ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Influence of Technical Vocational Education and Training on Skills Gap in the Masonry Workforce in Moroto District, Eastern Uganda

Akite Hellen Grace[1]; John Simiyu[2]

A Research Report Submitted to the Department of Technology Education in Partial Fulfilment of the Requirements for the Degree of Master of Technology Education in the School of Education of University of Eldoret

Publication Date: 2026/11/16

How to Cite: Akite Hellen Grace; John Simiyu (2026) Influence of Technical Vocational Education and Training on Skills Gap in the Masonry Workforce in Moroto District, Eastern Uganda. *International Journal of Innovative Science and Research Technology*, 11(10), 3232-3299. https://doi.org/10.38124/ijisrt/26oct1444

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

DECLARATION

I confirm that this research report is my original work and has never been submitted for any award of a degree.



26TH OCTOBER 2026

REG NO: SEDU/TED/M/001/23 DATE

This research report has been submitted for examination with my approval as a supervisor.



26TH OCTOBER 2026

Signed DATE

Prof: John Simiyu

School of Education

University of Eldoret

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

DEDICATION

I dedicate this research report to my husband and children, whose support and encouragement have been my constant source of strength throughout this academic journey.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude to everyone who has contributed to the successful writing of this research report. My sincere thanks go to my supervisors, for their expert guidance, continuous support and constructive feedback throughout the research process.

Lastly, special thanks to my family and friends for their love, patience and encouragement.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

ABSTRACT

This research report aimed to investigate how Technical Vocational Education and Training (TVET) influences the skills gap of masonry workers in Moroto District, Eastern Uganda. Even though there has been an emphasis on TVET to address the skills gap, the masonry trade continues to experience a significant shortage of skilled workers. This study sought to: (i) identify the effect of TVET on the skill level of masonry workers; (ii) establish the skills gap in masonry; and (iii) assess the influence factors on TVET. The study adopted a cross-sectional survey design involving 138 respondents from which a sample of 109 was selected using a simple random and purposive sampling technique. The researcher collected quantitative data using questionnaires and analyzed the results using descriptive statistics. Besides, the researchers gathered qualitative data through interviews and evaluated the findings using qualitative content analysis. The study found that the effect of TVET on the masonry workers' skills was moderate; respondents indicated that TVET programs improved complex tasks skills (3.50±1.209), work performance (3.46±1.253), work quality (3.46±1.083), confidence (3.41±1.197), and new skills application (3.29±1.191). Nonetheless, the current study established the presence of a skills gap in advanced masonry, management techniques, architectural designs, and modern construction methods. Additionally, the researcher found that masonry workers lack practical skills (3.30±1.136), relevance skills (3.24±1.226), and sufficient techniques (3.41±1.268). This study also revealed that the influence factors of TVET on masonry workers included limited resources (3.50±1.172), inadequate trainers (3.58±1.251), short training programs (3.47±1.262), insufficient materials and equipment (3.55±1.142), no regular refresher courses (3.59±1.159), environment (3.40±1.196), and feedback not embraced (3.49±1.153). Therefore, the study concluded that the current TVET programs have a limited role in addressing the skills gap by improving some of the basic skills and work quality. It further recommended that masonry workers should be given more time to acquire advanced practical skills and expand their knowledge of management techniques, architectural design, modern construction methods, and new skills application. Besides, future studies could focus on the effect of TVET on the skills gap among masonry workers in different regions, the effect of apprenticeship, and the impact of adopting digital construction technologies in masonry.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

TABLE OF CONTENTS

DECLARATION 3233
DEDICATION 3234
ACKNOWLEDGEMENT 3235
ABSTRACT 3236
LIST OF FIGURES 3240
LIST OF ABBREVIATIONS AND ACRONYMS 3242
CHAPTER ONE INTRODUCTION 3243
Introduction to the Chapter 3243
Background Information 3243
Statement of the Problem 3244
Purpose of the Study 3244
Objectives of the Study 3244
Research Questions 3245
Justification of the Study 3245
Significance of the Study 3245
Assumptions of the Study 3246
Scope of the Study 3246
Limitations of the Study 3246
Operational Definition of Terms 3246
CHAPTER TWO LITERATURE REVIEW 3248
Introduction 3248
Broad Content 3248
Theoretical Framework 3248
Conceptual Framework 3248
TVET as a Professional Field 3249
Evolution of TVET 3250
Place of TVET in Addressing Gaps in Industry 3250
Government Efforts to uplift TVET in Uganda 3251
Construction as an Industry 3251
Skills of Workers in the Construction Industry 3252
Skills Gap in the Masonry Workforce and its Relationship with Educational Training 3253
Impact of Educational Training on the Skill Levels of the Masonry Workforce 3255
Factors Affecting the Effectiveness of Educational Training in Addressing Skills Gaps in the Masonry Workforce 3256
Research gaps 3258
Chapter Summary 3258
CHAPTER THREE RESEARCH DESIGN AND METHODOLOGY 3260
Introduction 3260
Research Design 3260
Research Paradigm 3260
Study Area 3260
Target Population 3261
Sampling Procedures and Sample Size 3261
Sample Size 3261
Sampling Procedures 3262
Data Collection 3262
Questionnaires 3262
Interviews 3262

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Piloting of the Research Instruments 3262
Validity and Reliability of the Research Instruments 3263
Validity of the Research Instruments 3263
Pilot Study Area 3263
Data Collection Procedures 3264
Procedure for Using Questionnaire Method 3264
Procedure for Using Interview Method 3264
Data Analysis Techniques 3264
Quantitative Analysis 3264
Qualitative Analysis 3265
Ethical and Legal Considerations 3265
Chapter Summary 3265
CHAPTER FOUR RESULTS AND DISCUSSION 3266
Introduction 3266
Response Rate 3266
Demographic Characteristics of Respondents 3266
Analysis of Key Research Objectives 3267
Impact of Technical Vocational Educational and Training on the Skill Levels of the Masonry Workforce 3268
Skills gap among the masonry workforce and their relationship with the quality of Technical Vocational Educational and Training 3272
Factors Affecting the Effectiveness of Technical Vocational Educational andTraining in Addressing Skills Gap Among the Masonry Workforce 3275
Chapter Summary 3278
CHAPTER FIVE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS 3280
Introduction 3280
Summary of Findings 3280
Impact of Educational Training on the Skill Levels of Masonry Workforce in Moroto District 3280
Specific Skills Gap among the Masonry Workforce and their Relationship with the Quality of Educational Training in Moroto District 3280
Factors Affecting the Effectiveness of Educational Training in Addressing Skills Gap among the Masonry Workforce in Moroto District 3280
Conclusion on Research Objectives 3280
Impact of Educational Training on the Skill Levels of Masonry Workforce in Moroto District 3280
Specific Skills Gap among the Masonry Workforce and their Relationship with the Quality of Educational Training in Moroto District 3280
Factors Affecting the Effectiveness of Educational Training in Addressing Skills Gap among the Masonry Workforce in Moroto District 3281
Recommendations 3281
Impact of Educational Training on the Skill Levels of Masonry Workforce in Moroto District 3281
Specific Skills Gap among the Masonry Workforce and their Relationship with the Quality of Educational Training in Moroto District 3281
Factors Affecting the Effectiveness of Educational Training in Addressing Skills Gap among the Masonry Workforce in Moroto District 3282
Suggestions for Further Research 3282
REFERENCES 3283
APPENDICES 3288
Appendix 1: Informed consent for masonry workforce 3288
Appendix 2: Questionnaire for masonry workforce 3290
Appendix 3: Informed Consent for Instructors of Building and Construction 3293

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Appendix 4: Key Informants Interview Guide for Instructors of Building and Construction 3294
Interview Guide for instructors of building and construction 3294
Appendix 5: Informed Consent for Head of Technical Vocational Education and Training Institutions 3295
Appendix 6: Key informants Interview Guide for Head of TVET Institutions 3296
Interview Guide for Instructors of Building and Construction 3296
Appendix 7: A Map of Karamoja Showing the Location of Moroto District 3297
Appendix 8: Krejcie Morgan Sample Size Determination Table (1970) 3298
Appendix 9: Similarity Index 3299

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

LIST OF FIGURES

Figure 1: Conceptual Framework 3249

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

LIST OF TABLES

Table 1: Summary of Research Gaps 3258
Table 2: Sample Population and Sample Size 3261
Table 3: Reliability Statistics 3264
Table 4: Response Rate 3266
Table 5: Demographic Characteristics of Respondents 3266
Table 6: Likert Scale Interpretation 3267
Table 7: Respondents' Perceptions of the Effect of Technical Vocational Educational and Training on Masonry Skills 3268
Table 8: Qualitative Findings on the Influence of TVET on Masonry Workforce Skills 3269
Table 9: Perceptions on Skills Gaps in Masonry Training in Moroto District 3272
Table 10: Qualitative Findings on Gaps in Masonry Skills among TVET Trainees 3273
Table 11: Factors Affecting the Effectiveness of Technical Vocational Educational and Training on Masonry Skills Gaps 3276
Table 12: Qualitative Findings on Factors Limiting the Effectiveness of TVET in Masonry Skills Development 3277

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

LIST OF ABBREVIATIONS AND ACRONYMS

BIM	Building Information Modelling
GDP	Gross Domestic Product
HRM	Human Resource Management
SAVE	Safety Awareness and Voice Evaluation
TVET	Technical Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organisation
DV	Dependent Variable
IV	Independent variable
CVI	Content Validity Index
ILO	International Labour Organization

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

CHAPTER ONE
INTRODUCTION

➢ *Introduction to the Chapter*

This chapter comprises of the background information, statement of the problem, purpose of the study, objectives of the study, research questions, justification of the study, significance of the study, assumptions of the study, scope of the study, limitations of the study, theoretical framework, conceptual framework, operational definition of terms and chapter summary.

➢ *Background Information*

Globally, the construction industry is a growth engine and a key driver of economic development and regional growth in many countries (Adepoju & Aigbavboa, 2021). The industry is growing due to the rising demand for infrastructure, urbanization, and population growths, as well as significant infrastructure projects that seek to satisfy the needs of emerging economies (Gu, 2019; Shi et al., 2019). In monetary terms, the construction industry is worth about $10 trillion worldwide and is set to grow as the engine of economic development for years to come (Barbosa et al., 2017).

In developing countries, especially in Africa, building construction constitutes over 70% of total construction expenditure, signifying its significance to the continent's economies (Alinaitwe et al., 2007). In Uganda, the construction industry contributes over 12% to the Gross Domestic Product (GDP) and has been growing steadily over the past two decades (Uganda Bureau of Statistics [UBOS], 2005). The industry has been growing steadily due to the high demand for employment opportunities as most civil engineering projects are highly mechanized (Kikwasi, 2013). However, the industry faces a lot of challenges, including low productivity, which has become a big concern in Uganda (Alaghbari et al., 2019).

One of the reasons for low productivity in the construction industry in Uganda is the lack of skilled labor. This shortage of skilled labor is mainly attributed to a wide gap between the requirements of the construction industry and the skills of the available workforce. This is mainly due to the rapid changes in the construction industry brought about by the need for adopting new technologies and ideas in construction ushered in by the fourth industrial revolution (Adepoju & Aigbavboa, 2021). The construction industry is currently undergoing a technological revolution that is set to redefine construction projects. Some of the technologies currently used in construction include building information modeling, automation, artificial intelligence, and data analytics, among others. The adoption of these new technologies is set to improve project performance while also cutting down on costs and shortening construction time (Maskuriy et al., 2019). However, the new technologies have revealed a great shortage of skills, especially regarding technical competencies (Adepoju & Aigbavboa, 2021).

The relevance of technological education and training cannot be underestimated in a country like Uganda, where the construction industry is growing at a rapid pace. Technological education and training will equip construction workers with the necessary skills to meet the industry's needs. Various studies have shown that technological education has a significant effect on the workforce, especially regarding technical competencies and project management skills (Mullin & Williams, 2010). However, the current state of education and training in the construction industry is inadequate to meet the industry's needs. There is a great gap between the skills taught in technical institutions and those required by the industry. Some of the skills that are needed in the construction industry but are not taught in technical institutions include digital construction, cyber security, data analytics, and automation (Adepoju & Aigbavboa, 2021; Osei-Asibey, 2022). Existing research has largely focused on the implications of technological advancements and skill gaps in the construction industry at a macro level. For instance, studies by Alaghbari et al. (2019) and Osunsanmi et al. (2018) emphasize the impact of digital transformation on construction efficiency but do not specifically examine how education and training programs influence workforce competency. Furthermore, previous studies have not

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

adequately addressed the skills gap within Uganda's construction industry, particularly among masonry workforce in underdeveloped regions such as Moroto District.

Moroto District, located in North Eastern Uganda, faces unique challenges related to masonry workforce skills development due to limited access to quality educational training, insufficient technological resources, and inadequate infrastructure (UNESCO, 2020). These limitations further widen the skills gap, affecting the overall productivity of the masonry workforce. Addressing these gaps is critical to aligning workforce capabilities with industry needs and ensuring sustainable development in the region.

This study sought to bridge the existing knowledge gap by assessing the impact of educational training on the skill levels of the construction workforce in Moroto District. Specifically, the study aimed to identify the specific skill gaps in the masonry workforce and their relationship with the quality of technical vocational educational and training. Additionally, the study examined the factors affecting the effectiveness of technical vocational educational and training in addressing these skill gaps. The findings provided evidence-based insights to inform policy recommendations and targeted interventions aimed at enhancing workforce competency, productivity, and overall industry efficiency in Moroto District and beyond.

➢ *Statement of the Problem*

Uganda has witnessed significant growth over the years, playing a crucial role in infrastructure development across key sectors such as transportation, education, and healthcare (Adepoju & Aigbavboa, 2021; Alinaitwe et al., 2007; Shinyekwe et al., 2016). Many construction workers lack essential technical skills, modern tools, and industry-specific knowledge necessary for executing construction projects effectively that has contributed to substandard work and project delays but also increases operational costs and reduces the competitiveness of the masonry workforce.

A key contributor to this challenge is the mismatch between the skills imparted through technical vocational educational and training programs and the evolving demands of the construction industry. The rapid advancement of construction technologies, changing building standards, and the complexity of modern projects require a workforce that is adaptable and well-trained (Dharani, 2015; Yap et al., 2019). However, existing technical vocational educational and training institution programs may not be adequately aligned with industry needs, leading to a workforce that struggles to meet market expectations. This misalignment results in a reliance on foreign expertise for masonry work, increased costs for on-the-job training, and overall inefficiencies in project execution (McGuinness & Ortiz, 2016).

Given the urgent need for a well-trained workforce to sustain the growth of the construction industry, this study sought to assess the influence of technical vocational educational and training on the skills of masonry workforce in Moroto District, identify the specific skill gaps, and examine the factors influencing the effectiveness of technical vocational education and training programs. The findings of this study has provided evidence-based recommendations to enhance training programs, bridge the skills gap, and improve workforce productivity and efficiency in Uganda's construction sector.

➢ *Purpose of the Study*

The purpose of this study was to investigate the influence of Technical Vocational Education and Training skills gap in masonry workforce in Moroto District, Eastern Uganda.

➢ *Objectives of the Study*

This study was guided by the following objectives;

- To identify the specific skills gap among the masonry workforce in Moroto District.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

- To assess the influence of technical vocational educational and training on the skill levels of masonry workforce in Moroto District.
- To examine the factors affecting the effectiveness of technical vocational educational and training in addressing skills gap among the masonry workforce in Moroto District.

➢ *Research Questions*

- What are the specific skills gaps among the masonry workforce, in Moroto District?
- How does technical vocational educational and training influence the skill levels of the masonry workforce in Moroto District?
- What factors influence the effectiveness of technical vocational educational and training in addressing skills gap among the masonry workforce in Moroto District?

➢ *Justification of the Study*

Moroto District, like many other regions in Uganda, is experiencing rapid urbanization and infrastructural expansion, necessitating a skilled masonry workforce to meet industry demands. This study is justified by the need to assess the influence of educational training on the existing skills gap, ensuring that workers acquire competencies aligned with modern masonry practices in revolutionizing the construction industry with innovative techniques and sustainable materials.

The innovative techniques in masonry practices available are interlocking masonry which saves a lot of mortar due to the use of projections and depressions. 3D printings which produce accurate and intricate masonry units with less wastes and high efficiency. Grouting and reinforcement into hollow masonry units and reinforcing them with steel bars which makes them highly resistant to natural disasters. Robotic masonry which lays bricks faster and more accurate than humans, (Semi-Automated Mason, machine).

Sustainable materials include; use of local materials to reduce carbon footprint from transportation. Recycled bricks and stones used in making beautiful designs while conserving material resources. Eco-friendly masonry units made from waste materials and recycled products used in green buildings. Aerated concrete blocks which are light weight, precast green building materials that are durable against fire and mould.

Energy efficiency masonry materials include; green roofs and vertical gardens, that is, using vegetation to provide insulation, conserve water, reduce heat and beautify buildings. Insulated concretes forms, (ICFs) made up of reinforced concrete and insulating foams used in construction that offer good thermal properties. Energy efficient designs which involves designing to improve thermal properties and reduce energy consumption.

➢ *Significance of the Study*

The study's findings offered insights to the construction industry that will allow it to maximize its masonry workforce, resulting in improved safety standards, more timely project completion, and greater contributions to economic development.

The study has identified and closed the skills gap in order to improve professional development and skill enhancement that has a positive effect on the lives and livelihoods of the masonry workforce.

The findings of this study are meant to guide policymakers in making strategic decisions about technical vocational education and training, workforce development, and construction industries. With this information, policymakers can create focused interventions to close particular skills gap among the masonry workforce.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Consequently, this can aid in the development of policies that support inclusive and sustainable economic development in Moroto District.

The findings from this study can also be used as a valuable resource for scholars seeking to broaden their research in the field of skills gap analysis in the construction sector. This would contribute to the existing body of knowledge in this area.

➢ *Assumptions of the Study*

The following assumptions guided the design, data collection, analysis, and interpretation of the findings on the skills gap in the construction workforce of Moroto District, Eastern Uganda.

The study assumed the availability of reliable data on the masonry workforce in Moroto District, including information on demographics, employment trends, skill levels, and competencies. This data served as the foundation for assessing the skills gap and formulating targeted interventions.

Additionally, the study assumed that participants provided accurate and truthful responses during interviews. It relied on the assumption that participants had a clear understanding of their own skill levels and training needs, and that they were willing to share this information openly.

The study also assumed that findings related to the skills gap among the masonry workforce in Moroto District could be transferred to other similar contexts within Uganda or potentially to other regions with comparable socioeconomic characteristics. It assumed that the underlying factors contributing to the skills gap were broadly applicable beyond the specific study area.

➢ *Scope of the Study*

The study focused on examining the influence of technical vocational educational and training on the skills gap in the construction workforce. Specifically, it assessed the impact of technical vocational educational and training on skill levels among the masonry workforce, identified specific skill gaps, and analysed their relationship with the quality of training received. Additionally, the study investigated factors affecting the effectiveness of technical vocational educational and training in addressing these gaps.

➢ *Limitations of the Study*

The study was limited in the number and category of the masonry workforce it could include like masonry workforce train on job given to participate in the interview by site engineers yet the study wanted formal masons from training. In this case, agreement was made to request site engineers to allow only formal masons participation

Language barrier in accessing accurate and comprehensive data on the masonry workforce in Moroto District, especially regarding skill levels and employment trends, posed challenges but an interpreter conversant with the local language was hired to do the interpretation for ease of information accuracy.

Reliance on self-reported data from participants, such as their perceptions of skill levels and training needs, may have introduced bias and inaccuracies.

➢ *Operational Definition of Terms*

- Skill: Is defined as the ability to perform a task assigned to a level of competence and this can be enhanced through learning.
- Skills gap: In the context of this study, the term refers to the difference between the skills required to perform a certain job effectively in the construction industry, and those people possess in the Moroto District.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

- Competence: In general, it is the ability of an individual to perform a particular task or job effectively using the required knowledge, abilities, and work attitude.
- Masonry workforce: it consists of skilled and semi-skilled workers engaged in constructing buildings and structures using bricks, stones, concrete blocks, and mortars. They are usually involved in building foundations, walls, pavements, and other structures.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

CHAPTER TWO
LITERATURE REVIEW

➢ *Introduction*

This chapter presents a review of literature which is pertinent to the Influence of Technical Vocational Education and Training on the skills gap in the masonry workforce. A study as presented by various researchers, (Kicklighter & Andera, 2022) scholars' analysts and authors from journals, textbooks, publications internet sources and official reports World Bank (2020) The review is organized to provide a comprehensive understanding of the research problem, identifying existing knowledge gaps and establish a conceptual foundation for the study.

The purpose of this literature review is to critically examine, compare and synthesize previous studies, policies and scholarly works related to TVET and masonry skills development globally and in Uganda.

The chapter is structured around the themes derived from the research objectives;

- The specific skills gap among the masonry workforce in Moroto District.
- The influence of technical vocational educational and training curricula, training facilities and instructors on masonry skills acquisition.
- The factors and relevance of technical vocational educational and training in addressing industry needs and employability in the masonry workforce in Moroto District.

➢ *Broad Content*

- *Theoretical Framework*

The study focused on the role played by technical vocational education and training on the skills gap of masonry workforce in Moroto District, the skills gap of masonry workforce in Moroto District, factors affecting technical vocational education and training in addressing the skills gap of masonry workforce in Moroto District and Human Capital Theory.

Human Capital Theory was pioneered by Gary Becker and Theodor Schultz in 1960s and 1970s (Tan, 2014). According to the theory, human capital development raises productivity levels, economic growth, and improved individual welfare (Fugar et al., 2013). The theory views human capitals as individuals who are considered as capital goods (Tamsah & Yusriadi, 2022). These individuals, therefore, possess skills and abilities that are used to produce wealth. Human capital development encourages competitive advantage, attracting investment leading to the overall development of the country (Aliu & Aigbavboa, 2019). However, Human Capital Theory overestimates individuals' skills and labour market conditions, since it assumes that skills and knowledge purchased to increase productivity are permanent (Marginson, 2019). The theory does not predict changes in demand that may take place and fail to address the mismatch of skills during the process of acquiring technical vocational education and training (Marginson, 2019). To illustrate, the theory helped expound on the role played by technical vocational education and training in building the skills gap of masonry workforce in Moroto District. It helped relate the level of skills, competencies and education of the masonry workforce in Moroto District to their impact on the construction industry.

- *Conceptual Framework*

As presented in the conceptual framework (Figure 1), Lack of modern tools and equipment in technical vocational educational and training institution as the independent variable (IV), was identified as a key factor influencing the skills gap in the masonry workforce (DV). The framework illustrated that adaptability to modern construction technology and equipping workers with relevant and industry-specific skills, technical vocational educational and training institution had the potential to narrow the existing skills gap. This

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

relationship was shaped by intervening factors such as industry needs, technological advancements, policy frameworks, and the level of employer engagement. When training programs were well-structured and aligned with industry demands, they contributed to improved worker competency, reduced skills deficiencies, and enhanced productivity within the construction sector.

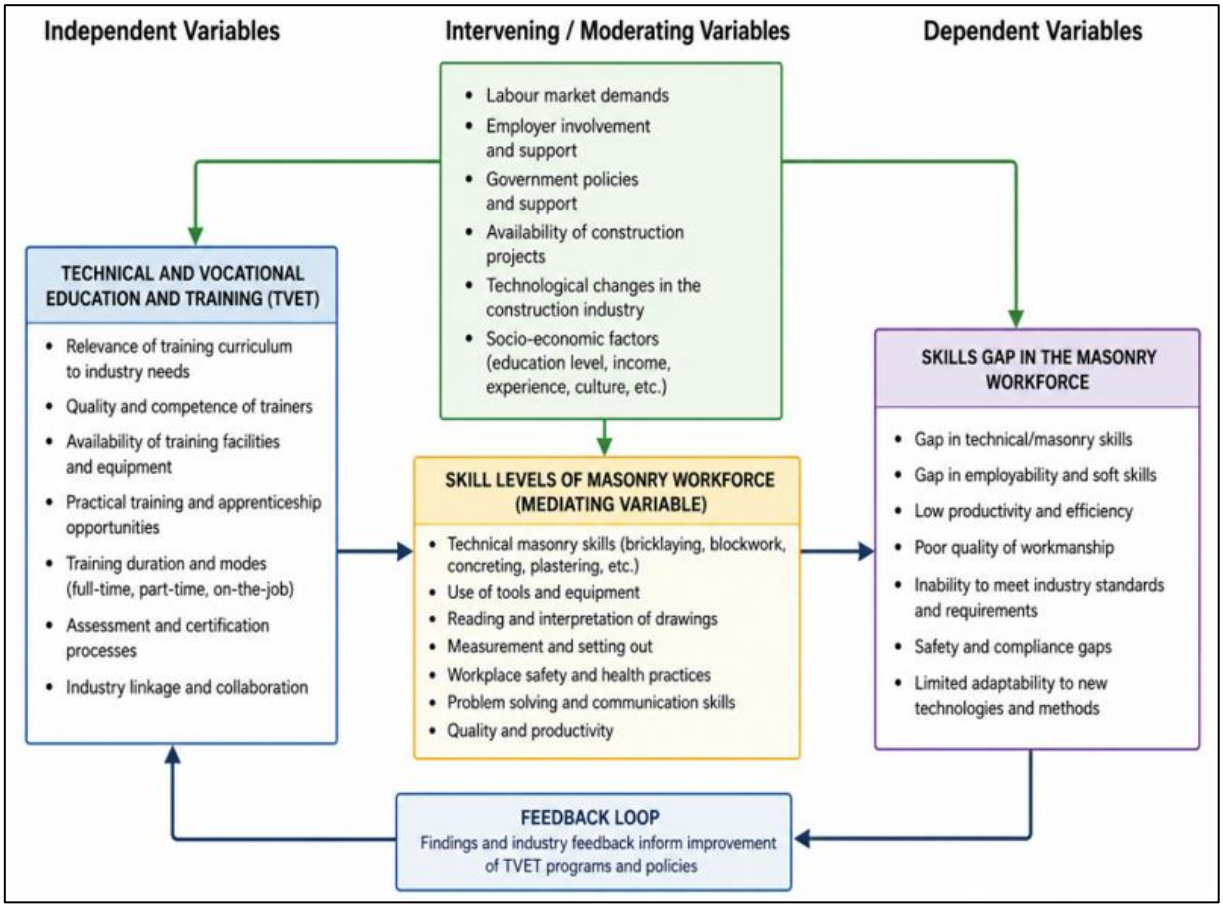


Fig 1 Conceptual Framework
Source: Researcher (2026)

- *TVET as a Professional Field*

Technical Vocational Education and Training (TVET) has increasingly become a professional and strategic field rather than an alternative or secondary pathway. In Uganda, this shift is especially visible as the government, through the Uganda Skills Development Project (USDP), has institutionalized TVET reforms, with a strong focus on competency-based curricula, assessment, and industry relevance (Ministry of Education & Sports [MoES], 2016). The establishment of Sector Skills Councils (SSCs) under USDP demonstrates a deliberate effort to involve employers in defining occupational standards, thereby reinforcing TVET's professional character (MoES, 2016). However, professionalism in TVET is hampered by significant quality assurance challenges. For instance, Mutebi and Ferej (2023), in their systematic review of Uganda's regulatory frameworks, highlight the fragmented nature of quality assurance governance in the TVET sector. Their analysis shows that oversight is dispersed across multiple government agencies, with no unified qualifications registry and weak mechanisms for policy implementation. Consequently, this affects the status of TVET and its relevance at both national and international levels. Erimirwa (2023) in her study on the challenges facing TVET in Uganda established that most training institutions have weaknesses in terms of inadequate resources and motivation of trainers. Consequently, the institutions find it difficult to provide quality training relevant to the labor market. Besides poor quality training, negative attitudes towards TVET also affect its status. Parents and communities perceive TVET as less prestigious compared to other forms of education (Agole et al., 2024).

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

To improve the status of TVET, there is a need to put in place policies that promote regulation, resourcing, and re-professionalizing of TVET. The USDP framework proposes the establishment of the TVET council to address the governance issues in the TVET system (MoES, 2016). Hence, in order to raise the status of TVET programs, it will be important to strengthen the capacity of existing institutions and improve professional qualifications and skills.

- *Evolution of TVET*

The evolution of the Technical Vocational Education and Training (TVET) system mirrors that of the rest of the world. It has undergone a progressive form of development away from the traditional informal apprenticeship system toward more formal and regulated systems. The system has evolved over time in response to the demands of the changing economy and the need for skills to support national development (Mutebi & Ferej, 2023). For instance, Skilling Uganda program was initiated and it resulted in many informal workers acquiring knowledge and skills to improve their businesses in Kampala (Moses & Liu, 2022). However, despite the tremendous effort towards reforming TVET, many institutions continue to face challenges in reforming their training programs in line with Competency-Based Education and Training (CBET). Okumu and Bbaale (2019) observed that most TVET institutions in Uganda face great challenges in implementing the CBET framework due to lack of adequate resources and infrastructure. They also report that the issue of industry relevance among TVET institutions is still a great challenge. In addition, the problem of poor curriculum and poor training of instructors continues to challenge the TVET system. Relatedly, the absence of proper career guidance services in most TVET institutions contribute to the general neglect of TVET. Barigye (2024) argues that career guidance and counseling are hardly available in most TVET institutions. There are also no career officers in these institutions. Even when career guidance services exist, they are only available in a few institutions and cannot address the diverse needs of students in terms of career exploration. This creates a great challenge in ensuring that students are able to make informed choices when pursuing TVET and subsequently in their career decisions after completing their studies at the institutions. This further explains the general poor perception of TVET among Ugandans. The evolution of TVET in Uganda shows that although great strides have been made towards developing a quality TVET system, there still exists a great need for reforms in order to meet the industry needs and improve graduate employability.

- *Place of TVET in Addressing Gaps in Industry*

One of the roles of TVET is to address the gap between the skills being taught in the institutions and those needed in the industries. From the perspective of industry, it is widely reported that the Ugandan TVET system does not provide adequate skills and competencies needed in the various industries. For instance, Agole et al. (2022) and Auta (2022) report that employers complain of lack of technical and functional proficiencies and “soft skills” from TVET graduates. This is mainly attributed to poor or no articulation of the industry needs into the TVET curricula, among other factors.

Work-based learning (WBL) provides an important avenue for addressing the issue of relevance of TVET to industry needs. Muhwezi (2025) argues that to make the WBL programs relevant and respond to the industry needs, the workplace attachment component should include continuous assessment by the industries. This enables the industry to have a continuous assessment of the performance of the students. The assessment is useful in determining how the students can be guided to meet specific industry needs. If the process is accompanied by close interactions between the students and the industries on a regular basis, it can be beneficial to both parties. First, the student acquires appropriate skills and competencies as well as work attitude needed in the industry. Second, the employer gets quality labor to support their operations. Besides the WBL programs, the establishment of the Sector Skills Councils (SSCs) by the USDP initiative is also aimed at addressing the issue of relevance of TVET to the industry needs. The councils are supposed to ensure that the curricula of the various TVET programs are industry relevant, as well as ensure that the standards, assessments, and qualifications are relevant (MoES, 2016). However, the involvement of various stakeholders

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

in the design and implementation of the councils has not been successful. Some industries lack sufficient skills and capacity to participate fully in the activities of the councils. Consequently, there is lack of alignment of the needs of the industries into the TVET system. Apart from addressing the lack of relevance of TVET programs and curricula, WBL and the establishment of the councils are also important in addressing the issue of insufficient quality education being provided in the TVET institutions. For instance, informal business owners in Uganda have benefited from the USDP initiative where they acquire knowledge and skills on how to run their businesses systematically (Moses & Liu, 2022).

- *Government Efforts to Uplift TVET in Uganda*

The Government of Uganda has made substantial and strategic investments in developing and ensuring the quality of TVET in the country and making it more responsive to the nation's development needs. The Uganda Skills Development Project (USDP) was approved in 2016 as a World Bank initiative to develop and scale up transformative institutional arrangements and reforms in the TVET subsystem (MoES, 2016). Some of the key reforms under the USDP include Sector Skills Councils, competency-based assessments, TVET Management Information System, and a communication, marketing, and branding strategy to reposition the perception of TVET in society (MoES, 2016). The quality of TVET programs in Uganda is currently the focus of considerable government attention. Despite the policy responses, however, Mutebi and Ferej (2023) agree that challenges in quality assurance persist in several areas, including fragmentation of regulatory responsibilities, absence of a national qualifications framework, and inadequate articulation or implementation frameworks for the policies. They propose that the government should ensure the effective coordination and functioning of the proposed TVET Council as specified in the USDP framework and develop a national qualifications framework for TVET.

Moreover, as the TVET Communication, Marketing, and Rebranding Strategy (2022-2026) acknowledges, there is a need to reposition TVET in the minds of Ugandan society to address the pervasive perception of the TVET qualification as a 'poor person's degree.' The strategy emphasizes sustained media campaigns, stakeholder engagement, and the promotion of success stories to rebrand vocational skills as valuable, respectable, and career-oriented pathways (MoES, 2024).

Complementing these efforts, the government has further sought to enhance inclusion through the USDP, which prioritizes gender equity by encouraging women's enrollment in traditionally male-dominated or "scarce skill" areas such as construction and manufacturing. Moreover, localized industrial training opportunities are being expanded to enable students to gain practical experience in real work environments (MoES, 2016). Despite these initiatives, significant challenges persist. Funding for infrastructure remains insufficient, many TVET institutions lack modern training laboratories, and institutional capacity to implement reforms is uneven. These limit the full realization of the USDP and other policy objectives, making the achievement of a fully modernized and inclusive TVET system a long-term endeavor.

- *Construction as an Industry*

The construction industry is among the most crucial sectors in Uganda, as it presents numerous opportunities for economic growth, employment, and infrastructure development. However, despite its significance, the industry lacks artisans and technicians due to several challenges. According to Akunda et al. (2024), there is a tendency that students studying building and civil engineering programmes in Ugandan tertiary institutions engage in theoretical studies without gaining practical skills at construction sites. Additionally, students report inadequate training equipment and limited industry involvement in curriculum development. Another concern is the lack of partnerships between private and public entities in developing training methodologies for the construction industry. Though the USDP set up Skills Councils for the construction sector, industry-specific curricula and assessment procedures are still a challenge in Ugandan tertiary institutions (MoES, 2016).

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Therefore, there is a need for innovation in vocational training, such as learning while producing. Using this approach, trainees will acquire skills by constructing industry-specific artefacts like houses or machines using the learning-by-doing method (Akunda et al., 2024). The approach will also motivate students to develop their projects using project planning and management skills to meet industry-specific expectations. The need for sustainability skills is another emerging issue that the construction industry will face in the future. Thus, incorporating sustainability-related skills, such as BIM and safety management, will enable TVET graduate to contribute to the country's economic growth while promoting sustainable development.

Finally, the value proposition of TVET on human capacity development is unquestionable. Wamala (2022) explains that Ugandan TVET graduates are more likely to be employed and less likely to be impoverished than those without vocational skills. This is because people with vocational training have more chances of being hired in the formal sector since they possess skills that are in demand. Therefore, apart from individual benefits, investment in vocational training will produce skilled workers and support Uganda's economic growth while reducing poverty.

- *Skills of Workers in the Construction Industry*

The construction sector as a whole has also quickly changed to compete in a global market as a service business. This calls for new kinds of skills from the workforce, including diversity, cultural sensitivity and expertise, and virtual teamwork and communication (Playfoot & Hall, 2009). "Skill" is described as "the capacity to carry out a specific task assigned with competence" (United Kingdom Commission Employer Skills Survey, 2010) or as the capacity to carry out "a specified task at a certain level of expertise" (Shah Burke, 2003; Trendle, 2008). In a similar vein a "skill" is defined as "the ability to perform a task assigned to a level of competence and this can be enhanced through learning" (Sudarmaji et al., 2021). Accordingly, expertise in the construction sector is an activity requiring knowledge, discretion, accuracy, and mastery, all of which are acquired via extensive instruction and experience in the job (Awe et al., 2010; Odusami, 2002). As such, the construction industry demands a diverse set of skills from its workforce, encompassing generic skills, technical, and soft skills (non-technical) essential for success (Akdur, 2021; Munir, 2022). Generic skills are a group of skills linked to problem solving, communication, and teamwork (Chan et al., 2017). They can be applied in all situations and by all professional combinations (Eksteen, 2019). General skills, critical skills, employability skills, key competencies, core skills, required skills, transferable skills, and essential skills are other terms for generic skills (Nägele & Stalder, 2017).

Technical expertise refers to learning particular to one's occupational area in formal and informal settings while working as an apprentice in a setting similar to the workplace (Sorrel, 2017). Technical expertise is evaluated via standardized tests and is often specified using coded statements in job descriptions (Sorrel, 2017). However, "Soft skills" are defined as the requisite attitudes and competencies often associated with non-technical skills (Litecky et al., 2004). In contrast to technical expertise, soft talents provide fundamental approaches and methods (Snell et al., 2002). Explained that "soft skills" are skills, competencies, and attitudes that relate to individuality, temperament, and conduct, as opposed to being connected to traditional or technical expert. The definition given by Snell et al. (2002) for soft skills is comparable to many other definitions of non-technical skills (Walters & Sirotiak, 2011).

Non-cognitive skills, such as non-academic abilities (Selamat et al., 2013), employability skills (McGrath-Champ et al., 2010), lifelong skills (Toor & Ofori, 2008), generic skills (Kruss et al., 2012), essential skills (Othman, 2014), key competencies (Ahn et al., 2012), transferable skills (Ayarkwa et al., 2012), enterprise skills (Merrifield, 2013), and general capabilities (Gann & Salter, 2001), have been extensively defined.

Moreover, soft skills and non-technical abilities include communication, critical reasoning, problem-solving abilities, teamwork and collaboration, conflict resolution, professional attitudes, productivity, stress-

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

resistance, social awareness, self-control, planning and organizational skills, workplace decorum, and diversity amongst other capabilities. Therefore, employers in the construction sector are searching for qualified workers with all the above skills and attributes to support the growth and prosperity of the sector (Crowson et al., 2000; Jayaram & Engmann, 2017). This is attributed to the fact that the requirements for construction skills and training are always evolving. In addition, new business procedures, production organization, and technological and vocational innovation necessitate that the workforce in the construction industry possess a higher level of expertise across a wider range of specializations (Ho, 2016; Moshood, 2020). For instance, Sorko and Rabel (2016) found that employees in the industry need to be proficient in digital competence, problem solving, and human-machine communication. Osman and Canan (2018) stated that IT knowledge, IT protection and security, computer programming, coding, data and information processing and analytics, teamwork, social skills, and communication skills are essential for the successful completion of construction projects. According to Motyl et al. (2017), professionals in the construction business need to possess both hard and soft abilities. In this regard, the authors defined the hard skills set as the knowledge of particular software, processing and analyzing information, computer programming, problem solving, design (Motyl et al., 2017). On the other hand, the identified soft skills consisted of leadership, teamwork, and communication (Motyl et al., 2017). However, Ras et al. (2017) explain that construction activities will demand a reduced number of routine tasks and require workers to develop critical thinking and decision-making skills. On the other hand, Meisels (2019) explained that construction will require workers with the competence in data analytics since his view is built on the fact that modern technology is a database that runs on big data. According to the research report the construction sector is currently facing the need for workers who have multiple skills because of the growing tendency for globalization and technological developments (Playfoot & Hall, 2009). It is essential to note that, there was a need to define multiple skills, and according to the United Kingdom Commission Employer Skills Survey (2010), skills can be defined by the ability to do something reasonably well. Nevertheless, I think this definition was limited because different jobs require various changing skills (Motyl et al., 2017).

When looking at the skills required in the construction industry, attention was drawn by the fact that the two categories of skills, namely technical and soft skills, are required by the market. Specifically, Motyl et al., (2017) explain that both hard and soft skills should be considered. However, technical skills are increasingly more valuable because construction activities are increasingly more technology-based, and IT competence are required by employers in the future (Osman & Canan, 2018). Therefore, technical skills should be included in the skills sets of construction workers that will be employed in the future.

- *Skills Gap in the Masonry Workforce and its Relationship with Educational Training*

According to Mahasneh and Thabet (2015), skills gap in construction refers to the difference between what the employers require skill-wise and what the employees offer. Skills gap in construction includes technical skills, managerial skills, and interpersonal or soft skills (Adepoju et al., 2022; Olusola, 2019; Warrner, 2018). According to Smith and Brown (2015), masonry workers had a significant skills gap, which was mainly tied to the nature of the training they underwent. At a time when the sector was experiencing increased urbanization, the skills gap was detrimental to the quality of construction in masonry. Smith and Brown undertook a mixed-methodology study in the Mid-Western United States to establish the effectiveness of vocational training among masonry workers. The survey was based on the researchers' questionnaires administered among over 200 masonry workers and instructors' semi-structured interviews. According to the study, although the theoretical aspects of training were appropriately covered, the practical aspects of skills training lacked, which affected the performance of masonry workers on-site (Smith & Brown, 2015). Inadequate skills training resulted in poor productivity levels among masonry workers.

Research by Adepoju and Aigbavboa (2021) sought to determine the extent to which the construction industry in Nigeria had adopted Construction 4.0 and the effect of such technology on the skill set of its workers. Using a structured survey questionnaire, Adepoju and Aigbavboa (2021) arrived at several key

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

findings. For a start, the study found that professionals in the construction industry had moderate knowledge of Construction 4.0 technologies and low levels of training. It also revealed a significant skills gap in areas such as human-machine interaction, data analytics, and cybersecurity (Adepoju & Aigbavboa, 2021). The study recommended prioritizing human capital investment through retraining and updating of skills in order to fill the skills gap in areas such as construction cybersecurity, construction data analytics, and construction robotics.

Akintoye and Oluwole (2010) took up the issue of the skills gap in the Nigerian construction industry, with a focus on the lack of interaction between academic institutions and industry players. Through their case study and field observation in urban construction, Akintoye and Oluwole identified the absence of appropriate articulation as a key skills gap contributor. The study observed that the failure of academic institutions to align their curricula with changing industry needs resulted in a skills gap in the Nigerian construction sector (Akintoye & Oluwole, 2010). In order to address this issue, the study recommended strengthening institutional-industry linkages.

Khuzwayo et al. (2024) took up the issue of skills gap in Masonry. The paper reveals that mason training in South Africa has a number of technical gaps, which adversely affect the quality of masonry construction works. This study was based on a case study design, which employed a scoping review and immersion research strategy. Untrained masons failed to comply with National Building Regulations and Building Standards by using substandard construction materials when laying blocks and mortar and also failing to finish mixed mortar within the recommended time after mixing (Khuzwayo et al., 2024). Consequently, the authors recommend that mason training needs to be aligned to National Building Regulations and Building Standards to promote quality masonry works in South Africa. They also recommend that the South African government and designated government departments develop and implement training programs for untrained masons.

In Scotland, the bricklaying industry has not benefited from off-site production despite its potential to reduce wastage and increase productivity. According to Lawani et al. (2022), the skills gap is so severe that 66 per cent of small and medium enterprises (SMEs) in Scotland reported having recruitment challenges for bricklayers.

Nkunya and Mwila (2024) looked at the impact of Technical Vocational Education and Training (TVET) acquired skills on students' readiness for employment in the field. Their study involved a survey of students at the Dar es Salaam Regional Vocational Training Service Centre. Their findings showed that fieldwork experiences, teaching materials, and industry engagement among students were below expectations. Lack of current teaching materials, limited field experiences, and inadequate industry linkages were major challenges hindering effective TVET as revealed by the study (Nkunya & Mwila, 2024). Based on the recommendations, it was recommended that for better labour market relevance, curriculum, and infrastructure of technical vocational institutions should be developed and expanded alongside industry collaborations.

A review and discussion of the aforesaid literature on the topic of the skills gap reveals that, as described by Mahasneh and Thabet (2015), it has continued to affect the mason workforce. Notably, there is a high rate of technical skills among masons but low rates of soft skills. In addition, most training programs for masons are poorly designed to incorporate modern developments in the construction sector. According to Adepoju and Aigbavboa (2021), the majority of construction workers in Nigeria have limited knowledge and training on Construction 4.0 technologies, which implies that skills training among these workers needs updating. From my perspective, this statement provides a rationale for the need for institutions offering vocational training to update their curricula periodically and incorporate new developments in the field.

Furthermore, the findings by Khuzwayo et al. (2024) that identified technical gaps in the training of masons are quite revealing. These gaps include failure to finish mixed mortar within the recommended time

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

after mixing, use of substandard sand and cement when constructing internal and external block works, and building masonry walls without proper curing, among others. From my point of view, this indicates a serious disconnect between training institutions and the industry, which requires closer collaboration in order to produce better-skilled workers. If the training institutions are not aware of the technical aspects of masonry construction works, it is impossible for them to train new workers to meet the industry standards. This further underscores the need for the government and other designated agencies such as the South African National Building Regulations and Building Standards Board to update mason training and make it relevant to current industry needs (Khuzwayo et al., 2024).

- *Impact of Educational Training on the Skill Levels of the Masonry Workforce*

Educational training plays a pivotal role in enhancing the skill levels of the masonry workforce, directly influencing construction quality and safety. For instance, research in Dar es Salaam, Tanzania, analyzed the influence of Technical Vocational Education and Training - acquired skills on labour market readiness among students at the Dar es Salaam Regional Vocational Training Service Centre (Nkunya & Mwila, 2024). Employing a mixed-methods approach, the study combined qualitative insights with quantitative regression analysis, collecting data from 86 participants, including 82 students and 4 trainers. The results revealed a moderate positive correlation between training outcomes and perceived employability, with 46% of the variance in employability explained by acquired skills. The study identified significant gaps in fieldwork opportunities and industry collaboration, suggesting that strengthening industry linkages and updating training programs could enhance the employability of masonry graduates.

In Ethiopia, an evaluation of the knowledge and skills attained by final-year students in construction programs assessed the effectiveness of internship coordination (Mengistu & Mahesh, 2019). Utilizing a mixed-methods approach, data were collected through questionnaires completed by students and company supervisors, supplemented by interviews with university instructors. The study found performance shortfalls in critical knowledge areas among students and highlighted unsatisfactory coordination of internship programs. These findings suggest the need for curriculum enhancements and improved internship management to better prepare students for the demands of the masonry profession.

Furthermore, research by Anton et al. (2020), focusing on the prevalence of work-related musculoskeletal pain among masonry apprentices revealed that approximately 78% of apprentices reported musculoskeletal symptoms, with low back and wrist/hand areas most affected. Despite the high prevalence, few apprentices missed work or sought healthcare. The study emphasizes the importance of integrating ergonomics education into apprenticeship programs to promote early adoption of safety practices and reduce injury rates among masonry workers.

A study by Kincl et al. (2020) evaluated the Safety Voice for Ergonomics (SAVE) training program among masonry apprentices. The randomized control trial demonstrated that apprentices who underwent the SAVE program exhibited increased safety participation and adopted improved ergonomic practices, such as adjusting scaffolding and using better body postures. This study underscores the effectiveness of specialized training in enhancing both safety and skill levels among masons.

Similarly, a study by Kincl et al. (2016) investigated the efficacy of the SAVE program through a workplace cluster-randomized controlled trial. The findings indicated that apprentices who received the SAVE training were more proactive in using their safety voice and engaging in safety behaviours, leading to a reduction in musculoskeletal disorders. This research highlights the importance of integrating safety communication and ergonomic training to improve the overall skill set of masonry apprentices.

Furthermore, research by Fagbenle et al. (2012) assessed the impact of various training types on the productivity of bricklayers in Nigeria. The study utilized questionnaires and interviews with construction

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

workers across Lagos, Abuja, and Port Harcourt. The results indicated that both craft training and job management skills training significantly enhanced the productivity of bricklayers, highlighting the importance of continuous professional development in the masonry sector.

In the context of the U.S. construction industry, a study by Knezovich et al. (2023) investigated the impact of workforce training on worker performance. The research surveyed construction workers using an online questionnaire, focusing on self-evaluated personal performance and the number of training hours in craft training, job management skills training, and planning skills training. The survey received 2,468 responses from all 50 states. The findings underscored the importance of training in enhancing worker performance, emphasizing that targeted training programs contribute to improved safety standards, timely project completion, and greater economic development contributions.

From the above reviewed literature, educational training undoubtedly plays a significant role in bridging the gap between the current capabilities of the workforce and the evolving demands of the industry. In examining the influence of Technical Vocational Education and Training - acquired skills on labour market readiness, Nkunya and Mwila (2024) highlighted how gaps in industry collaboration and practical experience hinder the overall effectiveness of such training programs. This emphasizes the necessity for a more integrated approach where training programs are continuously updated to align with industry practices. For instance, the lack of fieldwork opportunities identified in their study points to a wider issue in vocational training: theoretical knowledge is often prioritized at the expense of hands-on experience. This discrepancy caused a disconnect between what is taught and what is required on-site. Educational institutions must foster stronger partnerships with industry players to ensure that students gain valuable, real-world experience.

Similarly, the research by Anton et al. (2020) on musculoskeletal pain among masonry apprentices underscores the importance of incorporating health and safety training into the educational curriculum. This issue is not merely about skills for construction but also about ensuring the well-being of workers. Integrating ergonomics education into masonry training could play a crucial role in both improving skill levels and reducing workplace injuries. This would require educational programs to evolve and incorporate more comprehensive safety and wellness modules.

- *Factors Affecting the Effectiveness of Educational Training in Addressing Skills Gaps in the Masonry Workforce*

The shortage of skilled labour in the construction industry entails adverse effects on productivity. Akomah et al. (2023) reported a shortage of skilled labour in the construction industry in the central region of Ghana in the specialism of painting, decorating, electrical, and tiling. The researchers adopted a survey research design in understanding the scope of the problem and reasons why these professions were in short supply. The study considered various factors, including socio-economic, job attractiveness, industry constraints, and personal career perspectives. The researchers recommended that the scenario be addressed by motivating employees to improve their technical skills and work ethics and encouraging organisations to invest in training and development programs for construction workers. Addressing the issue of the skills gap in construction would promote industry productivity and sustainability.

Human Resource Management (HRM) practices are key productivity drivers in the masonry industry. Mbati (2019) reveals that productivity in the masonry industry could be improved by enhancing human resource management practices, including performance appraisal, training and development, recruitment and selection, and employee engagement practices. In Nairobi City County, the researcher found that while most of the construction sites had implemented safety, health, and welfare HRM practices, other critical areas such as recruitment and selection, employee relations, and performance and reward management had been neglected. The study established a direct relationship between the implementation of these HRM practices and the productivity levels of the masonry workers. As a result, the researcher recommends adopting the relevant

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

HRM practices and policies to improve the performance and, by extension, increase the productivity of the masonry industry. Thus, it is essential to consider human resource management practices in all construction sites, including residential building projects, to boost productivity levels in the construction industry.

Similar findings were made by Timothy et al. (2024) in a study conducted in Uganda on the influential factors in skills development among the trainees pursuing the building and civil engineering programs. The researchers identified inadequate practical training and poor curriculum as some of the challenges facing masonry skill development in the Technical Vocational Education and Training (TVET) institutions. A mixed methods research design was adopted in the study, which involved both qualitative and quantitative procedures. The study involved a total of 317 respondents from selected TVET institutions, including Kampala, Wakiso, Kasese, Kyenjojo, Kagadi, Iganga, Mbale, Rukungiri, Mbarara, Bushenyi, Kitgum, and Lira districts. The researchers recommended improvements in curriculum development towards achieving sustainable labour market needs, addressing shortages in masonry skills resulting from the absence of relevant practical training. In addition, Alinaitwe et al. (2007) conducted a study on the productivity of building craftsmen in Uganda. They found that incompetent supervision, worker inadequacy, rework, and lack of tools and materials contributed to poor labour productivity. Concurrently, the study revealed that the provision of workshops was inadequate, which hindered the practical training of the crafts trainees and consequently suppressed skill acquisition among those enrolled in the course. On the other hand, the researchers found that most instructors were only certified at the secondary level, making them less competent than necessary to provide quality training to the trainees pursuing the building and civil engineering programs. As a result, the researchers recommend investment in better infrastructure development, including workshops, and recruiting competent staff in the technical education institutions to address the shortage of skilled manpower in the masonry field. Moreover, the researchers conducted a survey among the building project managers, in which the respondents were required to rate each of the 36 factors, which influence time, cost, and construction quality. The results of the survey provide a comprehensive view of the factors that influence time, cost, and construction quality in a bid to increase productivity levels in the masonry industry.

Nkunya Mwila (2024) agreed that poor linkage between technical education and industry collaboration decreases the employability rates of vocational graduates. In addition, a study conducted in Dar es Salaam revealed that obsolete teaching tools, poor fieldwork opportunities, and inadequate industry links in TVET contribute negatively to graduate employability in Tanzania. Nkunya & Mwila (2024) adopted a mixed-methods research design in investigating the mediating role of training outcomes on the relationship between vocational education and graduate employability. The study involved both qualitative and quantitative approaches, with the latter involving regression analysis. The results revealed that training outcomes had a moderate positive relationship with vocational graduate employability, with skills accounting for 46 per cent of the prediction.

Furthermore, Hassan (2021) revealed that in Malaysia, the linkage between the construction industry and construction training institutes was weak, and as a result, the skills acquired by the construction workforce did not meet the industry's demands. Consequently, researchers recommend strengthening collaboration between the stakeholders to address the gap in skills in the masonry field. Similarly, Lawani et al. (2022) in their study on the barriers influencing masonry in Scotland report insufficient income, care, and self-employment as the major themes. The sub-themes associated with these themes were the Scottish weather, risk/profit, physical demand, government expectations, and the value of innovation, which together constitute several challenges in masonry. Thus, from the review, it is evident that various variables influence masonry, and future experimental studies should address all these variables.

On the other hand, Khuzwayo et al. (2023) in a study on the masonry construction industry report noncompliance, unethical practices, and lack of knowledge among the masonry industry players in South Africa. The researchers identified the challenges in the masonry construction industry and recommended a

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

remedy strategy, which involved implementing ISO 9001:2015. According to the study, factors such as improved compliance, ethics, and knowledge would promote the masonry construction industry in South Africa (Khuzwayo et al., 2023).

Many of the research studies reviewed on this paper have addressed some aspects of the individual skills development in the masonry industry. However, most of the researchers have failed to address the collective effect of these factors on the development of skills in the masonry field. Therefore, there is a need for future experimental studies, which take into consideration all the factors affecting individual skills development in masonry and their combined effect.

It would be beneficial if future researchers can address each of the challenges faced by vocational training institutions and the masonry industry separately and challenges associated with individual skill developments in masonry from the perspective of an individual being trained as well as exploring other sources of training besides the traditional ways.

➢ *Research Gaps*

Despite extensive research on education and training in the masonry workforce, several gaps remain. These gaps are summarized in Table 1 according to the study objectives.

Table 1 Summary of Research Gaps

Study objective	Identified research gap	How the current study addresses the gap
Objective 1: To identify the specific skills gap among the masonry workforce in Moroto District.	Previous studies conducted in Dar es Salaam, Nigeria, and South Africa may not reflect the specific skills gaps among masonry workers in Moroto District, Uganda.	Identifies the specific skills gaps among the masonry workforce in Moroto District.
Objective 2: To assess the influence of technical vocational educational and training on the skill levels of masonry workforce in Moroto District.	Limited context-specific evidence exists on the influence of training on masonry workforce skills and the practical application of acquired skills.	Assesses the influence of technical vocational educational and training on masonry workforce skill levels in Moroto District.
Objective 3: To examine the factors affecting the effectiveness of technical vocational educational and training in addressing skills gap among the masonry workforce in Moroto District.	Limited evidence exists on factors affecting training effectiveness, including innovative teaching practices and technologies.	Examines the factors affecting training effectiveness in addressing skills gaps among the masonry workforce in Moroto District.

Source: Researcher's synthesis of the literature reviewed

The identified gaps demonstrate the need for a context-specific investigation of masonry workforce skills in Moroto District. Addressing these gaps will provide evidence to inform improvements in training programmes and enhance workforce competencies and productivity in the construction industry.

➢ *Chapter Summary*

The reviewed literature on the influence of educational training on the masonry workforce indicates that proper training of these workers plays a critical role in improving the quality and safety of construction. TVET has been found to have a significant role in improving the employability and skills of masonry workers. For

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

example, in Dar es Salaam, Tanzania, a study found that there was a moderate positive relationship between the technical and vocational education and training skills acquired and employability (Nkunya & Mwila, 2024). Besides employability, studies conducted in Ethiopia and South Africa also implicate the need for improved internship, curriculum development, and industry engagement to address the gap in masonry skills.

Further, the reviewed literature indicates that musculoskeletal disorders are common among masonry workers and that there is a need to include safety training and ergonomic assessment in educating these workers (Anton et al., 2020; Kincl et al., 2016). The need for continuous professional development, including knowledge and skills on modern technology, is also emphasized in several studies conducted in Nigeria, the US, and Scotland.

The reviewed literature also demonstrates a gap in skills among masonry workers, which is mainly traced back to poor educational training and the lack of connection between industry needs and education curricula. For example, several studies indicate that the skills gap in the masonry industry has a significant effect on the rate of construction productivity and quality (Smith & Brown, 2015; Khuzwayo et al., 2024). Besides the poor connection between the education sector and the industry, the literature also indicates that socio-economic factors, attractiveness of the masonry career, and human resource management factors also contribute to the skills gap (Akomah et al., 2023; Mbati, 2019).

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

➢ *Introduction*

This chapter explained the methodology for the study. The following were specified: research design, study area, target population, sampling procedures and sample size, research instruments, piloting of research instruments. Furthermore, validity and reliability of research instruments, data collection procedures, data analysis techniques, and ethical issues were discussed; and at the end, a summary was provided.

➢ *Research Design*

The study adopted a descriptive cross-sectional survey design, utilizing both qualitative and quantitative methods of data collection. This design was appropriate as it enabled the researcher to collect data from a sample population at a specific point in time to understand their preferences, practices, and interests (Baumeister et al., 2026).

➢ *Research Paradigm*

This study was guided by the positivist research paradigm, which is grounded in the assumption that reality is objective, measurable, and independent of the researcher (ParkKonge & Artino, 2020; Sarkar & Kalita, 2026). Positivism emphasizes the use of empirical evidence, systematic observation, and statistical analysis to understand social phenomena (Alharahsheh & Pius, 2020; Aramide & Adigun, 2025). In the context of this study, the paradigm was appropriate because it enabled the researcher to objectively examine how TVET influences the skills gap among the masonry workforce in Moroto District.

Under this paradigm, knowledge is derived from quantifiable data collected through structured questionnaires and analyzed using statistical methods such as descriptive measures and chi-square tests. This allowed the researcher to identify patterns, relationships, and variations in the skill levels of masonry workers and the effectiveness of TVET programs. The positivist approach also supported the use of standardized tools that enhanced reliability, validity, and replicability of findings. Therefore, the paradigm provided a rigorous and unbiased framework for investigating the extent to which TVET contributes to addressing the skills gap in the construction sector.

➢ *Study Area*

The study was conducted in Moroto District, situated in northeastern Uganda between latitudes 1°53′ and 3°05′ N and longitudes 33°38′ and 34°56′ E (Nalule, 2010). The district covers approximately 3,500 km² at an elevation of 1,356 to 1,524 meters above sea level (Nakalembe, Dempewolf & Justice, 2017). It shares borders with Kabong to the north, Kotido to the northeast, Napak to the west, Nakapiripirit to the northwest, Amudat to the south, and Kenya to the east (Appendix 7) (Akwango et al., 2016). The district features both mountainous terrain, including Mount Moroto at 3,083 meters, and semi-arid plains (Mubiru, 2010).

According to the 2014 Uganda Bureau of Statistics census, Moroto District had an estimated population of 103,432 (UBOS, 2017), though this number is likely higher at present. The Karimojong, a Nilotic ethnic group with a semi-nomadic pastoral lifestyle centered on cattle herding, dominate the population.

Moroto District was selected for this study due to its predominantly informal construction workforce, where many builders acquired skills on the job without formal training (Sladoje, Randolph & Khan, 2019). This informality often led to technical deficiencies and non-compliance with industry standards. The district's limited access to formal educational opportunities further exacerbated these challenges, making it an ideal location for examining how educational training could address the skills gap in the construction sector.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

➢ *Target Population*

The target population comprised of masons, instructors for building and construction courses, and heads of technical vocational education and training institutions. Masons were selected for their hands-on construction experience and understanding of the effects of formal training. Instructors ensured that students acquired the skills and knowledge required to meet industry demands, while heads of technical vocational education and training institutions offered valuable perspectives on the alignment between training programs and industry needs.

Only respondents with formal technical training or professional certification were included in the study. Masons without formal training, workers outside the specified categories, professionals from non-registered construction sites, and inactive or retired professionals were excluded.

➢ *Sampling Procedures and Sample Size*

- *Sample Size*

The sample size was determined using Krejcie and Morgan's (1970) table, derived from the following formula:

$$S = \frac{X^2 \cdot N \cdot P \cdot (1 - P)}{(E^2 \cdot (N - 1)) + (X^2 \cdot P \cdot (1 - P))}$$

Where:

S = the required sample size

X^2 = the table value of Chi-square for 1 degree of freedom at the desired confidence level (usually 3.841 for a 95% confidence level)

N = the population size

P = the population proportion (assumed to be 0.50 if unknown)

E = the margin of error (expressed as a decimal, e.g., 0.05 for 5% margin)

Using the formula provided, a total of 109 respondents were selected from a population of 138, as shown in Table 2. The sample sizes for each group were determined based on proportional allocation as indicated in the Krejcie and Morgan (1970) sample size determination table (Appendix 8), ensuring that each category is represented according to its proportion within the population.

Table 2 Sample Population and Sample Size

Schools	Population	Sample size
Heads of TVET institutions	3	3
Instructors	15	14
Masons	120	92
Total	**138**	**109**

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

- *Sampling Procedures*

The study used a multi-stage sampling procedure in the selection of the sample from the target population. The stages followed in the sampling were as follows; in the first stage, two (2) Sub-Counties were selected from the study area by using the simple random sampling method. All Sub-Counties were written down on pieces of paper, which were then folded and randomly picked to identify the two Sub-Counties selected for the study.

The second stage involved selecting two (2) parishes from each of the selected two (2) Sub-Counties by using the simple random sampling procedure. The procedure was aimed at achieving diversity in the selection process of the parishes.

In the third stage, the study randomly selected four (4) villages from each of the selected parishes in the second stage to achieve geographical diversity.

In the fourth stage, the study identified all the construction sites that were formally registered in the selected villages and construction sites were then selected using the purposive sampling method.

Finally, respondents were selected from the identified construction sites using purposive sampling and the inclusion criteria in Table 3.1 since only construction workers in the selected construction sites were considered for the study. The study used the purposive sampling method because it was an effective way of selecting samples with specific characteristics, which include masons.

➢ *Data Collection*

The study used a structured questionnaire with closed-ended questions and face-to-face interviews. Two research assistants were selected and trained on research ethics to assist in data collection. Recruitment was based on their previous research experience and proficiency in local dialects and English.

- *Questionnaires*

Structured questionnaires were administered to masons who had attended formal education in TVET Institutions to assess the skills of the masonry workforce, identify skill gaps, and explore factors contributing to these gaps in Moroto District. The questionnaire featured closed-ended questions with a five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree) to evaluate the impact of educational training on skill levels (Objective 1), the relationship between skills gaps and training quality (Objective 2), and factors affecting training effectiveness in addressing skills gaps among the masonry workforce (Objective 3). The Likert scale was selected for its ability to capture respondent feedback efficiently, and structured questionnaires were cost-effective, easy to administer, and ensured respondent confidentiality (Ferrando et al., 2025; McGuirk & O'Neill, 2016; Patten, 2016).

- *Interviews*

The interview method was used to collect qualitative data from key informants, such as building and construction instructors and heads of technical vocational education and training institutions. This method facilitated face-to-face interaction, enabling the researcher to gather in-depth insights and additional information not captured through other methods (Kallio et al., 2016; Khan et al., 2025; Njeri Mugwe & Runo, 2026). The interviews focused on understanding the impact of educational training on the masonry workforce's skill levels (Objective 1), identifying specific skill gaps and their relationship with training quality (Objective 2), and examining factors affecting the effectiveness of training in addressing these gaps (Objective 3).

➢ *Piloting of the Research Instruments*

A pilot study was conducted before the main study to assess the feasibility, methodology, and overall effectiveness of the research design. The primary aim of the pilot study was conducted in Kotido District by

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

the researcher and two personnel to evaluate the clarity and practicality of the research instruments, procedures, and data collection methods. The insights gained from the pilot informed adjustments to the research protocol, allowing for the identification of potential challenges and refining the study design. This process ensured that necessary modifications were made before proceeding with the larger-scale study, enhancing the reliability and validity of the findings.

➢ *Validity and Reliability of the Research Instruments*

- *Validity of the Research Instruments*

Validity refers to the extent to which an instrument accurately measures the concept or phenomenon it is intended to assess (Alavi et al., 2026; Hossan et al., 2025). In this study, the questionnaire for the masonry workforce was structured into two sections: Section A (7 items) capturing respondents' demographic characteristics and Section B (36 Likert-scale items) addressing the three specific objectives of the study. To ensure that the instruments were appropriate for the intended purpose, face validity was first established through review by the researcher's supervisors and colleagues. Their feedback led to adjustments in wording, sequencing, and clarity of questions to better align them with the study objectives. Content validity was then assessed through expert judgment. A panel of six experts in Education, Vocational Training, and Construction Workforce evaluated each item for relevance and clarity, using a 4-point rating scale (1 = Not relevant, 2 = Somewhat relevant, 3 = Quite relevant, 4 = Highly relevant). Items rated 3 or 4 were considered "relevant."

The Content Validity Index (CVI) was computed using the formula:

$$CVI = \frac{\text{Number of items rated relevant by all judges}}{\text{Total number of items in the instrument}}$$

$$CVI = n/N$$

Where:

n = Number of items rated as relevant (ratings of 3 or 4)

N = Total number of items rated.

For this questionnaire:

N=43 (7 demographic items + 36 Likert-scale items)

n=37 items rated as relevant by all six experts.

CVI =37/43 = 0.86

According to Azli Syam et al. (2026) a CVI of 0.70 or higher is considered acceptable. The obtained CVI of 0.86 demonstrates a high level of content validity**,** confirming that the questionnaire items were relevant, comprehensive, and well-aligned with the study's objectives. This ensured that the instrument could effectively capture information on the impact of training, existing skills gaps, and factors influencing the effectiveness of educational training in the masonry workforce in Moroto District.

- *Pilot Study Area*

The reliability of the data collection instruments was established through a pilot study conducted in Kotido District, involving 18 respondents (2 site foremen, 4 trainers and 12 masons) (representing 5% of the

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

total sample size). The pilot study was designed to test the consistency of the instruments, identify potential weaknesses, and ensure that the items would yield stable and consistent results during the main study. Respondents completed the questionnaires, and their responses were analyzed for internal consistency using Cronbach's Alpha in SPSS (version 20).

Cronbach's Alpha is a widely used statistic for determining the internal consistency of a research instrument. Values range from 0 to 1, with values of 0.70 and above considered acceptable for research purposes (Liptáková, 2025; Madadizadeh & Bahariniya, 2025). The results for this study are presented in Table 3.

Table 3 Reliability Statistics

Cronbach's Alpha	Number of items in the questionnaire
0.82	43

Source: Primary pilot data

The obtained Cronbach's Alpha coefficient of 0.82 indicates good internal consistency, suggesting that the items in the questionnaire reliably measured the intended constructs. To further ensure reliability during the main study, 4 field assistants were thoroughly trained on data collection procedures and protocols, including administering the questionnaire in a standardized manner and maintaining consistency in recording responses. Strict supervision was also provided throughout the data collection process to minimize errors and ensure uniformity.

➢ *Data Collection Procedures*

- *Procedure for Using Questionnaire Method*

The questionnaire was designed to gather information in line with the research questions. The tool was developed and then administered to the respondents. The objectives and purpose of the study were explained to the respondents prior to completion. Additionally, participants who agreed to participate in the study were required to sign a consent form. Study assistants assigned each respondent a code to conceal their identity.

- *Procedure for Using Interview Method*

Before each interview, the researcher obtained consent from the respondents to record the conversation. The interviews were guided by open-ended questions designed to encourage participants to share their thoughts and experiences related to the study objectives. The researcher probed for clarification and further details as needed. One research assistant assisted by recording the interviews using an electronic device, and the conversations were transcribed verbatim for analysis. Each interview lasted approximately 45 to 60 minutes. This approach ensured that the study captured rich, detailed responses that directly addressed the research objectives.

- *Data Analysis Techniques*

All raw data were first entered into a Microsoft Excel worksheet for preliminary exploration and data cleaning before transferring them into Statistical Package for Social Scientists (SPSS) version 30 to generate descriptive statistics.

- *Quantitative Analysis*

Quantitative data were analysed using descriptive statistics in the form of frequencies, percentages, mean, standard deviations, and tables.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

- *Qualitative Analysis*

Data from key informant interviews were analysed using qualitative content analysis based on their level of recurrence within the collected data and in line with the key research questions. The data were first transcribed from the tapes recorded during the individual dialogues/discussions. Thereafter, the transcribed data were categorized according to emerging themes from each question in the interview guide and discussions. All data sources were triangulated during the analysis to increase data validity.

➢ *Ethical and Legal Considerations*

The study obtained the necessary research permit from the University of Eldoret prior to data collection. Approval was also sought from the Chief Administrative Officer (CAO) of Moroto District to conduct the study in the selected sub-counties. Sub-county leadership was briefed on the study's objectives to prevent misconceptions, promote transparency, and ensure cooperation during data collection.

Participation in the study was voluntary, and informed consent was obtained from all respondents before data collection. Respondents were informed about the purpose of the study and the procedures involved to ensure that they understood the nature of their participation. Their participation was based on their willingness to provide information without coercion.

Confidentiality and anonymity were maintained throughout data collection and reporting by using codes instead of personal identifiers. The information collected was treated confidentially and used for the purposes of the study. The researcher also ensured that the information obtained from respondents was handled responsibly and that the findings were presented accurately without misrepresenting their responses.

Furthermore, the researcher observed the relevant institutional and administrative requirements for conducting research in Moroto District. These measures were intended to ensure that the study was conducted responsibly while respecting the rights, privacy, and dignity of all respondents.

➢ *Chapter Summary*

The research methodology has been described in this chapter. It detailed the research design, a descriptive cross-sectional survey utilizing both qualitative and quantitative methods. The study area was Moroto District, selected due to its informal construction workforce. The target population included masons, site managers, instructors, and heads of technical vocational education and training institutions, with a sample size of 109 determined using Krejcie et al., & Morgan's (1970) table. Data collection involved structured questionnaires and interviews, with validity and reliability ensured through a pilot study and statistical tests like Cronbach's Alpha and the Content Validity Index.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

CHAPTER FOUR
RESULTS AND DISCUSSION

➢ *Introduction*

This chapter presents, analyses, and interprets the data collected in the study. Quantitative data are analysed using frequencies, percentages, means, and standard deviations, while qualitative data are analysed through qualitative content analysis. The findings are interpreted in relation to the research objectives.

➢ *Response Rate*

As shown in Table 4, all 3 targeted heads of technical vocational education and training institutions were successfully interviewed, yielding a response rate of 100%. Among the instructors, 10 out of 14 targeted respondents were interviewed using the interview guide, resulting in a response rate of 71.4%. Furthermore, all 92 questionnaires distributed to respondents were completed and returned, giving a response rate of 100% for the questionnaire. Overall, the study achieved a total response rate of 96.2%, which exceeds the minimum acceptable criteria for research as recommended by Babbie new edition (15th Edition). According to Babbie (2020), return rates of at least 50% are adequate for analysis and publication, 60% are considered good, and 70% or more are deemed excellent. The high response rate in this study indicates that the collected data are representative and reliable for subsequent analysis.

Table 4 Response Rate

Instrument	Target sample size	Frequency	Percentage
Interview Guide for heads of TVET institutions	3	3	100
Interview Guide Instructors	14	10	71.4
Questionnaire	92	92	100
Total	**109**	**105**	**96.2**

Source: Researcher's data (2025)

➢ *Demographic Characteristics of Respondents*

The study involved 92 respondents, with the majority being male (84.8%) and a smaller proportion female (15.2%) as indicated in Table 5 below. The age distribution showed that most respondents were aged 26–36 years (32.6%), followed by 18–25 years (29.3%), 36–45 years (18.5%), 46–55 years (14.1%), and 56 years and above (5.4%). Regarding educational attainment, most respondents held a certificate (29.3%) or diploma (20.7%), while 23.9% had completed secondary education, 16.3% primary, 5.4% a bachelor's degree, and 4.3% had no formal education. Work experience was largely between 6–10 years (43.5%), followed by 1–5 years (29.3%), 11–15 years (16.3%), and 16 years and above (10.9%). In terms of employment type, nearly half of the respondents were casual labourers (48.9%), 35.9% were permanent employees, and 15.2% were self-employed. Regarding training, 62.0% had received some form of training, while 38.0% had not. Training frequency varied, with 38.0% never trained, 25.0% rarely trained, 17.4% occasionally trained, 12.0% frequently trained, and 7.6% always trained. The findings indicate that the masonry workforce in the study area is predominantly young to middle-aged, male, moderately educated, and engaged mostly in casual labor, with varied levels of training experience.

Table 5 Demographic Characteristics of Respondents

Demographic characteristics	Category	Frequency (n)	Percentage (%)
Gender of respondents	Male	78	84.8
	Female	14	15.2
	Total	**92**	**100**
Age range of respondents	18–25	27	29.3
	26–36	30	32.6

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

	36–45	17	18.5
	46–55	13	14.1
	56 and above	5	5.4
	Total	**92**	**100**
Level of education of respondents	No formal education	4	4.3
	Primary	15	16.3
	Secondary	22	23.9
	Certificate	27	29.3
	Diploma	19	20.7
	Bachelors' Degree	5	5.4
	Total	**92**	**100**
Years of experience	1–5 years	27	29.3
	6–10 years	40	43.5
	11–15 years	15	16.3
	16 and above	10	10.9
	Total	**92**	**100**
Type of employment	Casual labourer	45	48.9
	Permanent employee	33	35.9
	Self-employed	14	15.2
	Total	**92**	**100**
Training received	No	35	38
	Yes	57	62
	Total	**92**	**100**
Training frequency	Never	35	38
	Rarely	23	25
	Occasionally	16	17.4
	Frequently	11	12
	Always	7	7.6
	Total	**92**	**100**

Source: Researcher's data (2025)

➢ *Analysis of Key Research Objectives*

The data corresponding to the specific objectives of this research are presented and analysed in this section. For each research objective, information was collected using questionnaires and interview guides, which were then analysed through descriptive statistics and qualitative content analysis. To strengthen the validity and reliability of the findings, triangulation was applied by integrating insights from both quantitative and qualitative data sources, thereby ensuring a more comprehensive and balanced interpretation of the results.

For the presentation of findings, responses of *"strongly agree"* and *"agree"* were combined and interpreted as positive, while those of *"strongly disagree"* and *"disagree"* were combined and interpreted as negative**.** The *"neutral"* category was maintained as a standalone response. The interpretation of the Likert scale in relation to mean values is summarized as follows in Table 6.

Table 6 Likert Scale Interpretation

Scale value	Response category	Interpretation	Mean value range	Meaning in responses
1	Strongly Disagree	Very Low	0.0 – 1.0	Very high disparity in answers

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

2	Disagree	Low	1.1 – 2.0	High disparity in answers
3	Neutral	Moderate	2.1 – 3.0	Moderate variation in answers
4	Agree	High	3.1 – 4.0	Low disparity in answers
5	Strongly Agree	Very High	4.1 – 5.0	Very minimal disparity (strong consensus)

Source: Researcher's data (2025)

In terms of interpretation, a *"very high"* mean score indicated minimal disparity in responses, suggesting strong consensus among participants, while a *"very low"* mean score reflected wide variations in responses, suggesting divergent views.

➢ *Impact of Technical Vocational Educational and Training on the Skill Levels of the Masonry Workforce*

This section discusses the analysis results of data gathered to evaluate the effectiveness of TVET in boosting the skills of masonry workers. Questionnaires were administered to masonry workers, while TVET instructors and heads were individually interviewed. The quantitative data were analysed using frequencies, percentages, mean scores, and standard deviation. The qualitative data were thematically analysed and are presented below to provide additional information that supports the analysis results.

The results presented in Table 7 below indicate that education and training have had a positive effect on the respondents' masonry skills and performance. For example, the ability to tackle complex masonry tasks registered the highest mean score of 3.50 with a standard deviation of 1.209. A total of 21.7% strongly agreed, and 34.8% agreed that their performance improved after acquiring education and training. Furthermore, 22.8% strongly agreed, and 31.5% agreed that their work performance improved after acquiring the intervention. In addition, 15.2% strongly agreed, and 37% agreed that the quality of work improved after acquiring the intervention. Meanwhile, 17.4% strongly agreed, and 34.8% agreed that they acquired confidence in performing masonry tasks following the intervention. The ability to apply the new skills and techniques acquired during the intervention in day-to-day work registered a mean score of 3.29 with a standard deviation of 1.191. Specifically, 15.2% strongly agreed, and 31.5% agreed that they could apply the new skills and techniques in their daily tasks. Moreover, reducing errors and mistakes was indicated by a mean score of 3.37 with a standard deviation of 1.136. Thus, 14.1%-18.5% strongly agreed, and 30.4%-32.6% agreed that the intervention helped reduce errors and mistakes. At the same time, improved work speed was registered by a mean score of 3.46 with a standard deviation of 1.123. Therefore, 14.1%-18.5% strongly agreed, and 30.4%-32.6% agreed that the intervention improved their work speed. In the same way, the relevance of intervention to masonry work registered a mean score of 3.37 with a standard deviation of 1.146, whereas improved masonry skills registered a mean score of 3.37 with a standard deviation of 1.136. As a result, 14.1% strongly agreed, and 38% agreed that the intervention was relevant to masonry work and improved masonry skills.

Table 7 Respondents' Perceptions of the Effect of Technical Vocational Educational and Training on Masonry Skills

Statements	**SA n (%)**	**An (%)**	**N n (%)**	**D n (%)**	**SD n (%)**	**Mean ± SD**
Technical Vocational Educational and Training has improved my overall masonry skills.	13 (14.1%)	35 (38.0%)	25 (27.2%)	11 (12.0%)	8 (8.7%)	3.37 ± 1.136
I am more confident in performing masonry tasks after completing technical vocational education and training.	16 (17.4%)	32 (34.8%)	30 (32.6%)	2 (2.2%)	12 (13.0%)	3.41 ± 1.197
The technical vocational education and training I received has	21 (22.8%)	29 (31.5%)	23 (25.0%)	9 (9.8%)	10 (10.9%)	3.46 ± 1.253

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

contributed to better work performance.						
I can now apply new techniques learned during technical vocational education and training in my daily work.	14 (15.2%)	29 (31.5%)	30 (32.6%)	8 (8.7%)	11 (12.0%)	3.29 ± 1.191
Technical vocational education and training has improved the quality of my masonry work.	14 (15.2%)	34 (37.0%)	32 (34.8%)	4 (4.3%)	8 (8.7%)	3.46 ± 1.083
The technical vocational education and training programs I have attended are relevant to my masonry work.	13 (14.1%)	35 (38.0%)	26 (28.3%)	9 (9.8%)	9 (9.8%)	3.37 ± 1.146
The skills acquired from technical vocational education and training has helped me work faster.	17 (18.5%)	30 (32.6%)	30 (32.6%)	8 (8.7%)	7 (7.6%)	3.46 ± 1.123
I feel that technical vocational education and training has reduced errors in my masonry work.	13 (14.1%)	34 (37.0%)	28 (30.4%)	8 (8.7%)	9 (9.8%)	3.37 ± 1.136
I am able to handle complex masonry tasks better after technical vocational education and training	20 (21.7%)	32 (34.8%)	23 (25.0%)	8 (8.7%)	9 (9.8%)	3.50 ± 1.209
The quality of my work has improved since I began attending technical vocational education and training sessions.	17 (18.5%)	32 (34.8%)	25 (27.2%)	10 (10.9%)	8 (8.7%)	3.43 ± 1.170

SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree, SD= Standard Deviation. Mean ± SD is calculated using the numeric coding (1=SD, 2=D, 3=N, 4=A, 5=SA).

The above quantitative findings (Table 7) are consistent with the views of the instructors in Table 8 below. They emphasized that training programs improve basic skills but highlighted limitations in advanced competencies.

Table 8 Qualitative Findings on the Influence of TVET on Masonry Workforce Skills

Respondent	**Key finding**	**Supporting quotation**
Instructor 1	Training improves basic skills but does not adequately develop advanced techniques.	"Technical vocational education and training improves basic skills but not advanced techniques. Trainees can handle simple bricklaying and basic structural work, yet they struggle with complex tasks like multi-story constructions and precision detailing, which limits their overall competency on real projects."
Instructor 8	Foundational skills improve, but trainees remain inadequately prepared for demanding site activities.	"Good impact on foundational skills; advanced skills still lacking. Trainees gain confidence in basic masonry but are not fully prepared for more demanding site activities."
Instructor 2	Trainees understand basic techniques but require supervision to address real site challenges.	"Training builds foundation but does not fully prepare trainees for real site challenges. While they understand theory and basic techniques, they often need supervision and corrective guidance when confronted with site-specific problems."

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Instructor 3	Trainees gain basic competencies but struggle with independent decision-making and large projects.	"Programs moderately improve skills; trainees still need guidance. They are confident with small-scale tasks but cannot independently manage large projects or make judgment calls when unexpected issues arise."
Head of TVET Institution 1	Training develops foundational masonry skills but leaves gaps in advanced structural planning.	"Our training programs have significantly helped learners acquire foundational masonry skills such as proper mixing of mortar and laying straight walls, but we still see a gap when it comes to more advanced techniques like structural planning."
Head of TVET Institution 2	Short training duration limits mastery of complex construction skills.	"The training has been impactful, especially for beginners, but its short duration limits the extent to which learners can master complex construction skills."
Head of TVET Institution 3	Basic workmanship improves, but technical drawing interpretation and measurement skills remain deficient.	"We have seen improvements in basic workmanship among trainees; however, advanced areas like reading technical drawings or interpreting measurements are still lacking."

Source: Qualitative data from instructors and heads of TVET institutions

From the above findings of quantitative and qualitative, it is evident that educational training in Moroto District effectively enhances foundational masonry skills, work performance, and confidence. However, gaps remain in advanced skill application, problem-solving, and independent execution of complex tasks, highlighting the need for extended practical training and mentorship to ensure comprehensive skill acquisition.

- *Discussion and Implications of Findings*

The results of this study presented in Table 7 indicate that educational training has a significant effect on the masonry skills and work performance of respondents in Moroto District. The quantitative results obtained in this study support the qualitative evidence presented in this chapter (Table 8). This is because each of the quantitative results indicates that respondents benefited from the following: acquiring complex masonry tasks, work performance, and improved quality of masonry. This suggests that the interventions in the form of training had a beneficial effect on respondents by imparting core skills to enhance their performance. As a result, the respondents gained confidence, achieved faster performance, and fewer mistakes. The implications of these results are that technical vocational education and training is an intervener in skill gaps, especially in areas like Moroto that lack adequate technical education. The study results also demonstrate that the short-term technical education program has a positive effect on speed, mistakes, and the confidence of the trainees. This result is significant to donors because even in the developing world where technical education is in short supply, the semi-skilled labor market can be tapped to generate income. As UNESCO (2018) explains, Technical Vocational Education and Training serves as a ladder of opportunity, especially in reaching vulnerable groups.

However, the analysis of the quantitative results revealed that with a mean score of 2.58, the interventions do not adequately prepare the trainees for advanced skills application at the worksite. This outcome has several implications. First, the inability to acquire advanced skills in masonry means the respondents will not be able to meet the industry demand for highly-skilled masons. This result echoes the findings of Nkunya and Mwila (2024) in Tanzania who found that Technical Vocational Education and Training failed to address fieldwork experience and partnerships, resulting in a skills gap. This finding indicate that in Moroto, trainees are well prepared for the basics of masonry but less prepared for the challenges of the actual worksite due to their limited exposure during technical education. Similarly, a study by Mengistu and Mahesh (2019) study on the challenges of Technical Vocational Education and training in Ethiopia revealed that despite the initial skills gap addressed by technical education, shortcomings in coordination of industrial attachment resulted in

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

insufficient knowledge of construction site practices by the students. A similar observation was made by the respondents when explaining the limitations of technical education in the Moroto region. Thus, the limitations of Technical Vocational Education and Training in Moroto, Tanzania, and Ethiopia are similar. These weaknesses emanate from the fact that technical education is mostly donor-sponsored, short-term, and focused on building basic competencies rather than linking education to actual worksite needs. As a result, the trainees benefit from limited work exposure, thus being unable to perform advanced tasks at the construction site.

However, the qualitative results of this study expand upon the quantitative results by illustrating the limitations of training in more detail. According to the instructors, the trainees gain confidence in executing simple masonry tasks but lack adequate skills to perform complex tasks. This observation corroborates the results of Fagbenle et al. (2012) and Knezovich et al. (2023) who report that the construction workers in the global north require continuous training to improve their skills and work performance continuously. From these results, it is evident that technical education has a significant effect on the performance of masons, thus increasing their productivity. However, the results of the current study suggest that the short-term interventions have a limited effect on the creation of a versatile masonry workforce.

An additional implication of the study results is the lack of focus on the safety of the masons during training. While the current study did not focus on occupational health and safety, the moderate scores on error reduction and the need for constant supervision at the worksite indicate that there is a need for enhanced safety considerations in masonry training. Several studies have demonstrated the importance of addressing workplace safety and health issues in technical education, especially in mitigating the risk posed by poor ergonomic working conditions. For instance, Anton et al. (2020) and Kincl et al. (2016; 2020) found that incorporating safety voice training into masonry apprenticeships improved trainee safety awareness, resulting in reduced occupational injuries. These results suggest that the lack of attention to safety promotion in masonry training may contribute to the need for constant supervision at the worksite among the trainees studied. A similar concern is raised by the International Labour Organization in its report on occupational safety and health (2022). According to the report, masonry is among the occupations with the highest number of occupational injuries worldwide, which can be attributed to inadequate safety training and poor working conditions. Thus, the moderate scores on error reduction and the need for supervision of trainees in the current study could be explained by the shortcomings of the technical education program in addressing occupational safety and health needs. If trainees need constant supervision to avoid errors at the worksite, their ability to be independent and productive is compromised. As a result, their potential to meet the occupational safety expectations of the masonry employer is limited, further hindering their progression to more advanced skills in masonry.

The Technical Vocational Education and Training heads identified several limitations of the technical education programs affecting training outcomes. The heads explained that the short-term and insufficient funding of technical education resulted in the inability to prepare the trainees to interpret technical drawings and plan structures. These limitations reveal the challenges of technical education in meeting the industry's demands for skilled masons. This observation is in line with the findings of Nkunya et al. (2024) who reported on the limited role of technical education in addressing fieldwork and partnership needs. At the same time, the observations of these respondents provide a rationale for the need to increase the duration of technical education and enhance collaboration with industry partners to improve the technical competence of the trainees. It is noteworthy that these recommendations align with the concerns raised by the instructors, suggesting that the lack of adequate training time reduces the opportunity for trainees to acquire advanced masonry skills.

An additional observation made by the Technical Vocational Education and Training heads was the reliance of technical education on outdated equipment in conducting training. The instructors report that the use of obsolete equipment and locally fabricated materials limits the ability of the trainees to perform in the

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

modern construction industry. These limitations highlight the need for technical education to invest in modern equipment to meet the needs of the industry. The implication of these results is that without the application of updated equipment in training, local trainees will continue to lag behind their counterparts in neighboring countries like Kenya and Uganda who have adopted the use of mechanized construction equipment. This observation is supported by the findings of Osei-Tutu et al. (2021) in Ghana who argue that exposure to updated construction technology during technical education plays a significant role in ensuring a competitive workforce after graduation.

Overall, the above discussion revealed that technical education has a considerable effect on the masonry skills of the trainees in Moroto District. However, it appears that the technical education has limited impact in preparing trainees for advanced skills acquisition and application at the worksite. Thus, although the analysis demonstrates that technical education has a beneficial effect on trainees' confidence and the quality and speed of work performance, as explained in the reviewed literature, there is a need to enhance technical education by making it industry-driven to ensure the production of highly-skilled masons who are ready to face the challenges of the modern construction industry.

In addition to the individual benefits of enhanced technical education, the current study also considers the community-level benefits of improved masonry training. For instance, the improved masonry skills of the trainees will have positive implications for the community in terms of improved construction worksites and housing. Consequently, with enhanced technical education in masonry, the community will benefit from reduced reliance on external masons, thereby promoting self-sufficiency in skilled labour.

- *Skills Gap Among the Masonry Workforce and Their Relationship with the Quality of Technical Vocational Educational and Training*

This section presents findings on the skills gaps experienced by the masonry workforce and how they relate to the quality of TVET in Moroto District. Information was obtained from masonry workers through questionnaires and from TVET instructors and institutional heads through interviews. The collected data were analysed using descriptive statistics and thematic analysis, with results presented to show the relationship between training quality and existing skills gaps.

The results from Table 9 indicate that respondents perceived notable gaps between educational training and the actual skills needed in the masonry field. For instance, the belief that there are specific areas of masonry where training has been inadequate recorded the highest mean score (3.55 ± 1.062), with 45.7% of respondents agreeing and 15.2% strongly agreeing. The view that the lack of practical training contributes to the skills gap in the masonry workforce (3.54 ± 1.094) and that the existing skills gap affects the quality of work in masonry projects (3.49 ± 1.418) were also highly rated, with between 25.0%–35.9% agreeing and 19.6%–31.5% strongly agreeing. Respondents also agreed that the quality of educational training does not meet the needs of the construction industry in Moroto (3.48 ± 1.104) and that filling the skills gap would improve the quality of masonry work (3.37 ± 0.991). Furthermore, there was an agreement that the skills taught do not match those required on the job (3.24 ± 1.226) and that the received training does not include all masonry techniques (3.41 ± 1.268). In addition, the participants agreed that the current training program does not address skills adequately (3.37 ± 1.340) and that there is a substantial gap between the learned and required skills (3.42 ± 1.225). Between 19.6% – 32.6% strongly agreed, and between 25.0% – 38.0% agreed with these statements. Lastly, the statement that the training programs should be updated to address the gaps in skills with a score of 3.32 ± 1.283 received agreement from 32.6% and strong agreement from 18.5%.

Table 9 Perceptions on Skills Gaps in Masonry Training in Moroto District

Statement	SA n (%)	A n (%)	N n (%)	D n (%)	SD n (%)	Mean ± SD

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

There is a noticeable gap between the skills taught in technical vocational education and training and the skills needed in the field.	17 (18.5 %)	35 (38.0 %)	20 (21.7 %)	10 (10.9 %)	10 (10.9 %)	3.42 ± 1.225
The technical vocational education and training I received did not cover all the necessary masonry techniques.	21 (22.8 %)	26 (28.3 %)	26 (28.3 %)	8 (8.7 %)	11 (12.0 %)	3.41 ± 1.268
I feel that my skills are not fully addressed by the current technical vocational education and training programs.	20 (21.7 %)	30 (32.6 %)	21 (22.8 %)	6 (6.5 %)	15 (16.3 %)	3.37 ± 1.340
There are specific areas of masonry where technical vocational education and training has been inadequate.	14 (15.2 %)	42 (45.7 %)	24 (26.1 %)	5 (5.4 %)	7 (7.6 %)	3.55 ± 1.062
The quality of the technical vocational education and training does not meet the needs of the construction industry in Moroto.	15 (16.3 %)	36 (39.1 %)	26 (28.3 %)	8 (8.7 %)	7 (7.6 %)	3.48 ± 1.104
The existing skills gap affects the quality of work in masonry projects.	29 (31.5 %)	23 (25.0 %)	19 (20.7 %)	6 (6.5 %)	15 (16.3 %)	3.49 ± 1.418
The lack of practical training contributes to the skills gap in the masonry workforce.	18 (19.6 %)	33 (35.9 %)	28 (30.4 %)	7 (7.6 %)	6 (6.5 %)	3.54 ± 1.094
There is a significant mismatch between the skills taught and the actual demands of the job.	12 (13.0 %)	33 (35.9 %)	25 (27.2 %)	9 (9.8 %)	13 (14.1 %)	3.24 ± 1.226
I believe that filling the skills gap would improve the quality of masonry work.	9 (9.8 %)	36 (39.1 %)	32 (34.8 %)	10 (10.9 %)	5 (5.4 %)	3.37 ± 0.991
The technical vocational education and training program should be updated to address current skill gaps in the masonry field.	17 (18.5 %)	30 (32.6 %)	23 (25.0 %)	9 (9.8 %)	13 (14.1 %)	3.32 ± 1.283

SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree, SD= Standard Deviation. Mean ± SD is calculated using the numeric coding (1=SD, 2=D, 3=N, 4=A, 5=SA)

Source: Researcher's data (2025)

The above quantitative findings align with the instructors' perspectives (Table 10) as they state that while the current training programs offer foundational knowledge, they lack in advanced techniques, management skills, and soft skills.

Table 10 Qualitative Findings on Gaps in Masonry Skills among TVET Trainees

Respondent	**Key finding**	**Supporting quotation**
Instructor 1	Weak advanced bricklaying, alignment, spacing, and construction planning skills.	"Trainees struggle with advanced bricklaying and planning. They often fail to apply proper alignment and spacing techniques and have difficulty visualizing the sequence of construction tasks, resulting in delays and inconsistent quality."
Instructor 2	Inadequate levelling, measurement, quantity calculation, and site management skills.	"Weak levelling, measurement, and site management skills are common among trainees. Many trainees cannot accurately calculate quantities or manage resources on-site, limiting their ability to work efficiently."

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Instructor 4	Limited independence, teamwork, plan interpretation, and safety compliance on large projects.	"Trainees cannot work independently on larger projects. They struggle with coordinating tasks with others, following complex plans, and ensuring safety protocols."
Instructor 7	Gaps in mortar mixing, structural masonry, safety, and practical experience.	"Mixing, structural masonry, and safety gaps exist. Lack of hands-on practice makes them prone to errors, particularly with advanced structural designs."
Head of TVET Institution 1	Limited architectural drawing interpretation due to inadequate training exposure.	"Most trainees struggle with interpreting architectural drawings, which is a direct result of limited exposure during the training sessions."
Head of TVET Institution 2	Insufficient coverage of advanced bricklaying techniques.	"Advanced bricklaying techniques, such as handling corners, arches, or roofing structures, remain a major gap. This shows that our training content is still too shallow."
Head of TVET Institution 3	Inadequate measurement, mixing ratios, and durability planning skills.	"Skills such as accurate measurement, mixing ratios, and planning for durability are missing. The short-term training programs do not cover these aspects adequately."

Source: Qualitative data from instructors and heads of TVET institutions

Based on both the quantitative and qualitative findings, it is clear that while training in Moroto District provides a solid foundation in masonry, substantial gaps remain in advanced technical skills, site management, and problem-solving abilities. These shortcomings underscore the necessity for longer, hands-on, and well-structured training programs to better align educational preparation with the practical demands of the masonry industry.

- *Discussion and Implications of Findings*

The results of this study (Table 9) revealed that technical vocational education and training in Moroto District, while valuable in building foundational masonry knowledge, is inadequate in addressing the comprehensive skill set demanded by the construction industry. Respondents identified the relevance of the course in addressing the lacunae in advanced level masonry, interpretation of architectural designs and layout, management of site among others as the primary research issue. Instructors and heads of technical vocational education and training institutions concurred that learners grapple with proper alignment, accurate measurements and planning, and adherence to safety measures (Table 10). This observation resonates with the findings of Mahasneh and Thabet (2015) on the skills gap in the construction industry which is manifested by the variance between what the employers expect and what the employees offer both technically and managerially.

The respondents' responses in Moroto district echo the observations made by Smith and Brown (2015) regarding the skills gap resulting from giving too much emphasis on theory over practicals in technical vocational education and training curricula. Consequently, technical vocational education and training graduates are unable to undertake actual assignments with confidence hence the errors, delays and inefficiencies recorded in the implementation process. Instructors noted the inability of the learners to layout, estimate materials and manage effectively the resources required during construction activities. Observations by Khuzwayo et al. (2024) in South Africa also implicate poor technical vocational education and training and inappropriate implementation of the standard codes in the poor construction observed.

Another critical dimension highlighted in this study is the absence of strong industry linkages. The heads of technical vocational education and training institutions acknowledged that short training programs, outdated tools, and limited engagement with industry actors prevented learners from acquiring the advanced skills required in the job market. This finding is consistent with Akintoye and Oluwole (2010), who argued that the disconnection between academic institutions and industry stakeholders exacerbates the skills gap. Similarly,

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Nkunya and Mwila (2024) found that outdated teaching methods and lack of fieldwork opportunities undermined labor market readiness among technical vocational education and training graduates in Tanzania. The situation in Moroto mirrors this challenge, as trainees graduate with basic skills but remain underprepared for industry-specific demands.

The study also draws attention to the need for integrating safety and soft skills into training. Although this study did not directly focus on safety, the moderate ratings on error reduction and the instructors' comments regarding safety lapses suggest that current programs do not sufficiently prepare trainees for safe, independent practice. Anton et al. (2020) and Kincl et al. (2016, 2020) emphasized the critical role of ergonomics and safety training in preparing masons for the workplace, showing that failure to integrate such training increases risks of injury and reduces productivity. In line with the findings of the study, the absence of safety education in Moroto can explain why the trainees' dependence on the workers increases after training. Moreover, the need to update curriculum to include emerging technologies and develop soft skills among technical vocational education and training (TVET) participants is also a critical implication. According to Adepoju and Aigbavboa (2021), the skills gap in construction, particularly with respect to Construction, 4.0 competencies such as data analytics and human–machine communication, necessitates the need to update the TVET curricula and invest more in reskilling. While it is true that the situation in Moroto is not at the level of construction 4.0, the implication of their finding is applicable in this context. If the curricula being used to train masons are not dynamic and do not include innovative approaches to construction, then it will not align with the global expectations in the construction industry.

Therefore, the study revealed that, while TVET programs contribute immensely to the acquisition of basic masonry skills by the participants, they are limited in scope and do not produce versatile and competitive workers needed in the local construction firms. The issue raised by the findings can be addressed by ensuring that the duration of the training programs is increased to include more practical sessions, updating TVET curricula to emphasize on sustaining the health and safety culture, and promoting partnership between the TVET institutions and construction companies to promote articulation of training programs. The findings are consistent with the review conducted by Khuzwayo et al. (2024) and Nkunya and Mwila (2024), which revealed that vocational training has the potential to support sustainable development goals if its design can be adjusted accordingly. As a result, the study can be considered an initiative towards improving the continuous improvement of TVET programs in line with the changing demands of the construction industry.

- *Factors Affecting the Effectiveness of Technical Vocational Educational andTraining in Addressing Skills Gap Among the Masonry Workforce*

The findings in this section (Table 11) highlight the factors that influence the effectiveness of TVET in reducing skills gaps among the masonry workforce in Moroto District. Data were gathered from masonry workers through questionnaires and from TVET instructors and institutional heads through interviews. The collected information was analysed using descriptive statistics and thematic analysis to identify factors affecting the ability of TVET to address workforce skills gaps.

The responses of participants to the statement on the causes of the gaps in skills among the masonry workforce in Moroto District were scored as follows: limited resources (3.50±1.172) with 21.7% strongly agreeing and 33.7% agreeing; lack of qualified trainers (3.58±1.251) with 27.2% strongly agreeing and 30.4% agreeing; short training period (3.47±1.262) with 21.7% strongly agreeing and 34.8% agreeing; lack of sufficient practical component, (3.30±1.136) with 9.8% strongly agreeing and 43.5% agreeing; effects of the environment (3.40±1.196) with 18.5% strongly agreeing and 33.7% agreeing; inadequate materials and equipment (3.55±1.142) with 22.8 strongly agreeing and 32.6% agreeing; lack of follow-up and refresher courses (3.59±1.159) with 20.7% strongly agreeing and 41.3% agreeing; and too fast a pace of training and presentations (3.27±1.149) with 12.0% strongly agreeing and 34.8% agreeing. In addition, incorporation of feedback mechanism and assessment (3.49±1.153) with 17.4% strongly agreeing and 40.2% agreeing; and

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

lack of updating of training materials to current demands and needs (3.40±1.100) with 16.3% strongly agreeing and 33.7% agreeing.

Table 11 Factors Affecting the Effectiveness of Technical Vocational Educational and Training on Masonry Skills Gaps

Statement	SA n (%)	A n (%)	N n (%)	D n (%)	SD n (%)	Mean ± SD
Limited resources hinder the effectiveness of technical vocational education and training programs.	20 (21.7 %)	31 (33.7 %)	22 (23.9 %)	13 (14.1 %)	6 (6.5 %)	3.50 ± 1.172
Technical vocational education and training is not regularly updated to match the changing needs of the industry.	15 (16.3 %)	31 (33.7 %)	27 (29.3 %)	14 (15.2 %)	5 (5.4 %)	3.40 ± 1.100
There is a lack of qualified trainers to effectively conduct the courses.	25 (27.2 %)	28 (30.4 %)	24 (26.1 %)	5 (5.4 %)	10 (10.9 %)	3.58 ± 1.251
The duration of the training sessions is too short to fully address the skills gap.	20 (21.7 %)	32 (34.8 %)	23 (25.0 %)	5 (5.4 %)	12 (13.0 %)	3.47 ± 1.262
The technical vocational education and training programs do not have enough practical applications.	9 (9.8 %)	40 (43.5 %)	23 (25.0 %)	10 (10.9 %)	10 (10.9 %)	3.30 ± 1.136
I believe that the environment in which training takes place affects its effectiveness.	17 (18.5 %)	31 (33.7 %)	25 (27.2 %)	10 (10.9 %)	9 (9.8 %)	3.40 ± 1.196
Trainees' access to materials and equipment impacts the quality of their learning.	21 (22.8 %)	30 (32.6 %)	26 (28.3 %)	9 (9.8 %)	6 (6.5 %)	3.55 ± 1.142
There is a lack of follow-up or refresher courses after initial training.	19 (20.7 %)	38 (41.3 %)	22 (23.9 %)	4 (4.3 %)	9 (9.8 %)	3.59 ± 1.159
The pace of the technical vocational education and training program is too fast to absorb new concepts.	11 (12.0 %)	32 (34.8 %)	31 (33.7 %)	7 (7.6 %)	11 (12.0 %)	3.27 ± 1.149
Feedback and evaluation mechanisms are not well integrated into the training process.	16 (17.4 %)	37 (40.2 %)	24 (26.1 %)	6 (6.5 %)	9 (9.8 %)	3.49 ± 1.153

SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree, SD= Standard Deviation. Mean ± SD is calculated using the numeric coding (1=SD, 2=D, 3=N, 4=A, 5=SA)

Source: Researcher's data (2025)

The quantitative findings in Table 11 have been verified by qualitative data (Table 12) which illustrate how the aforementioned causes affect the gap in skills among masons. Both instructors and heads of technical vocational education and training institutions concurred that the current training programs do not support the acquisition of advanced masonry skills among the masonry workforce, although they might contribute to the foundational skills.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

Table 12 Qualitative Findings on Factors Limiting the Effectiveness of TVET in Masonry Skills Development

Respondent	Key finding	Supporting quotation
Instructor 1	Short training duration, inadequate tools, unqualified trainers, and limited practical sessions hinder advanced skills acquisition.	"Short duration, limited tools, and unqualified trainers hinder trainees from mastering advanced skills. Courses focus on theory with minimal practical sessions, so trainees cannot internalize advanced techniques."
Instructor 3	Fast-paced sessions, inadequate follow-up, and insufficient trainers weaken skills retention and application.	"Fast-paced sessions, lack of follow-up, and insufficient trainers reduce the impact of training programs. Trainees often forget newly taught techniques or fail to implement them correctly on-site due to inadequate reinforcement."
Instructor 6	Limited practical exposure and insufficient training resources undermine competence and confidence.	"Limited practical exposure and resource constraints negatively affect trainees' learning. Without access to sufficient bricks, cement, tools, or real site simulations, learners cannot gain confidence or competence."
Instructor 9	Limited follow-up, short sessions, and environmental challenges reduce learning retention.	"Limited follow-up, short sessions, and environmental challenges affect learning retention."
Head of TVET Institution 1	Inadequate tools and materials restrict practical training.	"The lack of adequate tools and materials limits our ability to conduct hands-on practical sessions, leaving trainees with more theoretical than practical knowledge."
Head of TVET Institution 2	Inadequate trainer qualifications affect the depth of technical content delivery.	"Unqualified and undertrained instructors also affect the depth of content delivery, especially in technical masonry aspects."
Head of TVET Institution 3	Short training duration limits preparation, particularly for trainees without prior construction experience.	"The duration of the training is too short to adequately prepare learners, especially since many come in with no prior exposure to construction work."

Source: Qualitative data from instructors and heads of TVET institutions

According to the above quantitative (Table 11) and qualitative findings (Table 12), it is apparent that masonry training in Moroto District is hindered by limited resources, brief and accelerated course schedules, inadequate follow-up, a shortage of qualified trainers, and incomplete alignment with industry requirements. These challenges emphasize the importance of implementing longer, hands-on, and carefully structured training programs to equip trainees with the advanced skills and practical competencies needed for effective performance in the masonry field.

- *Discussion and Implications of Findings*

The findings of this study from Table 4.6 revealed that several interrelated factors hinder the effectiveness of technical vocational education and training in addressing skills gaps among the masonry workforce in Moroto District. Limited resources, such as inadequate tools, construction materials, and teaching infrastructure, were identified as a major constraint. This finding aligns with Alinaitwe et al. (2007), who

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

reported that insufficient infrastructure and tools significantly limit the effectiveness of practical learning, thereby reducing skill acquisition among trainees in Uganda. Similarly, Nkunya and Mwila (2024) highlighted that outdated teaching tools and inadequate fieldwork opportunities negatively affect graduates' employability in Tanzania, demonstrating that resource constraints are a widespread challenge in vocational training across the region.

The study also indicated that the lack of qualified trainers adversely affects training quality. Respondents emphasized that under qualified instructors limit the depth of content delivery, particularly for advanced masonry techniques. This corroborates the findings of Mbati (2019), who argued that weak human resource management practices, including insufficient trainer competency, undermine labour productivity in Nairobi's construction sector. Similarly, Khuzwayo et al. (2023) observed that substandard instructor qualifications in South Africa contributed to gaps in technical skills and overall construction quality, reinforcing the need for skilled trainers to enhance the effectiveness of vocational programs.

Short training duration and fast-paced sessions emerged as additional limitations. Trainees reported difficulty internalizing advanced concepts and applying them on-site, a challenge that mirrors the observations of Timothy, Peter and Wanjala (2024), who found that brief technical vocational education and training programs in Uganda fail to provide adequate practical exposure, limiting the development of critical masonry skills. Furthermore, the absence of follow-up or refresher courses was highlighted as a factor contributing to poor retention of newly acquired skills, consistent with Akomah et al. (2023), who emphasized that lack of ongoing professional development reduces skill application and diminishes workforce efficiency in Ghana's construction sector.

Practical application and hands-on learning were also found to be inadequate, with trainees unable to gain sufficient exposure to real-world construction tasks. This finding is consistent with Smith and Brown (2015), who reported that vocational training in the United States adequately covers theoretical knowledge but often lacks realistic practical modules, leading to reduced on-site performance. Similarly, Hassan et al. (2021) noted that weak linkages between technical vocational education and training providers and industry in Malaysia resulted in a mismatch between skills taught and those required by employers, highlighting the critical role of practical, industry-aligned training in reducing skills gaps.

Environmental factors, such as poor learning conditions and limited access to materials, were found to further constrain skill development. This observation aligns with Lawani et al. (2022) in Scotland, who identified environmental challenges, including physical strain and inadequate resources, as significant barriers to effective training and retention of skills among masonry workers. The integration of feedback and evaluation mechanisms was also deemed insufficient, limiting trainees' ability to self-correct and adapt their skills. This echoes the recommendations of Nkunya and Mwila (2024) and Alinaitwe et al. (2007), who emphasized the importance of structured assessment and continuous monitoring in improving the quality of vocational training outcomes.

These findings highlight that while technical vocational education and training programs provide foundational knowledge, they fall short in developing advanced technical competencies, problem-solving abilities, and workplace readiness. The study demonstrates that effective masonry training is contingent upon the availability of resources, qualified instructors, adequate practical exposure, structured follow-up, and alignment with industry standards, a pattern consistently observed across global studies, including those by Khuzwayo et al. (2023), Hassan et al. (2021), and Timothy et al. (2024).

➢ *Chapter Summary*

This chapter presented, analysed, and discussed findings from questionnaires and interviews with heads of Technical Vocational Education and Training institutions, instructors, and masonry trainees. The study

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

achieved a high response rate of 96.2%, ensuring reliable data for analysis. Respondent demographics showed that the masonry workforce was predominantly male, young to middle-aged, moderately educated, and largely engaged in casual labour, with varied exposure to training opportunities.

The findings revealed that Technical Vocational Education and Training improved foundational masonry skills, confidence, and work performance, particularly in handling complex tasks and enhancing quality of work. However, significant skills gaps remain, especially in advanced techniques, site-specific applications, and industry-aligned competencies. The effectiveness of training is constrained by limited resources, lack of qualified trainers, short program durations, inadequate practical exposure, weak feedback systems, and absence of refresher courses.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

➢ *Introduction*

This chapter provides the summary of findings, conclusion, recommendations per research objectives and areas for further research.

➢ *Summary of Findings*

- *Impact of Educational Training on the Skill Levels of Masonry Workforce in Moroto District*

The study established that technical vocational education and training significantly improved the foundational masonry skills, confidence, and work performance of trainees in Moroto District. Respondents reported enhanced ability to perform basic tasks effectively, though challenges persisted in applying advanced techniques, reducing errors, and independently handling complex site activities. The findings further revealed that short training durations and limited practical exposure constrained the full transfer of skills, a concern also raised by instructors and heads of technical vocational education and training institutions.

- *Specific Skills Gap among the Masonry Workforce and their Relationship with the Quality of Educational Training in Moroto District*

This study found that masonry training in Moroto District equips trainees with basic theoretical knowledge but fails to sufficiently prepare them with advanced technical, managerial, and soft skills required in the construction industry. Gaps exist in practical exposure, advanced masonry techniques, interpretation of architectural drawings, site management, safety practices, and application of modern construction standards. These deficiencies limit the effectiveness of graduates in meeting labour market expectations and sustaining quality outcomes in construction projects.

- *Factors Affecting the Effectiveness of Educational Training in Addressing Skills Gap among the Masonry Workforce in Moroto District*

This study established that the effectiveness of technical vocational education and training in addressing skills gaps among the masonry workforce in Moroto District is significantly hindered by limited resources, unqualified trainers, short training durations, and inadequate access to materials and equipment. The lack of refresher courses, minimal practical exposure, and poor integration of feedback and industry updates further restrict skill acquisition.

➢ *Conclusion on Research Objectives*

- *Impact of Educational Training on the Skill Levels of Masonry Workforce in Moroto District*

The study concluded that technical vocational education and training in Moroto District played a vital role in enhancing basic masonry skills, instilling confidence, and improving the quality of workmanship among trainees. However, gaps remain in the mastery of advanced techniques, independent problem-solving and real-site adaptability. These limitations highlight the need for training programs to go beyond foundational skills and incorporate extended practical sessions, mentorship, and stronger partnerships with industry stakeholders to ensure a workforce that is both skilled and industry-ready.

- *Specific Skills Gap among the Masonry Workforce and their Relationship with the Quality of Educational Training in Moroto District*

The study concluded that technical vocational education and training in Moroto District provided an important entry point into masonry but falls short of bridging the skills gap that affects the quality of construction work. The lack of adequate practical training, shallow curricula, unqualified trainers, and weak industry linkages hinder the acquisition of advanced competencies. As a result, trainees graduate with limited

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

ability to work independently, manage complex projects, or align with evolving industry standards. Bridging this gap requires reforms that emphasize practice-based learning, curriculum depth, and stronger partnerships with industry stakeholders.

- *Factors Affecting the Effectiveness of Educational Training in Addressing Skills Gap among the Masonry Workforce in Moroto District*

The study concluded that masonry training in Moroto District played an important role in equipping learners with foundational knowledge, but its effectiveness is hampered by systemic challenges. Limited resources, inadequate trainer qualifications, and insufficient exposure to practical applications remain major obstacles. Without reforms, trainees will continue to graduate with theoretical knowledge but lack the advanced skills, confidence, and adaptability needed in the construction industry. Therefore, aligning technical vocational education and training programs with industry requirements, strengthening institutional capacity, and enhancing trainer competence are essential for bridging the skills gap.

➢ *Recommendations*

- *Impact of Educational Training on the Skill Levels of Masonry Workforce in Moroto District*

Based on the findings on the impact of educational training on masonry workforce skills, the study recommends that:

✓ TVET institutions should strengthen industry-based learning by establishing formal partnerships with construction companies to provide trainees with supervised internships, mentorship, and practical exposure to real construction projects.
✓ TVET institutions and assessment bodies should strengthen competency-based assessment by evaluating trainees' ability to apply acquired masonry knowledge and skills in practical construction tasks, rather than relying predominantly on theoretical assessments.
✓ TVET curriculum developers should integrate occupational safety and ergonomics more effectively into masonry training to improve trainees' adherence to safety procedures, reduce workplace risks, and promote worker wellbeing.

- *Specific Skills Gap among the Masonry Workforce and their Relationship with the Quality of Educational Training in Moroto District*

In response to the identified gaps in advanced masonry, technical interpretation, measurement, and site management, the study recommends that:

✓ The Uganda Vocational and Technical Assessment Board (UVTAB), in collaboration with relevant curriculum developers and construction industry stakeholders, should review masonry training content to ensure it adequately covers advanced bricklaying, block and stone laying, structural masonry, corners, arches, and roofing structures.
✓ Curriculum developers should strengthen instruction in technical and construction planning skills, particularly architectural drawing interpretation, accurate measurement, quantity estimation, mixing ratios, structural alignment, and construction sequencing.
✓ TVET institutions should incorporate more practical exercises in site management and problem-solving to develop trainees' abilities to coordinate construction tasks, manage resources, maintain quality, and make appropriate decisions when confronted with unexpected site challenges.
✓ Construction industry representatives should participate in periodic curriculum reviews to ensure that the skills taught reflect current construction practices, technological developments, and the competency requirements of employers.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

- *Factors Affecting the Effectiveness of Educational Training in Addressing Skills Gap among the Masonry Workforce in Moroto District*

To address the institutional and instructional constraints affecting training effectiveness, the study recommends that:

✓ The Ministry of Education and Sports, TVET institutions, and relevant funding partners should review the duration and scheduling of masonry training programs to provide adequate time for practical instruction, repeated practice, and mastery of complex construction skills.
✓ The Government of Uganda, TVET administrators, and development partners should prioritize the provision and maintenance of adequate training resources, including bricks, cement, masonry tools, measuring equipment, and facilities for realistic construction simulations.
✓ TVET institutions should strengthen the recruitment and professional development of masonry trainers by ensuring that instructors possess appropriate technical qualifications, practical industry experience, and the pedagogical competencies required for effective skills instruction.
✓ TVET institutions should establish structured follow-up and refresher training arrangements to reinforce previously acquired skills, address weaknesses identified during practical assessments, and improve trainees' retention and application of techniques in workplace settings.

➢ *Suggestions for Further Research*

Based on the findings of the current study, the following areas for further research are recommended:

- Comparative studies across different districts in Uganda to provide insights into regional variations in technical vocational education and training challenges and effectiveness.
- Research on the impact of industry partnerships, apprenticeships, and refresher courses on skill retention and job readiness would further strengthen the evidence base for improving masonry training in Uganda and beyond.
- Longitudinal research tracking trainees from technical vocational education and training institutions to the workplace to provide deeper insights into how effectively training translates into long-term professional competence and productivity in the construction industry.
- Investigations into the integration of digital tools and construction technologies into masonry training would offer valuable guidance for modernizing curricula.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

REFERENCES

[1.] Adepoju, O. O., & Aigbavboa, C. O. (2021). Assessing knowledge and skills gap for construction 4.0 in a developing economy. Journal of Public Affairs, 21(3), e2264.

[2.] Adepoju, O., Aigbavboa, C., Nwulu, N., Onyia, M., & Adepoju, O. (2022). Reskilling for construction 4.0 (pp. 197-219). Springer International Publishing.

[3.] Agole, P. (2022). Confronting the Challenges of University Technical Vocational Education and Training in Uganda.

[4.] Agole, P., Ochieng, R., & Kerre, B. (2024). The Adaptability of Engineering Graduates to Ugandan Labour Market. Open Access Library Journal, 11(10), 1-16.

[5.] Akdur, D. (2021). Skills gaps in the industry: Opinions of embedded software practitioners. ACM Transactions on Embedded Computing Systems (TECS), 20(5), 1-39.

[6.] Akintoye, A., & Oluwole, A. (2010). Skill deficiency in the Nigerian construction industry: A case study of the masonry sector. Journal of Construction Engineering and Management, 136(10), 1162–1170.

[7.] Akomah, B. B., Ahinaquah, L. K., & Mustapha, Z. (2020). Skilled labour shortage in the building construction industry within the central region. Baltic journal of real estate economics and construction management, 8(1), 83-92.

[8.] Akunda, T., Ouma, P., Kerre, L., & Wanjala, B. (2024). An Exploration of The Factors Affecting Skills Development Amongst Trainees of Building and Civil Engineering in Technical and Vocational Institutions in Uganda. Journal of Research & Method in Education (IOSR-JRME), 14(5), 58-74.

[9.] Akwango, D. A., B. B. Obaa, N. Turyahabwe, Y. Baguma, and A. Egeru. (2016). "Agro-Pastoral Choice of Coping Strategies and Response to Drought in the Semi-Arid Areas of Uganda." 1(December):281–91.

[10.] Alaghbari, W., Al-Sakkaf, A. A., & Sultan, B. 2019. "Factors Affecting Construction Labour Productivity in Yemen. International Journal of Construction Management, 19(1), 79-91."

[11.] Alavi, M., Le Lagadec, D., & Cleary, M. (2026). Challenges of cross-cultural validation of clinical assessment measures: A practical introduction. Journal of Advanced Nursing, 82(1), 941-949.

[12.] Alharahsheh, H. H., & Pius, A. (2020). A Review of key paradigms: Positivism VS Interpretivism. Global Academic Journal of Humanities and Social Sciences, 2(3), 39–43.

[13.] Alinaitwe, H. M., Mwakali, J. A., & Hansson, B. (2007). Factors affecting the productivity of building craftsmen-studies of Uganda. Journal of Civil Engineering and Management, 13(3), 169-176.

[14.] Aliu, J., & Aigbavboa, C. (2023). Key generic skills for employability of built environment graduates. International Journal of Construction Management, 23(3), 542-552.

[15.] Anton, D., Bray, M., Hess, J. A., Weeks, D. L., Kincl, L. D., & Vaughan, A. (2020). Prevalence of work-related musculoskeletal pain in masonry apprentices. Ergonomics, 63(9), 1194-1202.

[16.] Aramide, K. A., & Adigun, I. O. (2025). From Positivism to Pragmatism: Mapping the Evolution of Research Paradigms in Library and Information Science. Lead City International Journal of Library, Information & Communication Sciences, 2(2), 102-127.

[17.] Auta, M. A., & Onwusuru, I. M. (2022). TVET graduates' employability for construction industry: a mixed-method study. Online Journal for TVET Practitioners, 7(1), 85-94.

[18.] Ayarkwa, J., Adinyira, E., & Osei-Asibey, D. (2012). Industrial training of construction students: perceptions of training organizations in Ghana. Education+ Training, 54(2/3), 234-249.

[19.] Azli Syam, N. A., Isa, N. K. M., Yunos, M. Y. M., Isa, N. J. M., & Sormin, D. (2026). Content validity of a sustainable food management assessment instrument for island hotels usingI-CVI and mean analysis. Discover Applied Sciences, 8(3), 331.

[20.] Barbosa, F., Woetzel, J., & Mischke, J. (2017). Reinventing Construction: A Route of Higher Productivity. McKinsey Global Institute.

[21.] Barigye, D. (2024). Technical vocational education and training in Uganda: Career guidance and practices. African Journal of Career Development, 6(1), 100.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

[22.] Baumeister, S. E., Kocher, T., Papapanou, P. N., Holtfreter, B., & Demmer, R. T. (2026). Cross-Sectional studies: strengths, limitations, and methodological considerations. Journal of periodontal research.
[23.] Chan, C. K., Zhao, Y., & Luk, L. Y. (2017). A validated and reliable instrument investigating engineering students' perceptions of competency in generic skills. Journal of Engineering Education, 106(2), 299-325.
[24.] Creswell, J.W., & Creswell, J.D. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Sage.
[25.] Dharani, K. (2015). "Study on Labours Productivity Management in Construction Industry. International Journal of Latest Trends in Engineering and Technology, 6(1), 278-284.
[26.] Eksteen, M. J. (2019). Does team-based learning develop essential generic skills in pharmacy students? South African journal of higher education, 33(1), 59-73.
[27.] Erimirwa, M. P. (2023). Performance Of Technical and Vocational Training System towards Skill Development in Uganda (Doctoral dissertation, Makerere University).
[28.] Eseza, N. (2025). Bridging Uganda's Graduate Skills Gap: The Role of Internships and Vocational Training in Enhancing Employability. Journal of Curriculum Development, Evaluation, and Education (JCDEE), 1(2), 1-11.
[29.] Fagbenle, O. I., Lawal, P., & Omuh, I. O. (2012). The Influence of Training on Bricklayers' Productivity in Nigeria. Journal of Construction Engineering and Management, 138(7), 853–860.
[30.] Ferrando, P. J., Morales-Vives, F., Casas, J. M., & Muñiz, J. (2025). Likert scales: A practical guide to design, construction and use. Psicothema, 37(4), 1-15.
[31.] Fugar, F. D., Ashiboe-Mensah, N. A., & Adinyira, E. (2013). Human capital theory: Implications for the Ghanaian construction industry development. Journal of Construction Project Management and Innovation, 3(1), 464-481.
[32.] Gann, D., & Salter, A. (2001). CHAPTER SEVEN Interdisciplinary education for design professionals. In Interdisciplinary design in practice (pp. 95-112). Thomas Telford Publishing.
[33.] Gu, C. 2019. "Urbanization: Processes and Driving Forces. Science China Earth Sciences, 62, 1351-1360."
[34.] Hassan, P. F., Noor, M. S. M., & Mohammad, H. (2021). Challenges in education and training to develop Malaysian construction workforce. International Journal of Sustainable Construction Engineering and Technology, 12(2), 53-69.
[35.] Ho, P. H. (2016). Labour and skill shortages in Hong Kong's construction industry. Engineering, Construction and Architectural Management, 23(4), 533-550.
[36.] Hossan, D., Wolfs, B., & Petkovic, M. (2025). Questionnaire validity and reliability: A review with practical guidelines. Journal of Entrepreneurship, Business and Economics, 13(1), 135-186.
[37.] Ibrahim, R., Boerhannoeddin, A., & Bakare, K. K. (2017). The effect of soft skills and training methodology on employee performance. European Journal of Training and Development, 41(4), 388-406.
[38.] International Labour Organization. (2022). International Research Agenda on Occupational Safety and Health. ilo.org
[39.] Jayaram, S., & Engmann, M. (2017). Diagnosing the skill gap. In Bridging the Skills Gap: Innovations in Africa and Asia (pp. 1-14). Cham: Springer International Publishing.
[40.] Khan, N., Khalique, F., & Saini, K. (2025). Qualitative research methods: harnessing interviews, focus groups, observations, and document analysis. In Qualitative research methods in air transport management (pp. 27-56). IGI Global Scientific Publishing.
[41.] Khuzwayo, B. P., Walker, M., & Graham, B. (2023). Improving South African Masonry Construction Industry. African Journal of Inter/Multidisciplinary Studies, 5(1), 1-11.
[42.] Kincl, L. D., Anton, D., Hess, J. A., & Weeks, D. L. (2016). Safety voice for ergonomics (SAVE) project: protocol for a workplace cluster-randomized controlled trial to reduce musculoskeletal disorders in masonry apprentices. BMC public health, 16, 1-9.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

[43.] Kincl, L. D., Hess, J. A., Weeks, D. L., Vaughan, A., & Anton, D. (2020). Efficacy of text messaging apprentices to reinforce ergonomics and safety voice training. Journal of safety research, 74, 35-43.
[44.] Knezovich, J., Moyer, S., McPhee, J., & Le Toile, R. (2023). Experience, Productivity, and Musculoskeletal Injury among Masonry Workers. Journal of Construction Engineering and Management, 143(6), 04017045.
[45.] Krejcie, R., & Morgan, S. (1970). "Sample Size Determination. Business Research Methods, 4(5), 34-36."
[46.] Krishnan, A. & Ramasamy, R. (2011). "Accessing the Construct and Content Validity of Uncertainty Business Using Sem Approach-An Exploratory Study of Manufacturing Firms. Global Journal of Management and Business Research, 11(12 Version 1.0), 01-07."
[47.] Kruss, G., Wildschut, A., Van Rensburg, D., Visser, M., Haupt, G., & Roodt, J. (2012). Developing skills and capabilities through the learnership and apprenticeship pathway systems synthesis report: assessing the impact of learnerships and apprenticeships under NSDSII. Human Sciences Research Council, Cape Town.
[48.] Lawani, K., McKenzie-Govan, S., Hare, B., Sherratt, F., & Cameron, I. (2022). Skill shortage of bricklayers in Scotland. Journal of Engineering, Design and Technology, 20(1), 321-338.
[49.] Liptáková, E. (2025). A practical example of calculating Cronbach's alpha as a tool for measuring the internal consistency of questionnaire items of a qualitative nature. Slovak Journal of Sport Science, 10(1), 18.
[50.] Litecky, C. R., Arnett, K. P., & Prabhakar, B. (2004). The paradox of soft skills versus technical skills in IS hiring. Journal of Computer Information Systems, 45(1), 69-76.
[51.] Madadizadeh, F., & Bahariniya, S. (2025). Tutorial on internal consistency assessment by Cronbach's alpha and McDonald's omega. Perioperative care and operating room management, 100568.
[52.] Marginson, S. (2019). Limitations of human capital theory. Studies in higher education, 44(2), 287-301.
[53.] Maskuriy, R., Selamat, A., Maresova, P., Ondrej, K., & Oladipo, O. D. (2019). "Industry 4.0 for the Construction Industry: Review of Management Perspective. Economies, 7(3), 68."
[54.] Mbati, D. W. (2019). The Effect Of Human Resource Management Practices On Masonry Labour Productivity In The Kenyan Construction Industry. Unpublished Masters Thesis, University of Nairobi].
[55.] McGrath-Champ, S., Rosewarne, S., & RITTAU, Y. (2010). Education, skill and unions in the Australian construction industry. Labour & Industry: a journal of the social and economic relations of work, 21(1), 438-462.
[56.] McGuirk, P. M., & O'Neill, P. (2016). "Using Questionnaires in Qualitative Human Geography."
[57.] Meisels, M. (2019). Engineering and Construction Industry Trend. Retrieved from Https://Www2.Deloitte.Com/Us/En/Pages/Energy-and-Resources/ Articles/Engineering-and-Construction-Industry-Trends.Html.
[58.] Mengistu, D. G., & Mahesh, G. (2019). Construction education in Ethiopia: Knowledge and skills level attained and effectiveness of internship program. Higher Education, Skills and Work-Based Learning, 9(3), 510-524.
[59.] Merrifield, K. A. (2013). Do 'employability skills' matter? How important are employability skills to teachers, young people and employers today? (Doctoral dissertation, University of York).
[60.] Ministry of Education & Sports. (2024). TVET Communication, Marketing, and Rebranding Strategy (2022–2026). Government of Uganda.
[61.] Ministry of Education and Sports, Uganda. (2016). Uganda Skills Development Project (USDP). Retrieved from Ministry of Education & Sports website.
[62.] Motyl, B., Baronio, G., Uberti, S., Speranza, D., & Filippi, S. (2017). "How Will Change the Future Engineers' Skills in the Industry 4.0 Framework? A Questionnaire Survey. Procedia Manufacturing, 11, 1501–1509."
[63.] Moses, K. M., & Liu, W. T. (2023). The role of TVET skill development in transformation of informal sector in developing countries: The case study of skilling Uganda program in Kampala urban area Uganda. In Proceedings, 83 (1), 46.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

[64.] Moshood, T. D. (2020). Emerging challenges and sustainability of industry 4.0 era in the Malaysian construction industry. TD Moshood, AQ Adeleke, G. Nawanir, WA Ajibike, RA Shittu, Emerging Challenges and Sustainability of Industry, 4, 1627-1634.
[65.] Mubiru, D. N. (2010). Climate Change and Adaptation Options in Karamoja. Vol. 1.
[66.] Muhwezi, M. (2025). Industry involvement in the assessment of workplace learning. International Journal of Vocational Education and Training Research, 11(1), 39–57.
[67.] Mukooli, H. M. (2022). The role of vocational training in the industrial development in Uganda (Unpublished master's dissertation). Makerere University, Kampala, Uganda.
[68.] Mullin, P. T., & N. Williams, A. (2010). "Using Skills Gap Analysis in Construction Management to Stimulate a Demand Led Model of Curriculum. Conference Proceedings W089-Special Track 18th CIB World Building Congress, Pp.65–79."
[69.] Munir, F. (2022). More than technical experts: Engineering professionals' perspectives on the role of soft skills in their practice. Industry and Higher Education, 36(3), 294-305.
[70.] Nägele, C., & Stalder, B. E. (2017). Competence and the need for transferable skills. Competence-based vocational and professional education: Bridging the worlds of work and education, 739-753.
[71.] Nakalembe, Catherine, Jan Dempewolf, and Christopher Justice. (2017). "Land Use Policy Agricultural Land Use Change in Karamoja Region, Uganda." Land Use Policy 62:2–12. doi: 10.1016/j.landusepol.2016.11.029.
[72.] Nalule, A. (2010). Social Management of Rangelands and Settlements in Karamoja.
[73.] Njeri Mugwe, J., & Runo, S. (2026). Methods and Tools of Data Collection in Nonexperimental Designs II (Qualitative Approaches). In Research Methodology in Agricultural Sciences (pp. 447-470). Singapore: Springer Nature Singapore.
[74.] Nkunya, H. R., & Mwila, P. M. (2024). Bridging the Gap Between TVET Skills and Labor Market Demands an Analysis of the Influence of Training Outcomes in Dar Es Salaam, Tanzania. International Journal of Research and Innovation in Social Science, 8(12), 703-709.
[75.] Odusami, K. T. (2002). Perceptions of construction professionals concerning important skills of effective project leaders. Journal of Management in Engineering, 18(2), 61-67.
[76.] Osman B. and Canan A. (2018). The Effects of Industry 4.0 on Human Resources Management. Globalization, Institutions and Socio-Economic Performance Macro and Micro Perspectives.Berlin New York: Peter Lang. p. 337–359. Https://Doi.Org/10.3726/B14702.
[77.] Osunsanmi, T. O., Aigbavboa, C., & Oke, A. (2018). Construction 4.0: The Future of the Construction Industry in South Africa. International Journal of Civil and Environmental Engineering, 12(3), 206–21.
[78.] Park, Y. S., Konge, L., & Artino, A. R. Jr. (2020). The Positivism Paradigm of Research. Academic Medicine, 95(5), 690–694.
[79.] Playfoot, J., & Hall, R. (2009). Effective education for employment: A global perspective. Retrieved December, 5, 2014.
[80.] Ras, E., Wild, F., Stahl, C., & Baudet A. (2017). "Bridging the Skills Gap of Workers in Industry 4.0 by Human Performance Augmentation Tools– Challenges and Roadmap. Conference Proceedings of the Tenth International Conference on Pervasive Technologies Related to Assistive, Island of Rhodes, Greece, June."
[81.] Selamat, J. H., Ismail, K. H., Ahmad, A., Hussin, M. H., & Seliman, S. (2013). Framework of soft skills infusion based on learning contract concept in Malaysia higher education. Asian Social Science, 9(7), 22.
[82.] Shah, C., & Burke, G. (2005). Skills shortages: concepts, measurement and policy responses. Australian bulletin of labour, 31(1), 44-71.
[83.] Shi, G., Shan, J., Ding, L., Ye, P., Li, Y., & Jiang, N. (2019). "Urban Road Network Expansion and Its Driving Variables: A Case Study of Nanjing City. International Journal of Environmental Research and Public Health, 16(13), 2318."
[84.] Shinyekwa, I., Kiiza, J., Hisali, E., & Obwona, M. (2016). "The Evolution of Industry in Uganda. Manufacturing Transformation, (9)."

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

[85.] Sladoje, M., Randolph, G., & Khan, L. (2019). Transforming secondary urban areas for job.
[86.] Sirotiak, T. L. (2008). The effect of problem/project-based learning on a desired skill set for construction professionals. Iowa State University.
[87.] Snell, S., Snell-Siddle, C., & Whitehouse, D. (2002). Soft or hard boiled: Relevance of soft skills for IS professionals. In Proceedings of the 15th Annual Conference of the National Advisory Committee on Computing Qualifications (pp. 403-408).
[88.] Sorrell, D. (2017). Technical Skills in the Classroom. Bridging the Skills Gap: Innovations in Africa and Asia, 33-53.
[89.] Sorko S. R., Rabel B., &. Richter H. M. (2016). "The Future of Employmentchallenges in Human Resources through Digitalization, Proceedings of International Scientific Conference 'Industry 4.0', Borovet, Bulgaria, December 12–15, 2016."
[90.] Sudarmaji, H., Susila, I. W., & Sutiadiningsih, A. (2021). The influence of skill aspect on vocational education graduates for improving job achievement in the era industry 4.0. Int. J. Progress. Sci. Technol, 24(1), 167-174.
[91.] Tamsah, H., & Yusriadi, Y. (2022). Quality of agricultural extension on productivity of farmers: Human capital perspective. Uncertain Supply Chain Management, 10(2), 625-636.
[92.] Tan, E. (2014). Human capital theory: A holistic criticism. Review of educational research, 84(3), 411-445.
[93.] Toor, S. U. R., & Ofori, G. (2008). Developing construction professionals of the 21st century: Renewed vision for leadership. Journal of Professional Issues in Engineering Education and Practice, 134(3), 279-286.
[94.] Trendle, B. (2008). Skill and labour shortages-definition, cause and implications. Department of Education, Training, and the Arts.
[95.] UBOS. (2017). Uganda National Household Survey.
[96.] Uganda Bureau of statistics. (2005). Statistical Abstract. Government of Uganda, 2005. 14 P.
[97.] UK Commission for Employment and Skills (UKCES) (2010). National Employer Skills Survey for England 2009: Main Report.
[98.] Walters, R. C., & Sirotiak, T. (2011). Assessing the effect of project based learning on leadership abilities and communication skills. In 47th ASC Annual International Conference Proceedings (pp. 1-8).
[99.] Yap, J. B. H., Chow, I. N., & Shavarebi, K. (2019). "Criticality of Construction Industry Problems in Developing Countries: Analyzing Malaysian Projects. Journal of Management in Engineering, 35(5), 04019020."

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDICES

APPENDIX 1: INFORMED CONSENT FOR MASONRY WORKFORCE

➢ *Title of the Study:*

Influence of Technical Vocational Educational and Training on Skills Gap in the Construction Workforce in Moroto District, Eastern Uganda.

➢ *Introduction:*

I am Akite Hellen Grace, a student of University of Eldoret in Kenya pursuing a Master of Technology Education in the School of Education. You are being invited to participate in a research study about the influence of educational training on the skills gap in the construction workforce, specifically among masonry workers in Moroto District. Your participation is voluntary, and you may choose to withdraw at any time without penalty. The information you provide will be confidential and used solely for academic purposes.

➢ *Purpose of the Study:*

The purpose of this study was to assess how technical vocational education and training affects the skill levels of the masonry workforce, identify the specific skills gap, and examine the factors influencing the effectiveness of the technical vocational education and training in Moroto District.

➢ *Procedure:*

You will be asked to complete a questionnaire with demographic information and several statements related to educational training and skills gaps. The questionnaire will take approximately 15-20 minutes to complete.

➢ *Confidentiality:*

All responses were kept confidential. No personal identifiers were included in the final report, and the data were securely stored for the duration of the study.

➢ *Risks and Benefits:*

There were no significant risks associated with the study. Participation were contributed to understanding the factors affecting technical vocational education and training in the construction industry and may help improve training programs in the future.

➢ *Voluntary Participation:*

Your participation is entirely voluntary. You are free to skip any questions you do not wish to answer and may withdraw from the study at any point without any consequences.

➢ *Consent:*

By signing below, you indicate that you understand the purpose of the study, the procedures involved, and your rights as a participant. You agree to participate voluntarily.

➢ *Participant's Statement:*

I have read and understood the information provided above. I voluntarily consent to participate in this study.

Signature of Participant: _____

Date: _____

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

➢ *Researcher's Statement:*

I have explained the nature of the study to the participant, and any questions raised have been answered. The participant's consent is obtained voluntarily.

Signature of Researcher: 

Date: 26th October 2026

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDIX 2: QUESTIONNAIRE FOR MASONRY WORKFORCE

➢ *Questionnaire for Respondents*

- *Section A: Demographic Characteristics of Respondents*

Please provide the following demographic information by ticking (✓) the appropriate box.

Demographic information	**Response Options**
1. Age	[ ] 18-25, [ ] 26-35, [ ] 36-45, [ ] 46-55, [ ] 56 and above years
2. Gender	[ ] Male, [ ] Female
3. Level of education	[ ] No formal education, [ ] Primary, [ ] Secondary, [ ] Certificate, [ ] Diploma, [ ] Bachelors' Degree
4. Years of experience in masonry	[ ] 1-5 years, [ ] 6-10 years, [ ] 11-15 years, [ ] 16 and above years
5. Type of employment	[ ] Casual labourer, [ ] Permanent employee, [ ] Self-employed
6. Training received in masonry	[ ] Yes, [ ] No
7. Frequency of attending training programs	[ ] Never, [ ] Rarely, [ ] Occasionally, [ ] Frequently, [ ] Always

➢ *Section B: Questionnaire for Specific Objectives*

- *Instructions for Respondents*

Please answer each of the following statements based on your experience with educational training in the masonry workforce. Indicate your level of agreement with each statement by ticking the appropriate box on the scale below: 1 – Strongly Disagree (SD), 2 – Disagree (D), 3 – Neutral (N), 4 – Agree (A), and 5 – Strongly Agree (SA).

Please be honest and objective in your responses.

✓ *Objective 1:*

To Assess the Impact of Technical Vocational Education and Training on the Skill Levels of the Masonry Workforce in Moroto District

#	**Statement**	**1 (SD)**	**2 (D)**	**3 (N)**	**4 (A)**	**5 (SA)**
1	Technical vocational education and training has improved my overall masonry skills.	☐	☐	☐	☐	☐
2	I am more confident in performing masonry tasks after completing technical vocational education and training.	☐	☐	☐	☐	☐
3	The technical vocational education and training I received has contributed to better work performance.	☐	☐	☐	☐	☐
4	I can now apply new techniques learned during training in my daily work.	☐	☐	☐	☐	☐
5	Technical vocational education and training has improved the quality of my masonry work.	☐	☐	☐	☐	☐

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

6	The technical vocational education and training programs I have attended are relevant to my masonry work.	☐	☐	☐	☐	☐
7	The skills acquired from technical vocational education and training has helped me work faster.	☐	☐	☐	☐	☐
8	I feel that technical vocational education and training has reduced errors in my masonry work.	☐	☐	☐	☐	☐
9	I am able to handle complex masonry tasks better after training.	☐	☐	☐	☐	☐
10	The quality of my work has improved since I began attending training sessions.	☐	☐	☐	☐	☐

✓ *Objective 2:*

To Identify the Specific Skills Gap Among the Masonry Workforce and their Relationship with the Quality of Technical Vocational Educational and Training in Moroto District

#	**Statement**	**1 (SD)**	**2 (D)**	**3 (N)**	**4 (A)**	**5 (SA)**
1	There is a noticeable gap between the skills taught in technical vocational education and training and the skills needed in the field.	☐	☐	☐	☐	☐
2	The training I received did not cover all the necessary masonry techniques.	☐	☐	☐	☐	☐
3	I feel that my skills are not fully addressed by the current technical vocational education and training programs.	☐	☐	☐	☐	☐
4	There are specific areas of masonry where training has been inadequate.	☐	☐	☐	☐	☐
5	The quality of the technical vocational education and training does not meet the needs of the construction industry in Moroto.	☐	☐	☐	☐	☐
6	The existing skills gap affects the quality of work in masonry projects.	☐	☐	☐	☐	☐
7	The lack of practical training contributes to the skills gap in the masonry workforce.	☐	☐	☐	☐	☐
8	There is a significant mismatch between the skills taught and the actual demands of the job.	☐	☐	☐	☐	☐
9	I believe that filling the skills gap would improve the quality of masonry work.	☐	☐	☐	☐	☐
10	The technical vocational education and training program should be updated to address current skill gaps in the masonry field.	☐	☐	☐	☐	☐

✓ *Objective 3:*

To Examine the Factors Affecting the Effectiveness of Technical Educational and Training in Addressing Skills Gap Among the Masonry Workforce in Moroto District

#	**Statement**	**1 (SD)**	**2 (D)**	**3 (N)**	**4 (A)**	**5 (SA)**
1	Limited resources hinder the effectiveness of technical vocational education and training programs.	☐	☐	☐	☐	☐
2	Technical vocational education and training is not regularly updated to match the changing needs of the industry.	☐	☐	☐	☐	☐
3	There is a lack of qualified trainers to effectively conduct the courses.	☐	☐	☐	☐	☐

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

4	The duration of the training sessions is too short to fully address the skills gap.	☐	☐	☐	☐	☐
5	The technical vocational education and training programs do not have enough practical applications.	☐	☐	☐	☐	☐
6	I believe that the environment in which technical vocational education and training takes place affects its effectiveness.	☐	☐	☐	☐	☐
7	Trainees' access to materials and equipment impacts the quality of their learning.	☐	☐	☐	☐	☐
8	There is a lack of follow-up or refresher courses after initial training.	☐	☐	☐	☐	☐
9	The pace of the training program is too fast to absorb new concepts.	☐	☐	☐	☐	☐
10	Feedback and evaluation mechanisms are not well integrated into the training process.	☐	☐	☐	☐	☐

END

Thank you for your participation!!!

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDIX 3: INFORMED CONSENT FOR INSTRUCTORS OF BUILDING AND CONSTRUCTION

➢ *Title of the Study:*

Influence of Technical Vocational Educational and Training on Skills Gap in the Construction Workforce in Moroto District, Eastern Uganda

➢ *Introduction:*

You are invited to participate in an interview as part of a research study investigating the influence of technical vocational education and training on the skills gap in the construction workforce in Moroto District, Eastern Uganda. This study aimed to assess the impact of technical vocational education and training on the skill levels of the masonry workforce, identify specific skills gaps, and examine the factors affecting the effectiveness of technical vocational education and training.

➢ *Purpose of the Study:*

The purpose of this study was to gather insights from instructors of building and construction regarding how technical vocational education influences the skills gap in the masonry workforce. Your participation has help us better understand the relationship between technical vocational education and training and workforce competency.

➢ *Procedures:*

If you agree to participate, you will be asked to take part in an interview that will last approximately 30-45 minutes. The interview will focus on your experiences, observations, and perspectives related to technical vocational education and training and its effectiveness in addressing skills gaps among masonry workers.

➢ *Voluntary Participation:*

Your participation in this study is entirely voluntary. You have the right to decline participation or withdraw from the study at any time without any consequences.

➢ *Confidentiality:*

Your responses will be kept strictly confidential and used only for academic purposes. Your identity will not be disclosed in any reports or publications arising from this research.

➢ *Risks and Benefits:*

There are no anticipated risks associated with participating in this study. Your insights will contribute to understanding and improving technical vocational education and training programs for the construction workforce.

➢ *Consent Statement:*

I have read and understood the information provided above. I voluntarily agree to participate in this research study. I understand that I may withdraw at any time without penalty.

Participant's Signature: _____ Date: _____

Researcher's Name: _____ Date: _____

Contact Information: If you have any questions about this study, please contact the researcher: [Name: Akite Hellen Grace; Tel.: +256772562886]

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDIX 4: KEY INFORMANTS INTERVIEW GUIDE FOR INSTRUCTORS OF BUILDING AND CONSTRUCTION

➢ *Interview Guide for Instructors of Building and Construction*

Construction site code ……...

Place of the interview ……..…..

Time of the interview …….

Duration of the interview ……

➢ *Questions*

- How would you describe the impact of the current educational training programs on improving the skill levels of the masonry workforce in Moroto District?
- In your experience, what are the most common skills gaps you observe among masonry trainees, and how do these relate to the quality of educational training provided?
- What factors do you believe affect the effectiveness of educational training in addressing the skills gap among the masonry workforce in this district?
- How well do you think the training content aligns with the practical demands of the construction industry in Moroto District?
- What recommendations would you suggest to improve educational training programs to better address the skills gap in the masonry workforce?

Thank you for your participation!!

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDIX 5: INFORMED CONSENT FOR HEAD OF TECHNICAL VOCATIONAL EDUCATION AND TRAINING INSTITUTIONS

➢ *Title of the Study:*

Influence of technical Vocational Educational and Training on Skills Gap in the Construction Workforce in Moroto District, Eastern Uganda

➢ *Introduction:*

You are invited to participate in an interview as part of a research study investigating the influence of educational training on the skills gap in the construction workforce in Moroto District, Eastern Uganda. This study aims to assess the impact of educational training on the skill levels of the masonry workforce, identify specific skills gaps, and examine the factors affecting the effectiveness of educational training.

➢ *Purpose of the Study:*

The purpose of this study was to gather insights from instructors of building and construction regarding how educational training influences the skills gap in the masonry workforce. Your participation will help us better understand the relationship between educational training and workforce competency.

➢ *Procedures:*

If you agree to participate, you will be asked to take part in an interview that will last approximately 30-45 minutes. The interview will focus on your experiences, observations, and perspectives related to educational training and its effectiveness in addressing skills gaps among masonry workers.

➢ *Voluntary Participation:*

Your participation in this study is entirely voluntary. You have the right to decline participation or withdraw from the study at any time without any consequences.

➢ *Confidentiality:*

Your responses will be kept strictly confidential and used only for academic purposes. Your identity will not be disclosed in any reports or publications arising from this research.

➢ *Risks and Benefits:*

There are no anticipated risks associated with participating in this study. Your insights will contribute to understanding and improving educational training programs for the construction workforce.

➢ *Consent Statement:*

I have read and understood the information provided above. I voluntarily agree to participate in this research study. I understand that I may withdraw at any time without penalty.

Participant's Signature: _____ Date: _____

Researcher's Name: _____ Date: _____

Contact Information: If you have any questions about this study, please contact the researcher: [Name: Akite Hellen Grace; Tel.: +256772562886]

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDIX 6: KEY INFORMANTS INTERVIEW GUIDE FOR HEAD OF TVET INSTITUTIONS

➢ *Interview Guide for Instructors of Building and Construction*

Construction site code ……...

Place of the interview …….....

Time of the interview …….

Duration of the interview ……

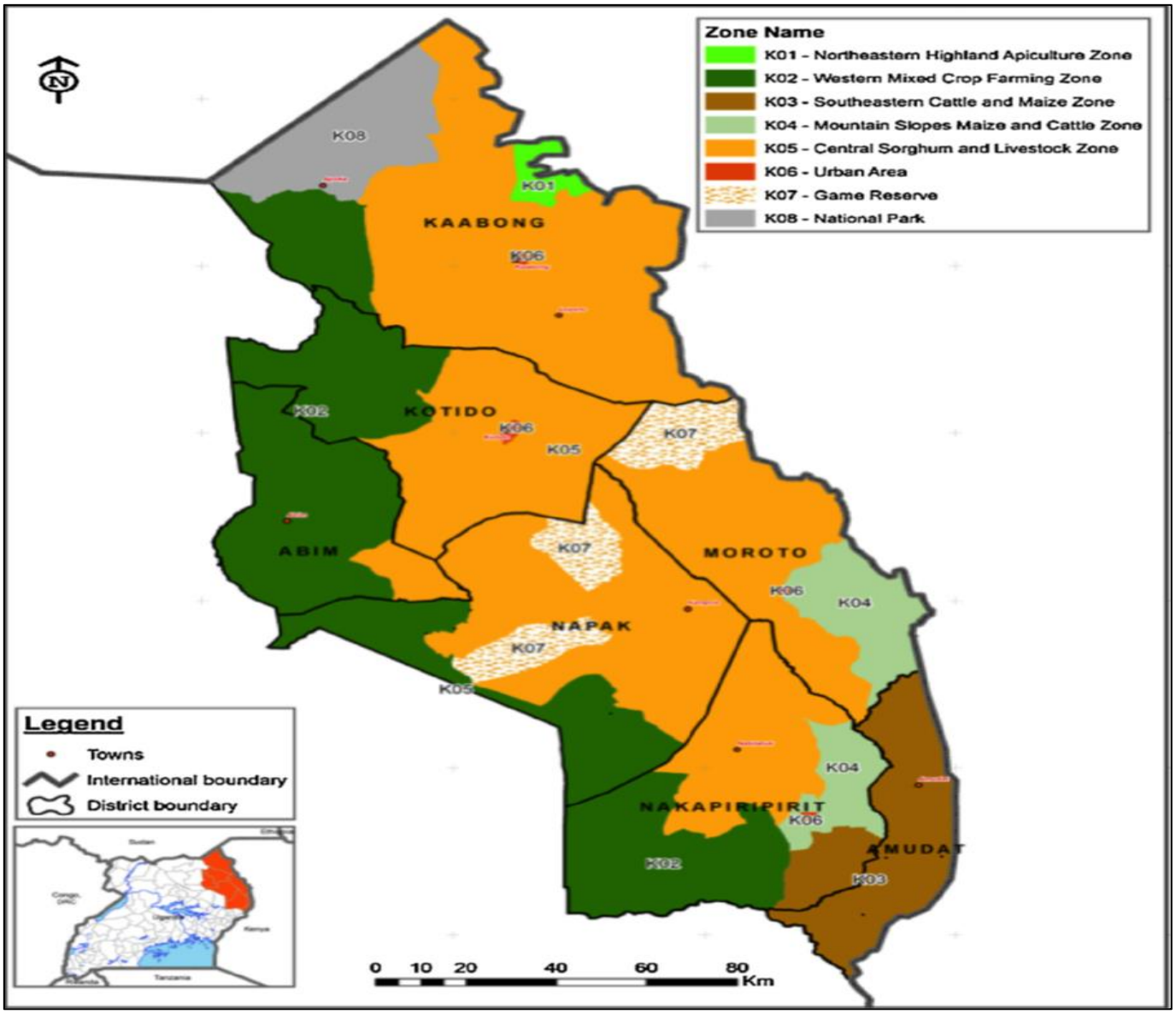
➢ *Questions:*

- How do you evaluate the effectiveness of your institution's educational training programs in improving the skill levels of the masonry workforce in Moroto District?
- From your perspective, what specific skill gaps exist among the masonry workforce, and how do these gaps relate to the quality and structure of the training provided at your institution?
- What are the key challenges your institution faces in delivering effective educational training to address the skills gap in the construction workforce?
- How does your institution ensure that the training curriculum remains aligned with the current skill demands of the construction industry in Moroto District?
- What strategies or improvements would you recommend to enhance the effectiveness of educational training in reducing the skills gap among the masonry workforce?

Thank you for your participation!

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDIX 7: A MAP OF KARAMOJA SHOWING THE LOCATION OF MOROTO DISTRICT



ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDIX 8: KREJCIE MORGAN SAMPLE SIZE DETERMINATION TABLE (1970)

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size. *S* is sample size.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26oct1444

APPENDIX 9: SIMILARITY INDEX

DrillBit

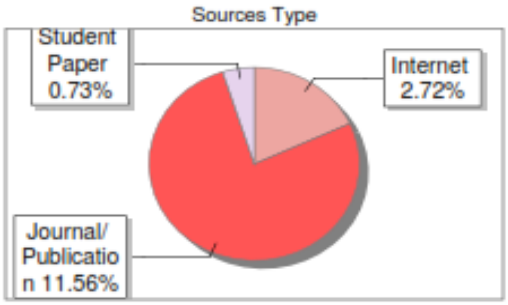
The Report is Generated by DrillBit Plagiarism Detection Software

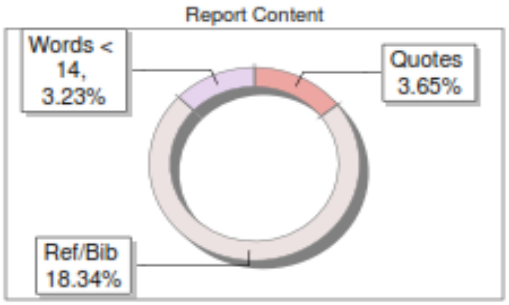
Submission Information

Author Name	AKITE HELLEN GRACE REG NO: SEDU/TED/M/001/23
Title	INFLUENCE OF TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING ON SKILLS GAP IN THE MASONRY WORKFORCE IN MOROTO DISTRICT, EASTERN UGANDA
Paper/Submission ID	6630222
Submitted by	titustoo@uoeld.ac.ke
Submission Date	2026-08-04
Total Pages, Total Words	114, 23974
Document type	Thesis

Result Information

Similarity **15 %**





Exclude Information

Quotes	Not Excluded
References/Bibliography	Not Excluded
Source: Excluded < 14 Words	Not Excluded
Excluded Source	**0 %**
Excluded Phrases	Not Excluded

Database Selection

Language	English
Student Papers	Yes
Journals & publishers	Yes
Internet or Web	Yes
Institution Repository	Yes

A Unique QR Code use to View/Download/Share Pdf File