	df2	
1	.798 ^a	.637	.621	.651	.637	41.210	4	94	.000	1.736
a. Predictors: (Constant), Industrial linkages, trainer Experience, trainer Academic Competence, pedagogical competences										
b. Dependent Variable: performance										
Model	Sum of Squares			df	Mean Square	F	Sig.			
	Regression			4	17.455	41.210	.000 ^b			
1	Residual			94	.424					
	Total			98						
a. Dependent Variable: performance										
b. Predictors: (Constant), Industrial link, trainers Experience, trainers Academic Competence, pedagogical competence										
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics				
	B	Std. Error	Beta			Toleranc	VIF			
	(Constant)	.072	.400	.180	.858					
	trainer Academic Competence	.633	.151	.369	4.184	.000	.498	2.009		
1	Pedagogical competence	.723	.114	.610	6.345	.000	.418	2.390		
	trainer Experience	-.123	.138	-.075	-.893	.374	.542	1.847		
	Industrial linkage competence	-.083	.113	-.070	-.735	.464	.430	2.324		
a. Dependent Variable: performance										

The findings in Table 4.28 indicate that trainer competence accounts for 63.7% variance in students' academic performance, $R^2=.637$, $F(4, 94) = 41.210$, $p < .05$. When the

variance is controlled for through shrinkage, we get an adjusted R^2 value of 65.1%. The findings are significant at alpha value (p-value) of 0.05 implying that the confidence interval is within 95%. This means that the results are not by chance but as a result of careful choice of the model. Further findings using the model coefficients indicates that there were two predictors, that is trainers' academic competence ($\beta=.369$, $p<.05$) and pedagogical competence ($\beta=.610$, $p<.05$) that positively and significantly contributed to students' academic performance. This implies that for every unit improvement in trainers' academic competence, students mean mark improves by a magnitude of 0.369, likewise, for every unit improvement in trainer Pedagogical competence, students mean marks improves by a magnitude of 0.610. In addition, other predictors such as trainer experience and industrial linkage competences positively contributed to students' academic performance but were not significant.

4.8 Discussion of the findings

4.8.1 Effect of trainer academic competence on students' academic performance

Effect of trainer academic competence on students' academic performance, established that trainers who had better or higher academic qualifications were in better placed position to enhance students' academic performance. Practically, trainers who had advanced their studies to some level always had better ideas to enhance students' academic performance. Similarly, trainers with lower qualification may struggle with attitude hence leaving a negative impact on students' academic performance. Kinuthia K. (2018) stated that trainers who did not have the proper academic requirements could not train their subjects effectively. The researcher opined that, high academic qualifications made the trainers have the confidence of handling their subjects and in turn serve as a source of academic encouragement to the learners.

It can thus be concluded that more academically qualified trainers positively influenced students' academic performance such that the higher the trainer's qualification, the better the students' academic performance. These findings were in agreement with Yara and Otieno (2010) study on academic performance in mathematics in secondary schools in Bondo District revealed that performance in mathematics was below mean and cited the limitation for academic qualifications of mathematics teachers as the main cause of the situation.

Trainer qualifications range from doctorate, masters' degrees, Bachelor, Diplomas to Certificates. In particular, a number of studies including that of Klieme, E., Hartig, (2014), trainer qualifications to have a significant impact on student learning. These includes studies carried out in Florida State, U.S.A by Diep & Hartmann, (2016), on trainer academic competences and student academic performance in Mathematics found out that there was positive association between students' academic performance in middle and high school mathematics.

However, a study by Okeyo, D. A., & Kanake, L. K. (2021), on factors influencing students' skill acquisition in national Polytechnics highlighted trainer academic competence as one of the factors affecting students' skill acquisition. Trainer academic competences and their training resource as witnessed in the study by Cumberland, D. M., Herd, A., Alagaraja, M., & Kerrick, S. A. (2016), showed that the academic, knowledge of the trainer was the most important factor influencing students' performance. Contrastingly, a study by Anita (2013) carried out a study on the influence of teacher academic characteristics on student's academic performance in Biology in schools in Nandi south district, Kenya, the findings revealed that teacher's academic qualifications did not influence students' academic performance. The previous study by Anita (2013) in Nandi south district Kenya, in biology and students' academic

results did not show that teacher academic qualification was any important for students' academic performance, contrary to what Agwanda (2002) got in Kisumu municipality.

Thus, the National polytechnic institutions need to employ higher academically qualified trainers for better students' academic performance. This will imply that appropriate policies to hire trainers are registered under TVETA and the Public Service Commission of Kenya as they are the ones who deal with the hiring of trainers for technical and vocational training institutions.

4.8.2 Effect of trainer pedagogical competence on students' academic performance

This study has shown that trainers' pedagogical competence had positive and significant effect on students' academic performance. This implies that the more the trainers are professionally qualified, the higher the students' academic performance, hence any improvement in trainers' pedagogical competence will automatically improve students' academic performance. Trainers higher-level pedagogical competences imply that trainers are well versed in both preparations of training as well as assessment tests. This implies that for more competent trainers, they have easy time in classrooms to deliver their content, which makes it easy for students to understand following the current results particularly in technology.

This was inconformity with a study in Florida America, by Bohne, C., Eicker, F., & Haseloff, G. (2017), on trainer pedagogy which concluded that trainers who had a standard pedagogical certification in the subject they taught had a statistically significant positive impact on student test scores relative to trainers who were not certified. Further, Cruickshank, V. (2017) explained that qualified trainers made remarkable difference and, in particular, trainers' pedagogical qualification and the amount of education and knowledge within the trainer had a direct effect on student performance.

In a study by Yusof, Roddin, & Awang, (2015), there was need to make TVET trainer pedagogical development be a lifelong process so as to provide learners with up-to-date skills to fit the job market. Also, researchers had acknowledged TVET trainer as agents of successful improvements in TVET education (Louhran, 2014). Lack of professionally qualified trainers significantly contributed to poor student performance. Training and learning, (Kinuthia K. 2018) is a complex work process, which involves classroom management, lesson preparation, organization of training and learning activities, evaluation and feedback. Students' success in the classroom is largely dependent on effective classroom instruction and adequate preparation by trainers. Planning should be the first thing a trainer needed to do before starting to train and meeting a group to trainers for the first time, which was also an indicator to achieve educational goals (Bohne, C., Eicker, F., & Haseloff, G. (2017). Yusof, Roddin, & Awang, (2015), observed that there was need to make TVET trainer pedagogical development be a lifelong process so as to provide learners with up-to-date skills to fit the job market. Also, researchers have acknowledged TVET trainer as agents of successful improvements in TVET education (Louhran, 2014). Lack of professionally qualified trainers significantly contributes to poor student performance. Training and learning, (Kinuthia K. 2018) is a complex work process, which involves classroom management, lesson preparation, organization of training and learning activities, evaluation and feedback. Students' success in the classroom is largely dependent on effective classroom instruction and adequate preparation by trainers.

The present findings however firmly supported the previous studies such as those carried out by Klieme, E., Hartig, (2014), and noted that the ability of a trainers to teach was not derived only from one's academic background but based upon outstanding pedagogical skill acquired, which suggests that both teacher academic competence and

pedagogical competence are important for students' academic improvement. These findings therefore support the findings that indicated a positive relationship between trainers' pedagogical competence and students' academic performance in the National Polytechnics in western Kenya.

4.8.3 Effect of trainers' experience competences on students' academic performance

This study found that majority of trainers had few years of experience; hence, they were inexperienced in other aspects of training such as classroom management. It is worth to note that when trainers had enough experience, they effectively worked. Students whose trainers were more experienced would deliver their academic performance well compared to students whose trainers were less qualified. Further implications were that any improvement in trainers' experience competences would positively improve students' academic performance and such trainers be assigned examination candidate classes.

Trainers' experience competences were the prime predictors of students' academic performance. Mokoro, D. (2020), asserted that a lot of training was experience competences and not training that added value on academic performance. He concluded that of all the trainer characteristics, there was good evidence that trainers gain in influence with additional years on the job. This gained influence with the additional years gained of experience was very effective for curriculum implementations as it also natured trainers attitude (Mokoro, D. 2020).

However, this study was likened to a study in Europe by Gibbons, (2015) which showed that experience of a trainers had significant effect on students' performance in TVET at National Polytechnics level. Long serving trainers had a richer background of

experience to draw from and could contribute insightful ideas to the course of training and learning. Such trainers were open to correction and were less dictatorial in classroom. Students taught by more experienced trainers achieved at a higher level, because their trainers had mastered the content and acquired classroom management skills to deal with different types of classroom problems. Studies on the influence of trainers' experience on student academic performance had found a positive relationship between trainers' effectiveness and their years of training experience, but not always significant or an entirely linear one (Falsario H.N., Muyong, R.F., Nuevaespaña, J.S. 2014).

In the Kenyan situation, training experience for majority of trainers have remained inadequate in TVET institutions. Ferej et al (2012) established that the majority of the TVET trainers had inadequate work experience. The rationale is that vocational trainers with enterprise experience are able to convey up-to-date, real- world vocational knowledge and experiences to their students.

The current study intended to determine if there were any trainer experience competences that affected the students' academic performance in the diploma of the Science Engineering and Technology courses in the national examinations of the national Polytechnics in western Kenya. This study has found that there was already the trainers experience competence in the national polytechnics, but there was need to employ more trainers with sufficient experience according to the findings.

4.8.4 Effect of trainers' industrial Linkage competences on students' academic performance

From the study findings it was revealed that industrial Linkage competences by trainers were very important for students' practical application for the students' academic performance. This was especially paramount for students in the sciences engineering and technology. Therefore, given the effectiveness of trainer industrial linkage competences, on students' academic performance it would be better to enhance these trainers' industrial links for more positive students' academic performance.

Observation schedules showed that trainers had prepared training and learning resources in advance and stored them in workshops, classrooms and laboratories. These meant that trainers used the same aids for training. Document evidence showed records of work previously covered, which included the continuous assessments and exams at end of every term and graduation trends. Records at the Principals desk showed that the trainers had these qualities in the study program with high, medium and low academic qualifications, experience and had pedagogy, although, some of the staff members were still undergoing in-service training.

The current study findings on trainer industrial linkage, competences and student's performance corroborate the previous studies, such as Makworo, Mwangi and Nyongesa (2013) who opined that the relationship between the rate of technical advancement and the quality of human intervention had become increasingly evident as had been the need for those active in the economy to be trained to use the new technologies for innovation.

Industrial linkages are not only critical for trainees, but it is also important for trainers. The 'industrial attachment' is often used in the Kenyan TVET systems to show what the organizations term does to allow VET practitioners to update their practical

skills in industry. TVET practitioners help to train workplace instructors during their on-the-job learning, enabling “instructors to develop their pedagogical skills by cooperating with trainers while trainers benefit from instructors’ up-to-date knowledge of recent technologies and work practices” (Mokoro, D. 2020). However little contract to these findings, Mokoro et al. (2020) emphasized the importance of industrial linkages by noting that new skills would be needed, and educational institutions be required to meet needs by providing not only vocational training, but also training for scientists, innovators and technologists.

In general, the findings show that trainer competence had positive and significant effect on students’ academic performance with key contributors as trainers’ academic competence and pedagogical competences. It can thus be concluded that trainers’ competencies positively improved students’ academic performance in the national polytechnics in western Kenya.

These findings agree with the theory advanced by David H. Hargreaves (2001) that the capital theory of school effectiveness and improvement was built around four distinct concepts: intellectual capital (human capital), social capital, leverage, and outcomes is here now being actualised that education should bring about intellectual and moral outcomes in the youth in order for them to make sound intellectual and moral judgments and choices.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study aimed at establishing the effect of trainer competences on students' academic performance of the diploma SET courses in the National Polytechnics in Western Kenya. The specific objectives of the study were: to determine the effect of trainer academic competence on students' academic performance, to assess the effect of trainers' pedagogical competence on students' academic performance, to determine the effect of trainers' experience competence on students' academic performance, to assess the effect of trainers' industrial linkage competences on students' academic performance. Three questionnaires were used to collect data from heads of departments, trainers and students. Interview schedules were used to obtain data from Principals and County directors of technical education, observation schedule and document analysis were used to collect further data. This chapter therefore presents the research summary, conclusions and recommendations drawn from the findings of the study in the national polytechnics in western Kenya. It finally gives suggestions of areas for further research.

5.2 Summary of the rest of the study

From the findings, majority of the trainers had attained a degree, although with less experience. The findings revealed that the most academic competencies that they had were useful. It was further established that trainers' academic competencies were positively associated with students' academic performance $r=.676$, $p<.05$. The findings also revealed that trainer academic competence had an overall positive significant effect

on students' academic performance at $\beta=.676$, $p<.05$ and accounted for a significant variance of 45.6 percent. This was also supported by qualitative report from interviews which indicated that trainers' competence positively affected students' academic performance.

Pedagogy was measured in terms of preparation for training tools, art of training as well as trainers on students' assessment or evaluation. This was reflected across the three sets of respondents. The findings also established that there was a positive and significant correlation between trainer pedagogical competences and students' academic performance. Preparation and use of training tools had the strongest significant relationship with academic performance $r=.881$, $p<.05$ followed by students' evaluation $r=.662$, $p<.05$. Therefore, both aspects were significantly correlated with students' academic performance. It was established that trainer pedagogical competencies had a positive significant effect on performance $\beta=.749$, $p<.05$ and accounted for 56.2% variance in students' academic performance. Qualitative findings further confirmed that trainer competencies in pedagogy could positively impact on students' academic performance.

From the findings, it was established that majority of the trainers had 1-5 years of experience. However, there was also experience measured in terms of classroom management and general experience competence. The three sets of respondents high rated these indicators of experience. Finally, using Pearson product moment correlation, it was established that there was a positive and significant correlation between trainer experience competences and students' academic performance at $r=.600$, $p<.05$ as well as classroom management ad students' academic performance at $r=.520$, $p<.05$. Further analysis using simple linear regression model revealed that trainer experience had a

positive and significant effect on students' academic performance ($\beta=.430$, $p<.05$) and accounted for 18.5% variance in students' academic performance.

The findings revealed a positive rating on trainer industrial linkages across all the respondents including trainers, students and heads of departments. Qualitative results also revealed that this practice took place although at a modified low rate, and was very important to students' academic performance. Quantitative results using correlations and regression models revealed a positive relationship between the two variables, as well as significant effect of trainer industrial links on students' academic performance. Specifically, the findings revealed that trainer industrial linkage competencies and students' academic performance were positively and significantly correlated at $r=.552$, $p<.05$, as well as industrial innovations and students' academic performance $r=.387$, $p<.05$. Using simple linear regression model, the findings revealed that industrial linkage competencies had a positive and significant effect on students' academic performance ($\beta=.526$, $p<.05$) and accounted for 27.7% variance in students' academic performance.

5.3 Conclusion

The conclusions in the study were based on the findings of the set out objectives.

Trainer competences were positively associated with students' academic performance at $r=.676$, $p<.05$. and was significant. academic performance at $\beta=.676$, $p<.05$ and accounted for a significant variance of 45.6 percent.

Trainer pedagogical competences had the strongest significant relationship with academic performance $r=.881$, $p<.05$ followed by students' assessment evaluation $r=.662$, $p<.05$. Trainer pedagogical competencies had positive significant effect on performance at $\beta=.749$, $p<.05$ and accounted for 56.2% variance in students' academic performance.

Trainer experience competences and students' academic performance at $r=.600$, $p<.05$ as well as classroom management and students' academic performance at $r=.520$, $p<.05$. Simple linear regression model revealed that trainer experience had a positive and significant effect on students' academic performance at $\beta=.430$, $p<.05$ and accounted for 18.5% variance in students' academic performance.

Trainer industrial linkage competencies and students' academic performance were positively and significantly correlated at $r=.552$, $p<.05$, as well as industrial innovations and students' academic performance $r=.387$, $p<.05$. Simple linear regression model, revealed that industrial linkage competencies had positive and significant effect on students' academic performance at $\beta=.526$, $p<.05$ and accounted for 27.7% variance in students' academic performance.

The researcher concluded one objective after the other as below: David H. Hargreaves argued that school-based professional development calls for the mentorship of trainers and gives them the chance to create and experiment with new training methods. He promoted the idea that successful teaching leads to knowledge development, creativity, and transfer, resulting in excellent cognitive outcomes. According to studies, social capital affects students' performance as well as the professionalism, efficacy, and continual professional growth of trainers. Leverage, intellectual capital, and social capital were combined to form the independent variables in this study.

5.4 Recommendations

Based on the findings of this study, the researcher made the following recommendations.

1. The Government should enable trainers in the National Polytechnics improve their academic qualifications through further studies in order to improve students' academic performance.
2. The Government should enable trainers in the National Polytechnics improve their pedagogical qualifications through capacity building at training centres and or in-service training and seminar programmes to improve students' academic performance.
3. The National Polytechnic administration should assign trainers that have high experience to critical or examination classes to promote better students' academic performance.
4. The government should enable all trainers handling the Science Engineering and Technological courses, be subjected to industrial linkages in order to improve students' academic performance.

5.5 Suggested areas of further study

Although this study got important findings on trainer competences that effect students' academic performance as institutional factors in National Polytechnics in western Kenya, there is need to undertake another suggested study on:

- i). Impact of Competence-based training on employability of TVET graduates.
- ii). Influence of Trainer Competence Factors on Learners' Life Skills Achievement.
- iii). The effect of qualification competences on industrial employee performance.

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APPENDICES

Appendix I: Interview schedule for Principals

I'm Caleb Jotham Miyawa a student at University of Eldoret, in Technology Education carrying out research on "the effect of trainer Competence on academic Performance in the diploma Science Engineering and Technical (SET) courses in the National Polytechnics in Western Kenya." The purpose of the principals' interview is to obtain your opinion on the effect of trainer Competencies on academic performance in your national polytechnic. Your responses will be treated confidentially and be used for the academic research purposes only.

1. (a) For how long have you been working as Principal?

2. What is your opinion on the academic performance of learners in the diploma Science Engineering and Technology courses?

3. How many trainers (on permanent employment) do you have currently taught the diploma SET courses? _____

4. (a) What are the training methods employed by majority of t trainers in the Diploma of the SET courses

(b) How does the use of various training methods affect academic Performance in the diploma of the SET courses?

5. a). Do you have adequate instructional media tools in the SET courses?

Yes [], No []

b). Do you have trainers deserving for a trainer in-service programm?

Yes [], No []

6. Does teacher academic competence affect students' academic performance?

7. a). How frequent is evaluation conducted in the SET courses?

b) Specify the mechanisms (techniques) of evaluation employed by your trainers.

(c). What is your opinion on the effect of evaluation mechanisms in the SET Courses?

8. (a) What are the most common Instructional tools utilized by trainers in the SET Department? (Name them)

9. a). What is your view regarding the effect of trainer pedagogical competencies on academic performance in the SET courses? _____

b) Is preparation of all teaching tools a requirement for student academic Performance?

c) What are the names of these training tools?

d). Who supervises the preparation of these training tools?

10. a) Does trainer experience have any effect on students' SET course academic performance?

b) Is teacher attitude an asset to students' academic Performance in the diploma of the SET courses?

11). Does trainer experience mature trainer classroom management skills, and trainer personality?

12. a) Do trainer industrial linkage competences have any effect on students' academic performance in the Science engineering and Technology depart?

b). Do your trainers attend industrial linkage programs in the SET courses?

Yes [] No [].

End. THANK YOU.

Appendix II: Questionnaire for Heads of Departments

I'm Caleb Jotham Miyawa a student at University of Eldoret, in Technology Education carrying out research on "The effect of trainer Competence on academic Performance in the diploma Science Engineering and Technology (SET) courses in the National Polytechnics in Western Kenya." The purpose of the questionnaire is to obtain your opinion on the effect of trainer Competence on academic performance in your national polytechnic. Your responses will be treated confidentially and be used strictly for the academic research purposes only. Please answer all the questions as accurately as possible and do not write your name on the paper.

Section A. Bio data

- 1). State the name of your department _____
- 2). What is the total student enrolment in this department? _____
- 3). How many trainers are there in your department? _____
- 4). what is your gender? Male [], Female []
- 5). What is your age bracket? 20- 30 years [] 31 - 40 years [] 41 -50 years []
51 – Above []
- 6) My training experience is; 1- 5 []; 6-10 []; 11-15 []; 16-20 []; 21-25 [];
26-30 []; 31-35 []; 36-40 [];
- 7) My highest academic qualification is;
Diploma []; B. Degree []; Masters []; PhD [].

Section B. Trainer Academic Competences

8). Do trainer academic competency have any effect on students' academic performance? Yes [] No []

9) To what extent do you agree with the following statements when training practical subjects on the effect of trainer academic competence on students' academic performance? Use Likert scale of 1-5 where: 1 - strongly disagree, 2- disagree, 3-moderately agree, 4-agree and 5= strongly agree

-Academic Skills Competencies	1	2	3	4	5
I encourage problem analyses when training					
I encourage problem syntheses when training					
I encourage good memory recall					
I practice good communication skills					
I encourage good subject mastery when training					
I encourage critical thinking when training.					
I encourage good problem-solving skills when training.					
Academic enabler Competencies	1	2	3	4	5
I cover syllabus in time					
I have the determination when training.					
I manage my time well during training					
I am examiners of KNEC					
I encourage good administrator ship					
I encourage good mentorship					

10). How frequent do you as HOD and internal curriculum supervisor oversee the preparation of these instructional tools in the department?

Never [] Rarely [] Sometimes [] Always []

11). How frequent do your trainers utilize instructional tools in the training and learning process in your department?

Never [] Rarely [] Sometimes [] Always []

Section B. Trainer pedagogical competencies

12). To what extent do you agree with the following statements on the effect of trainer pedagogical competences on students' academic performance? Use a scale of 1-5 where 1=strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5= strongly agree.

<i>Preparation of training tools and art of training</i>	1	2	3	4	5
I prepare and use course outlines.					
I prepare and use experiments and demonstrations					
I prepare and use lesson notes.					
I prepare and use.					
I prepare and use students' CAT mark- records.					

<i>Students' (Assessment) Evaluation</i>	1	2	3	4	5
I use Practical work for student evaluation.					
I use two CATs for student evaluation.					
I use end of term exams for student evaluation.					
I use assignments for student evaluation.					
I use group presentations for evaluations.					

13). Do your deserving trainers attend in-service programm for trainer professional improvement?

Yes [] No []

Section C. Trainers experience

14) Do trainers experience competences have any effect on students' academic performance in Science Engineering & Technical examinations?

Yes [] No []

15) To what extent do you agree with the following statements on the effect of trainer experience on academic performance? Use Likert scale of 1-5 where 1= strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5= strongly agree.

<i>Experience competencies</i>	1	2	3	4	5
Trainers handle students in modelling manner					
Trainers lead in their students' academic performance					
Trainers are good managers in their training work					
Trainers provoke reason and active thinking during training					
Training hard topics appears oversimplified for understanding					
Trainers are sources of academic advises.					

Section D. Trainers industrial Linkages

16) Have you ever been linked to industry?

Yes [] No []

17) a). If yes, did you feel effective to your students' academic performance?

Yes [], No []

b). For how long in years [].

18) If yes, do you feel when you are training that there is matching effect between industry needs and your students' academic syllabus needs?

Yes [] No []

19). If in question 19 above is No, what is your reason for not having been attached?

20) Does trainer industrial linkage have any effect on students' academic performance? Yes [] No []

21). To what extent do you agree with the following statements when training practical subjects on the effect of trainer industry linkage competencies on academic performance? Use a scale of 1-5 where 1= strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5=strongly agree. Please put a tick in the appropriate space.

Industry Attachment Competencies	1	2	3	4	5
Our trainers are usually linked in industries					
Our students visit local industries for out of class learning					
Industry accepts our students on industrial attachments.					
Linkage to industry enhances stronger relationships					
Involvement with industry improves students' academic performance					
Involvement with industry improves technological innovations.					
Industry Attachment Innovation Competencies	1	2	3	4	5
Has improved Robotics displays					
Has improved mechanics and automotive					
Improved shows, exhibitions and displays					
Has improved electrical and electronic gadgets.					
Has improved the use of computers					

Thank you. End.

Appendix III: Questionnaire for Trainers

I'm Caleb Jotham Miyawa a student at University of Eldoret, in Technology Education carrying out research on "The effect of trainer Competence on academic Performance in the diploma Science Engineering and Technology (SET) courses in the National Polytechnics in Western Kenya." The purpose of the questionnaire is to obtain your opinion on the effect of trainer Competence on academic performance in your national polytechnic. Your responses will be treated confidentially and be used for the academic research purposes only.

Please answer all the questions as accurately as possible and do not write your name on the paper.

Section A. Bio data

- 1) In which department do you teach? _____
- 2) My sex is; Male [] Female []
- 3) . What is your age bracket? 20- 30 years [] 31 - 40 years [] 41 -50 years [] 51 – Above []
- 4) Which diploma course or (paper) did you prepare candidates in the SET Course(s) in 2020 KNEC exams and their result scores:
 - i) Course _____
 - ii). Score _____

Section B. Trainer Academic Competences

- 5) My highest academic qualification is;

Diploma []; Degree []; Masters []; PhD [].
- 6). Does trainers' academic competence have any effect on students' academic performance? Yes [] No []

7). To what extent do you agree with the following statements when training practical subjects on the effect of trainer academic competence on students' academic performance? Use Likert scale of 1-5 where: 1 - strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5= strongly agree

Academic Skills Competencies	1	2	3	4	5
I encourage problem analyses when training					
I encourage problem synthesises when training					
I encourage good memory recall					
I practice good communication skills					
I encourage good subject mastery when training					
I encourage critical thinking when training.					
I encourage good problem-solving skills when training.					
Academic enabler Competencies	1	2	3	4	5
I cover syllabus in time					
I have the determination when training.					
I manage my time well during training.					
I am examiners of KNEC					
I encourage good administrator ship					
I encourage good mentorship					

8) How often do you use instructional media?

Never [] Rarely [] Sometimes [] Always []

9). How frequent does your HOD as internal curriculum supervisor oversee the preparation of these instructional tools in the department?

Never [] Rarely [] Sometimes [] Always []

10). How frequent do you utilize instructional tools in the training and learning process in your department? Never [] Rarely [] Sometimes [] Always []

Section D. Trainer pedagogical competencies

11). To what extent do you agree with the following statements on the effect of trainer pedagogical competences on students' academic performance? Use Likert scale of 1-5 where 1= strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5= strongly agree.

<i>Preparation of teaching tools and art of training</i>	1	2	3	4	5
I prepare and use course out lines.					
I prepare and use experiments and demonstrations					
I prepare and use lesson notes.					
I prepare and use charts					
I prepare and use students' CAT mark records.					

<i>Students' (Assessment) Evaluation</i>	1	2	3	4	5
I use Practical work for student evaluation.					
I use two CATs for student evaluation.					
I use end of term exams for student evaluation.					
I use assignments for student evaluation.					
I use group presentations for evaluations.					

12). which other techniques do you use to evaluate your students understanding of the Subject and concepts you teach in class? -----

13). Have you ever at one time attended a trainers' in-service course programm to promote your professional performance? Yes [], No [].

14). Would you require the trainers' in-service course programm? Yes [] No []

16). what was the performance of your learners in KNEC examinations for the previous five years? 2017 -----, 2018 -----, 2019 -----, 2020 -----, 2021 -----

Section C. Trainer experience

19) Do trainers experience competences have any effect on students' academic performance in Science Engineering & Technical examinations? Yes [] No []

20) To what extent do you agree with the following statements on the effect of trainer experience on students' academic performance? Use Likert scale of 1-5 where 1= strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5= strongly agree.

<i>Experience competences</i>	1	2	3	4	5
Trainers handle students in modelling manner					
Trainers lead in their students' academic performance					
Trainers are good managers in their teaching work					
Trainers provoke reason and active thinking during teaching					
Trainers hard topics appears oversimplified for understanding					
Trainers are sources of academic advises.					

Section D. Trainer industrial Linkages

21) a) . Have you ever been linked in industry? Yes [] No []

21 b). For how long in years [].

22) If yes, did you feel effective to your students' academic performance?

Yes [] No []

23) If yes, do you feel when you are training that there is matching effect between industry needs and your students' academic syllabus needs?

Yes [] No []

24) Does teacher industrial linkages have any effect on students' academic performance? Yes [] No []

27). To what extent do you agree with the following statements when training practical subjects on the effect of trainer industry linkage competencies on academic performance? Use the Likert scale of 1-5 where 1= strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5=strongly agree. Please put a tick in the appropriate space.

Industry linkage Competencies	1	2	3	4	5
Our trainers are linked to industry					
Our students visit local industries for out of class learning					
Industry accepts our students on industrial attachments.					
Attachment in industry enhances stronger relationships					
Involvement with industry improves students' academic performance					
Involvement with industry improves technological innovations.					
Industry Innovation Competencies	1	2	3	4	5
Has improved Robotics displays					
Has improved mechanics and automotive					
Improved shows, exhibitions and displays					
Has improved electrical and electronic technology gadgets					
Has improved the use of computers					

28) Mention innovations recorded in this SET courses for the last three years if any.

- i)-----
- ii)-----
- iii)-----

Thank you. End.

Appendix IV: Questionnaire for Students

I'm Caleb Jotham Miyawa a student at University of Eldoret, in Technology Education carrying out research on "The effect of trainer Competence on academic Performance in the diploma Science Engineering Technology (SET) courses in the National Polytechnics in Western Kenya." The purpose of the questionnaire is to obtain your opinion on the effect of trainer Competence on academic performance in your national polytechnic. Your responses will be treated confidentially and be used for the academic research purposes only

Please answer all the questions by ticking in the brackets [] or completing the blanks as accurately as possible but do not write your name on the paper.

Section A. Bio data

1. The name of my department is _____
2. My sex is _____ Male [] Female []
3. In the department I am in ____ year of study 1st [] 2nd [] 3rd []

Trainer academic competencies

4). To what extent do you agree with the following statements when training practical subjects on the effect of trainers' academic competence on students' academic performance? Use Likert scale of 1-5 where: 1 - strongly disagree, 2- disagree, 3-moderately agree, 4-agree and 5= strongly agree

Academic Skills Competencies	1	2	3	4	5
Our trainers encourage problem analyses when teaching					
Our trainers encourage problem synthesises when teaching					
Our trainers encourage good memory recall					
Our trainers practice good communication skills					
Our trainers encourage good subject mastery when teaching					
Our trainers encourage critical thinking when teaching.					
Our trainers encourage good problem-solving skills when training.					
Academic enabler Competencies					
Our trainers cover syllabus in time					
Our trainers have determination when training.					
Our trainers are good time managers during training.					
Our trainers are examiners of KNEC					
Our trainers encourage good administrator ship					
Our trainers encourage good mentorship					

Section D. Trainers pedagogical competencies

5). To what extent do you agree with the following statements on the effect of trainers' pedagogical competences on students' academic performance? Use Likert scale of 1-5 where 1= strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5= strongly agree.

<i>Preparation of training tools and art of training</i>	1	2	3	4	5
Our trainers prepare and use course outline.					
Our trainers prepare experiments and demonstrations.					
Our trainers prepare and give us lesson notes.					
Our trainers prepares and use charts					
Our trainers prepare and use students' CAT mark (lists) records.					

Trainers on Students' (Assessment) Evaluation	1	2	3	4	5
Our trainers use Practical work for student evaluation.					
Our trainers use two CATs for student evaluation.					
Our trainers use end term exams for evaluation.					
Our trainers use assignments for student evaluation.					
We do group presentations for evaluations.					

Trainers' experience competencies

6) To what extent do you agree with the following statements on the effect of trainers' experience on academic performance? Use Likert scale of 1-5 where 1= strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5= strongly agree

<i>Experience competencies</i>	1	2	3	4	5
Our trainers handle students in modelling manner					
Our trainers lead in their students' academic performance					
Our trainers are good managers in their teaching work					
Our trainers provoke reason and active thinking during teaching					
Our trainers oversimplify complex topics for quick understanding					
Our trainers are sources of academic advises.					

Trainer Industrial Linkages

7) To what extent do you agree with the following statements on the effect of trainer industrial linkage competences on students' academic performance? Use Likert scale of 1-5 where 1= strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5= strongly agree

Industry linkage Competencies	1	2	3	4	5
Our trainer are usually Linked to industries					
Our students visit local industries for out of class learning					
Industry accepts our students on industrial attachments.					
Attachment in industry enhances stronger relationships					
Involvement with industry improves students' academic Performance					
Involvement with industry improves technological innovations.					
Industry innovation	1	2	3	4	5
Has improved Robotics displays					
Has improved mechanics and automotive					
Improved shows, exhibitions and displays					
Has improved electrical and electronic gadgets.					
Has improved the use of computers					

9) State any effect(s) of trainer industrial linkages to the National Polytechnic academic performance -----

Thanks

Appendix V: Interview schedule for County Directors Technical Education

I'm Caleb Jotham Miyawa a student at University of Eldoret, in Technology Education carrying out research on "The effect of trainer Competence on academic Performance in the diploma Science Engineering Technology (SET) courses in the National Polytechnics in Western Kenya." The purpose of the interview schedule is to obtain your opinion on the effect of trainer Competence on academic performance in your national polytechnic. Your responses will be treated confidentially and be used for the academic research purposes only.

Section A. Bio data

- 1) What is your gender? Male [] Female []
- 4) What is the category of the Polytechnic? Boys [] Girls [] Mixed []
- 5) What is the type of Polytechnic: Day [] Boarding [] Mixed []
- 6) This Polytechnic operates as Public [] Private []
- 7) What is your highest academic qualification?
Diploma [] BED [] MED [] PhD []
- 8) What is your trainer professional qualification? Trained [] Untrained []

Section B. Teacher Qualification

- 9) Do trainer professional qualification have any effect on students' academic performance? Yes [] No []

Section C. Trainer Experience

- 11) Does trainer experience have any effect on students' academic performance?
A) Yes [] b) No []

Section D. Trainer industrial linkages

- 12). Do trainer industrial linkage competences have any effect on students' academic performance? Yes [] No []
- 13). How often do your trainer attend industrial links in this National Polytechnic?
- 14). Do your students undertake industrial attachment during their study?
Yes []. No []

End. Thank you

Appendix VI: Sample Letter of Introduction

Caleb Miyawa
University of Eldoret
P.O.Box 1125
Eldoret, Kenya.

The principal,
Sigalagala /Kisumu/Kisii National Polytechnics
P.o. Box ----
Kakamega/Kisumu/Kisii.

REF: Permission to carry out Research in your National Polytechnic

Dear Sir/ Madam,

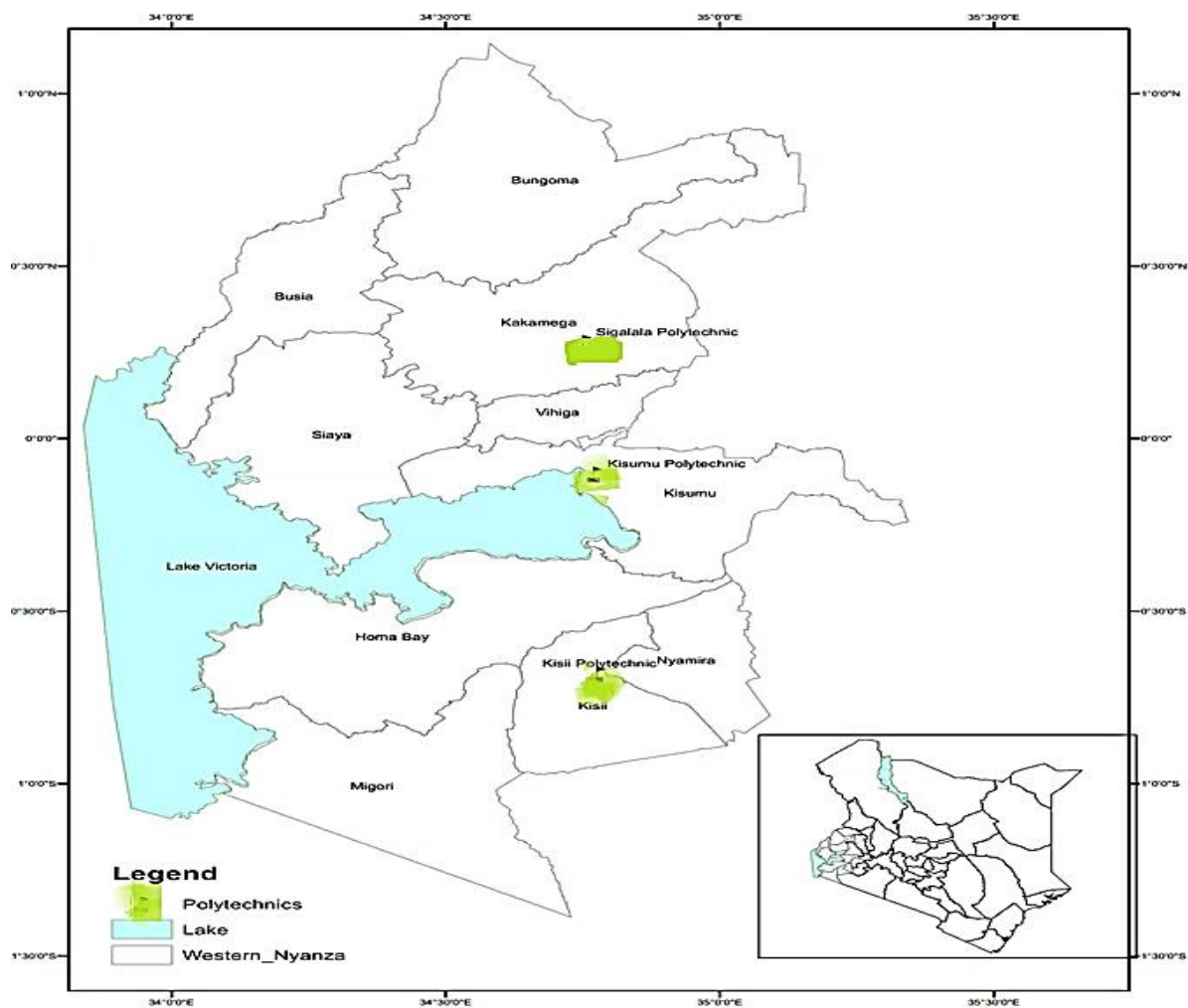
Am post-graduate student from University of Eldoret, conducting a study on Effect of Trainer Competences on Student Performance in science, engineering and technological courses: A Case of National Polytechnics in Western Kenya. Your National Polytechnic is within the study area and its one of the institutes under consideration in the research study.

For that matter you have been selected to participate in this study. All the information you volunteer will be kept confidential and you or your institute will not be identified in any report arising from the study. Thank you.


Yours faithfully,

Caleb J. Miyawa.

Appendix VII: Map of Western Kenya



**Appendix VIII: Letter from University of Eldoret to NACOSTI requesting for
Research permit**



**University of
Eldoret**
flame of knowledge and innovation

P.O. Box 1125-30100,
ELDORET, Kenya
Tel: 0774 249552
Fax No. +254-(0)53-206311 Ext 2232

School of Education
Department of Technology Education

Our Ref: UOE/B/TED/PGR/065

DATE: 21st December, 2021

The Executive Secretary,
National Council for Science, Technology & Innovation
P.O.BOX 30623-00100,
NAIROBI.

Dear Sir/Madam,


**SUBJECT: RESEARCH PERMIT FOR MIYAWA CALEB JOTHAM-
SEDU/TED/M/016/19**

This is to confirm that the above named student has done course work of his Master of Education in Technology Education: Mechanical and Automotive Technology Option.

He is currently preparing for his field research work on the thesis entitled: *"Effect of Teacher Competence on Students Academic Performance: Case of National Polytechnic in Western Kenya"*. He has successfully presented the proposal and has been approved by the university.

Any assistance accorded to him to facilitate successful conduct of the research and the publication will be highly appreciated.

Yours faithfully,




UNIVERSITY OF ELDORET
Head Dept. Of Technology Education
P.O. B. 1125 Eldoret-30100


DR. HOSEAH KIPLAGAT
HOD, TECHNOLOGY EDUCATION


Copy to: Dean, School of Education

University of Eldoret is ISO 9001: 2015 Certified




Appendix IX: Research Permit


REPUBLIC OF KENYA


**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

Ref No: **762074** Date of Issue: **06/January/2022**


RESEARCH LICENSE




This is to Certify that Mr.. Caleb Jotham Miyawa of University of Eldoret, has been licensed to conduct research in Kakamega, Kisii, Kisumu on the topic: Effects of Teacher Competence on Students Academic Performance: Case of National Polytechnic in Western Kenya for the period ending : 06/January/2023.

License No: **NACOSTI/P/22/15118**

762074
Applicant Identification Number


Director General
**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION**

Verification QR Code



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Scan the QR Code using QR scanner application.**

Appendix X: Similarity Report



University of Eldoret
Certificate of Plagiarism Check for Synopsis

Author Name	MIYAWA CALEB JOTHAM SEDU/TED/M/16/19
Course of Study	Type here...
Name of Guide	Type here...
Department	Type here...
Acceptable Maximum Limit	Type here...
Submitted By	titustoo@uoeld.ac.ke
Paper Title	EFFECT OF TRAINER COMPETENCE ON STUDENTS' ACADEMIC PERFORMANCE IN DIPLOMA OF THE SET COURSES: A CASE OF NATIONAL POLYTECHNICS IN WESTERN KENYA
Similarity	10%
Paper ID	987828
Submission Date	2023-09-28 16:20:14
Signature of Student	 Head of the Department
Signature of Guide	

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