PERCEPTION OF STAKEHOLDERS ON DUAL VOCATIONAL EDUCATION AND TRAINING AT SELECTED TVET INSTITUTIONS AND COMPANIES IN WESTERN REGION, KENYA

BY

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DECLARATION

Declaration by the Student

I hereby declare that this study is my original work and has not been previously submitted for any of the study programs in any institution of higher education. No part of this thesis can be reproduced without the consent of the author and/or Moi University.

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DEDICATION

To my loving family and my mother, Evelyne Wanyama. They have been very supportive throughout the writing of this work. God bless you abundantly.

ABSTRACT

The Dual Vocational Education and Training (VET) model is a training program that methodically integrates the benefits of in-company training with vocational school education to train skilled workers. Despite the significance of dual instruction programs in improving the job placement of graduates, TVET data have shown that the dual instruction model's implementation suffers from the unwillingness of relevant stakeholders and their lack of involvement in the process. This study aimed to assess stakeholders' perceptions of the dual training model's implementation in TVET institutions and companies in Western Kenya. The following research objectives guided the study: to determine the perception of trainers on the introduction of the dual VET model; to assess the perceived involvement of companies in the implementation of the dual VET; to examine the perception of trainees on the introduction of dual training; and to establish the stakeholders' perception of government involvement in dual training. This study was based on the social cognitive learning theory approach. The target population was drawn from TVET institutions and companies in Busia, Bungoma, Kitale and Kisumu counties. The choice of study area was informed by the selected institutions' involvement in the piloting phase of the dual training model by the Ministry of Education. The sample size of 144 respondents was determined using Slovin's formula, and the study adopted a quantitative research approach using a cross-sectional survey design. Purposive sampling was used to select the relevant respondents. Data were collected using a self-administered, closed-ended questionnaire. Data were analyzed using descriptive statistics to determine frequencies, percentages, means, and standard deviations, and inferential statistics using multiple linear regression analysis, which is suitable for testing the relationship between independent and dependent variables. This study found that trainees reported generally positive perceptions ($m = 3.91$) of the dual training model's introduction. The trainees ($m = 4.23$) and trainers and supervisors ($m = 3.53$) expressed positive views on company involvement in the training process. Government involvement received moderately positive views from the trainees ($m = 3.72$) and trainers/supervisors ($m = 3.78$). Regression analysis revealed potential links between respondents' demographics and perceptions, with varying significance. For instance, older trainers and supervisors were less likely to believe that training followed the plan ($p = 0.009$) but more likely to believe that the training matched industry needs ($p = 0.032$). The study concludes that while trainees, trainers, and supervisors generally hold positive views on the introduction of the dual VET model, continued engagement and collaboration among stakeholders is necessary for effective implementation of dual instructions. Based on the results, this study recommends developing policies and regulations that foster accountability among all relevant stakeholders of Dual VET in the Kenyan TVET system.

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LIST OF ACRONYMS

TVET:	Technical Vocational Education and Training
VET:	Vocational Education and Training
GIZ:	Germany Agency for International Cooperation
KFW:	Kreditanstalt für Wiederaufbau
MoE:	Ministry of Education
KNBS:	Kenya National Bureau of Statistics
NCPD:	National Council for Population Development
HIV:	Human Immunodeficiency Virus
SLT:	Social Learning Theory
D-VET:	Dual Vocational Education and Training
ZPD:	Zone of Proximal Development
HND:	Higher National Diploma
CBET:	Competence-Based Education and Training

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CHAPTER ONE

1.0 INTRODUCTION

The chapter begins by presenting background information, the problem statement, purpose, objectives, and research questions. The chapter also discusses the theoretical framework, conceptual framework, the significance of the study, defining the scope, justifying the study and definitions of terms.

1.1 Background to the study

The Dual Vocational Education and Training (VET) model is a program that systematically integrates the benefits of on-the-job training with vocational education to cultivate a skilled workforce in Germany. This model merges practical job experience with classroom-based training to equip trainees with the essential skills, knowledge, and attitudes for a seamless transition into employment. Gonon et al. (2014) provides a historical perspective on the dual VET model, tracing its evolution from the first and second industrial revolutions to the 21st century, and highlight the transition from the demand for a competent workforce, which simply functioned as required, to the need for qualified workers, who understood processes, and now to the necessity for both competence and qualification. The literature suggests that the dual VET model has been successful in Germany and other countries in the Global North, including Austria, Luxembourg, Sweden, Switzerland, Denmark, and the Netherlands (Gonon et al., 2014).

Recognizing Germany's successful implementation of the dual VET model, Kenya partnered with it in 2016 to promote youth employment and sustainable economic growth.

According to Kenya's Ministry of Education (MoE) and the Kreditanstalt für Wiederaufbau (KFW) Development Bank, a qualified workforce is vital for competing in local and international labor markets, making high-quality vocational training essential for Kenya. The dual VET training program aimed to bridge the mismatch between theory and practice, ensuring that graduates are job-ready and addressing job-skills mismatches by fostering collaboration between technical-vocational institutions and industries. Consequently, it sought to promote technical and vocational training in Kenya, historically seen as an educational path for poor academic performers (Sankale, 2019), and contribute to the transformation of the country into a rapidly industrializing middle-income nation. The dual training model also aligns with Vision 2030, the Kenyan Government's development agenda, which promotes the growth of startups and youth-based entrepreneurship through a skilled workforce. The pilot phase of the program was launched in 2019 and has been widely adopted across all productive sectors of the economy. In the model, trainees split their time evenly between vocational institutions and industry collaborators, spending 50% of the total training time in each institution.

The benefits associated with the successful implementation of the dual VET model are diverse across different countries. In Kenya, such implementation promises better employment prospects and opportunities for entrepreneurship, along with an enhanced capacity for trainees to excel in higher-education programs. Additionally, Kenya's Ministry of Education (MoE) and the KFW Development Bank anticipated benefits for participating organizations, including guaranteed access to qualified employees, reduced integration expenses for external skilled workers, and increased productivity, which would lead to higher revenue generation for the companies. The reported benefits from nations such as

Germany, Austria, Liechtenstein, and Switzerland highlight the advantages for both trainees and enterprises. According to a comparative study by (Bolli et al., 2021)

, trainees who develop personal and social skills, undergo relevant labor market training, and obtain recognized qualifications upon completion enhance their job market prospects. For enterprises, dual VET serves as an effective method to integrate employees into the company structure, elevates business value, mitigates the risks of skills shortages, and minimizes recruitment expenses, ultimately bolstering future competitiveness. Moreover, the contribution of the private sector to vocational training alleviates pressure on public budgets and offers mutual benefits for companies and the state.

According to Kuczera et al. (2018), the dual VET model has become a vital TVET delivery strategy for creating a skilled and adaptable workforce while mitigating unemployment. Many nations grappling with high unemployment rates have increasingly prioritized dual education and vocational training to improve the transition rates from college to the workforce and encourage their youth in informal sectors to gain qualifications, thereby joining the formal economy. Although data on the progress of the implementation of the dual VET model in Kenya are limited, available reports indicate promising outcomes, with some graduates already securing employment with partner organizations and increased gender inclusivity in technical areas (Soud, 2024). Considering these early successes and the reported benefits from other countries, Kenya’s Ministry of Education, alongside implementing partners of the program, has recognized the need to accelerate the adoption of the dual instruction model, primarily through enhanced collaboration with stakeholders

(GIZ, 2020). Therefore, this study aimed to address this need by examining stakeholders' perceptions of dual VET at selected TVET institutions and participating companies.

1.2 Statement of the problem

Kenya has an estimated population of 50.3 million people. Youths aged 15 – 34 years number approximately 17.8 million (KNBS, 2022). According to the National Council for Population Development, Kenya is experiencing a youth bulge. The proportion of youth has increased over the years, from 30% in 1969. The youth population increase is expected to decrease slightly in the coming years but will remain the largest national population demographic at 35%. By 2030, the country's population is expected to rise to 63.9 million, of which approximately 22.3 million will be youth aged 15-34 years (NCPD, 2017).

A high youth population is a great resource for a country. If properly managed, it presents an enormous number of socio-economic opportunities. However, Kenya's youth face several challenges, with unemployment being the main hindrance to their productive engagement (NCPD, 2017). Although the country's unemployment rate was 4.9% in 2022, youth between 20 and 24 years, the age bracket for fresh vocational institutes and university graduates, were the most unemployed at 15.6%, with a long-term unemployment rate of 9.9% (KNBS, 2023). Including youth who do not join college, over one million young Kenyans join the market every year in search of opportunities (NCPD, 2017). Meanwhile, the majority of those who are lucky enough to get jobs often find themselves underemployed or in the informal sector (Cowling, 2023; Munene, 2021).

The high youth unemployment rate in Kenya poses several challenges. A sizable population of unemployed youth could potentially cause social and political unrest (NCPD, 2017). A study on the relationship between unemployment and corruption in Kenya supports this. Youth in informal settlements in major towns, such as Nairobi, Kenya's capital, engage in criminal activities, including theft, partly as a way of expressing their frustration with corrupt political leaders, viewed as the cause of youth unemployment and hopelessness across the country (Onchari, 2019). The National Council for Population and Development has also expressed concerns about the high youth unemployment rate, linking it to poor savings culture in many households and anti-social behaviors such as drug and alcohol abuse, unsafe sex, and emerging incidences of terrorism involving the Kenyan youth.

The literature suggests that the main reason for high youth unemployment in Kenya is the mismatch between tertiary-level education and skills demand in the job market (Munene, 2021; Nason, 2019; NCPD, 2017). Reports indicate that companies across sectors are struggling to find suitable candidates for vacancies because post-secondary level education offered in most TVET institutes and universities does not meet the requirements of the private sector. The 2018 Kenya Federation of Employers survey emphasized this claim, noting that nearly two-thirds of graduates entering the market every year lack essential skills, including critical thinking, creativity, analytical mindset, teamwork, communication, and writing skills (Munene, 2021). While the National Council for Population and Development holds that the underlying reason for youth lacking the requisite skills is the lack of practical training in TVET institutes and universities, Munene (2021) is convinced that the problem is the undue focus of post-secondary school education in Kenya on academic excellence rather than employment needs. The scholar further asserts that although job creation is a key component of solving youth unemployment in the country, it is yet to be accommodated in the tertiary education and training curricula.

While the dual VET model shows promise, its successful implementation requires buy-in and collaboration from multiple stakeholders, including TVET institutions, industry partners, trainees and government agencies. However, research on how these key stakeholders perceive the introduction and implementation of dual VET programs in Kenya is limited. Understanding stakeholder perceptions is critical for identifying challenges, opportunities for improvement, and factors that may impact the model's effectiveness and sustainability. This study aimed to assess the perceptions of trainers, trainees, industry supervisors, and other relevant stakeholders regarding the dual VET model at selected TVET institutions and companies in Western Kenya. Specifically, it examines perceptions of curriculum relevance, infrastructure and resource adequacy, industry involvement, and government support. The findings provide insights to inform policy and practice regarding dual VET implementation in Kenya's TVET sector.

1.3 Purpose of study

This study aimed to determine stakeholders' perceptions of Dual VET implementation at selected TVET institutions and companies in Kenya.

1.4 Objectives of the study

This study was guided by the following objectives:

i. To determine trainers' perceptions of dual VET.

ii. To assess the perceived involvement of companies in the implementation of dual VET.

iii. To examine the perception of trainees regarding the introduction of dual training.

iv. To establish the stakeholders’ perception of government involvement in dual training.

1.5 Research Questions

The study was guided by the following research questions:

i. How do trainers perceive dual VET implementation?

ii. How is the level of companies’ involvement in dual VET perceived?

iii. How do trainees perceive the relevance and effectiveness of dual VET?

iv. What is the perception of the government's role in facilitating dual VET programs?

1.6 Theoretical framework

The following theories were selected to understand the dual VET model because of their role in providing valuable frameworks for understanding and improving learning experiences and outcomes. Each theory provides a unique framework for explaining how learning occurs and offers helpful insights that justify the implementation of the dual VET model in Kenya. Many learning theories have historically impacted education and employee training. However, these theories tend to guide practical approaches to education that can help students learn effectively. Therefore, this section explores three crucial learning theories.

1.6.1 Social learning theory

Albert Bandura's Social Learning Theory (SLT), posited that individuals learn by observing models in their environment. According to this theory, models can be family members, friends, movie stars, television characters, authority figures, educators, and other environmental factors that influence behavior. By processing and thinking about the observed behavior of characters within their surroundings, individuals can assimilate or imitate new behaviors, positive or negative, depending on what they see.

Bandura's social learning theory assumes that humans learn new behaviors by observing the behaviors modeled by others and their consequences. Behaviors that are rewarded (receive positive reinforcement) are likely to be imitated, while those that receive punishment (negative reinforcement) are less likely to be imitated. Bandura 's idea of observational learning contrasts with those of previous scholars and behavioral theorists who believed that learning was the product of individual action. A good example is B. F. Skinner (1950), who postulated that children learn as a product of the consequences of their behavior (Cherry, 2023). In contrast, Bandura suggested that individuals can learn by observing the behavior of others and their consequences rather than just their own. The theory draws from a series of experiments in which researchers exposed young children to videos of an adult acting violently toward an inflatable Bobo doll, after which the aggressor was punished or rewarded. The subjects were then placed in a room with the same doll. The study found that the children who watched the model that received positive reinforcement or no consequences for attacking the doll were themselves more likely to exhibit aggressive behavior toward the same inflatable doll, and vice versa (Schunk, 2012).

Bandura broadened the social learning theory, renaming it to “Social Cognitive Theory.” The key argument of the social cognitive theory is that human behavior results from the interaction between environmental influences, personal factors, and behavioral patterns (Bandura, 1986). The theorist suggests that learning occurs in a social context with reciprocal and dynamic interactions between the individual, environment, and behavior. In this regard, Bandura believed that humans can both actively influence and be influenced by their environment (Stajkovic & Sergent, 2019).

Bandura's social learning theory has had a wide range of applications spanning decades in explaining various human behaviors and phenomena. His principles have been applied to a wide range of topics, including organizational training programs, personality functioning and development, teaching and education, marketing and advertising, psychological disorder treatment, and health promotion (Nickerson, 2024). The central tenet of Bandura's social cognitive theory is reciprocal determinism, or the interaction of an individual, the environment, and their behavior. Schunk (2012) expounded on this premise by explaining that people seek to develop a sense of agency and exert control over significant events in their lives. Factors such as outcome expectations, self-efficacy, a person's goals, and self-evaluation play crucial roles in influencing this sense of agency and control (Schunk, 2012).

The perception that people actively influence rather than passively absorb knowledge from environmental inputs remains relevant to contemporary learning at all educational levels. The ability to learn by watching and imitating the models encountered in the environment means that students can acquire information more quickly (Schunk, 2012). In explaining why social learning may be key to solving workplace problems, Hightower (2018) argues that employees have historically leaned on colleagues to help solve workplace problems, a notion that employers can leverage to simplify on-the-job learning and training (Hightower, 2018).One study published in the *Frontiers in Education found* that social learning tools could enhance the teaching-learning experience of Generation Z students (Cilliers, 2020), who form the majority of the current crop of TVET students.

Assisting learners in achieving and developing competence in action to address present and future professional problems is the main objective of the dual vocational education and training (VET) system (Selimi et al., 2020; Ertl, 2020; Gonon et al., 2014). Bandura's social learning theory, which emphasizes the value of social interaction, observation, and imitation in the learning process, is a perfect fit for the principles of Kenya's dual VET program, which mixes classroom instruction with work-based learning (GIZ, 2020). Students can acquire the skills and information necessary to succeed in their chosen industries by observing and interacting with seasoned professionals at the industry level. When viewed in this light, Bandura's social learning theory, which has been expanded upon by the writings of other well-known academics, including Schunk (2012), provides a valuable framework for understanding and improving Dual VET programs. TVET institutions in Kenya can incorporate Albert Bandura’s social learning principles into their curricula and practices to enrich their programs and make them more accessible to students. In this way, trainees can easily develop the requisite skills and knowledge to be successful in the modern workplace.

The key tenets of this theory; observational learning, reinforcement, self-efficacy, and reciprocal determinism are particularly relevant in understanding how stakeholders form their perceptions of the dual training model in Technical and Vocational Education and Training (TVET).

I. Observational learning and modeling

Stakeholders such as trainers, employers, trainees, and policy actors are likely to form their perceptions of dual training based on what they observe in other institutions or countries where the model is already implemented. For example, witnessing successful dual training programs that produce competent and employable graduates can influence stakeholders to develop positive attitudes toward adopting the model. This observational learning helps to normalize the dual training approach within the wider educational and industrial ecosystem.

II. Reinforcement and vicarious learning

Social Learning Theory suggests that behavior is influenced by the consequences that follow it. In the context of dual training, when stakeholders observe others receiving recognition, support, or tangible benefits from participating in the model, they are more likely to view it favorably. This vicarious reinforcement encourages replication of such behavior and builds positive perceptions among those who are yet to participate.

III. Self-efficacy

An individual's belief in their capacity to perform tasks successfully. Trainers, employers, and trainees with higher self-efficacy are more likely to engage positively with dual training. For instance, trainers who believe they can effectively deliver both school-based and work-based components are more open to the model. Similarly, employers confident in their mentorship capacity, and trainees who believe they can succeed in real-world work environments, are more supportive of dual training.

IV. Reciprocal determinism

This theory acknowledges the interplay between personal factors, behavior, and environmental influences termed reciprocal determinism. In this study, stakeholders' perceptions are not formed in isolation but are shaped through interactions between individual attitudes, their behavior (e.g., participation or resistance), and external factors such as policy frameworks, industry support, resource availability, and institutional readiness. This triadic relationship helps explain the complexity of perception formation among diverse stakeholders in different settings.

1.6.2 Social constructivist theory

Social constructivist theory, or simply social constructivism, is the view that learning or the construction of knowledge occurs through social interaction and the help of others, usually in group settings. Social constructivism suggests that human development or learning is socially situated, and that learners construct new knowledge through interaction with others in a shared environment. This sociological theory was developed by Lev Vygotsky, a Soviet psychologist who lived during the late 19^{th} to early 20^{th} centuries. The main tenet of his philosophy is that learners construct new knowledge through involvement, making them active participants in the creation of their knowledge (Hayden et al., 2021; Schreiber & Valle, 2013). The theory is founded on the belief that knowledge is the result of interactions between environmental and subjective factors rather than being a copy of objective reality (Palincsar, 1998; Adams, 2006).

According to Lev Vygotsky, as cited by Schreiber and Valle (2013), individuals process new knowledge in three steps: construction, storage, and retrieval. Construction is a mental or internal process in which a learner builds an interpretation or understanding of a new concept by drawing on many separate pieces of knowledge. Storage is the mental process of committing new information to memory, while retrieval refers to finding and using the information that one has stored in memory (Schreiber & Valle, 2013). The process of constructing meaning from stimuli in one's environment can lead to correct or sometimes incorrect meanings. Learners can sometimes make mistakes when retrieving information stored in their memory. These mistakes are referred to as reconstruction errors, or the construction of logical but incorrect memories using a mix of information retrieved from long-term memory and the individual's general knowledge and beliefs about the world (McDermott & Roediger III, 2024).

Lev Vygotsky's theory of social constructivism is part of a wider constructivist paradigm split into radical and social components. Vygotsky's perspective on constructivism falls into the social camp, believing that human development is socially situated and that knowledge is constructed through learners' interactions with others. This view contrasts with radical (or cognitive) constructivist theory, which posits that learning is an individual process. According to radical or cognitive constructivist psychologists such as Jean Piaget (1980), the process of constructing knowledge depends on the individual's subjective interpretation of their active experience. In this view, people or individual learners experience the external world or the environment around them and construct knowledge based on their cognitive processes and internal assessment of their experiences (Brau, 2020). Cognitive constructivism is primarily linked to Swiss psychologist Jean Piaget, sometimes referred to as Piaget's theory of cognitive development. On the other hand, social constructivism is associated with Lev Vygotsky who pioneered the idea of group-based knowledge construction or learning in a social context. Constructivism, or individual constructivism, emphasizes the importance of personal experiences in knowledge construction. In contrast, social constructivism highlights the influence of social interactions on learners' knowledge construction. This thesis focuses on Lev Vygotsky's view, which concentrates on the social aspects of learning through experiences and posits that individuals construct new knowledge through interaction with others, emphasizing the collaborative nature of learning (Brau, 2020).

Vygotsky's idea that learners construct new knowledge through active involvement is extremely pertinent to the dual vocational education and training model of instruction, which systematically combines vocational school education with on-the-job training to cultivate a more skilled workforce. By merging practical job experience with classroom-based instruction, the Dual VET model equips learners with the essential skills and knowledge for a seamless transition into employment. Meanwhile, Lev Vygotsky's social constructivist model provides an ideal way to restructure the learning environment to make vocational and technical education programs more practical, viable, and effective. According to the provisions of Vygotsky's social constructivist theory, learners can benefit from contact with peers who are more competent in the subject area or have more industry exposure. This should not be mistaken with the concept of cognitive apprenticeship, which encompasses the teaching of a skill by a skill master to an apprentice (Edmondson, 2006). A dual vocational education and training program informed by social constructivism would encourage students to work together to solve problems, share their knowledge and experiences, and reflect on their learning both in the classroom and in the industry environment. In the classroom, teachers play the role of facilitators rather than the sole sources of information, while learners develop their knowledge and become well-honed in their respective skills, allowing them to sharpen the practical aspects of their training. On the job, managers and other instructors would play the role of teachers, providing oversight and facilitation. As Amineh & Asl (2015) observe, the social constructivist education theory encourages learners to be actively involved in their own process of learning (Amineh & Asl, 2015). Such a collaborative learning process among status equals, in this case, students, goes a long way in instilling teamwork and fostering better work outcomes (Tripathy, 2018). Students can discuss concepts and find solutions collaboratively. They can further test and build ideas, knowledge, and skills, allowing them to gain a better comprehension of both the theoretical information taught in the classroom and the tasks required of them in the workplace. Additionally, student-led learning leads to improved insights into their performance (Grover et al., 2017).

The social constructivist theory perspective should inform the design of and foster the success of dual-instruction learning environments that promote active engagement, collaboration among students, and the application of classroom-based theory to on-the-job practice. This approach can significantly benefit DVET programs, which aim to better prepare college students for the modern workspace. The idea of constructing workspace-relevant knowledge through social interaction and collaboration makes social constructivism a good fit for dual vocational education and training programs, which typically involve a combination of classroom instruction and workplace learning.

1.6.3 Sociocultural theory

Sociocultural theory, developed by Soviet psychologist Lev Vygotsky in the early 20th century, suggests that learning is a social process by which development occurs through the learner's interactions with individuals who possess more knowledge or skill than the learner. According to the proponents of sociocultural theory, students learn best when they interact with others who are more knowledgeable than they are. Vygotsky (1978) refers to teachers, parents, peers, and anyone with the ability to provide guidance and support in the context of a child's education as "more knowledgeable others" (MKOs)(Gauvain & Richert, 2023). In this view, sociocultural theory suggests that the human learning process is predominantly social in nature and that an individual's cognitive functions depend on their interactions with other people around them, particularly those with more experience or skill than themselves (Scott &Palincsar).

Vygotsky further introduced the concept of the *zone of proximal development* (ZPD), referring to the range of tasks that learners cannot do independently, except with help from a more experienced other. Gauvain and Richert (2023) explain that learners can gradually move tasks from their zone of proximal development to their independent skill set with guidance and support from more experienced entities, underscoring the importance of guidance and direction in the learning process. Tudge and Scrimsher (2003) further note that Vygotsky was not just interested in what more knowledgeable others could bring to the learning interaction, but also in what the student brought to the interaction, and how the broader historical and cultural setting shaped the interaction (Tudge & Scrimsher, 2003).

The sociocultural theory of cognitive development explores the influence of the world on individual development and emphasizes the importance of social interaction and participation in learning. In the context of dual vocational education and training (VET), this notion suggests that students learn not only by being taught theoretical knowledge in the classroom, but also by participating in workplace culture and observing and interacting with experienced practitioners in their respective or prospective workplaces (Sarnovska&Antonivska, 2020).Vygotsky's concept of the *zone of proximal development* is particularly relevant to dual VET as it refers to the range of tasks that students can perform with assistance from more experienced practitioners at the workplace but cannot yet perform independently. In this regard, a dual vocational education and training approach provides a model that allows workplace mentors to guide the trainee and help them develop their practical knowledge and skills while navigating their ZPD before leaving college.

The benefit of this approach is that students eventually finish college when they have the required workplace experience and skills to manage themselves. In other words, the dual VET setting allows them adequate room to gradually move tasks from their zone of proximal development to their independent skill set before being thrown into the murky job market.

Sociocultural theory further supports the use of several mediators to direct and facilitate learning. Its central tenets encourage the more competent (the supervisor or trainer) to mediate the development of the less competent (the trainee) using technical instruments and other practical methods. According to Eun (2018), coordinated contact between the trainer or supervisor and the learner is necessary for the mere observation of successful performance to lead to knowledge development and learning. By combining theoretical classroom education with practical learning experiences in the workplace, dual VET programs provide a rich learning environment conducive to cognitive development, as envisioned in sociocultural theory. As proponents of sociocultural theory argue, TVET instructors in a dual instruction program must act as a scaffold, providing awareness and orientation to trainees and developing suitable training programs. Their input can include establishing criteria and standards for the dual instruction program, organizing access to the workplace, following up with trainees, and recording the results. In addition to serving as trainers and enterprise-based training facilitators, scaffolders have the duty of creating performance or training achievement reports that link the training plan with the work, ensuring that a trainee has acquired the necessary skills for the industry and TVET institutions (GIZ 2020).

1.7 Conceptual framework

Independent variables

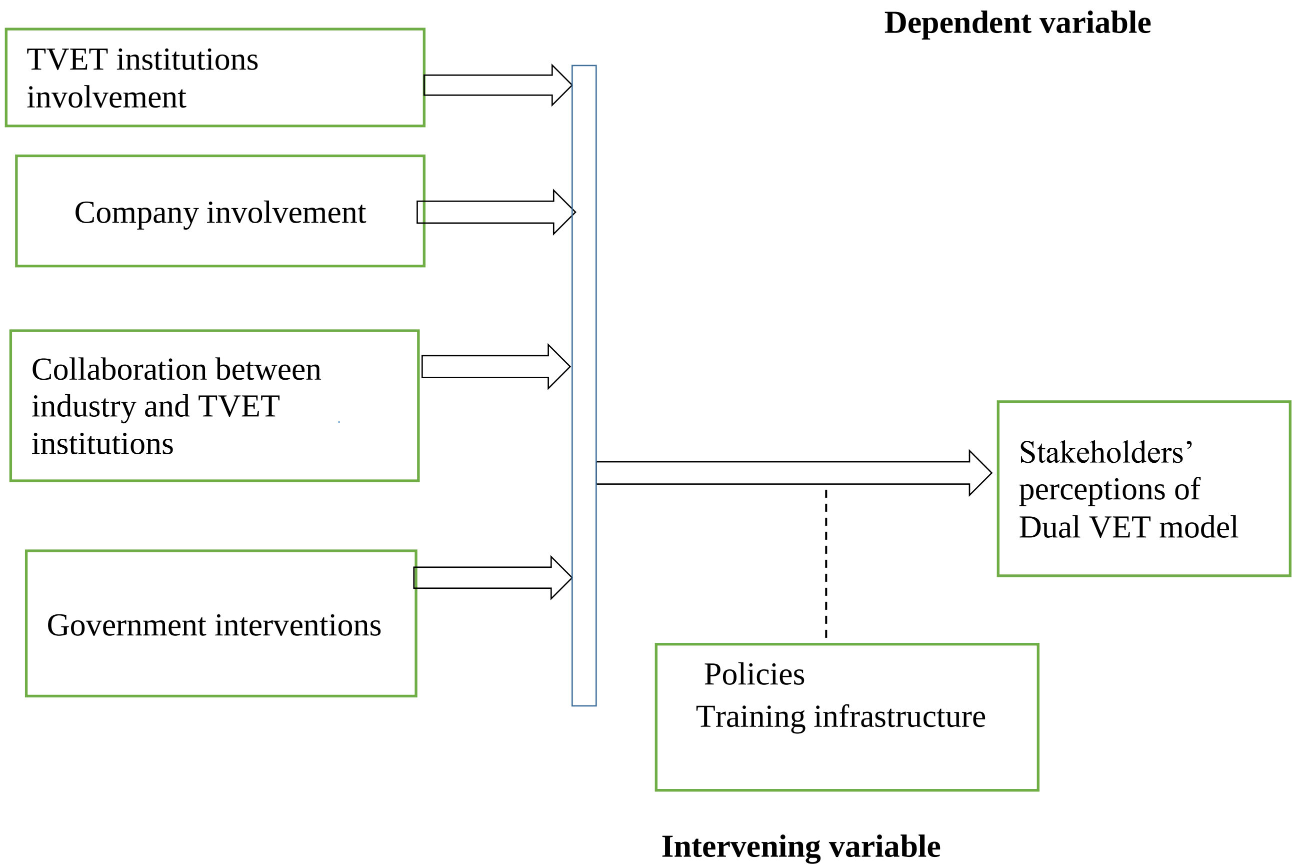

Figure 1: Conceptual Framework

1.8. Justification of the study

The need for the successful implementation of the dual vocational education and training (VET) model in Kenya, as well as its role in transforming tertiary-level education and bridging the gap between graduate skills and labor market demands, has been emphasized by relevant government and partner agencies (TVET ACT, 2013; MoE, 2018; KNBS, 2022, NCPD, 2021; GIZ, 2020). The potential of the dual VET program to promote job creation, enhance entrepreneurship skills, and accelerate Kenya's economic growth has been underscored in the relevant literature (Kuczera et al. 2018; Nason, 2019; Palmer, 2020; Ertl, 2020; Selimi et al., 2020; Munene, 2021; Gewer, 2021).

Stakeholders, including students, educators, industry partners, and policymakers, hold diverse views on the benefits and challenges of Dual VET. Many perceive it as a valuable approach to bridge the skills gap between academic education and industry requirements, providing students with practical, hands-on experience alongside theoretical knowledge. However, some stakeholders express concerns about the quality of training, coordination between institutions and companies, and the alignment of curricula with rapidly evolving industry needs. The perception of Dual VET's effectiveness in enhancing employability and promoting economic growth in the region varies among different stakeholder groups, highlighting the need for continuous dialogue and collaboration to address challenges and optimize the potential of DVET programs in Western Kenya.

1.9 Significance of the study

The dual VET model is a vital link in ensuring that Kenya's labor force is prepared for the rapidly changing demands of industry. The significance of this study rests in its examination of the perceptions of key stakeholders, including industry supervisors, trainers, and trainees, whose opinions are crucial to the effectiveness and continued development of such a vocational paradigm.

For trainees, their perceptions of the relevance and effectiveness of the dual TVET system were considered essential, as they stand to directly benefit from the model's practical orientation and employment prospects post-training. By capturing their expectations from lived experiences, this study sought to illuminate the model's alignment with the trainees' career aspirations and the skill demands of the labor market, thus advocating an education pathway that is intrinsically learner-centric.

Trainers, on the other hand, were expected to provide a pedagogical perspective that is fundamental for evaluating the instructional effectiveness of the dual TVET model. Their insights were closely linked to real-world implementation experience of the dual training model by drawing on their experiences of curriculum delivery, industry engagement, and implementation challenges. Therefore, the researcher hopes that these insights can support continuous program improvements.

Industry supervisors, as the ultimate consumers of TVET training, offered a critical view of the program's output quality. Their involvement in curriculum development, mentorship, and assessment processes ensures that training remains responsive to the dynamism of the industry, with implications for productivity and the broader economy. An appraisal of their expectations was thus deemed critical in revealing the extent to which the dual VET model can be considered relevant and sustainable.

One of the pillars supporting the successful implementation of the dual TVET system in Kenya is the government’s involvement. Therefore, stakeholders’ views on the government’s role were to shed light on how much policy barriers and facilitators can impact the program’s execution. Government action, or inaction, may impact financing, quality control, and the model's strategic integration into the country's overall skills development strategy.

The researcher believed that this study was particularly valuable because it highlighted the perspectives of the separate but related partners, providing a thorough evaluation of the dual TVET model's potential in Kenya. Moreover, by conducting this study, the researcher hoped to offer a vital body of knowledge that would help industry participants, governments, and academic institutions make relevant strategic decisions regarding dual training implementation. Ultimately, this study was considered vital in contributing to the development of a workforce that is competitive, skillful, and flexible and in promoting the socioeconomic advancement of the country.

1.10 Scope and limitation of the study

This study focused on the perceptions of trainees, trainers, and supervisors regarding the implementation of the dual instruction model in Kenya at both the institutional and industry levels. It examined dual instruction as a whole and not in its sections. The study involved primary implementers of the program: trainees, trainers, heads of departments, and industry supervisors.

This study was limited to the selected technical and vocational training (TVET) institutions and their partnering firms. Although Kenya had approximately 2400 TVET institutions by 2022 (Cowling, 2024), only seven (7) were involved in this study. Although the study adopted a mixed methods approach, questionnaires were employed to collect data due to time and financial constraints, which hindered the gathering of detailed insights from participants through interviews. The study faced some challenges, particularly with respondents who were unable to freely volunteer information. To address this limitation, we ensured that their responses would remain confidential and emphasized that any information provided would be used solely for academic purposes. Another issue was the limited time available to complete the study. To overcome this, we utilized questionnaires for data collection, as they were straightforward and allowed respondents to provide answers more quickly, thereby reducing the overall time required for the study.

1.11 Assumptions of the study

The study assumed that the respondents enthusiastically participated in the study and provided accurate data. The sample was expected to represent the seven TVET institutions incorporated during the program's pilot phase.

1.12 Operational Definition of Terms

Dual VET: training method combines theoretical instruction from TVET colleges with hands-on training in industry. This strategy ensures that students gain both theoretical knowledge and relevant practical experience, making them job-ready upon graduation.

Government interventions: These are formalized government laws enacted to support appropriate education training courses provided by TVET institutions.

Infrastructural challenges include restrictions on training equipment, facilities, workshops, and structures to create a conducive teaching and learning environment.

Labor market, also known as labor supply and demand, is the supply and demand for labor, with employees providing the supply and employers providing the demand.

Relevant education: programs are designed and built around an educational curriculum that incorporates well-coordinated knowledge- and competency-based components.

Self-employment — Making money from one's own business, trade, or profession rather than from an employer's set wage or remuneration.

TVET graduates are students who have completed TVET programme courses at the sampled technical and vocational training institutes.

TVET Institutions are Technical Training Institutions (TTIs) accredited to provide vocational and technical skills to trainees.

TVET Institution and Industry Collaboration: This is a closed link between the TVET institution and the industries that support practical training. Examples of ways to help include equipment and tool donations, staff exchange programs, and student and staff placements on work experience attachments.

Vocational or technical skills: Specialized skills, competence, or knowledge are necessary to execute specific activities or tasks.

1.13 Chapter Summary

This chapter outlines the background of the study, the problem being addressed, and the overall aim, along with the specific objectives. It includes the research questions that this study intends to answer. Additionally, this chapter discusses the significance of the study, its scope, justification, and limitations. The assumptions of the study are also summarized. Finally, the theoretical and conceptual frameworks of the study are presented.

CHAPTER TWO

LITERATURE REVIEW

2. 0 Introduction

This chapter provides a comprehensive overview of existing research on the dual instruction system and its impact on youth employment. It explores various studies conducted worldwide, examining the effectiveness of this approach in different cultural and economic contexts. The literature review aims to identify common themes, challenges, and best practices in implementing dual instruction systems to address youth unemployment and improve employability.

2.1 Introduction

A review of the literature from studies across the globe reveals different responses to the dual instruction system as an effective strategy for addressing youth unemployment and enhancing young people's employability in different parts of the world over the years. While evidence suggests that dual VET models generate higher school-to-work transition rates, the existing literature supporting this claim is far from conclusive. Additionally, much of it adduces evidence from countries such as Germany and Austria, which have a long history of dual vocational education. More evidence from countries in the early stages of adopting dual forms of vocational training is required (Bentolila et al., 2018). In their analysis of the Spanish Dual VET system, Puerta and García (2024) observed that unions, employers, and other stakeholders, including teachers and students, did not actively advocate for the dual instruction system or participate in its initial development. Pozo-

Llorente and Poza-Vilches (2020) in their evaluation of the same system note that understanding the origins and policy dynamics of Dual VET is a key element in contextualizing the perspectives of professionals involved in the field. Through a comprehensive review of the literature, this chapter aims to provide insights into how various stakeholders view the early implementation of Dual VET, its impact on employability and the labor market, challenges in its implementation, and its potential to reduce the education-employment gap. The discussion involves evaluating the perceptions of trainees and trainers on the dual VET models into vocational training and dissecting the overall perception of government and industry involvement in dual training.

2.2 German Dual Vocational Education and Training System

In the German-style "dual" system, theoretical knowledge is taught in educational institutions, whereas practical skills are developed through apprenticeships at companies. This German system has long been admired worldwide and is linked to lower youth unemployment rates. However, this correlation does not necessarily imply a causal relationship between educational structure and graduate employability, even though it is commonly assumed; only Switzerland, Austria, and Denmark have successfully implemented systems similar to Germany's (Piopiunik& Ryan, 2012).One of the main challenges in establishing a dual system is convincing companies that participating in an apprenticeship program will be beneficial in the long run. Employers may be reluctant to support apprenticeships because of the high costs associated with training, including the need for supervision and the use of expensive technology. Additionally, there is a risk that trainees may be recruited by other firms after training. This creates a classic coordination problem: while all companies would benefit from improved skills, each organization prefers that others invest in training. Consequently, the overall training provided often falls short of socially acceptable standards. Coordination issues partly justify the existence of autonomous Technical and Vocational Education and Training (TVET) institutions over employer-provided training. Although public or institutional TVET aims to solve these coordination problems, they can be difficult to eliminate entirely when training is firm-based, as these issues tend to reappear in various forms.

Recent company surveys (OECD, 2012) indicate that occupation-specific skills alone are insufficient to meet labor market demands. In fact, 57 percent of companies in nine countries reported being unable to find qualified entry-level personnel (Mourshed et al. 2012). As a result, in-demand skills are increasingly important in today's workplace.

2.3 Vocational Education and Training and Employment in the Workplace

The primary objective of Technical and Vocational Education and Training (TVET) is to equip students with the skills necessary for entry into the labor market. Graduates acquire a skill set that enhances their marketability across various sectors, potentially increasing their chances of securing employment in those sectors. Skill development may lead to improved opportunities for graduates to obtain well-paying and productive jobs, thereby contributing to an elevated standard of living. Karki (2011) indicates a significant positive relationship between the development of both soft and hard skills and employment outcomes. Additionally, King and Palmer (2008) suggested a correlation between skill development and workforce productivity. A productive and skilled workforce has access to the labor market for respectable employment, which can lead to economic growth through a chain reaction. When Technical and Vocational Education and Training (TVET) is effectively implemented, human resources become more skilled, resulting in a more productive labor force.

During financial crises, TVET plays a critical role in restoring economic stability by providing jobs and revenue in both the formal and informal sectors. TVET improves employment opportunities in developing countries, particularly in rural areas. In Cambodia, TVET is used to integrate youth from disadvantaged regions to support the country's economic prosperity. Countries in South Asia that experience high unemployment rates, such as Pakistan, Nepal, Bangladesh, and Sri Lanka, significantly depend on foreign employment. Consequently, TVET programs that emphasize skills training can help young people prepare for global job markets and better integrate into local economies (Martinez-Fernandez & Choi, 2012).

Research indicates that formal training reduces unemployment rates, demonstrating a strong positive correlation between the TVET sector and the Sri Lankan labor market. This correlation shows a higher return on investment in training and facilitates a smoother transition from school to employment (Tan and Chandrasiri, 2004). Competency-based training within TVET allows individuals to navigate multiple careers, thereby enhancing their adaptability to changing circumstances. In more developed economies, workers have the opportunity to develop beyond their basic knowledge and expand their employment options. However, in some underdeveloped countries, a mismatch between educational programs and labor market needs limits employment opportunities.

Despite its potential, TVET faces challenges, including negative perceptions and resource shortages, which can complicate access to job opportunities (Netherlands Initiative for

Higher Education Capacity Development, 2010). In undeveloped and emerging nations, where general education graduation rates are low, implementing a strong policy-driven TVET system is critical.

Focusing on industry-driven curricula in TVET has the potential to reduce unemployment and contribute to the achievement of the Millennium Development Goals. Developing countries often exhibit knowledge gaps related to the new technologies and innovations prevalent in wealthier nations. TVET can help address these gaps through the transfer of skills and expertise and promote greater technical alignment (Netherlands Initiative for Higher Education Capacity Development, 2010). When TVET is paired with updated curricula and adequate resources, it can foster a competitive workforce in both developing and developed nations, enhancing the likelihood of finding appropriately compensated employment in the formal sector. Additionally, improving quality while reducing costs can benefit multinational corporations and consumer markets in developed countries that rely on goods and services produced in these nations. Skill development in underdeveloped countries can also stimulate Foreign Direct Investment (FDI), facilitating the influx of technology and capital necessary for economic growth (Kurtishi-Kastrati, 2013).

A study conducted by the German Federal Ministry for Economic Cooperation and Development (BMZ) in 2005 highlighted a significant increase in the number of self-employed individuals, which can be attributed to a growing workforce, rising competition, and limited employment opportunities in the government sector.

For workers facing challenges in securing positions commensurate with their skill levels, relocation to areas with better job prospects or establishing small or medium-sized enterprises presents viable options. As indicated by King and Palmer (2008), skills development and Technical and Vocational Education and Training (TVET) are effective strategies for enhancing employability in both the labor market and self-employment, thereby contributing to overall productivity. Both TVET and Vocational Education and Training (VET) aim to improve livelihoods, generate employment, and promote self-employment.

Countries such as Germany and Austria exhibit low rates of youth unemployment, whereas Central European nations, such as Ireland and Spain, report youth unemployment levels exceeding 50%, with Greece facing similar challenges. TVET programmes are strongly associated with self-employment and apprenticeship schemes, which may restrict mobility within the European Union (UNESCO-UNEVOC, 2013). Thus, TVET is essential for fostering self-employment in response to the needs of a capable workforce. The French government actively supports continuous vocational education, facilitates programs for individuals aspiring to establish their own businesses, and strives to alleviate tax burdens and financial obligations for small enterprises and self-employed professionals (UNESCO-UNEVOC, 2015).

The integration of TVET programmes into national strategic initiatives can significantly enhance self-employment opportunities and promote economic growth in developing and emerging economies characterized by high unemployment rates. For instance, Bangladesh's national employment policy recognizes TVET as a critical instrument for empowering self-employment (Tansen, 2012). In Nepal, the prevalence of self-employment and informal employment, coupled with inadequate counselling services, led the Council for Technical

Education and Vocational Training (CTEVT) and the Asian Development Bank (ADB) to implement a "skill for employment" program aimed at poverty alleviation in the informal sector (Kafle, 2007). Various programs in Nepal also provide enterprise-based vocational training (Lamichhane 2013). Moreover, entrepreneurship education is vital for encouraging individuals to initiate their own businesses. In lower-income nations, such programs offered through formal and informal TVET institutions serve to inspire self-employment (UNESCO-UNEVOC 2006).

The Nepalese labor market faces challenges, including a shortage of skilled labor for domestic needs, limited job opportunities, and an increasing number of young individuals leaving the country without the skills required for adequate employment. This situation has heightened awareness of the importance of self-employment, particularly in relation to family business ventures (Pant 2008).

The informal sector in developing countries is experiencing rapid growth, characterized by minimal entry requirements, small-scale operations, and a lack of documentation, regulations, recognition, and job security (Onwe 2013). Numerous African countries also have substantial informal economies (Palmer, 2009; Department of Human Resource Science and Technology, 2007). According to Palmer (2009), TVET plays a pivotal role in promoting self-employment in Ghana, as the nation seeks to coordinate organizations involved in skills training while emphasizing the formal sector to facilitate economic activity for private-sector growth. The significance of self-employment in the informal sector has been acknowledged for over a decade. The International Labour Organization (ILO) (1998) asserts that informal economies in developing countries provide more self-employment opportunities than formal economies, with training serving as a valuable resource for informal market workers.

In Ethiopia, TVET has contributed to the advancement of self-employment by customizing courses to align with the needs of both industry and trainees, as discussed by Broussar and Tekleselassie (2012). Consequently, graduates are empowered to create their own Micro and Small Enterprises (MSEs), which constitute a significant component of the country's informal economy. The Ethiopian government acknowledges MSEs as vital in addressing pressing employment challenges and fostering economic development.

2.4 Importance of TVET curriculum to the industry requirements

The curricula for Technical and Vocational Education and Training (TVET) must be updated to incorporate new teaching methodologies and delivery strategies. Existing educators should undergo retraining, and future teachers should be prepared to instruct in an environmentally sustainable manner, prioritizing high-quality alternative teaching techniques. Curricula should be revised and integrated to include both well-structured knowledge-based and competency-based content, along with market needs assessments and methodologies, to ensure alignment with ELR programs (Chinedu et al., 2023).

The primary objective of TVET is to equip students with the skills necessary for entering the workforce. Graduates develop a diverse skill set that enables them to secure employment in various sectors. Skill development significantly enhances graduates' chances of obtaining well-paying, productive jobs, which ultimately improves their standard of living (Netherlands Initiative for Higher Education Capacity Development, 2010). According to Karki (2011), there is a strong positive correlation between the development of soft and hard skills and employment opportunities. Additionally, King and Palmer (2008) highlighted the connection between skill advancement and workforce productivity. A skilled and competent individual can find suitable employment in the labor market, leading to economic growth due to this chain reaction. When implemented effectively, TVET enhances the skill levels of human resources and increases workforce productivity.

To ensure that TVET programs remain relevant to labor market needs, adopting a demand-driven, competency-based curriculum design approach is essential. This framework ensures that industry stakeholders are involved in curriculum development, equipping TVET graduates with skills applicable in real-world settings. The implementation of demand-led, competency-based curriculum development strategies is critical for creating industry-relevant TVET systems in South Africa.

2.5 Challenges if infrastructure in TVET institutions

School facilities, as explored by Adeboyeje (2000) and Emetarom (2004), encompass a diverse range of physical and spatial components that are fundamental to fostering effective teaching and learning. These facilities are essential for establishing an environment conducive to academic achievement, allowing students to realize their potential and attain commendable educational outcomes. The infrastructure within educational institutions lays the groundwork for delivering quality education and serves as an indispensable support system for both educators and learners.

Teaching facilities include a variety of crucial resources vital for educational success, such as well-equipped classrooms, advanced laboratory environments and specialized workshops. According to Bakare (2009), these infrastructures embody the necessary organizational frameworks that facilitate the efficient operation of the institution. Important educational tools, ranging from textbooks and laboratory instruments to computers and interactive seating arrangements, are instrumental in creating a robust learning atmosphere (Omotayo et al., 2008).

Attention to the provision, adequacy, utilization, and management of educational facilities is paramount for maintaining a high-quality learning environment. Akinsolu (2004) emphasized that an effective and well-implemented educational program cannot succeed within the limitations of poorly maintained or inadequate infrastructure. Numerous studies have consistently reinforced the notion that school facilities are invaluable assets that significantly enhance and support productive teaching and learning experiences.

2.6 TVET and industry partnership

Collaboration between industries and educational institutions is becoming increasingly vital in many emerging countries, including Kenya. The International Organization for Technical Education and Vocational Training frequently highlights the importance of strengthening the connections between training programs and the job market in its international proposals aimed at enhancing technical education and vocational training systems. One of the most apparent relationships identified is that of industrial connection. However, several challenges hinder partnerships between Technical and Vocational Education and Training (TVET) institutions and the industry, such as a lack of initiative from TVET institutions and insufficient engagement from organizations. To foster support for improved practical training, technical institutions should actively maintain close ties with the industry through initiatives such as equipment and tool donations, staff exchange programs, and student and staff placements for work experience.

2.7 Trainers' Perception on the Dual VET Model Introduction

The introduction of dual Vocational Education and Training (VET) systems, which combine school-based education with workplace training, in different parts of the world, including non-Germanic countries, has garnered significant attention. School-based and workplace trainers are a fundamental element in the implementation of any dual training program, making their perceptions and opinions about the potential benefits and challenges of introducing the dual VET model into vocational education important subjects of study.

Literature on trainers' perceptions of dual training indicates a strong belief in the correlation between classroom education and workplace tasks, reflecting trainers' perception of the two elements of dual VET as interrelated. Eiríksdóttir (2020) studied the views of stakeholders, including vocational teachers and workplace trainers, on the integration of classroom learning and workplace training in a dual VET system. The primary finding of this study was that the integration of school- and work-based learning in the Icelandic dual vocational education and training system is not well-defined, with limited communication and collaboration between school-based teachers and workplace trainers. In response to the question about the perceived relevance and usefulness of school-based learning, trainers exhibited a high level of agreement regarding the relevance and usefulness of school-based learning in a dual VET system. This finding reveals a notable lack of integration between school-based and work-based learning in dual programs, leading to a perception of disjointed programs. Despite this perceived challenge, VET trainers maintain a strong sense of professional identity, viewing themselves as dual professionals grounded in both their industry and teaching roles (Eiríksdóttir, 2020). The existing literature further reveals sustained implementation variability between countries that could be perceived as another form of disjointedness. The implementation of the dual VET model can vary significantly between countries, posing a challenge. In Spain, for instance, the dual VET model has been implemented through a school-based approach rather than a Germanic firm-based model. This variation in implementation can lead to differences in the effectiveness of the dual VET model in different contexts (Artiles et al. 2020). Ultimately, trainers may find it challenging to adapt to these variations, potentially affecting the overall success of training programs.

Although not explicitly mentioned in existing research data, Germany's longstanding success with dual training models can be attributed to trainers' positive perceptions of the system, who are at the center of the system's implementation. Germany is one of the countries where dual VET models have been most successful, despite recent reports of a glaring dropout problem (Krötz& Deutscher, 2021). It is worth noting that dropout cases from dual vocational education and training programs may reflect students' perceptions of such programs but not trainers' perceptions. The sustained collaboration between workplace trainers and school-based instructors points to a perception of these programs as a way to complement rather than compete with higher education, allowing Germany's dual VET model to foster the successful transition of young people from school to the labor market (Ertl, 2020).

Sauli's (2021) report, *The Collaboration Between Swiss Initial Vocational Education and Training Partners: Perceptions Of Apprentices, Teachers, And In-Company Trainers*, reveals a positive perception of the dual instruction system on the part of the trainers.

Through the instructors' discourse in the report, it is evident that trainers hold positive views of various aspects of dual training. Some, especially workplace trainers, believe that the dual training system presents opportunities for imparting essential real-world skills that are key to developing a well-honed professional. Meanwhile, school-based instructors feel that apprenticeships allow them to stay updated with the trends being employed at the workplace through their students, trendy haircuts being a cited example in the hairdressing industry (Sauli, 2021); The dual VET model offers significant benefits, particularly in enhancing the school-to-work transition and providing a complementary relationship between vocational and academic learning. The existing literature suggests that trainers share this view. Nonetheless, challenges such as implementation variability and competition with higher education (HE) must be addressed to optimize the potential of the dual VET model. Trainers play a crucial role in navigating these benefits and challenges, and their perceptions are essential for the successful integration of the dual VET model into vocational education in China.

2.8 Perceived Involvement of Companies in Dual VET Implementation

Dual vocational education and training is a blend of school-based or classroom instruction and workplace training. This means that companies are an inherent component of this training model by design, completing the dual VET system in Germany. A review of the literature from various empirical studies and peer-reviewed journals suggests that companies are actively involved in implementing dual VET programs, often in collaboration with educational bodies to tailor training to specific company needs while aligning the material to approved school curricula. Spees (2018) recognizes the crucial involvement of both employers and trade unions, pointing out that they drive decision-making processes and are actively involved in curriculum development and competency standards. In Germany, students take uniform examinations for their final graduation, leading to formal vocational qualifications, despite slight variations in school curricula across different German states (Spees 2018). While recognizing various national and international actors, such as the European Union, as drivers of the transfer of dual VET to Spain, Puerta and García (2024) emphasize that the organizational structures of each country remain crucial determinants of implementation. Such organizational structures often do not incentivize companies to participate in training programs (Puerta & García, 2024). This lack of incentives for firms may explain why a 2019 study by Fernando Marhuenda-Fluixá, Chisvert-Tarazona, and Palomares-Montero found that companies had made limited contributions to the development of Dual VET in the country. However, subsequent studies have pointed to increased participation by companies in recent years. Ramírez, García, and Fuentes (2023) investigated the implementation of dual training in Spain's autonomous community of Andalusia. The findings identified workplace mentors as essential contributors to in-company training success, who helped mold a positive dual VET perception among trainees by fostering the necessary capabilities (Remirez et al., 2023). More importantly, the findings of this study demonstrate that companies actively involve themselves in the training and qualification of students or apprentices under dual vocational education and training policies in Spain, where such involvement was limited during the early stages of adoption. These findings are echoed by Marrero-Rodríguez and Stendardi (2023), who studied the implementation of dual VET in Spain, focusing on the working conditions of company tutors within the tourism sector in Andalusia and the Canary Islands. Their study's findings, like those of Remirez et al. (2023), established the active involvement of companies in implementing dual VET programs in the country, albeit with educational institutions leading the process while adapting content and learning outcomes to specific company needs.

Evidence suggests that government policies can restrict companies’ participation in the development and implementation of dual VET systems. Bonoli and Wilson (2019) studied firms’ involvement in dual apprenticeships in Germany, Denmark, and Switzerland, which are known for their long tradition of dual models in vocational training. The study established that inclusiveness measures exist in each country studied. However, company involvement is limited by regulations that stipulate the extent to which firms must play an active role in dual VET programs in Germany. Such restrictive measures are associated with each country’s level of macro-corporatism and political economy traditions (Bonoli& Wilson, 2019). A separate study in Spain had similar results, except that they were limited to the tourism sector. More specifically, Marrero-Rodríguez and Stendardi (2023) found that heterogeneity and informality characterized dual vocational education in Spain's tourism sector, and the sector's characteristics and informal assessment procedures influenced company tutors.

In the United States, companies not only train but also fund training programs for apprentices, unlike Germanic countries, where the government provides funding for vocational education (Spees, 2018). This limited federal support has been identified as a barrier to the adoption of dual vocational education and training across the United States. Additionally, company involvement in dual VET programs is limited by logical economic considerations, mainly the country’s tradition of a high job turnover rate among young workers, which renders it less economically sound to train apprentices only to lose them without realizing the firm's return on investment. Employers' driving motivation behind having apprenticeship programs is typically to recruit future workers from the pool of current apprentices. Therefore, they usually provide young prospects with relevant training to meet their company's specific needs. Therefore, the tradition of high employee turnover rates dilutes this motivation and explains the limited company involvement in dual training in the US (Spees, 2018). Nonetheless, some elements of dual VET are emerging in parts of the US, with German companies such as BMW, Volkswagen, and Siemens leading the implementation of dual training models in South Carolina, North Carolina, and Tennessee to compensate for the lack of skilled employees in those states (Spees, 2018).

Bolli, Kemper, Parajuli, Renold, and Thapa (2023) analyzed the factors influencing the implementation and scaling-up of a pilot dual VET program in Nepal. Key among their findings was that companies lacked information about the dual vocational and education system in Nepal, and that the lack of knowledge was the key barrier to the successful implementation of such programs in the country. (Bolli et al., 2023). In contrast to the situation in Nepal, firms in India use in-house training for new recruits and employees, demonstrating their willingness to foster a culture of dual vocational education and training. Companies have expressed a willingness to cooperate in skill development programs and joint funding with the government to promote dual training in the country (Mehrotra et al., 2015).

2.9 Trainees' Perception on The Introduction of Dual Training

Louw and Katznelson (2015) argue that classroom education and work-based learning in a vocational education and training system are often disconnected from a student's perspective. This perception stems from VET students' expectation that their classroom lessons will find direct application in the tasks encountered during internship as a practice-based version of their class-based training. In this manner, VET students expect a seamless link between classroom knowledge and real-world applications. However, encountering a disconnect between theory and practice in the workplace often leads students to question the relevance of academic concepts, rather than attributing it to potential curriculum gaps or internship variations. This perception positions theoretical knowledge as an inadequate reflection of the practical side of dual training in the eyes of trainees (Rintala, 2020). Students often find it challenging to apply their VET schoolwork within their internship company setup, leaving them struggling to connect these two aspects of their VET training program. Louw and Katznelson (2015) further argued that VET students find it difficult to blend their school culture with that of the workplace. Additionally, two different sets of expectations confront them as dual VET apprentices: one set is that of a school-going student and the other a worker in an internship position (Louw and Katznelson 2015). While different students may perceive dual VET systems differently, the experiences identified in this study are likely to influence their perception of the training model.

Many studies suggest that students perceive dual VET models as beneficial and valuable, while others indicate that social and institutional barriers can hinder the completion of such programs for some students. Jørgensen (2015) examined the case of high dropout rates and low performance among male students within the dual VET system in Denmark. Their analyses indicated that most students perceived the dual VET system as a valuable alternative to general education. However, social and institutional differentiation processes reduced the affected students' chances of completing their dual instruction programs. This study highlights how trainees’ perceptions of dual training, like any form of education, are often subject to the influence of other factors. In Australia, vocational education and training (VET) is considered a pathway for students of low socioeconomic status (SES) to enter Higher Education (HE) and is often promoted as such (Vanderburg et al., 2022). This overview may significantly influence trainees’ perceptions of vocational training models involving dual instruction. Being a nationally accepted view means that students are likely to perceive such training as reserved for low-socioeconomic-status students and not for those who can afford direct university education. More importantly, the findings suggest that universities should promote VET pathways as viable alternatives for all students (Vanderburg et al., 2022).

Evidence suggests that students’ perceived autonomy within workplace training setups fosters a positive view of dual training. Gross, Berger, Wenger, and Sauli (2020), in their study, *Motivating Styles in Dual, Initial Vocational Education and Training*, determined that apprentices perceived in-school instructors as more controlled in their motivating styles, which could be viewed as restrictive or limiting (Anca, 2023). In comparison, the study argues that students find their in-company trainers more supportive of their (learners’) autonomy, with control mainly affecting organizational pressure and demands (Gross et al., 2020). Apprentices consider autonomy essential in dual vocational education and training programs, as it entails involvement and freedom of choice, which effectively instills responsibility, critical thinking, and metacognition (Anca, 2023).

Studies have found that students are more likely to feel a sense of freedom and liberty when there is autonomy (Anca, 2023). According to Widiartini and Sukerti (2023), such autonomy is associated with positive learning outcomes. The study, published in

JurnalPendidikan dan Pengajaran, assessed the effect of students' self-assessment and learning autonomy on their performance in vocational education. The results directly linked students' learning autonomy and self-assessment to their performance in the course. Students' learning autonomy maximized their self-assessment, leading to improved performance and better learning outcomes overall. The researchers determined that autonomy allowed learners to be directly involved in the learning process, making them more responsible and outcome-oriented (Widiartini and Sukerti, 2023). A separate study published in the Journal of Surgical Research associated autonomy in medical training with increased confidence, readiness for independent practice, development of clinical decision-making skills, and professional identity (Alen et al., 2019).

Trainee perceptions of quality in dual training is essential and could influence the overall success of dual instruction programs altogether. Krötz and Deutscher (2021) studied the relationship between perceived quality of training within VET settings and drop-out rates from such programs. The findings indicate that differences in perceived training quality between trainees and trainers can influence dropout rates in dual VET programs by impacting dropout intentions (Krötz& Deutscher, 2021). Ideally, trainees should perceive quality in their training to remain motivated to study. In cases where trainers perceive quality in a different light than trainees, drop-out intentions may rise, leading to increased cases of dropouts witnessed in dual training programs. In a study, Le Mouillour (2018) established that VET actors internationally struggle with issues of quality improvement and assurance despite the perceived importance of VET programs for education and economic policy.

Data on trainee perceptions of dual training in Kenya and other African countries are limited, likely because the region is still in the early stages of adopting the dual instruction model. Nonetheless, evidence suggests a growing interest in dual instruction models, which is likely to inspire a surge in studies targeting stakeholder perceptions, including trainees' perceptions of the introduction of dual training within the region.

2.10 Industry Perception of Government Involvement in Dual Training

The International Labor Organization (ILO) provides key insights into industry perceptions of government involvement in dual training. While painting out the difference between dual VET systems and other workplace-based programs, Seedman (2012) notes that formal apprenticeships, or more popularly, dual instruction systems that entitle apprentices to off-the-job learning while undertaking their workplace curricula, are structured programs regulated by legislation at the national level. This argument directly alludes to the government's role in dual instruction programs. Apprentices in such dual programs receive predetermined wages for their services at the workplace, as stipulated in their formal contracts (Seedman 2012). Spees (2018) further adds to the contributions of Seedman (2012) by noting that vocational education and training (VET) within the German context is regulated and funded by the country's governing body (the central government) and the federal states. The German government works closely with its industry, which is responsible for coordinating dual instruction systems (Spees, 2018).

While comparing the German dual instruction system with that of the US, Spees (2018) observes that the States' government exerts limited federal oversight on the country's Career & Technical Education (CTE) programs. This limited government control can be attributed to what Spees (2018) terms a "highly decentralized and fragmented CTE landscape" in the United States, characterized by varying licensing requirements for technical professions like plumbing in different states across the continental US (Spees, 2018). This decentralized and fragmented nature of the US CTE system could explain why the country has seen little or slow adoption of dual VET instructional models despite widespread knowledge of their potential benefits (Eichhorst et al., 2015). The lack of a standard national qualifications system to guide decision-making leads to skepticism not only from potential dual VET students but also from parents, critics, and the business community, whose support is required to complete such a two-fold training system (Stone, 2012). In comparison, Germany has a highly integrated and cooperative VET system with a longstanding history of private sector buy-in. Companies in Germany have traditionally worked with the government to spearhead dual training models, making the country a front-runner in such systems. The German government facilitates the school-based or theoretical side of their dual VET programs through subsidies and tuition-free education in public vocational schools. This is another area where the US system falls short, as funding available for CTE programs is far more limited than in Japan. In the United States, companies that support apprenticeships often fund the programs. Consequently, apprenticeships in the US are typically costly for many companies (Spees, 2018).

Recently, the US government has implemented educational reforms to embrace a dual training system (Collins, 2019). The reforms designed to strengthen and expand the adoption of dual learning in technical education institutions received thousands of comments, counterproposals, and opinions within the consultation period following their publication, showing the vast public interest in the issue of dual training in the United States (Collins, 2019). While the US joins many governments, employers, and educators worldwide with growing interest in German-style dual instruction methods, Remington (2018) observes that the actual implementation of such systems remains challenging. The US is one of the countries where local partnerships embracing elements of German-style dual training have been formed. Such partnerships bring together government entities, educational institutions, and corporations to upgrade TVET (Remington 2018).

The successful adoption and popularization of dual instruction systems across Europe can be attributed not only to the efforts of individual governments to support the systems within their jurisdictions but also to their inclination to collaborate with one another across borders. The European Commission has a long tradition of collaborating with EU member governments and other key stakeholders to promote sustained dual VET across Europe, which has been a fundamental force behind the system's success. The Commission provides technical support and guidance to EU member governments and other countries keen to implement the dual education system (Guerrero Puerta & Lorente García, 2024). According to Guerrero Puerta and Lorente García (2024), this approach encourages cross-sector collaboration and facilitates the exchange of best practices between the countries involved. The sharing and transfer of best practices, including knowledge and experiences, among countries in Europe is a fundamental driving force behind dual instruction models, as it allows countries to learn from one another and adopt the best practices from successful frontrunners like Germany (Puerta & García, 2024).

The European Commission has a long history of urging member states to adopt dual VET systems as a strategy to address youth unemployment and improve young individuals' employability. The Bruges Communiqué of 2010, as cited by Van Loo and Schmid (2012), highlighted the importance of expanding vocational education and training, which the

European Commission further supported while advocating for workplace-based training. The Commission believed that the dual VET training model should be adopted across Europe, a vision that informed the establishment of the 2013 European Alliance for Apprenticeships in collaboration with trade union organizations and individual corporations (Gráf& Marques, 2022). The alliance aimed to promote the emergence of a European model of collective skill formation, with Ireland and France showing signs of adopting elements of a collectivist training model centered on apprenticeship training (Prak & Wallis, 2019). This initiative was further designed to support educational systems keen on introducing or reforming key aspects of workplace-based training and fostering learning based on this model (Puerta and García, 2024).

According to Sauli (2021), the Federal Act on Vocational and Professional Education and Training formally mentions and describes collaboration among stakeholders within the Swiss context. The federal act outlines the shared responsibilities of training companies, vocational schools, and providers of branch courses with respect to supporting learners technical training. Sauli (2021) further describes branch courses as a third learning place that aims to complement classroom instruction and workplace training (Sauli, 2021).

Countries across Europe that have benefitted and continue to benefit from the dual learning system have Germany's government and the German Chambers of Commerce and Industries to thank just as much as the European Commission, if not more. The country has served as a crucial frontrunner in developing the dual instruction model and has been keen on spreading the dual model to southern European countries like Spain and Portugal, in a move designed to allow the export of training and other related services (Puerta & García, 2024).

In Norway, one of the government's primary contributions to dual training was through Reform 94, which introduced a more holistic approach by integrating general education directly into the vocational curriculum. It provided vocational students with a dedicated semester of college preparatory courses that served as a bridge to higher education. The program also fostered increased access to apprenticeship opportunities by strengthening vocational pathways (Bertrand et al., 2021). In their Norway case study, Aspøy and Tønder (2022) identified two system safeguards introduced by Reform 94. The first safeguard provided an alternative path to the same vocational qualification as an apprenticeship for students who did not secure one during their training. The second safeguard was a supplementary third year that allowed students to transition from a vocational system to general studies, opening the door to higher education (Aspøy& Tønder, (2022). Although not without challenges, the model has seen significant success, with a significant surge in the number of apprenticeships in the years following its implementation being a notable indicator. Studies also indicate that nearly 50 percent of the country's youth cohorts enter a vocational program in upper secondary school, which could be a positive indication based on interpretation (Aspøy and Tønder, 2022).

While commenting on the Danish system, Louw and Katznelson (2015) note that the Danish Ministry of Education established a framework program for development work at vocational schools in 2014. The framework program saw 18 vocational schools conduct 21 development projects within three different professions: business, social and healthcare, and technical trades (Louw & Katznelson, 2015).

According to University World News (2018), as cited by Erima (2021), vocational training took root in Kenya in 2018. A major shift in federal education policy saw the government allocate a larger budget to TVET following increased attention to these institutions. Perhaps the most crucial part of this reform was the steep reduction in fees for students in technical and vocational education institutes, which was instrumental in promoting the birth of dual-instruction models in the country (Erima, 2021).

In a study, Kithinji (2022) reviewed five donor-funded dual apprenticeship training projects that the Kenyan government launched in partnership with various companies, international institutions, and vocational training centers to provide trainees with opportunities to acquire practical skills on top of their class-based theoretical knowledge across disciplines. The results of this study show that dual apprenticeship learning systems have the potential to enhance the quality of vocational training, making dual vocational training a likely panacea for the country’s youth unemployment menace. (Kithinji 2022). However, by design, this study underscores the crucial role that governments play in introducing and legislating dual training programs within their respective jurisdictions.

2.11. Chapter Summary

This chapter has provided a comprehensive overview of the dual instruction system and its impact on youth employment across various countries and contexts. The literature review reveals both the potential benefits and challenges of implementing dual VET models to address youth unemployment and enhance employability. Key themes that emerged include the importance of aligning curricula with industry needs, the role of partnerships between educational institutions and companies, and the perceptions of various stakeholders including trainers, trainees, and industry representatives. While dual VET systems have shown promise in countries with established traditions like Germany, their implementation in other contexts faces hurdles such as coordination issues, resource constraints, and cultural differences. The experiences of countries adopting dual VET models highlight the need for tailored approaches that consider local economic and educational landscapes. As governments and industries increasingly recognize the value of workplace-based learning, further research and collaboration will be crucial to optimize dual instruction systems and bridge the education-employment gap for youth across diverse global settings.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter presents the methodological framework employed in this study. It outlines the research design, study population, sampling techniques, data collection methods, and analytical approaches used to address the research questions. This chapter provides a detailed roadmap of the investigative process, ensuring transparency and replicability of the study's findings.

3.2 Research design

A research design is a blueprint or master plan that specifies the process of data collection and analysis (Babin & Zikmund, 2015). The aim of research design is to plan, structure, and strategize by connecting major parts of a research project to answer research questions or study hypotheses (Merriam & Tisdell, 2015).

The study employed a quantitative research approach as it enables obtaining responses from a population with similar views towards the study phenomena and thus enables the collection of in-depth data at the same time. The design was appropriately chosen because it enabled the investigator to establish the influence of the independent variable on the dependent variable over time, owing to the parameters of the study respondents being evaluated.

This study adopted a descriptive survey research design. The survey research design enabled the collection of data related to the study in their current form. According to Creswel and Creswel (2018), survey research design is appropriate as it allows exploration of the study variables in their present existing condition or undisturbed form.

A non-experimental survey research design was used because it enabled the study of variables without manipulation. In this study, the manipulation of variables was not important because it aimed to determine the perception of various stakeholders on the dual training model.

The study design determined how relevant data were collected to meet the study objectives. Thus, it is a blueprint guide of how the study was conducted, the data acquired, the analyses performed, and the results presented. The research design was guided by the study objectives.

3.3 Location of the Study

The research was conducted in two (2) TVET institutions in Kenya located in the western and Nyanza regions, namely, the Bumbe Technical Training Institute (BTTI) and the Ramogi Institute of Advanced Technology (RIAT), respectively, and five (5) firms located in Kisumu, Busia, Kitale, and Bungoma. The selection of BTTI and RIAT, along with the five partnering firms, provided a representative sample of the institutions involved in the pilot phase of the dual training model. This strategic choice of locations across western and Nyanza regions offered insights into the implementation and effectiveness of the model in diverse settings, potentially capturing regional variations and industry-specific nuances in the TVET sector.

The following firms from the above regions formed the study area:

Table 3. 1: Target Population

S/No.	Name of the Company	Location
1.	CMC Motors	Kitale
2.	Jambo Leo auto garage	Kisumu
3.	Busia Highway Garage	Busia
4.	Precision Performance auto garage	Bungoma
5.	Subaru Kenya	Kisumu

3.4 Target Population

The target population for the study consisted of 225 respondents drawn from industry players, trainees, and trainers. The target population consisted of relevant individuals, objects, and subjects that the study wished to observe and collect data from. Therefore, the target population is the entire population with relevant information that the study seeks to meet the research objectives. According to Cooper and Schindler (2014), the target population may not be accessible, although it remains relevant to the study. Therefore, the section from which the researcher may access and collect data becomes the accessible population and the population of interest for the researcher. The target population for this study encompassed a diverse group of stakeholders, including industry players, trainees, and trainers. This comprehensive approach aimed to capture a wide range of perspectives and experiences relevant to the research objectives. By including industry professionals, the study sought to gain insights from those actively engaged in the field, while the inclusion of trainees and trainers allowed for a more holistic understanding of the educational and developmental aspects of the industry.

The concept of target population extends beyond mere individuals to include objects and subjects that could provide valuable data for the research. This broader definition acknowledges that relevant information may come from various sources, not just human respondents. However, as Cooper and Schindler (2014) point out, the entire target population may not always be accessible to researchers. This limitation leads to the identification of an accessible population, which becomes the practical focus for data collection. The accessible population, while potentially smaller than the target population, still represents the group from which the researcher can feasibly gather information to address the study's objectives. This distinction between target and accessible populations is crucial for understanding the scope and limitations of the research, as well as for interpreting the generalizability of the findings.

The target population was distributed as shown in Tables 3.2, 3.3, and 3.4.

Table 3.2Trainers study population

Category	**Institution**	**Target population**
Trainers	Bumbe TTI	20
	RIAT	20
Total		40

Table 3.3 Trainees study population

Category	Institution	Target population
Trainees	Bumbe TTI	85
	RIAT	85
Total		**170**

Table 3.4 Industry supervisors study population

Category	Institution	Target population
Industry supervisors	CMC Motors	3
	Jambo Leo auto garage	3
	Busia Highway Garage	3
	Precision Performance auto garage	3
	Subaru Kenya	3
Total		15

3.5 Sampling Procedure and Sample Size

3.5.1 Study Institutions

A purposive sampling technique was employed to select Bumbe Technical Training Institute (BTTI) and Ramogi Institute of Advanced Technology (RIAT). According to (Etikan, 2016), purposive sampling is the deliberate choice of a participant as they possess certain attributes which the researcher needs to study and does not need underlying theories or a given set group of participants. This method was chosen because the respondents were sourced from various departments, and trainees were also at different levels of education, varying from level 6 and level 5, and first year to third year of study. These two institutions represent TVET as they are well-established, accredited, and among the oldest in their respective counties. Bumbe TTI is the oldest institution in Busia Countyhaving been established in 1977 while RIAT was established in 1971. Both BTTI and RIAT offer technical courses from Artisan to Diploma level.The purposive sampling technique employed in selecting Bumbe Technical Training Institute (BTTI) and Ramogi Institute of Advanced Technology (RIAT) was strategically chosen to ensure a diverse and representative sample for the study. This method allowed the researchers to deliberately select participants based on specific attributes relevant to the research objectives, without the need for underlying theories or predetermined participant groups (Etikan, 2016). The selection of respondents from various departments and different educational levels, ranging from level 5 to level 6 and spanning from first to third year of study, provided a comprehensive cross-section of the TVET student population.

BTTI and RIAT were chosen as exemplars of TVET institutions due to their well-established status, accreditation, and historical significance in their respective counties. BTTI, founded in 1977, holds the distinction of being the oldest institution in Busia County, while RIAT, established in 1971, boasts an even longer history. Both institutions offer a wide range of technical courses, from Artisan to Diploma level, making them ideal representatives of the TVET sector. This selection ensures that the study captures data from institutions with a proven track record of delivering technical and vocational education, thereby enhancing the reliability and relevance of the research findings.

3.5.2 Trainers, trainees and supervisors sampling procedure and sample size

The study used Slovin's formula$n = \frac{N}{1+N(e)^2}$, (where ***"n"*** is the desired sample size, ***"N"*** is the population size, and ***"e"*** is the margin of error [0.05]) to determine the sample size of instructors and students. According to Israel (2013), Slovin's formula is appropriate for determining the study sample size when the available population of the subjects is known.

3.5.3 Sampling Procedure and Sample Size

The sample size of this study was 144 respondents. Kothari (2016) states that the sample size is a subset of the target population that is drawn for examination and making inferences. The sample size was determined by the Slovin's formula, 1967

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

Where;

N= Target population

$n =$ Sample Size

$e =$ Alpha level at ± 5% and 95% Confidence Level

$1 =$ Constant

- $n = \frac{225}{1 + 225(0.05)^2} = 144$

3.6 Research Instruments

The study used closed-ended questionnaires to collect primary data from the respondents. According to Ekinci (2015), closed-ended questionnaires with a Likert scale range of 1–5 indicating (Strongly Disagree– **SD** [1], Disagree - **D** [2], Neutral – **N** [3], Agree - **A** [4] and Strongly Agree- **SA** [5]) provide useful insights from target respondents regarding a study. Closed-ended questionnaires were appropriate for this study as they permitted the collection of a wide range of data from the respondents. According to (Baburajan, 2022), closed-ended questionnaires aid in guiding the response suggestion within a certain range of aspects, enabling the focus as precisely as possible. These study instruments collected data from technical and vocational trainees, industry supervisors, and trainers in the selected TVET institutions.

Structured questionnaires containing structured questions with statements related to the study objectives were used to collect information from the respondents.

The questionnaires were administered to the TTI's administrators, and principals, deputy principals, and registrars to gather their perception of the implementation of the Dual VET model. The questionnaires administered to the trainers and supervisors sought to determine their views and involvement in discharging the responsibilities of dual instruction. The last questionnaire was administered to the trainees to determine their perceptions of the dual VET model.

3.7 Data Collection Procedure.

The data collection process for this study was comprehensive and methodical, beginning with obtaining necessary clearances from Moi University and NACOSTI. To manage the large number of respondents efficiently, the researcher enlisted the help of research assistants. These assistants were thoroughly trained on the study's purpose, objectives, and ethical considerations, ensuring they could approach respondents appropriately, establish rapport, and maintain ethical standards throughout the data collection process. The assistants' involvement extended to participating in the pilot study, which familiarized them with the research instruments and procedures.

The sampling strategy employed stratified random sampling to ensure accurate representation of the population within the TVET institutions. This method involved dividing the target population into homogeneous and exclusive segments, from which random samples were drawn. The researcher obtained permission from each TVET institution and company before commencing data collection. Respondents were equally distributed across their respective years of study, and specific classes were identified for sourcing participants. Upon completion of data collection, the questionnaires were collected, serialized, and prepared for verification and analysis, demonstrating a systematic approach to data management and preparation for subsequent research phases.

3.8 Validity and Reliability of research instruments

3.8.1Instrument Validity

The validity of research instruments refers to the accuracy with which the research tool measures what it is intended to measure. An instrument with a higher accuracy is said to be valid, while an instrument with a lower accuracy in measuring what it is intended to measure is said to be less valid. Content validity is the extent to which the research instruments cover the key areas where the researcher would want to solicit information from respondents. Content validity was ensured by subjecting the tools to the expert opinions of the study supervisors. To ensure construct validity, this study properly defined the research variables and ensured that they were compatible with previous studies.

3.8.2Instrument Reliability

Reliability measures the consistent ability of the research instruments to give similar results with minimal standard deviation when administered on the same sample or phenomena at different times by a different researcher (Ekinci, 2015). Highly consistent instruments are desirable to minimize errors due to instrumentation. The study employed a test and then a re-test technique to ensure the instruments were reliable, where the score of the two tests was computed by determining their Karl Pearson's product moment coefficient of correlation. A positive score of $r \geq 0.7 \leq 1$ indicated that the tools were reliable. The reliability correlation coefficient was determined using Karl Pearson's Correlation co-efficient formula, as indicated herein:

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

Eqn. 3.1

Where;

r= reliability correlation coefficient

n =10% of sample size

x= total score of test-administration

y=total score of retest-administration

3.9 Pilot study

A pilot study was conducted at the Ekerubo Gietai Technical Training Institute in Nyamira County. The institution was chosen for piloting because it was involved in the piloting phase of dual training within the region. Mugenda and Mugenda (2013) opined that between 1 and 10% of the research instruments are adequate for pretesting and yield reliable data that can assess how reliable the instruments are in a study. The study proposed to pre-test 3% of the trainees and trainers within the institution. The data collected from the pilot test were subjected to the Cronbach's alpha test, and items in the data collection instruments were set until an internal reliability coefficient of 0.74 and 0.73 for trainees and trainees, respectively, was attained and adopted. The results of the pilot study were used to refine the research instruments and ensure their reliability for the main study. This process helped to identify any potential issues or ambiguities in the questionnaires and interview guides, allowing for necessary adjustments before full-scale implementation. The final versions of the instruments were then distributed to the larger sample population, ensuring that the data collected would be both valid and reliable for addressing the research objectives.

3.10 Data Analysis Technique

This study employed quantitative data analysis techniques. The quantitative data, collected through questionnaires, underwent a rigorous process of error checking, coding, and entry into a statistical software package**,** Statistical Package for Social Sciences (SPSS) version 24where it was subsequently analyzed. Descriptive statistics, including measures of central tendency, distribution, frequencies, and cross-tabulations, were used to perform quantitative analysis and compare data across various respondent categories. The results of the analysis are presented through tables, figures, and charts to facilitate a clearer interpretation. Finally, the findings were summarized according to the specific objectives of the study.

3.11 Ethical Considerations

Ethics are defined as norms, artifacts, and values for behavior that define what is morally acceptable in society and what is deemed unacceptable for a particular group. Ethical considerations are important because they help uphold the dignity of the study and enhance the acceptability of the study results, such that allegations of misrepresentation, falsification, and fabrication of research data cannot stand, while also promoting truthfulness and minimization of errors (Wisdom and Creswell, 2013).

The study was guided by ethical considerations before, during, and after the exercise. First, the researcher sought permission from the university's research department by obtaining data collection clearance and an introduction letter. Second, the researcher applied for a research permit from the National Commission of Science, Technology, and Innovation (NACOSTI). Next, permission was obtained from the administration of each TVET institution and company to be included in this study. Before any questionnaire was administered, the permission of the respondents was sought. Those who did not want to be included in the study for any reason were not coerced into filling out the questionnaire. The administration of the questionnaire was terminated upon the request of non-continuation by the respondents for whatever reasons. The respondents were also given a chance to ask questions related to the study. To ensure that the information provided remained private and confidential, no personal details were recorded in the questionnaires. The respondents were assured that all the information obtained would be used for academic purposes only.

3.12 Summary

This chapter presents the research methodology employed in this study. The data collection instruments were presented, the procedures for data collection and sample sizes were also presented as well as the analysis that followed data collection was also presented.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1. Introduction

This chapter uses a descriptive survey approach to synthesize empirical data and variable findings to assess stakeholders' perceptions of the dual training model. This study aimed to determine selected TVET institutions' perceptions of the introduction and implementation of the Dual Vocational Education and Training Model. Evaluated the perspectives of trainers and trainees on the dual training model. The companies' involvement in implementing the dual VET model was evaluated in this study. Established government involvement in the successful implementation of dual VET.

The participants' characteristics are shown first in the analysis. The findings and results of the respondents' backgrounds are presented. Finally, a description of the study variables is presented.

4.2. Response Rate

The study sought to collect data from 144 respondents, including trainers, supervisors, and trainees in TVET institutions in the study region. Of the 144 questionnaires issued, 86 trainees, 18 trainers, and 15 industry supervisors' questionnaires were returned and found fit for analysis. This represented a response rate of 87%, since Mugenda and Mugenda (2013) opined that a response rate of above 50% is considered adequate and the results can be used to draw conclusive deductions in the study.

4.3. Participants characteristics

4.3.1. TVET trainee respondents

Table 4.1. Demographic overview of the TVET trainee respondents

		Count	Column N %
Gender of trainees	Male	66	77
	Female	20	23
Age of trainees	18 – 27	76	88
	28 – 37	9	10
	38 – 47	1	1
	48 – 57	0	0
Level of study of trainees	Artisan	0	0
	Craft	16	19
	Diploma	14	16
	CBET Level 5	52	60
	CBET Level 6	4	5
Year of study of trainees	One	20	23
	Two	60	70
	Three	6	7

The table 4.1 shows majority of TVET trainees were male 66 (77%). Females represented a smaller proportion of the sample 20 (23%). In terms of age distribution, the majority fell within the 18–27 age range, accounting for 88% of the trainee population. Older age groups, particularly those above 28 years, were rarely present (N = 1). Regarding the level of study, most of the trainee respondents were enrolled in CBET Level 5 programs, constituting 60% of the total, followed by Craft programs at 19% and Diploma programs at 16%. The CBET Level 6 and Artisan programs had the lowest representation, accounting for 5% and 0%, respectively. In terms of the year of study, the majority were second-year trainees (70%), followed by first-year (23%) and third-year trainees (7%).

4.3.2. TVET trainers and industry supervisors

Table 4.2. Demographic overview of the TVET trainers and industry supervisors

		Count	Column N %
Gender of trainer/supervisor	Male	21	64
	Female	12	36
Age of trainer/supervisor	18 - 27	3	9
	28 - 37	11	33
	38 - 47	10	30
	48 - 57	9	27
Trainer/supervisor qualification	Craft	7	21
	Diploma	13	39
	HND	6	18
	Degree	6	18
	Masters	1	3
	PhD	0	0
Trainer/Supervisor work experience	0-5	12	36
	5-10	13	39
	10-15	4	12
	Above 15	4	12

The table 4.2 above on gender distribution among trainers and supervisors indicates a higher presence of males, comprising 21 (64%) of the total number of respondents (N = 86), while females represented 12 (36%). Their distribution by age was relatively even across different brackets, with the highest concentration falling within the 28–47 range, collectively making up 90% of the demographic. However, there was still a notable representation of individuals aged 18–27 years, accounting for 9% of the group. In terms of qualifications, the majority held diplomas (39%) or crafts (21%), followed by Higher National Diploma (HND) (18%) and degrees (18%). Notably, there were trainers and supervisors with higher academic achievements, such as a Master's degree (3%), but none in the sample possessed a PhD. Regarding work experience, there was a fairly even distribution across different ranges, with 36% having 0-5 years, 39% having 5-10 years, and the remaining 24% having over 10 years, with equal proportions for the groups, those who had between 10 and 15 years and those who had over 15 years of experience.

4.4. Implementation of the dual VET model at TVET institutions

4.4.1. Trainees' perceptions on the implementation of the Dual VET model at the institutional level

Table 4.3: Students' perceptions on the implementation of the Dual VET model at the institutional level

Variables	N	M	SD
The training is relevant for industry application	86	4.35	.699
The syllabus is applicable to the industry	86	4.14	.814
There is adequate training infrastructure for training the workshops and laboratories	86	3.56	1.113
Workshops are well equipped for practical	86	3.60	1.120

The analysis on table 4.3 sought to determine the perception of TVET students regarding the implementation of the Dual VET model at their different institutes. The variables analyzed were (a) the relevance of training for industry application, (b) the applicability of the syllabus to the industry, (c) the adequacy of training infrastructure, and (d) the extent to which the workshops and laboratories were well-equipped for practical learning. The students provided their perspectives on these aspects using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Regarding the relevance of training for industry application, the students had a positive rating ($M = 4.35$, $SD = 0.699$). Regarding the syllabus's applicability to the industry, the students similarly had a positive rating ($M = 4.14$, $SD = 0.814$). The perception of the adequacy of training infrastructure was moderately positive, slightly lower than other aspects, with a mean score indicating a generally favorable view ($M = 3.56$, $SD = 1.113$). The students similarly held a positive view regarding how well-equipped the workshops were, with a mean score indicating a favorable view ($M = 3.60$, $SD = 1.120$). Therefore, this analysis answers the question of the extent to which the TTI has implemented a dual VET model in Kenya as moderately positive, considering the weighted average of perceptions (3.91).

The findings of this analysis indicate a generally positive perception among TVET students regarding the implementation of the Dual VET model in Kenya. While students expressed high satisfaction with the relevance of training and syllabus applicability to industry needs, their views on infrastructure adequacy and workshop equipment were slightly less favorable, though still positive. The overall weighted average perception score of 3.91 suggests that the implementation of the Dual VET model in Kenyan TTIs is moderately successful. These results provide valuable insights for policymakers and educators to further enhance the Dual VET system, particularly in areas of infrastructure and practical learning facilities, to better align with industry requirements and student expectations.

Table 4.4: Association of student demographic details with the view that TVET training is relevant for industry application (sex: AT1; age: AT2; study level: AT3; academic year: AT4)

								95% Confidence Interval	
		Estimate	Odds Ratio	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[BT5 = 2]	-2.371		1.727	1.885	1	.170	-5.757	1.014
	[BT5 = 3]	-1.052		1.623	.420	1	.517	-4.233	2.130
	[BT5 = 4]	1.592		1.613	.975	1	.323	-1.568	4.753
Location	AT1	.560	1.751	.533	1.107	1	.293	-.484	1.604
	AT2	.515	1.674	.615	.704	1	.402	-.689	1.720
	AT3	.053	1.054	.259	.041	1	.839	-.454	.560
	AT4	-.031	.970	.421	.005	1	.942	-.857	.796

Ordinal regression analysis as shown in table 4.4 was conducted to predict TVET students' perceptions of the implementation of the dual VET model based on their sex (AT1), age (AT2), study level (AT3), and academic year (AT4). The variables used were: a) the training is relevant for the industry, b) the syllabus applies to the industry, c) there is adequate training infrastructure in workshops and laboratories, and d) workshops are well equipped for practical learning. The analysis did not significantly link any of the students' demographic data to any of the variables. However, the model revealed key connections between student traits and variables for future examination.

Positive perceptions regarding variables (a) and (b) were more linked to female students (coded 2) (a: $\beta = 0.560$, $p = 0.293$; b: $\beta = 0.440$, $p = 0.394$). Similar views were more connected with male students (coded 1) for variables (c) and (d) (c: $\beta = -0.733$, $p = 0.136$;

d: β = -0.277, p = 0.571). Older students were more likely to have positive views on the implementation of the dual VET model than younger students (a: β = 0.515, p = 0.402; b: β = -0.522, p = 0.375; c: β = 0.952, p = 0.113). Students across the different study levels held diverse views; positive views were more linked to students at higher levels for variables (a: β = 0.053, p = 0.839; d: β = 0.010, p = 0.966), while similar opinions were more expressed by students at lower levels for variables (b: β = -0.025, p = 0.920; c: β = -0.143, p = 0.555). Except for the view that the syllabus applies to the industry (b: β = 0.626, p = 0.134), students who recently joined the TVET institutions expressed more positive views regarding the implementation of the dual VET model than their seniors (a: β = -0.031, p = 0.942; c: β = -0.327, p = 0.410; d: β = -0.617, p = 0.124).

4.5. Implementation of the dual VET model in the industry

Table 4.5: Perceptions of trainers and supervisors on implementation of the Dual VET model

Variables	N	M	SD
Training is conducted in accordance to training plan	33	3.82	.846
The curricular meet the labor needs	33	3.64	.929
Training equipment are adequate for trainees	33	2.36	.783
Workshops are spacious and enough to handle practical	33	2.09	.723
Training skills corresponds to industry needs	33	3.67	.777
Practicum trainings reinforce the TVET trainees’ skills	33	3.7273	.83937

This analysis in table 4.5 sought to determine the perceptions of TVET trainers and industry supervisors regarding the implementation of the Dual VET model at the industry level in Kenya. The analysis focused on (a) adherence to the training plan, (b) curricula meeting labor market demands, (c) adequacy of training equipment for trainees, (d) adequacy and spaciousness of workshops for practical sessions, (e) correspondence of training skills to industry needs, and (f) reinforcement of the trainees' skills through practicum training. The results indicate a range of perceptions (a: $M = 3.82$, $SD = 0.846$; b: $M = 3.64$, $SD = 0.929$; c: $M = 2.36$, $SD = 0.783$; d: $M = 2.09$, $SD = 0.723$; e: $M = 3.67$, $SD = 0.777$; f: $M = 3.73$, $SD = 0.839$). Consequently, the answer to the question, To what extent has the industry implemented the dual VET model in Kenya? is moderate, given the weighted average of the mean perceptions (3.22).

The findings of this analysis reveal a mixed implementation of the Dual VET model at the industry level in Kenya. While some aspects, such as adherence to the training plan and reinforcement of skills through practicum training, show relatively positive perceptions, others, particularly the adequacy of training equipment and workshop spaces, indicate significant room for improvement. The overall moderate implementation level (weighted average of 3.22) suggests that while progress has been made, there are still challenges to be addressed to fully realize the potential of the Dual VET model in Kenya. These results provide valuable insights for policymakers, educational institutions, and industry stakeholders to focus their efforts on enhancing the areas that require attention, ultimately strengthening the alignment between vocational education and industry needs.

Table 4.6. Prediction of trainers and supervisors that the training is conducted according to the training plan

		Estimate	Odds Ratio	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Threshold	[DT14 = 2]	-3.516		1.762	3.983	1	.046	-6.969	-.063
	[DT14 = 3]	-1.678		1.639	1.047	1	.306	-4.891	1.535
	[DT14 = 4]	1.093		1.623	.453	1	.501	-2.089	4.274
Location	AT1	-.316	.729	.532	.352	1	.553	-1.359	.728
	AT2	1.029	2.797	.644	2.548	1	.110	-.234	2.292
	AT3	.148	1.160	.262	.321	1	.571	-.365	.662
	AT4	-.519	.595	.431	1.454	1	.228	-1.363	.325

Ordinal regression analysis was also conducted as in the table 4.6 above to predict trainers' and supervisors' perceptions of the implementation of the dual VET model. The statements analyzed were: (a) the training is conducted according to the training plan, (b) the curricula meet the labor market, (c) the training equipment is adequate for the trainees, (d) workshops are spacious enough to handle practical sessions, (e) training skills correspond to industry needs, and (f) practicum training reinforces the trainees' skills. The trainers and supervisors' demographic data were used as covariates in the analysis. Demographics included sex, age, qualification, and work experience.

The analysis significantly proved that the age, qualifications, and work experience of trainers and supervisors were predictors of their perceptions of the Dual VET model's implementation. Age was significantly linked to the view that training is conducted according to the training plan (a: $\beta = -1.656$, $p = 0.009$), with more positive opinions associated with younger trainers and supervisors, and the perception that training skills correspond to industry needs (e: β = 1.279, p = 0.032), whereby more positive views were expressed by older trainers and supervisors. Qualification was significantly and positively linked to three variables (b: β = 1.064, p = 0.008; e: β = -0.806; p = 0.044; f: β = 1.332, p = 0.003). Experience was significantly negatively associated with the view that training skills correspond to industry needs (e: β = -1.500, p = 0.016), indicating that there could be more skill gaps in consciousness among the more experienced trainers and supervisors than their junior, newly recruited colleagues. Although sex was not significantly correlated with the perceptions of the implementation of the Dual VET model, there was an indication that male trainers and supervisors held more positive views (b: β = -0.292, p = 0.698; c: β = -0.161, p = 0.843; d: β = -0.271, p = 0.720; e: β = -0.431, p = 0.580; f: β = -0.621, p = 0.439).

4.6. Industry involvement in the implementation of the dual VET model

4.6.1. TVET trainers and firm supervisors' engagement

Table 4.7: Students' perceptions of trainers and firm supervisors' engagement in the dual VET model

Variables	N	M	SD
There is adequate hands-on experience for the TVET trainees	86	4.05	.810
Institution exposes the trainees to sufficient practical training	86	3.80	.968
The trainers are well qualified to impart the instructions	86	4.09	.730
Every trainee is assigned a supervisor during in-firm training	86	4.1279	.86496

The analysis in table 4.7 sought to determine the perception of TVET students regarding their engagement with TVET trainers and firm supervisors in the context of the Dual VET model implementation in Kenya. The analysis focused on (a) the adequacy of hands-on experience, (b) exposure to sufficient practical training, (c) instructor qualifications, and (d) supervision during in-firm training. Perceptions were captured using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The students generally perceived the hands-on experience provided in dual VET programs to be adequate (M = 4.05, SD = 0.810). The students also perceived the instructors to be well qualified to impart instructions (M = 4.09, SD = 0.730). The provision of supervisors during in-firm training also received a relatively high mean rating (M = 4.13, SD = 0.865), indicating that the students felt adequately supported and guided during their practical training placements. While still favorable, the students' perception of their exposure to sufficient practical training was slightly lower (M = 3.80, SD = 0.968).

The findings of this analysis reveal generally positive perceptions among TVET students regarding their engagement with trainers and firm supervisors in Kenya's Dual VET model. Students expressed high levels of satisfaction with the adequacy of hands-on experience, instructor qualifications, and supervision during in-firm training. While the perception of exposure to sufficient practical training was slightly lower, it remained favorable. These results suggest that the Dual VET model in Kenya is largely successful in providing quality practical training and support to students. However, there may be room for improvement in ensuring students receive sufficient practical training exposure.

Table 4.8: Perceptions of the trainers and supervisors on their engagement in the dual VET model

Variables	N	M	SD
There is adequate hands-on experience for the trainees	33	3.36	.822
Institution exposes the trainees to sufficient practical training	33	3.00	.935
The trainers are well qualified to impart the instructions	33	3.94	.609
Every trainee is assigned a supervisor during in-company training	33	2.94	.933
The syllabi are taught by specialists completely	33	3.58	.751
Supervisors are guided by approved course units for quality	33	3.94	.659

The analysis in table 4.8 sought to determine the perception of TVET instructors and firm supervisors regarding their engagement with TVET students under the Dual VET model. The data collected using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) focused on (a) adequate hands-on experience for trainees, (b) exposure to sufficient practical training, (c) qualifications of trainers, (d) assignment of supervisors during in-firm training, (e) teaching of syllabi by specialists, and (f) guidance provided to supervisors. The TVET instructors and firm supervisors both perceived the provision of hands-on experience for trainees as moderately positive (M = 3.36, SD = 0.822). The perception of exposure to sufficient practical training was neutral (M = 3.00, SD = 0.935). Both instructors and supervisors perceived the trainers to be well qualified to impart relevant instructions to the trainees about the VET model (M = 3.94, SD = 0.609). The assignment of supervisors during in-firm training was less favorably perceived (M = 2.94, SD = 0.933). The perception that the syllabi were taught by specialists was moderately positive (M = 3.58, SD = 0.751). The guidance provided to supervisors on approved course units for quality dual VET training was perceived positively (M = 3.94, SD = 0.659).

The findings reveal a mixed perception of the Dual VET model among TVET instructors and firm supervisors. While certain aspects, such as the qualifications of trainers and guidance provided to supervisors, were viewed positively, other elements like the assignment of supervisors during in-firm training and exposure to sufficient practical training received less favorable ratings. These results highlight areas of strength in the current implementation of the Dual VET model, as well as potential areas for improvement. Further research and targeted interventions may be necessary to address the identified gaps and enhance the overall effectiveness of the Dual VET program in providing comprehensive vocational education and training.

4.6.2. Industry collaboration

Table 4.9: Students' perceptions of industry involvement in the Dual VET model

Variables	**N**	**M**	**SD**
All trainees pursuing apprenticeship training are assigned a role under supervision	86	4.16	.838
Trainees are fully satisfied with the level of collaboration with the industry	86	4.17	.706
Industry training sufficiently reinforces the trainees' skills and experience	86	4.24	.702
Trainees are adequately instructed during apprenticeship training	86	4.28	.680
Trainees are attached to skilled supervisors	86	4.30	.652

A descriptive analysis was conducted as shown in table 4.9 to determine the perception of TVET students on the involvement of industry in their training under the dual VET model. The analysis focused on (a) assignment of roles under supervision, (b) satisfaction with industry collaboration, (c) reinforcement of skills and experience through industry training, (d) quality of instruction during the apprenticeship, and (e) attachment to skilled supervisors. The students notably expressed the following positive perceptions of the involvement of industry in their training under the dual VET model (a: $M = 4.16, SD = 0.838$; b: $M = 4.17, SD = 0.706$; c: $M = 4.24$, $SD = 0.702$; d: $M = 4.28$, $SD = 0.680$; e: $M = 4.30$, $SD = 0.652$).

The findings reveal a consistently positive perception among TVET students regarding industry involvement in their training under the dual VET model. Students expressed high levels of satisfaction across all evaluated aspects, with mean scores ranging from 4.16 to 4.30 on a 5-point scale. Notably, students particularly valued the attachment to skilled supervisors and the quality of instruction during their apprenticeships. These results underscore the effectiveness of the dual VET model in providing meaningful industry experiences and reinforcing students' skills.

Table 4.10: Perceptions of trainers and supervisors on TVET institution and industry collaboration

Variables	N	M	SD
All trainee pursuing in-company training is assigned a role under supervision	33	3.03	1.185
You are fully satisfied with the level of collaboration with the industry	33	2.85	.755
Industry training sufficiently reinforces the trainee's skills and experience	33	3.58	1.001
Trainees are adequately instructed during in-company training	33	4.03	4.18
Trainees are attached to skilled supervisors	33	.684	.635

A similar analysis was conducted as shown in table 4.10 to determine the perceptions of TVET instructors and industry supervisors regarding the involvement of the industry in the Dual VET model in Kenya. The analysis focused on (a) trainees' in-firm assignment of roles under supervision, (b) satisfaction with industry collaboration, (c) reinforcement of skills and experience through industry training, (d) quality of instruction during in-company training, and (e) attachment to skilled, supervisors. The respondents perceived the assignment of roles under supervision as moderate (M = 3.03, SD = 1.185). Their satisfaction with collaboration between TVET institutions and industry was lower (M = 2.85, SD = 1.001). Both the TVET instructors and industry supervisors perceived the quality of instruction during in-firm training positively (M = 4.03, SD = 0.684). Similarly, they held a positive view of the industry's involvement in the Dual VET model regarding the attachment of TVET trainers (M = 4.18, SD = 0.635).

The analysis of TVET instructors' and industry supervisors' perceptions reveals mixed results regarding industry involvement in Kenya's Dual VET model. While the assignment of roles under supervision and satisfaction with industry collaboration were perceived as moderate to low, the quality of instruction during in-firm training and attachment of TVET trainers were viewed positively. These findings highlight areas of strength in the current implementation of the Dual VET model, as well as opportunities for improvement in enhancing collaboration between TVET institutions and industry partners.

4.7. Government involvement in the implementation of the Dual VET model

Table 4.11: Students' perceptions of government involvement in dual VET model implementation

Variables	N	M	SD
Workshops and laboratory equipment are funded by the government in TVET institutions	86	3.44	.989
The Government employs qualified trainers in TVET institutions	86	4.01	.819
The Government facilitates equality and access to training for all students in the country	86	3.71	.838

A descriptive analysis was performed as in table 4.11 to determine the perception of TVET students regarding government involvement in the dual VET model implementation in Kenya. The data analyzed, which were collected using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), focused on the following government interventions: (a) funding of workshops and laboratory equipment, (b) employment of qualified trainers, and (c) facilitation of equality and access to training for all TVET students in the country. Although the students positively perceived the statement that the government has employed qualified trainers in the TVET institutions (M = 4.01, SD = 0.819), their views regarding the statements that workshops and laboratory equipment are funded by the government and that the government facilitates equality and access to training to all students in the country were low (a: M = 3.44, SD = 0.989; c: M = 3.71, SD = 0.838).

The analysis reveals mixed perceptions among TVET students regarding government involvement in the dual VET model implementation in Kenya. While students strongly acknowledge the government's efforts in employing qualified trainers, their views on funding for workshops and laboratory equipment, as well as facilitating equal access to training, are less favorable. These findings suggest that while progress has been made in certain areas, there is room for improvement in others. Future policy decisions and resource allocation should consider these perceptions to enhance the overall effectiveness of the dual VET model in Kenya and ensure a more comprehensive and equitable approach to TVET education.

Table 4.12: Prediction that the government employs qualified trainers based on the TVET students' sex (AT1), age (AT2), study level (AT3), and academic year (AT4)

		Estimate	Odds Ratio	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Threshold	[FT18 = 1]	-6.195		1.679	13.614	1	.000	-9.487	-2.904
	[FT18 = 2]	-4.575		1.587	8.306	1	.004	-7.686	-1.464
	[FT18 = 3]	-2.749		1.534	3.210	1	.073	-5.756	.258
	[FT18 = 4]	-.923		1.517	.370	1	.543	-3.896	2.051
Location	AT1	-.312	.732	.495	.398	1	.528	-1.281	.657
	AT2	-.990	.372	.571	3.006	1	.083	-2.108	.129
	AT3	-.314	.730	.246	1.633	1	.201	-.796	.168
	AT4	-.108	.898	.398	.074	1	.786	-.888	.672

Ordinal regression analysis was also conducted as shown in table 4.12 to predict the demographic characteristics of TVET students significantly linked to perceptions of government involvement in the implementation of the dual VET model in Kenya. The government interventions analyzed included: (a) the assertion that workshops and laboratory equipment are funded by the government; (b) the belief that the government employs qualified trainers in the TVET institutions; and (c) the perception that the government facilitates equality and access to training for all TVET students in the country. The analysis did not significantly associate any of the students' demographic traits with their perceptions of government involvement in the dual VET model implementation in Kenya.

However, there was an indication that, except for the view that the government employs qualified trainers in the TVET institutions, the male students expressed themselves more positively on government involvement in the dual VET model implementation in the country (a: β = -0.312, p = 0.528; b: β = 0.821, p = 0.116; and c: β = -0.242, p = 0.629). The analysis also associated younger students with more positive views regarding the assertion that workshops and laboratory equipment are funded by the government and the belief that the government employs qualified trainers in TVET institutions (a: β = -0.990, p = 0.083; b: β = -0.735, p = 0.209; c: β = -0.242, p = 0.629). Similarly, the analysis connected students at lower levels of dual VET training with the perceptions that workshops and laboratory equipment are funded by the government and that the government employs qualified trainers in TVET institutions (a: β = -0.314, p = 0.201; b: β = -0.042, p = 0.868; and c: β = 0.247, p = 0.318). Notably, the perception that the government facilitates equality and access to training for all students in the country was expressed more by those who recently joined the TVET institutions than by the more senior students in the system (a: β = -0.108, p = 0.786; b: β = -0.795, p = 0.060; c: β = -0.162, p = 0.687).

Table 4.13: Perceptions of the trainers and supervisors on government intervention in the dual VET

Variables	N	M	SD
Workshops and laboratory equipment are funded by the government in TVET institutions	33	3.15	.834
The Government employs qualified trainers in TVET institutions	33	4.24	.502
The Government facilitates equality and access to training for all trainees	33	3.94	.659

A similar analysis as in table 4.13 was performed to determine the perception of TVET instructors and industry supervisors on government involvement in the implementation of the dual VET model. The data collected using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) focused on (a) government funding for workshops and laboratory equipment, (b) employment of qualified trainers, and (c) facilitation of equality and access to training for all TVET students in the country. Perceptions of the workshops and laboratory equipment funding and the facilitation of equality and access to training were moderately positive (a: M = 3.15, SD = 0.834; c: M = 3.94, SD = 0.659) whereas the opinion on employment of qualified trainers was positive (M = 4.24, SD = 0.502).

The analysis reveals varying perceptions of government involvement in implementing the dual VET model. While there is strong agreement on the government's role in employing qualified trainers, opinions on funding for workshops and laboratory equipment are more moderate. The facilitation of equality and access to training for all TVET students is viewed positively, albeit with some reservations. These findings suggest areas where government efforts are well-received and others that may require further attention or improvement to enhance the overall effectiveness of the dual VET system.

Table 4.14: Prediction of the trainers and supervisors' perception that the government employs qualified trainers in TVET institutions

		Estimate	Odds Ratio	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Threshold	[FTS23 = 3]	-3.557		2.650	1.802	1	.179	-8.751	1.637
	[FTS23 = 4]	1.929		2.436	.627	1	.428	-2.844	6.703
Location	ATS1	-.712	.491	1.037	.471	1	.493	-2.744	1.321
	ATS2	2.084	8.040	1.050	3.942	1	.047	.027	4.142
	ATS3	-.015	.985	.448	.001	1	.973	-.893	.863
	ATS4	-2.025	0.132	1.032	3.847	1	.050	-4.049	-.001

Ordinal regression analysis was also conducted to correlate the TVET trainer and supervisor demographic data with their perceptions of government involvement in the implementation of the dual VET model in Kenya. The following statements were analyzed: (a) workshops and laboratory equipment are funded by the government in TVET institutions; (b) the government employs qualified trainers in TVET institutions; and (c) the government facilitates equality and access to training for all students in the country. The analysis significantly proved that the age, qualification, and work experience of trainers and supervisors were predictors of their perceptions of the different government interventions. The trainers and supervisors' age was significantly positively linked to the employment of qualified trainers' intervention ($\beta = 2.084$, $p = 0.047$), a perception that was, however, negatively correlated with their work experience ($\beta = -2.025$, $p = 0.050$). The qualification of the trainers and supervisors negatively predicted the claim that workshops and laboratory equipment are funded by the government in TVET institutions ($\beta = -0.753$, $p = 0.651$).

Although sex was not significantly associated with perceptions of any of the government interventions, male trainers and supervisors expressed more positive perceptions of government involvement in the implementation of the dual VET model in Kenya (a: $\beta = -0.716$, $p = 0.350$; b: $\beta = -0.712$, $p = 0.493$; c: $\beta = -0.791$, $p = 0.327$). Table 4.5.4. predicts the trainers' and supervisors' views on the assertion that the government supports the dual VET model implementation by employing qualified trainers in TVET institutions. The demographics included sex (ATS1), age (ATS2), qualifications (ATS3), and work experience (ATS4).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary of the findings based on the study objectives, conclusions of the study, recommendations based on the research findings, and suggestions for further research.

5.1. Summary

This section presents the summarized research findings on the perception of the introduction of dual vocational education and training at selected Technical and Vocational Education and Training (TVET) institutions and companies in Western Kenya.

i) Participants' Characteristics

The research findings revealed that a significant majority of the TVET trainees were male (77%), with females representing only 23% of the sample. Most participants were aged between 18 and 27 years, accounting for 88% of the trainee group, while minimal representation was found among older age groups (28 years and above). The majority of trainees are enrolled in Competency-Based Education and Training (CBET) Level 5 programs (60%), while others are engaged in Craft and Diploma programs. Within this context, most participants were in their second year of study.

Trainers and supervisors also show a comparable gender bias, with 64% male and 36% female. The age distribution among trainers is more diverse, with a significant proportion

(90%) aged between 28 and 47. In terms of academic qualifications, trainers include a variety: diplomas (39%), crafts (21%), Higher National Diplomas (HNDs), and degrees (18% each), with only a small fraction holding a Master's degree (3%). The trainers' work experience varied, with substantial experience distributed across those with 0-5 years, 5-10 years, and over 10 years of training.

ii) Perceptions of the Dual VET Model

Both TVET instructors and firm supervisors expressed a moderately positive view of the hands-on experience provided by the dual VET model. Although there was a neutral response regarding the sufficiency of practical training exposure, this highlights potential gaps in the effectiveness of practical training. Instructors and supervisors are perceived to be well-qualified in imparting necessary instructions, although the assignment of supervisors during in-company training is viewed less favorably by students.

In terms of industry collaboration, students perceive substantial industry involvement through structured role assignments, satisfactory collaboration levels, and ample skill reinforcement through training. Feedback indicated a positive view of the guidance and supervisory support provided during training.

iii) Implementation at Industry Level

The assessment of VET model implementation in industries focuses on adherence to training plans and curriculum relevance to labor market demands. The results indicate moderate satisfaction levels regarding the extent of implementation, with some gaps identified in the adequacy and spaciousness of the training equipment and workshops.

iv) Implementation at Institutional Level

Students' perspectives on the dual VET model reveal positive views regarding its relevance to industry applications and how well the syllabus aligns with industry needs. The infrastructure for training workshops and laboratories is generally viewed as moderately adequate, suggesting areas for improvement. Student feedback indicates effective implementation but also highlights opportunities for enhancement.

v) Industry Involvement

Students rated the role of industries positively in assigning trainees to appropriate roles and enhancing their skills through hands-on training. They appreciate the level of industry collaboration but identify areas for better coordination and more clearly defined role assignments. Trainers and supervisors also held a positive view of industry involvement, although opinions on the depth of collaboration varied slightly.

vi) Government Involvement

The perceived role of the government in implementing dual VET includes funding for institutional equipment, employing qualified trainers, and ensuring equitable access to training. Students expressed positive sentiments regarding the government's role in hiring capable trainers. However, there were lower levels of satisfaction regarding funding and accessibility initiatives. Trainers and supervisors have similar perceptions, with notable support for government contributions related to trainer employment.

5.2. Conclusion

The findings from this study provide valuable insights into the implementation of the Dual VET model in Kenya from the perspectives of students, trainers, and industry supervisors. The analysis reveals both strengths and areas for improvement in the current system.

Overall, the implementation of the Dual VET model in Kenya appears to be moderately successful, with generally positive perceptions from students regarding the relevance of training and industry application. However, there are notable gaps in infrastructure and practical learning facilities that need to be addressed to better align with industry requirements and student expectations.

The industry involvement in the Dual VET model shows mixed results. While students expressed high satisfaction with their industry experiences, trainers and supervisors identified areas for improvement, particularly in the assignment of supervisors during in-firm training and exposure to sufficient practical training.

Government involvement in the Dual VET model implementation also received mixed perceptions. While efforts in employing qualified trainers were acknowledged, funding for workshops and laboratory equipment, as well as facilitating equal access to training, were areas identified for improvement.

These findings highlight the need for continued collaboration between TVET institutions, industry partners, and the government to enhance the effectiveness of the Dual VET model in Kenya. Future policy decisions and resource allocation should focus on addressing the identified gaps, particularly in infrastructure, practical training opportunities, and ensuring equitable access to quality vocational education and training for all students.

5.3. Recommendations

Based on the findings of the study, it is clear that for successful implementation of the dual training model, stakeholders can work collaboratively to strengthen the Dual VET model in Kenya, address existing challenges, and maximize its potential to equip learners with relevant skills for the labor market, promote inclusive education, and support national development goals. As a result, the researcher has devised the following suggestions:

1. Aligning curricula with industry demands is vital for creating a skilled workforce and ensuring technological proficiency, adaptability, safety, compliance, soft skills, and entrepreneurship knowledge. Continuous collaboration between TVET institutions and industry stakeholders is essential for keeping training programs relevant. Regular industry consultations and curriculum reviews can help strengthen this alignment.
2. Addressing inadequate training infrastructure and equipment requires increased investment. Government funding, public-private partnerships, and grants can enhance workshop facilities and ensure access to modern resources for practical training purposes.
3. Improving supervision and quality assurance during practical training is crucial for the Dual VET model's success. Clear guidelines, mentorship programs, and regular evaluations can uphold the quality standards and support trainees and supervisors.

4. Strengthening collaboration among government agencies, industry partners, TVET institutions, trainers, and trainees is crucial for implementing the Dual VET model. Regular communication and joint initiatives can facilitate the achievement of shared goals.

5.5 Areas of Further Research

The purpose of this study was to determine perception of selected TVET institutions and companies on introduction of dual vocational education and training in Kenya

This study examined four variables: curriculum relevance, infrastructure challenges, industry collaboration, and government intervention. However, there is need for further research on the following;

1. Effective methods for continuous curriculum alignment with rapidly evolving industry demands
2. Impact of improved training infrastructure on student outcomes and employability

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APPENDICES

Appendix I: Introduction Letter

Claude Juma Ochwila

Department of Technology Education, School of Education

Moi University

P. O. BOX 3900 - 30100

ELDORET

3thJune, 2023

TO WHOM IT MAY CONCERN

I am Claude Juma Ochwila, a master's student in the Department of Technology Education, School of Education, Moi University. I have completed my course work and I am embarking on my research on the**PERCEPTION OF INTRODUCTION OF DUAL VOCATIONAL EDUCATION AND TRAINING AT SELECTED TVET INSTITUTIONS AND COMPANIES IN WESTERN REGION, KENYA**

You have been selected to participate in this study by completing a questionnaire. You are requested to answer all questions as objectively as possible. Be assured that all the information provided will be treated with the utmost confidentiality it deserves, and anonymity is guaranteed.

I sincerely thank you for your anticipated cooperation as you give this exercise your utmost attention and time out of your busy schedule.

Yours faithfully,

Claude Juma Ochwila

MTED/6000/22

Appendix II: Questionnaire for TVET Trainees

This study examines the extent to which TVET institutions and firms have implemented the Dual VET model. This study aimed to establish stakeholders' perceptions of the Dual VET model's introduction and implementation. The results of this study will inform policies on dual instruction in TVETs. Therefore, I request your assistance in completing the questionnaire to achieve the study goal. I assure you of your anonymity and the concealment of your data. I am grateful for your co-operation. Likert scale range of 1–5 indicating (Strongly Disagree– **SD** [1], Disagree **- D** [2], Neutral – **N** [3], Agree **- A** [4] and Strongly Agree- **SA** [5].

SECTION A: PERSONAL INFORMATION

1. **Mark your Gender**

   Male ( )

   Female ( )

2. **Mark your Age**

   18 – 27 ( )

   28 – 37 ( )

   38 – 47 ( )

   48 – 57 ( )

   Over 57 ( )

3. **Level of study**

i) Artisan ( )
ii) Craft certificate ( )
iii) Automotive technician level 5 ( )
iv) Automotive technician level 6 ( )
v) Diploma ( )

4. Year of study

One ( )

Two ( )

Three ( )

SECTION B: Implementation of Dual VET at the institute

	STATEMENT	**SA-5**	**A-4**	**N-3**	**D-2**	**SD-1**
5.	The training is relevant for industry application					
6.	The training syllabus applies to the industry					
7.	The is adequate training infrastructure for training the workshops and laboratories					
8.	Workshops are well-equipped for practical					

SECTION C: TVET instructors and firm supervisors' engagement in Dual VET

	STATEMENT	**SA-5**	**A-4**	**N-3**	**D-2**	**SD-1**
9.	There is adequate hands-on experience for the TVET trainees					
10.	Institution exposes the trainees to sufficient practical training					
11.	The instructors are well-qualified to impart the instructions					
12.	Every trainee is assigned a supervisor during in-firm training					

SECTION D: Industry Involvement in Dual VET

	STATEMENT	SA	A	N	D	SD
13.	All trainees pursuing apprenticeship training are assigned a role under supervision					
14.	You are fully satisfied with the level of collaboration with the industry					
15.	Industry training sufficiently reinforces the trainee's skills and experience					
16.	Trainees are adequately instructed during apprenticeship training					
17.	Trainees are attached to skilled supervisors					

SECTION F: Government interventions

	STATEMENT	SA	A	N	D	SD
18.	Workshops and laboratory equipment are funded by the government in TVET institutions.					
19.	The Government employs qualified trainers in TVET institutions					
20.	The Government facilitates equality and access to training for all students in the country					

21. What challenges did you face during the in-firm training?

………………………………………………………………………………………………

………………………………………………………………………………………………

What challenges did you face during your training at the institution?

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

Appendix III: Questionnaire for Industry Supervisors and TVET Trainers

This study examines the extent to which TVET institutions and firms have implemented the Dual VET model. This study aimed to establish stakeholders' perceptions of the Dual VET model's introduction and implementation. The results of this study will inform policies on dual instruction in TVETs. Therefore, I request your assistance in completing the questionnaire to achieve the study goal. I assure you of your anonymity and the concealment of your data. I am grateful for your co-operation. Likert scale range of 1–5 indicating (Strongly Disagree– **SD** [1], Disagree **- D** [2], Neutral – **N** [3], Agree **- A** [4] and Strongly Agree- **SA** [5].

SECTION A: PERSONAL INFORMATION

1. **Mark your Gender**

   Male ( )

   Female ( )

2. **Mark your Age**

   18 – 27 ( )
   28 – 37 ( )
   38 – 47 ( )
   48 – 57 ( )
   Over 57 ( )

3. **Professional qualification**

   Craft ( )

   Dip ( )

   HND ( )

   Degree ( )

   Others ---

4. **Work experience**

   0 – 5 ( )

   5 – 10 ( ) Above 10 ( )

SECTION B: Implementation of Dual VET at industry

	STATEMENT	SA-5	A-4	N-3	D-2	SD-1
5.	Training is conducted by the training plan					
6.	The curricula meet the labor market					
7.	Training equipment is adequate for trainees					
8.	Workshops are spacious and enough to handle practical					
9.	Training skills correspond to industry needs					
10.	Practicum training reinforces the TVET trainee's skills					

SECTION C: Supervisors' engagement in Dual VET

	STATEMENT	SA-5	A-4	N-3	D-2	SD-1
11.	There is adequate hands-on experience for the TVET trainees					
12.	Institution exposes the trainees to sufficient practical training					
13.	The instructors are well-qualified to impart the instructions					
14.	Every trainee is assigned a supervisor during in-firm training					
15.	The syllabi are taught by respective specialists completely					
16.	supervisors are guided by approved course units for quality					

SECTION D: TVET institution and industry collaboration

	STATEMENT	SA	A	N	D	SD
17.	All trainees pursuing apprenticeship training are assigned a role under supervision					
18.	You are fully satisfied with the level of collaboration with the industry					
19.	Industry training sufficiently reinforces the trainee's skills and experience					
20.	Trainees are adequately instructed during apprenticeship training					
21.	Trainees are attached to skilled supervisors					

SECTION F: Government interventions

	STATEMENT	SA	A	N	D	SD
22.	Workshops and laboratory equipment are funded by the government in TVET institutions.					
23.	The Government employs qualified trainers in TVET institutions					
24.	The Government facilitates equality and access to training for all students in the country					

Appendix IV: Informed consent

Hello, I am Claude Juma Ochwila, a Master's student at Moi University, currently undertaking research as part of my Master of Education in Technology Education (Automotive Technology) program. My study is titled "Perception of Introduction of Dual Vocational Education and Training at Selected TVET Institutions and Companies in Western Region, Kenya." The findings of this research will be shared with relevant stakeholders to support effective interventions and the implementation of dual training.

As a participant in this study, you have the following rights:

1. To participate voluntarily and withdraw at any time without pressure
2. To be informed about the study procedures and what to expect
3. To understand the nature and objectives of the study and its potential impact.
4. To ask questions throughout the research
5. To receive a copy of research results; reference for obtaining the results is also provided
6. To have your privacy respected, all information provided will be kept confidential and used solely for this research.
7. To be informed of the benefits of participating in the study.

Your participation is crucial to the success of this study. Please complete the attached questionnaire and provide your honest responses. Thank you for your cooperation in this study. We have reviewed and agreed to the terms outlined above.

RESEARCHERS SIGNATURE……………………………………..DATE………………..

PARTICIPANTS SIGNATURE……………………………………..DATE………………..

Yours sincerely

Claude Juma

MTED/6000/22

Appendix VI: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **537350**

Date of Issue: **21/August/2023**

RESEARCH LICENSE

This is to Certify that Mr.. CLAUDE JUMA OCHWILA of Moi University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Busia, Kisumu on the topic: INTRODUCTION OF DUAL VOCATIONAL EDUCATION AND TRAINING IN KENYA: PERCEPTION OF SELECTED TVET INSTITUTIONS AND COMPANIES. for the period ending : 21/August/2024.

License No: **NACOSTI/P/23/28567**

537350

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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See overleaf for conditions

MOI UNIVERSITY

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P.O. Box 3900
Eldoret, Kenya

OFFICE OF THE DEAN, SCHOOL OF EDUCATION

ISO 9001:2015 CERTIFIED INSTITUTION

REF: MU/SE/PGS/54 **DATE:** 4th August, 2023

The Permanent Secretary
Ministry of Education
Science and Technology
P.O. Box 30040-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH PERMIT IN RESPECT OF CLAUDE JUMA OCHWILA (MTED/6000/22)

The above named is a 2nd year Masters student at Moi University, School of Education, Department of Technology Education.

It is a requirement of his Masters studies that he conducts research and produces a thesis. His research is entitled:

"INTRODUCTION OF DUAL VOCATIONAL EDUCATION AND TRAINING IN KENYA: PERCEPTION OF SELECTED TVET INSTITUTIONS AND COMPANIES.

Any assistance given to him to facilitate the successful conduct of his research will be highly appreciated.

Yours faithfully,

for

PROF. ANNE. S. KISILU
DEAN, SCHOOL OF EDUCATION

MOI UNIVERSITY
SCHOOL OF EDUCATION
DEAN
04 AUG 2023
Sign..............................
P. O. Box 3900-30100, ELDORET

JKC/mkm

Appendix VII: Plagiarism Awareness Certificate

SR785

ISO 9001:2019 Certified Institution

THESIS WRITING COURSE

PLAGIARISM AWARENESS CERTIFICATE

This certificate is awarded to

CLAUDE JUMA OCHWILA

MTED/6000/22

In recognition for passing the University's plagiarism

Awareness test for Thesis **entitled: PERCEPTION OF INTRODUCTION OF DUAL VOCATIONAL EDUCATION AND TRAINING AT SELECTED TVET INSTITUTIONS AND COMPANIES IN WESTERN REGION, KENYA with** similarity index of 14% and striving to maintain academic integrity.

Word count:21843

Awarded by

Prof. Anne Syomwene Kisilu

CERM-ESA Project Leader Date: 17/02//2025