

An Exploration Of The Factors Affecting Skills Development Amongst Trainees Of Building And Civil Engineering In Technical And Vocational Institutions In Uganda.

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Abstract

The study explored the factors affecting skills development amongst trainees of building and civil engineering in Technical and Vocational institutions in Uganda. Technical and Vocational Education and Training (TVET) involves studying technologies and science, offering the youth opportunity to acquire skills, attitudes, and knowledge in various occupations to match with the world of work. The study was guided by the research question; ‘What are the factors affecting skills development amongst trainees of building and civil engineering in Technical and Vocational institutions of Uganda’? The study adopted cross-sectional analytical type of design. Data was collected using questionnaires and interviews, from 317 trainees, trainers, lecturers, instructors, managers of industries, technicians and heads of department in building and civil engineering sector. The quantitative data collected was coded and analyzed using statistical package for social sciences (SPSS), while the qualitative data was analyzed thematically. It was concluded that: Level of education of trainers, Training facilities, are considered significant factors because they are above average mean of 4.39. Formative and summative evaluation of trainees on industrial training by industry and institutions’ supervisors, are significant factors because of their categorization of workers in industry. The study also identified challenges such as curriculum misalignment, lack of modern infrastructure, and financial constraints. It was therefore recommended that practical work, be aligned with constructivist principles, be emphasized for hands-on in order to match with world of work requirements. It was also recommended that institutions should conduct regular evaluations of training methods to gauge effectiveness of training on skills development amongst trainees building and civil engineering sector. Also adopt flexible approaches to accommodate diverse learning preferences, recognizing that trainees may have different perceptions of effective learning methods that could improve their training on skills development. TVET institutions should encourage collaboration with industry partners to foster close collaboration. TVET institutions should focus on modernizing the equipment and tools to match with curricula to keep pace with technological advancements.

Keywords: *Skills development, trainees of building and civil engineering, Technical and Vocational Education and Training*

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I. Background And Overview Of Technical And Vocational Education And Training (TVET)

TVET involves studying technologies and science, offering young people the opportunity to acquire practical skills, attitudes, and knowledge regarding various occupations in the productive field (Alzahrani & Woollard, 2013; UNESCO, 2021; Okumu & Bbaale, 2019). The main objective of TVET is to provide skills for gaining applied knowledge for a well-paid employment, promote and support creativity, innovativeness and entrepreneurship to create jobs and employment opportunities (Okumu & Bbaale, 2019).

Due to a range of macro-level developments internationally, technological advancement, lifelong learning, high demand of establishment quality TVET systems and demographic shifts, technical and vocational education and training has risen to the top of education policy programs across the world. Nevertheless, understanding the technical and vocational education and training sector lacks gradation in equating TVET trainers to general education. The current policy guiding all TVET stakeholders in Uganda is the 2019 policy. The policy emphasizes the need to develop a skilled and competent work force in TVET framework. The trainers or teachers or instructors in building and civil engineering in Uganda ignore the challenges they face when compared to their general education counterparts, there is need to embed new technologies for improving their low status compared to their counterparts in general education.

Several international guidelines from the last decade reflect the growing importance of TVET, UNESCO commended for technical and vocational education and training and the UN's Sustainable Development Goals framework as being crucial in encouraging an economical production in the labor force. But also, in facilitating the individual fulfillment there a need for social interconnection necessary for sustainable expectations in economic growth. However, greater concentration in technical and vocational education and training in appreciation of its crucial role have not yet steered the improvement of solid systems globally (World Bank, 2021). The need to explore the challenges faced by trainers or teachers or instructors for macro-level development for technological advancement, lifelong learning and demographic shift for the TVET to rise to the top level is eminent. Other concerns are pre-service training, funding, recruitment and continuous progress development (Rawkins, 2021)

First, it should be understood that the acquisition of technical skills can take place in different Technical and vocational education and training learning environments which include the following; formal learning, non-formal learning and informal learning. This is a type of learning that is identical with school or curriculum-based; non-formal refers to training and education offered outside the formal educational system; and informal learning, the learning-by-doing into which skills are acquired (Pongo & Obinnim, 2015). Further still, non-formal training imparts knowledge and skills to the adults, out of school group of the youth, mature group less than fifty years of age of both male and female sexes for a certain short period of time ranging from three weeks to three-six months for the purposes of their personal acquisition of skills for developments (Lachem, 2012).

In addition, the informal segment accounts for over 80% of all training skills (ILO, 2007) and training in the informal sector is superior to technical and vocational education and training in schools that enforce rigid admission criteria for learners (Johansson and Adams 2004; Tarja, 2018). Besides teaching in the informal sector often takes place in the local language for the natives to teach trainees or learners easily (Tarja, 2018). Culturally the training is conducted in a conducive environment for illiterate or poorly educated learners to acquire the content of knowledge and skills properly.

In many African countries, there is lack of employment of technical and vocational educational and training graduates, although most economies have high opportunities for skilled workers (UNESCO, 2021). This situation has highlighted the mismatch between training and labor market demand for skills development. Technical skills capacity building systems in Africa are hampered by poor relationship with the labor market, by lack of requisite skills demanded by labor market and inadequate programs. Furthermore, very few countries seem to lay emphasis on capacity building in rural communities even though they recognize the role of the informal economy, which is the largest employer, in the labor market or world of work and the main source of technical and vocational education and training in Africa (UNESCO, 2022).

In the technical and vocational education and training system in Africa, most of the time has to be associated with pay or self-employment as this is at the heart of all the best practices and strategies observed worldwide in technical vocational education and training. The main objective of technical and vocational education and training is not a matter of providing skills to gain well paid employment but also to promote and support creativity, innovativeness and entrepreneurship to develop the ability of innovation and creation of jobs and employment opportunities for Africans Uganda in particular (Okumu & Bbaale, 2019).

The largest external funder of technical and vocational education and training in projects in Sub-Sahara Africa (SSA) is the World Bank but its 'policy advice' is continues to be highly influential both among national governments and other bilateral and multi-lateral aid agencies. And with other major areas of development policy, this highlights the need for close external scrutiny of both the funder's policy and practice. And this research has exposed the Bank's own analysis and organizational learning and reporting processes that have important shortcomings.

The main conclusions can be strained from this analysis of almost 30 years of World Bank policies on technical and vocational education and training advice and practice in Sub-Sahara Africa. To begin with and without doubt at an operational level, the quality and relevance of technical and vocational education skills development of Bank projects has improved considerably especially during the last 10 years. In large parts of Africa Uganda inclusive this is because the Bank has taken on board many of the key implementation lessons from its own technical and vocational education and training projects during the 1990s and early 2000s (World Bank, 2022). This learning process has been facilitated by a more pragmatic, less ideologically driven approach to technical and vocational education and training provision and especially the role of the public sector in developing countries. It is noticeable; however, how little formal research has contributed to this improved understanding.

Secondly, given the basic conceptual weaknesses of the vocational education and training sustainable private partnership (VETSP) and the close match between technical and vocational education and training policy and practice. The implementation of Bank in technical and vocational education and training projects encountered major problems during the 1990s and early 2000s with the result of the project outcomes and impacts that were limited (World Bank, 2022). Numerous shortcomings can be identified ranging from key defects in project design,

over ambitious project objectives and a basic lack of understanding about how to effect system reforms in the context of weak institutional capacity and seriously complex political constraints.

In addition, largely in response to this situation, from the mid-late 2000s onwards, the Bank has developed a new approach to skills development in SSA. There has been a decisive shift away from a narrow focus on TVET and enterprise-based training to a more forward looking and proactive role of skills development as a whole with particular emphasis on public pre-occupational employment training and public-private partnerships targeted at key growth sectors (Bennell, 2022). The recognition that this requires a minimum critical effort is reflected in the much larger size of projects and the much greater involvement of key stakeholders in both project design and implementation. However, further research is needed in order to establish how successful this new approach has been to date in the 15 or so countries where it has been or is currently being piloted. For most of the skills development projects, it is too early to reach robust conclusions about project outcomes, let alone longer-term impacts.

Fourthly, the policy analysis and recommendations of the SBAR are broadly consistent with this new approach. However, since the report itself makes no attempt to analyze the design and implementation of the Bank's own skill development projects in SSA during the last decade, there is no explicit endorsement of this new approach in the report (World Bank, 2022).

More so, significant divergences exist between the new approach which has already been extensively implemented on the ground and the narrative of the SBAR particularly with respect to private training provision and school-based training. Given the extent of these differences, the Bank is in danger of failing to preach what it practices with respect to key areas of skills development in SSA (Bennell, 2022).

And finally, far more detailed empirical research is needed not only on the Bank's technical and vocational education policy and practice (especially individual project outcomes and impacts) but, more widely, on all aspects of current technical and vocational education and training provision at the country level in SSA. Practicing what you preach, preaching what you practice. The prevalence of Competency Based Education Training (CBET) in TVET and in stronger economies has allowed the individuals to move to other jobs within the industry rather than having to stick with one lifetime job thereby bringing flexibility in them to cope with and transfer skills and knowledge to new situations and environment. This has thus allowed the development of competencies in workers more than just the knowledge acquisition, strengthening their opportunities for employment. In poor nations, TVET still suffers poorer image due to misalignment of curricula and the labor market and poor resources making it comparatively more difficult for creation of employment opportunities (Netherlands Initiative for Capacity Development in Higher Education, 2010). Bhurtel (2015) thus, the underdeveloped and developing countries require a strong policy to be embedded in TVET system.

The strong policy system required purposely for solving the skills mismatch or skills gap which has been a long-standing issue whereby the levels and types of the existing skills that do not meet the needs of labor market demands. With no exception, this concern also become one of the challenges that facing by TVET institutions or sectors and if this issue prolongs, it will lead to graduate unemployment highly specifically in TVET sector (Rodzalan *et al*, 2022).

The UNESCO International Conference on Innovation and Excellence in TVET Teacher Education held in Hangzhou, China in November 2004 aimed, *inter alia*, at contributing international discussion and developments concerning the quality of teaching, learning, and scholarship in the field of TVET. The conference highlighted a shared understanding that the professionalization of TVET practitioners or educators is of crucial importance for the proactive development of TVET in general.

This is of particular significance in an increasingly competitive global market and is evidenced in discussions concerning the production of high-quality products. With these challenges, education, training, and human resources development has become of outstanding importance for a sustainable and competitive development in almost every country worldwide (UNEVOC, 2005). In this regard it seems to be impossible that "simultaneous convergence and divergence of education and training" (UNEVOC, 2005) can be observed in a global context.

Statement of the Problem

Technical and vocational education and training (TVET) institutions are supposed to provide hands-on training to enable graduates to be employable. However, the problem of unemployment among many TVET graduates has continued to be a major challenge especially among the youth in the building and civil engineering field. Unemployment may be due to lack of skills that match with the labor market demands or unfit for self-employment (Okumu & Bbaale, 2019). According to a 1997 tracer study, employment opportunities for graduates are dwindling and the periods spent searching for jobs is getting longer, consequently, TVET institutions are severally bothered about the skills of their graduates not matching with the labor market demands (Mayanja *et al.*, 2001).

According to the Uganda Business Technical Examinations Board (UBTEB) results for the period 2019-2023 indicated that out of 15,430 candidates who underwent TVET assessment, only 64% passed the practical assessment, indicating a failure rate of 36% mostly in building and construction. Basing on the fact that TVET is meant for skills development, it means that the training target was not achieved. Therefore, this study was intended to explore the factors affecting skills development amongst trainees of building and civil engineering in Technical and Vocational institutions in Uganda.

Theoretical Framework

The paper was based on the constructivism is a learning theory. It is a theory found in psychology that explains how people might acquire knowledge and learn. According to Bada and Olusegun, (2015), the theory suggests that humans construct knowledge and meaning from their experiences. Social constructivist theorist of Vygotsky (1978) pinpoints that; learning is essentially a social activity that will guide trainees in developing new knowledge and skills through their prior experiences. For effectiveness of technical vocational education and training on skills development, self-directed approaches in the learning process are the essential advantages of the constructivist theory.

Since the construction is the process of learning, trainers have roles like; to encourage, or create motivating conditions for trainees, proceeds the concern for creating delinquent situations, foster acquisition and retrieval of prior knowledge, and generate the methods of learning not the creation of learning (Olsen, 1999). Twenty first century necessities have changed the education environment from teacher-fronted framework to learner-centered classrooms. Moving from this point, formulated around constructivist approach where trainees believed to have created new understandings by integrating their existing knowledge with technical vocational education and training knowledge of new experiences of skills development (Fer, 2009). It is important to state that the theories of learning should not be applied rigidly, instead adapt the theories in a way that serves the learners stated objectives and carry out his or her goals. The trainer should be thoughtful and creative to use it effectively during teaching or learning period. In this way, the theories become a means to an end, not an end in itself (Ahmed, 2012).

II. Literature Review

A number of the factors affect skills development amongst trainees of building and civil engineering in Technical and Vocational Education.

McNamara (2016) pointed out that it is so important to select training activities that improve the training and learning process. These activities include instructor-led sessions, computer-based training, web-based training, and self-directed, interactive, or multimedia-inspired lessons. When selecting the most appropriate media and resources, trainees need to be able to capitalize on their skills, knowledge, and attitude towards the training program. They ought to be in line with technical skills that are needed by labor market demands or world of work. During the development phase, training design must be piloted to ensure that the trainees were taught understandable content and which should be applicable to the learners in their areas of specialization. Several important points must be checked, such as the accuracy of the content that matches with TVET designed curriculum in the logical sequence of materials to be presented, and the proposed course, learning objectives and outcomes that are suitable to those who would attend the training program.

The Training Environment (TE) plays an imperative role in training effectiveness of the trainees. When attending training, a number of factors that improve or weaken the learning environment are common. These factors could be the space and colors of the building, seating arrangement, and environmental considerations, materials used for training, the attitude and perception of the trainees. Then other factors that may affect a positive learning environment could as well be financial or economical. The key to establishing optimal training environment is the trainer and the trainee. As a role model, trainers must set the tone by their attitude, the clothes they wear, their passion, and interest for the participants (Orey, 2014).

The basic training facilities and materials may include lecture theater that are typically large-sized rooms, for multiple purpose and medium-sized instruction rooms, audio or visual-equipped rooms, and computer training rooms (McNamara, 2016). A good training facility must have flexible and technologically advanced learning environment. This means the environment may be able to adapt to new good situation to the trainees and trainers; and must be safe, comfortable, and accessible to all stakeholders. Another factor that may affect training effectiveness is training materials, which are used by trainers during training process. The main objective of using training materials is to involve the trainees to participate in the activities, promote active interaction among them and encourage faster learning, and help to improve their comprehension (McNamara, 2016). These training materials are usually made up of video clips, audio, and hands-on tools that to increase the learning experiences of trainees. Training facilities must have high-quality indoor environments that can positively influence task performance and attention spans of trainees (Orea, 2016).

The Training Plan Schedule (TPS) factor may affect the training effectiveness if it has not properly planned and scheduled the trainees to achieve their main objectives of skills development. The main goal is to create a conducive environment for the trainees to be actively involved in the training program. This training ought to be designed to address any relevant problems, which may occur during training. Likewise, training schedules help to find effective solutions to any related eventualities, which may occur during the training process (Silverman, 2015).

Presentation Style- (PS) another factor that may affect training effectiveness of trainers. The main goal of the trainer is to motivate the trainees and increase their desire and positive perception to learn new knowledge and skills. At this point, the presentation style (PS) employed by the trainer to help trainees in their learning and keep remembering the content. This could be achieved if trainers utilize presentation styles that are lively and interesting (Silverman, 2015).

The influence of social factors on collaborative learning and engagement was investigated in one study that looked at the ability of social factors for developing collaborative learning and engagement. It further looked at whether collaborative learning and engagement have a link between social factors and student's learning performance. Using constructivism theory to observe the student's learning behavior, findings evaluated through structural equation modeling (SEM), shown that social factors, for example interaction between trainees, peers and trainers, social presence, and usage of social media positively influence active collaboration in learning and trainees' involvement, thus affecting their learning performance (Qureshi et al, 2023).

Cultivating trainees' information literacy is becoming increasingly important for the trainers in the 21st century. However, trainers' competence to develop trainees' technical skills is far from satisfying as there remains a demand for promoting trainers' competence to develop trainees' skills that matches with construction industry or market demands. This study explored the key factors affecting trainees in building and civil engineering in technical and vocational education and training institutions on skills development, relying on a large-scale sample of trainers' and schools' self-reported data. First, this study indicated that considering the school's perspective can deepen the understanding of trainees in technical and vocational education and training institutions of building and civil engineering on skills development. The null model shows that about 16% of the cultivating trainees' in technical and vocational education and training institutions, skills have become a new requirement for trainers in the 21st century. Promoting technical and vocational education and training on skills development requires the joint effort between technical and vocational education and training policy makers, trainer educators, trainers themselves, researchers and stakeholders. They ought to pay attention to the role of institutional type, and support of digital learning resources and networks, and trainers' perceived usefulness of information computer technology in technical and vocational education and training sector (Wu et al, 2022).

Technical vocational education and training is an avenue to empower the youth to be self-employed, to have employable skills and that boost economic development. In a study that investigate the institutional factors influencing acquisition of employable skills by students in technical and vocational education and training institutions in Nairobi County, Kenya established trainers had prerequisite academic qualification to train in technical and vocational education and training institutions. In addition, it was found that technical and vocational education and training trainers do not have any professional development program or industrial attachment, academic qualification influence acquisition of employable skills to students. Furthermore, the study found out that there was inadequate provision of training equipment, and institutions did not have modern equipment to match those used in the industries. More so, trainers mainly use lecture, demonstration, and discussion training methods due to large class sizes, inadequate training staff hence are forced to hire part-time trainers or merge classes to complete syllabuses.

The study recommended that industries should support technical vocational education and training institutions by providing industrial attachment programs for trainers, all stakeholders; parents, industries, government and donors should contribute in providing mode adequate training equipment, technical and vocational education and training trainers should be practically-oriented their training methods like field trip, project work, simulation and work-based training, regular methods in order to achieve the desired result of imparting the employable skills necessary for the world of work and the government should support technical and vocational education and training institutions in hiring of better trained trainers to curb inadequacy of training and merging of training rooms (Obwoye et al, 2016).

In a related study in Kenya, career choice in technical vocational education and training in the North Rift valley region in Kenya was found to be influenced by among other factors like; social, infrastructural, financial, job market dynamics and even marketing. The technical vocational education and training institutions were recommended to work in collaboration with the government to ensure that they are well positioned to meet all trainees' demands and possibly go beyond in the world of work (Nyangweso, 2022). Another study that investigated the relevancy of industrial attachment established that industrial attachment exposures influenced the development of employability skills. It thus recommended that harmonization of the programs content and the exposure during industrial attachment should be sought. The study further recommended the need for technical

vocational education and training institutions and the industries to work together to strengthen skills exposure in line with industrial attachment general guidelines (Mwaura et al, 2022).

III. Methodology

Philosophical Research Paradigm of the Study

This study took the form of a constructivist paradigm, which posits that humans construct knowledge and meaning from their experiences (Bada and Olusegun, 2015). In this constructivist study, the role of the researcher was limited to collecting data analyzing and interpreting it objectively. The researcher therefore relied on this philosophy to collect quantitative and qualitative data that was described and statistically analyzed to draw logical conclusions about the study.

Study Research Design

This study adopted the format of a descriptive research design applying a mixed research methodology approach. It provided answers to what, when, where, how, and who questions. It helped obtain data about the factors affecting skills development amongst trainees of building and civil engineering in Technical and Vocational institutions in Uganda. The findings aimed to lay the groundwork and provide valuable pointers for subsequent quantitative and qualitative study designs within the context of skills development amongst trainees in Uganda.

Location of the Study and Duration

The research was conducted within all the five regions of Uganda, a landlocked country located in East Africa, bordered by South Sudan to the north, Kenya to the east, Tanzania and Rwanda to the south, and the Democratic Republic of Congo to the west. It lies across the equator and is characterized by diverse geography, including expansive savannas, lush forests, and several large lakes, including Lake Victoria, which is one of the largest freshwater bodies in the world (World Bank, 2022).

Uganda's infrastructure is characterized by a mix of modern and traditional elements. While major cities like Kampala have well-developed road networks, airports, and telecommunication systems, rural areas often lack access to basic infrastructure such as paved roads, electricity, and clean water. Efforts are underway to improve infrastructure across the country, including ongoing projects to expand road networks and enhance access to electricity (UBOS, 2023).

Uganda has a population of over 40 million people, making it one of the most populous countries in East Africa. The population is predominantly young, with a significant portion of under the age of 30. Uganda is home to numerous ethnic groups, with the Baganda being the largest single ethnic group. English and Swahili are the official languages, although there are many local languages spoken across the country (World Bank, 2022).

Uganda's economy is diverse, with industries ranging from agriculture, manufacturing, tourism, and services. Key industries include agriculture, which employs a significant portion of the population and contributes a substantial share to the country's GDP. Other important industries include textiles, food processing, construction, telecommunications, and banking (World Bank, 2022).

The study was carried out in Uganda considering five regions of the country as the map of Uganda indicated and these are the following districts: Kampala and Wakiso districts (central region), Kasese and Kyenjojo, Kagadi (western region), Iganga and Mbale districts (eastern region), Rukungiri, Mbarara and Bushenyi districts (South region) and Kitgum and Lira districts (northern region). These districts were selected because they offer a representation of the whole country, and they cover the major technical and vocational education and training institutions countrywide.

In Kampala, the study targeted the following government agencies involved in technical and vocational educational and trainings; Ministry of Education and Sports (MoES), National Council for Higher Education (NCHE) headquarters, Skilling Uganda Secretariat, Uganda Employers Union and Workers Union secretariats.

The technical and vocational education and training institutions were randomly selected across the country in five regions of Uganda, and these are central region, eastern region, northern region, Southern region and Western region. Kyambogo University was chosen since, it's the mother of all technical institutions in Uganda and it has been training all technical teachers and instructors for all technical vocational education and training institutions.

This study was carried out from January 2023 to December 2023.

Target Population

The target population of the study was as indicated in the table 1 below:

Table 1: Population size from different groups

| No | Category of the population | Groups | Population size |
|----|--|----------------|-----------------|
| 1 | Head of departments in TVET colleges (Brickwork, Plumbing and Carpentry and joinery | 8 colleges | 24 |
| 2 | Head of departments in TVET institutes (Brickwork, Plumbing and Carpentry and joinery. | 200 institutes | 600 |
| 2 | Ministry of Education and sports in particular the following, Departments TVETOM, HET, TTTRI. | 3 departments | 06 |
| | Students in Building and Civil Engineering TVET colleges | 8 colleges | 24 |
| 3 | Students in TVET institutes. | 200 institutes | 600 |
| 4 | A trainer per Trade (Brickwork, Plumbing & Carpentry) from construction industry. From UNABCEC I obtained 188 construction firms and within these firms among the 564, three (3) TVET graduates as per trade were sampled out for this research study. | 188 firms | 564 |
| | Total. | | 1818 |

Sampling Technique

The table 2 below shows the sample size and selection criteria that was used in the study.

Table 2: Sample Size and Sampling Technique

| No | Category of the population | Population size | Sample size determined by using stratified sampling | Sampling technique |
|----|---|-----------------|---|--------------------|
| 1 | Head of departments in TVET colleges (Brickwork, Plumbing and Carpentry and joinery | 24 | 4 | Purposive |
| 2 | Head of departments in TVET institutions (Brickwork, Plumbing and Carpentry and joinery | 600 | 105 | Purposive |
| 3 | Ministry of Education and sports in particular the following, Departments of TVETOM, HET, TTTRI. | 06 | 01 | Purposive |
| 4 | Students in TVET colleges | 24 | 4 | Purposive |
| 5 | Students in TVET institutes | 600 | 105 | Purposive |
| 6 | A trainer per Trade (Brickwork, Plumbing & Carpentry) from construction industry in all five regions of Uganda. | 564 | 98 | Purposive |
| | Total | 1818 | 317 | |

Research Procedure

Data Collection Instruments

The data collection instruments utilized in this study included a variety of tools, which were questionnaires and interview guides, meticulously crafted to evaluate the efficacy of technical vocational education and training (TVET) in fostering skills development within Uganda's civil and building engineering sectors.

Questionnaires

Questionnaires were one of the principal methods employed for data gathering, designed with tailored sets of questions to solicit feedback from key stakeholders involved in TVET. These stakeholders included employers, instructors, technical teachers, students, and lecturers across diverse TVET institutions. The questionnaire design was informed by best practices in survey methodology (Creswell, 2013), integrating both closed-ended questions utilizing a five-point Likert scale for quantitative analysis and open-ended questions to capture informed qualitative perspectives.

The distribution and collection of questionnaires were meticulously managed by the researcher with support of the research assistant, ensuring timely retrieval within a designated two-week period. This methodological rigor aimed to uphold data integrity and minimize response bias. The questionnaires focused specifically on assessing the developmental journey of trainees as they progressed through their training programs, emphasizing the acquisition and application of technical skills essential to the civil and building engineering disciplines and addressing key specific research questions.

In addition to assessing skill acquisition, the questionnaires also sought to gather insights into the perceived effectiveness of current TVET curricula, instructional methods, and institutional support systems in preparing students for professional roles within the industry. The inclusion of multiple perspectives that is to say from employers evaluating workforce readiness to instructors and students reflecting on educational outcomes provided a comprehensive view of the strengths and areas for improvement within Uganda's TVET framework.

Furthermore, the questionnaire design facilitated comparative analysis across different respondent groups, allowing for informed interpretations of how perceptions and experiences vary among stakeholders. This

approach not only enriched the understanding of educational practices but also contributed valuable data for informing policy decisions aimed at enhancing the quality and relevance of TVET programs in Uganda.

By employing a blend of quantitative metrics and qualitative insights, this study aimed to generate robust findings that could inform evidence-based strategies for optimizing TVET outcomes in the civil and building engineering sectors.

Interview Guides

In addition to questionnaires, this study employed semi-structured interview guides tailored to align with its research objectives, aimed at eliciting rich qualitative data. These interviews provided a deeper exploration of the effectiveness of technical vocational education and training (TVET) in enhancing skills development within Uganda's civil and building engineering sectors.

The semi-structured interview guide was meticulously designed to ensure consistency and relevance to the study's goals. It facilitated face-to-face interviews conducted by the researcher with key stakeholders directly involved in TVET governance and industry practice. Interviewees included representatives from the National Council for Higher Education (NCHE), officials from the Skilling Uganda Secretariat, executives from the Uganda Employers' Union Secretariat, and managers of companies within the civil and building engineering industry.

The choice of semi-structured interviews was guided by Silverman's (2013) methodology, emphasizing flexibility while maintaining a focused approach to data collection. This approach allowed for in-depth conversations that explored informed perspectives and experiences related to TVET effectiveness. Furthermore, the interviews enabled the researcher to observe non-verbal cues and contextual factors that may influence perceptions and practices in skills development (Odiya, 2009).

Through these interviews, the study aimed to gather comprehensive insights into various aspects of TVET implementation, including curriculum relevance, industry alignment, institutional support, and challenges faced in skill acquisition and employment readiness. The qualitative data obtained complemented the quantitative findings from the questionnaires, providing a holistic understanding of the current landscape of TVET in Uganda's civil and building engineering sectors.

The interview process was structured to encourage participants to share their expertise and perspectives openly, fostering a collaborative approach to addressing educational and workforce development challenges. The researcher ensured confidentiality and ethical considerations throughout the interview sessions, maintaining the integrity of the data collected.

Validity and Reliability of Instruments

Validity

According to Cypress (2017), ensuring the validity of research instruments is paramount in maintaining the accuracy and credibility of study findings. In this research, validity was rigorously addressed through several key steps designed to align questions with specific indicators related to the study's concepts. The process began with the careful design of questions within the questionnaires, interview guides, and document analysis guides. Each item was crafted to directly measure aspects relevant to the effectiveness of technical vocational education and training (TVET) in enhancing skills development within Uganda's civil and building engineering sectors.

To further validate the research instruments, the researcher engaged in consultations with supervisors and experts in the field of TVET as well as the research ethical committee. Their valuable insights were instrumental in assessing the relevance and clarity of items within the instruments. Feedback received from these consultations enabled iterative improvements to ensure that the instruments effectively captured the intended data. Additionally, the researcher utilized the Content Validity Index (CVI) as a quantitative measure to evaluate the validity of the instruments. Twelve lecturers, recognized as experts in the field, were selected to serve as judges for this purpose (Amin, 2005). Each judge independently evaluated the clarity, relevance, and comprehensiveness of the items within the questionnaires, interview guides, and document analysis guides.

The inter-judge coefficient of validity for the instruments was determined to be 0.8 for questionnaires and 0.75 for interview guides, exceeding the recommended threshold of $CVI \geq 0.7$. This indicated strong agreement among the experts regarding the validity of the instruments.

Items that did not meet the CVI threshold of 0.7 were carefully reviewed and revised or removed based on expert feedback, ensuring that only the most valid and reliable items remained in the final versions of the instruments. This meticulous process of validation safeguarded against potential biases or ambiguities in data collection, enhancing the overall robustness of the study's methodology. The rigorous validation procedures underscored the researcher's commitment to methodological rigor and the integrity of findings. By adhering to these standards, the study aimed to provide credible insights into the effectiveness of TVET in Uganda's civil and building engineering sectors, offering valuable implications for educational policy and practice.

Reliability

Reliability assessment is essential to ensure the consistency and dependability of research instruments in capturing accurate data over time (Zohrabi, 2013). In this study, both stability and internal consistency methodologies were employed to evaluate the reliability of the data collection instruments. To assess internal consistency, the Cronbach's alpha coefficient was calculated for the scales used in the questionnaires. A Cronbach's alpha of 0.7 or higher is generally considered acceptable for research purposes. In this study, the overall internal consistency of the questionnaire was found to be 0.84, indicating strong internal correlations among the items. The subscales within the questionnaire demonstrated Cronbach's alpha coefficients ranging from 0.83 to 0.87, further affirming the reliability of the dimensions measured.

For stability assessment, the test-retest method was utilized. Ten experts were selected to complete the questionnaire twice within a week. The scores from the first and second administrations were then analyzed using the interclass correlation coefficient (ICC). The results indicated significant stability, with a statistically significant correlation between the first and second test scores (CI: 95%; $P < 0.001$). This finding supported the repeatability of both the subscales and the overall questionnaire, demonstrating consistency in responses over time.

During the reliability testing phase, six items were identified and removed from the questionnaire due to scores falling below 1.5 in the item-total correlation analysis, indicating weak contribution to the overall scale. Additionally, two components were eliminated based on the content validity ratio (CVR) criteria, where their mean numerical value was less than 1.5 and their strict CVR was below 0.59. Furthermore, four items were removed based on the Content Validity Index (CVI) calculation, as their scores did not meet the threshold of 0.78.

The rigorous reliability assessment procedures emphasized the methodological rigor of the study, ensuring that only the most reliable and valid items remained in the final versions of the instruments. These efforts aimed to minimize measurement errors and enhance the accuracy of data collected on the effectiveness of technical vocational education and training (TVET) in Uganda's civil and building engineering sectors.

These findings contributed to the overall credibility of the study's conclusions and recommendations for educational policy and practice.

Data Analysis

Quantitative Data Analysis

Quantitative data collected through questionnaires was processed and analyzed using statistical methods to address the research questions effectively. The data was first compiled, entered, and securely stored in a computer system to ensure data integrity and accessibility. Using statistical software such as SPSS (Statistical Package for the Social Sciences) version 21.0, the quantitative data underwent rigorous analysis.

Descriptive statistics were employed to summarize and interpret the data obtained from the questionnaires. These statistics provided a clear overview of the basic characteristics of the responses, including measures of central tendency (e.g., mean, median) and variability (e.g., standard deviation, range). Through graphical representations and tabular formats, the distributions of responses were illustrated, offering insights into participant perceptions, attitudes, and experiences related to technical vocational education and training (TVET) in Uganda's civil and building engineering sectors. The utilization of SPSS facilitated the application of appropriate statistical tests to examine relationships between variables, assess correlations, and explore differences among participant groups based on demographic characteristics or other relevant factors. By employing inferential statistical techniques where applicable, the study aimed to derive statistically significant findings that informed conclusions and recommendations for enhancing TVET practices.

Qualitative Data Analysis

Qualitative data collected from interviews and open-ended survey responses underwent a rigorous analysis process guided by principles outlined in Braun and Clarke's (2012) thematic analysis framework. Initially, the qualitative data was systematically classified into simple content categories, themes, and sub-themes relevant to the research objectives. This classification process involved closely examining and comparing responses to identify patterns, similarities, and differences across participant perspectives. Expressions directly pertinent to the study objectives were meticulously selected and integrated into the analysis, providing firsthand insights and narratives from the respondents. The data was then coded, processed, and analyzed to extract meaningful information that illuminated key themes and contextual nuances within the qualitative dataset.

IV. Presentation, Analysis And Discussion Of Results.

Demographic Data of the Respondents.

The demographic or bio data of the TVET Students or Trainees, TVET lecturers, trainers, technical teachers and instructors were obtained through questionnaires and the following results were established.

Gender.

Table 3: Gender of the Students or Trainees, Lecturers, Trainers, Technical Teachers and Instructors

| | | Student or Trainee | | Lecturers, Trainers, Technical Teachers and Instructors | |
|--------------|--------|--------------------|---------|---|---------|
| | | Frequency | Percent | Frequency | Percent |
| Valid | Male | 83 | 76.1 | 89 | 87.3 |
| | Female | 26 | 23.9 | 13 | 12.7 |
| Total | | 109 | 100.0 | 102 | 100.0 |

Source: author, 2024

According to the analysis, 76.1% of the TVET trainee respondents from vocational colleges and institutes were male while 26% were female as shown in table 3. According to UNESCO (2017), achieving a more balanced representation could contribute to a diverse and inclusive learning environment. The observed gender disparity among TVET students, prompts consideration for gender-inclusive strategies in program recruitment and marketing. More so, according to table 4.1, 87.3% of the TVET lecturers, trainers, instructors from TVET colleges and institutes were male, whereas 12.7% were females. The predominance of male TVET lecturers (87.3%) warrants attention to recruitment practices for gender diversity. This underpins Hall’s recommendation that encouraging an equitable representation of both genders in teaching roles can contribute to a more inclusive educational setting (Hall, 2018). The findings therefore prompt for a balanced student-teacher environment in terms of gender distribution.

Age of the Students or Trainees.

Table 4 : Age Range in Years of the Students or Trainees

| Age range of students | | Frequency | Percent | Age range of employees | Frequency | Percent |
|-----------------------|----------------|-----------|---------|------------------------|-----------|---------|
| Valid | 15 to 20 years | 3 | 2.8 | 30 to 35 | 1 | 1.1 |
| | 20 to 25 years | 96 | 88.1 | 36 to 50 | 41 | 46.1 |
| | 25 to 30 years | 10 | 9.2 | older than 50 | 47 | 52.8 |
| Total | | 109 | 100.0 | | 89 | 100.0 |

Source: author, 2024

A larger percentage of TVET students or trainees from TVET colleges and institutes were between 20 to 25 years as shown in table 4. The concentration of TVET students in the 20 to 25 age range suggests that these programs are effectively catering to the needs of youth individuals seeking practical skills. Institutions can continue to align their programs with the preferences and aspirations of this age group, ensuring relevance and attractiveness (Ngware et al, 2024).

Respondents were distributed across different age brackets as shown in table 4. Most respondents fall into the older age brackets, indicating that the study captured the perspectives of experienced professionals (Jafar et al, 2020). The prevalence of older workers concurs with the recommendations emphasizing the experience and expertise of mature professionals (Taylor & Hoareau McGrath, 2016). The constructive nature of learning suggests that incorporating the experiences of older workers into training and mentorship programs can enhance knowledge transfer (Glaserfeld, 1989). This suggests that the insights gained from the data reflect years of professional experience.

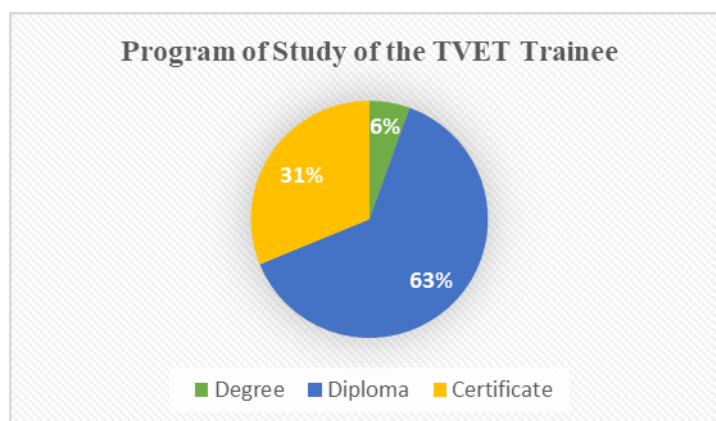


Figure 1 : Program of study of the Students or Trainees.

Source author, 2024

The analysis of the TVET trainee’s responses also indicated that 5.5% of the respondents were bachelor’s degree students, 63.3% were on diploma studies and only 31.2% were undertaking certificate studies from TVET institutions. The dominance of diploma programs among the respondents provided this study with data from respondents with practical hands-on training in TVET a critical element in skill training. This can guide institutions in expanding and refining diploma programs which are ideally technical based. Additionally, the presence of degree programs suggests an opportunity to explore and enhance TVET at higher level of technical education.

Highest Profession Qualification of TVET Trainers.

The table below presents the distribution of the highest profession qualifications among TVET lecturers, trainers, and instructors from TVET colleges and institutes.

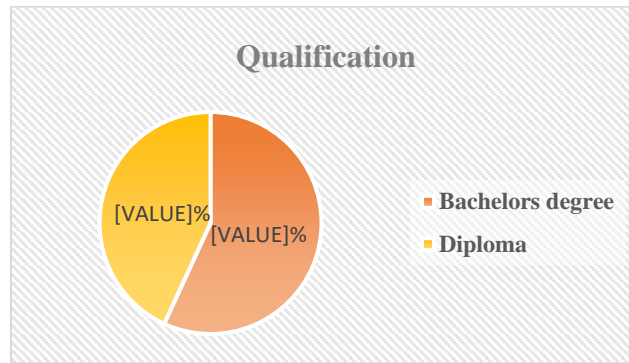


Figure 2: Highest Profession Qualification
Source: author 2024

According to Figure 4, 58% of the TVET lecturers, trainers, instructors from TVET colleges and institutes had obtained bachelor’s degrees and 44% of them had obtained diploma at the time of this study. It is crucial to understand, nevertheless, that although the distribution of qualifications provides information on the diversity of TVET educators, a holistic educational approach involves more than simply certifications.

A comprehensive educational approach includes a range of elements, such as curriculum design, hands-on learning, and pedagogical approaches, as Johnson (2021) emphasizes that a balance between diplomas and bachelor's degrees may improve in a holistic approach to education. UNEVOC (2018) indicates that institutions need to give priority to elements other than teacher credentials. Assuring that the curriculum is relevant to the demands of the industry, encouraging the development of practical skills, and supporting chances for educators to continue their professional development are all part of this.

Factors Affecting Skills Development in TVET Institutions in Uganda.

Respondents were asked to give their views on the factors affecting students’ training on skills development in TVET institutions in Uganda based on their degree of agreement or disagreement on a 5-point Likert scale and the following was established. Interviews were also conducted with respondents from the Ministry of education and Sports, UNABCEC representatives, Skilling Uganda Secretariat and National Council for Higher Education.

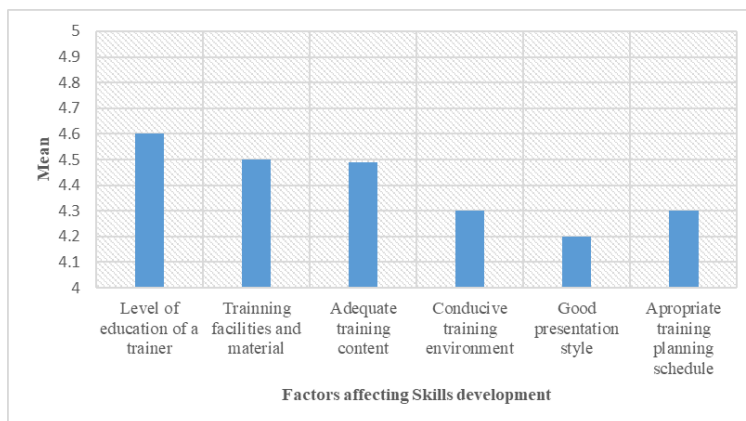


Figure 3: The factors affecting training students’ skills development in TVET institutions in Uganda.

Table 5: One sample T-Test

| Variable | Obs | Mean | Std. Err. | Std. Dev. | t-value | P-Value |
|----------------------------------|-----|----------|-----------|-----------|---------|---------|
| Adequate training Content | 89 | 4.494382 | 0.0532968 | 0.5028011 | 84.3274 | 0.0000 |
| Training environment | 89 | 4.325843 | 0.0614252 | 0.5794841 | 70.4246 | 0.0000 |
| Training Schedule | 89 | 4.325843 | 0.0571168 | 0.5388388 | 70.7368 | 0.0000 |
| Presentation Style | 89 | 4.224719 | 0.745309 | 0.703123 | 56.6841 | 0.0000 |
| Level of Education | 89 | 4.584270 | 0.0525377 | 0.4956398 | 87.2567 | 0.0000 |
| Training Materials | 89 | 4.505618 | 0.0532968 | 0.5028011 | 84.5382 | 0.0000 |

Source: author, 2024

Adequate Training Content:

As shown in figure 6, all respondents collectively acknowledged the importance of adequate training content in skills development. A combined percentage of 100% agree that sufficient training content positively impacts skills development. Specifically, 50.6% agree, and an equivalent 49.4% strongly agree, highlighting the unanimous consensus on this factor.

Similarly, when asked about the factors affecting skills development, interview respondents acknowledged the role of adequate training content in skills development. One of the notable respondents from the interviews conducted said that.

I think that for the past 10 years, institutions that have put an extra effort to utilize adequate training content in their teaching and learning in TVET institutions because they have had a positive impact on their students' performance and have significantly produced the best TVET students for the world of work (UNA5).

These findings supported McNamara's emphasis on selecting training activities that improve the training and learning process (McNamara, 2016). Theoretical connections highlighted the importance of self-directed learning approaches, emphasizing constructivism's role in empowering trainees to define their own learning needs (Burton & Carroll, 2001). Therefore, adequate training content has a significant impact on skills development in TVET institutions since it equips learners with relevant skills and prepares them for the world of work.

The one-sample t-test yielded a mean rating of 4.49 with a standard error of 0.053 and a high t-value of 84.327. The p-value is close to zero ($p < 0.001$), indicating a significant deviation from the null hypothesis. This suggests that respondents' perceptions regarding the impact of adequate training content on skills development are significantly different from zero. The findings imply a consensus among respondents that sufficient training content positively influences skills enhancement within technical and vocational education and training institutions in Uganda.

Conducive Training Environment

Additionally, the consensus among respondents is evident in their agreement on the influence of a conducive training environment on skills development. According to figure 6, a significant combined percentage of 94.4% express agreement with this factor. Out of these, 56.2% agree, and 38.2% strongly agree, underscoring the widespread acknowledgment of the impact of the training environment on skills enhancement. More so, respondents also observed the overall impact of the conducive training environment underscoring its importance on the psychological preparedness of the students towards studies. One of the remarkable interview respondents said that.

I believe that a conducive training environment is very important in as far as the students' mental and psychological wellbeing is concerned. Students deserved to have a conducive training environment for them to settle and avoid unnecessary distractions if they are to acquire skills and master them (NHC1).

Another respondent said that.

As professionals, we have always noticed a decline in results especially at times when the work environment is destructive, and I strongly believe that this is closely linked to training environments too, for better understanding of concepts, the training environment nature must be conducive otherwise people would miss out on key concepts due to distractions (MED3).

These findings emphasized the impact of the learning environment on skills development (Orey, 2014). The theoretical framework supported the findings by highlighting that learning is essentially a social activity, emphasizing the role of trainers in setting the attitude for a positive learning environment (Vygotsky, 1978). A conducive training environment facilitates learning greatly because it is a benchmark for learning by creating an appropriate environment for both learners and trainers.

The one-sample t-test yielded a mean rating of 4.33 with a standard error of 0.061 and a high t-value of 70.425. The p-value is close to zero ($p < 0.001$), indicating a significant deviation from the null hypothesis. This suggests that respondents perceive a conducive training environment to significantly impact skills development. The findings highlighted the importance of factors such as infrastructure and atmosphere in fostering effective learning experiences.

Appropriate Training Planning Schedule

Respondents exhibit a strong consensus on the positive effect of an appropriate training planning schedule on skills development as shown in figure 6. A combined percentage of 97.0% agree with this factor's influence. Specifically, 60.7% agree, and 36.0% strongly agree, reaffirming the collective understanding of the significance of a well-structured training schedule's effect on skills development. Akin to that, respondents from the ministry of education acknowledged to this factor highlighting the need for a proper and well-balanced schedule to avoid haphazard kind of work. One of the interview respondents said that.

Here we normally advise all our departments to have proper schedules with well determined timelines that helps us to measure performance and hit targets. In training, having a proper schedule is very important if you want to foster active engagement and involvement (MED7).

This underscores the importance of well-structured training schedules (Silverman, 2015). Theoretical connections emphasize the role of training schedules in creating a conducive environment for active involvement in the training program. Setting proper training timelines and schedules in institutions facilitates proper learning since TVET requires more practical work.

The one-sample t-test yielded a mean rating of 4.33 with a standard error of 0.057 and a high t-value of 75.737. The p-value is close to zero ($p < 0.001$), indicating a significant deviation from the null hypothesis. This suggests that respondents attribute significance to an appropriate training planning schedule in skills development.

Good Presentation Style

The respondents' agreement on the impact of a good presentation style on skills development is evident as shown in figure 6. A notable 88.8% collectively agree that an effective presentation style contributes positively to skills development according to figure 6. This agreement consists of 52.8% who agree and 36.0% who strongly agree, reflecting a consistent viewpoint. Additionally, the respondents' views and opinions were almost like what was observed from the questionnaires. The respondents acknowledged the role of a good presentation style sighting that in this modern era, it is a very essential tool for any learner. One of the respondents said that.

We have now advanced to a new technological era whereby everyone needs to showcase their skills in an advanced manner, anyone who has good presentation abilities stands a high chance of getting along with projects on time (UNA2).

Another respondent added that.

It is one of the things you cannot avoid now as a trainer, online teaching has come up and anyone who has mastered good presentation stands a higher chance to deliver training content to his students effectively and within a short time (NHC2).

The findings highlighting the role of presentation styles in motivating and increasing trainees' desire to learn (Silverman, 2015). Theoretical connections underscore the importance of lively and interesting presentation styles to aid learning (Ahmed, 2012). The trainers ought to be taught in a lively and good presentation way to motivate them and make teaching more practical and enjoyable.

The one-sample t-test yielded a mean rating of 4.22 with a standard error of 0.075 and a high t-value of 56.684. The p-value is close to zero ($p < 0.001$), indicating a significant deviation from the null hypothesis. This suggests that respondents perceive a good presentation style to positively influence skills development.

Training Facilities and Materials

Respondents overwhelmingly recognize the importance of training facilities and materials in skills development. A combined percentage of 100% agree that the availability and quality of resources positively affect skills enhancement as shown in figure 6. Specifically, 49.4% agree, and an equivalent 50.6% strongly agree, highlighting a unanimous consensus. Similarly, respondents' perceptions connect with existing literature emphasizing the importance of a flexible, technologically advanced learning environment (McNamara, 2016). Accordingly, some of the respondents emphasized that.

I acknowledge the positive path of TVET but there still lies financial constraints affecting infrastructure and equipment availability (NHC2).

Further still, another respondent noted that.

I still do not understand why Ugandans do not know the importance of modern facilities for effective skills development because as we advance in technology, very many things change including education (MED1).

Theoretical connections to constructivism underscore the role of the learning environment in shaping experiences and modifying learning styles (Vygotsky, 1978). These findings align with the positive influence of high-quality indoor environments on task performance (Orea, 2016). Theoretical connections highlight the role of training materials in promoting active interaction and improving comprehension (McNamara, 2016). With proper

training facilities and materials, of high quality, practical learning and ease of learning can be made efficient and more effective.

The one-sample t-test yielded a mean rating of 4.51 with a standard error of 0.053 and a high t-value of 84.538. The p-value is close to zero ($p < 0.001$), indicating a significant deviation from the null hypothesis. This suggests that respondents attribute importance to training facilities and materials in skills development. The findings underscore the role of infrastructure and resources in fostering effective learning environments.

Level of Education of a Trainer.

Respondents express a common consensus on the impact of a trainer's level of education on skills development. The collective agreement stands at 100%. Out of these, 58.4% strongly agree, and 41.6% agree, reinforcing the notion that the educational background of trainers significantly influences skills development as shown in figure 6. Further still, the respondents greatly acknowledge the impact of the level of education of a trainer highlighting that a person gets exposed to more information and training as he acquires more education and so trainers who has higher qualifications can offer relevant skills to learners. One of the interview respondents said that.

We normally encourage a balance in the level of education for effective skills development in TVET for example, we believe that whereas degree holders are much exposed to knowledge and skills as compared to diploma holders, they cannot be better than masters' holders (NHC2).

Another respondent added that.

Learning is by training and acquiring knowledge and it cannot happen as a miracle if you do not have well trained instructors as well as experienced ones if you want a cream to send out to the labor market to compete for employment (MED4).

The collective agreement reinforces the notion that the educational background of trainers significantly influences skills development. These findings are in line with the importance of trainers' competence in developing skills that match industry demands (Wu et al., 2022). The training content matches greatly with your level of education and so, courses like craft courses should be taught with someone with a background of craft education because it makes the trainer to know what to do and match it with what he was taught to do.

In addition, according to the interviews conducted with NCHE officials, UNABCEC representatives, Ministry of education and sports officials and Managers of companies in the industry, curriculum alignment and industry demands as well as challenges and holistic development were established. A notable respondent said that.

There is positive trend in graduate quality, but there is still need for curriculum alignment with industry demands (UNA3).

In addition to that, another respondent said that.

I think our curriculum wouldn't be a bad one, but we still need to modify a few courses in the right direction. Some courses are still too theoretical, and this has made us produce many job seekers than job makers, yet TVET is a practical field (NHC2).

More so, another respondent added that.

While there is a positive trend in graduate quality, challenges such as internship availability persist, in impacting the holistic development of skills (MED1).

Lastly, another respondent noted that.

Students have continuously failed to get industrial training placements, and this has gradually made them to miss out on getting hands on experience to prepare them for the world of work (MED4).

These findings resonate with existing literature, where scholars advocate for a curriculum that meets the evolving needs of the industry (McNamara, 2016). Theoretical underpinning in constructivism aligns with this, emphasizing experiential learning and adapting to new learning styles (Bada & Olusegun, 2015). This alignment is identified as a key factor affecting skills development. The consensus suggests that bridging the gap between academia and industry is vital. The findings also resonate with the importance of comprehensive training experiences (Wu et al., 2022). Constructivism theory supports the findings by asserting that learning is a social activity, with experiences shaping new knowledge (Bada & Olusegun, 2015). This highlights the need for comprehensive training experiences.

The one-sample t-test yielded a mean rating of 4.58 with a standard error of 0.053 and a high t-value of 87.257. The p-value is close to zero ($p < 0.001$), indicating a significant deviation from the null hypothesis. This suggests that respondents perceive the level of education of a trainer to significantly influence skills development. The findings underscore the importance of educator qualifications in facilitating effective teaching and learning experiences.

Overall, the respondents' opinions are strikingly aligned, emphasizing a common consensus on the factors affecting students' training on skills development in TVET institutions in Uganda as shown in figure 6. The data underscores the collective understanding that adequate training content, a conducive training environment, appropriate planning schedules, effective presentation styles, quality facilities and materials, and the educational level of trainers all play crucial roles in enhancing skills development.

The overwhelming agreement on each factor points to a shared perspective among respondents regarding the significant influences on skills development within TVET institutions in Uganda. Adequate training content, training facilities and materials, and the level of education of a trainer appear to be the factors that are perceived to affect skills development more significantly than the others, according to the respondents' agreement and as supported by the one sample t-test. More so, curriculum alignment with industry needs, availability of modern infrastructure and equipment, and financial constraints were also perceived as key factors affecting skills development in TVET institutions as established.

V. Conclusion:

Based on the findings from data analysis, it was concluded that: Level of education of trainers, Training facilities, and materials and Adequate Training content are considered significant factors, while Conducive Training Environment, Appropriate Training planning schedule and Good Presentation style are considered less significant.

VI. Recommendations

Basing on the findings the researcher made the following recommendations guided by the objectives of the study on the efficacy of TVET institutions on skills development.

It was recommended that; a trainer should have a higher qualification than a trainee, training facilities and materials should be available all the time, and training content should match with curriculum as designed per TVET policies 2019.

It was recommended that formative and summative evaluations of trainees always be encouraged during their time of study both at institutions' level and the period of two-three months of industrial training in industry for both years one and two respectively.

It was recommended that; social, economic and environmental effects are highly encouraged to provide professional skills and knowledge to the trainees of building and civil engineering in order to foster collaboration between TVET institutions and industry.

It was recommended that; TVET institutions should encourage trainees to participate many times in practical and empowers components that aligned with industry standards and best practices resulting in employability opportunities of the trainees.

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