Addis Ababa University

School of Graduate Studies
College of Education and Language Studies
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PhD Dissertation

Effectiveness of Occupational Competency Assessment and Certification of TVET in Ethiopia: Bridging Rhetoric and Reality.

By

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DECLARATION

I, the undersigned, confirm that this doctoral thesis, *Effectiveness of Occupational Competency Assessment and Certification of TVET in Ethiopia: Bridging Rhetoric and Reality*, is the only thing I've done for research that counts toward my Doctor of Philosophy in Curriculum Studies degree. This thesis work has not been previously submitted by the researcher in either part or whole in any other university or elsewhere for the award of any degree or diploma.

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Date of final Submission 17/08/2025

CERTIFICATION

We hereby certify that the thesis, Effectiveness of Occupational Competency Assessment and Certification of TVET in Ethiopia: Bridging Rhetoric and Reality—submitted to the Department of Curriculum and Comparative Education by Ashebir Tekle for the award of the degree of DOCTOR of PHILOSOPHY in Curriculum Studies—is carried out under our professional guidance and supervision. The entire thesis, or a part of it, has not been previously submitted for the award of any degree or diploma in other universities.

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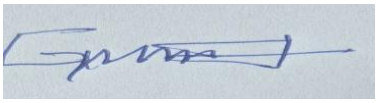
2. Signature 

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Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by Ashebir Tekle, entitled "Effectiveness of Occupational Competency Assessment and Certification of TVET in Ethiopia: Bridging Rhetoric and Reality." submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Curriculum Studies complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Abstract

The study investigates the effectiveness of competency assessments and the alignment of rhetoric and reality in the practice of the occupational competency assessment and certification system in Ethiopia. The study utilized a mixed-methods, concurrent embedded design and adopted a pragmatic view to collect data from candidates, trainers, assessors, supervisors, directorates, and industry representatives using questionnaires, interviews, focus group discussions, observation, and document review. First the sample was identified purposively from the total population, who had significant experience and a profound understanding of competency assessment, and next it was taken randomly. The study utilized analysis including mean, standard deviation (SD), ANOVA, t-tests, correlation, and regression analysis, as well as narrative techniques to evaluate the qualitative data, organizing the analysis around the research questions as themes. The findings indicate that essential stakeholders, particularly the Ministries of Urban Development and Construction and Tourism, exhibited insufficient involvement in the policy development process. Additionally, major implementers of TVET policies and strategies, such as trainers and industries, lacked a clear understanding of the current policies and strategies. The value of competency assessments is generally viewed positively by most of the stakeholders. However, the study identifies several significant limitations, including low frequency of candidate assessment, a failure to uphold assessment standards, a high candidate-to-assessor ratio, and assessment tools that do not align with occupational standards. These issues show that the existing method misjudges TVET candidates' skills. Additionally, it found both congruence and disparity with the intended strategies and guiding principles. Activities like assessor methodology training, international benchmarking, tool validation, accreditation of assessment centers, and societal values align with the strategy and guiding principles. However, structural deficiencies, a lack of autonomy at the Center of Competency (CoC) Institutions, and mergers with other organizations cause a significant portion of these activities to fail to produce the expected results. The Ethiopian competency assessment system faces challenges in ensuring fairness, comparability, and reproducibility due to reliance on a single assessor per session, which leads to bias and inconsistency in decision-making procedures and a lack of internal and external verifiers. The study reveals that influencing factors related to CoC institutions have the highest standardized effect on competency assessment effectiveness, followed by assessment centers with the second largest coefficient. The predictor assessment tool has the least impact. The Ministry of Labor and Skill is recommended to enhance competency assessments by promoting awareness and dialogues at federal and regional levels. This includes incorporating industry expertise, highlighting training quality, and ensuring CoC Institutions autonomy. The study also suggests addressing concerns about single assessors, inconsistency in decision-making, and lack of internal and external verifiers. CoC institutions should be transparent, foster equity, and improve their efficacy through explicit communication, assessor competence, periodic evaluations, and an appeal mechanism. Assessment centers should be provided with standardized equipment, advanced technology, pre-assessment orientations, and optimal resource utilization.

Key Words: *Assessors, Assessment Centers, CoC Institutions, Competency Assessment, Ministry of Labor and Skill, Policy and Strategies, TVET*.

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Ashebir Tekle, 2025

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Abbreviations and Acronyms

AAEQOCAA	Addis Ababa Education Quality Occupational Competency Assessment Authority
ACoCA	Amhara Center of Competency Agency
ADB	Asian Development Bank
CoC	Center of Competence
CBE	Competency-Based Education
CBET	Competency-Based Education and Training
DTWD	Department of Training Workforce Development
ENQF	Ethiopian National Qualifications Framework
ESDP	Education Sector Development Program
EU	European Union
FTA	Federal Technical Vocational Education and Training Agency
GIZ	German Corporation for International Cooperation
KTVETA	Kenya Technical vocational Education and Training Authority
MoE	Ministry of Education
MoLS	Ministry of Labor and Skill
MoSHE	Ministry of Science and Higher Education
NCVER	National Centre for Vocational Education Research
NTQF	National Technical Vocational Education and Training Qualifications Framework
OCoCA	Oromia Center of Competency Agency
SNNPR	Southern Nations Nationalities and People Regions
TC	Training Centers
TESDA	Technical Educational Skill Development Authority
TVET	Technical and Vocational Education and Training
UC	Unit of Competence
UK	United Kingdom
UNESCO	United Nations Educational Scientific and Cultural Organization
VET	Vocational Education and Training

Chapter One

1. Introduction

1.1. Background of the Study

Education is essential for sustainable development; it enables learners to make informed decisions and undertake responsible actions that promote environmental integrity, economic viability, and social justice for current and future generations while honoring cultural diversity (Taimur & Sattar, 2020). It equips individuals with the tools to tackle future challenges, laying the groundwork for a resilient society. Education fosters social cohesion and encourages dialogue, building inclusive communities capable of addressing global challenges. It encompasses various programs, including primary, secondary, Technical and Vocational Education and Training (TVET), and higher education programs. Continuous investment in education cultivates a generation of enlightened leaders, innovators, and citizens essential for sustainable development, prosperity, and peace. The significance of TVET at this level is undeniable. TVET aims to equip individuals with skills and knowledge, facilitating access to enhanced living standards and consistent job growth (Lange, Hofmann, & Di Cara, 2020).

According to UNESCO (2021a), Technical and Vocational Education and Training is an essential element of the education system aimed at developing skilled workers for a country. Developing nations should view TVET as a feasible approach for economic development and unemployment reduction. Mulder (2017) concisely characterizes TVET as "applied learning," (p.xiii), with TVET institutions serving as sources of skilled workers ready to address sustainable development challenges. In a rapidly changing job market, individuals must consistently exhibit their competences to obtain employment, progress in their professions, and adjust to emerging challenges. Both developed and emerging economies agree that TVET assists vocationally oriented individuals in obtaining positions from semi-skilled to specialized roles (OECD, 2025). Furthermore, TVET equips individuals with essential 21st-century skills, like critical thinking, collaboration, entrepreneurial mindset, and effective communication (MoSHE, 2020). Salleh and

Sulaiman (2020) emphasize the significance of the TVET system and the need for interventions that correspond with the skill requirements of the 21st-century new economy. The skills include occupational health and safety, lifelong learning and career development, communication, information technology, entrepreneurship, critical thinking and problem solving, collaboration and teamwork, learning and innovation, and environmental literacy (Oliquino, 2019). They also acknowledge that obstacles will inevitably arise, impeding the effective preparation of future skills demands.

According to the Ethiopian Federal TVET Agency (FTVETA, 2017), the history of Ethiopian TVET may be traced back to ancient times when people were required to transmit survival skills to meet fundamental requirements. Artisanship was passed down from parents to children through informal learning methods. Ancient Ethiopian landmarks like the Axum obelisk, Lalibela rock-hewn church, and the castle of Fasiledes display the country's great craft abilities and cultural art. Emperor Tewodros (1855-1866) implemented skill training initiated by European Protestant missionaries to manufacture weapons for the defense and unification of the realm (Ayele, 2016). Emperor Menelik II (1889-1913) endeavored to educate experts in diverse disciplines, including the aviation sector, with the assistance of scholars from Germany and France. However, the lack of social support has hindered the advancement of skill training in Ethiopia (FTVETA, 2017; Worku, 2024). Moreover, societal misconceptions regarding skills further hinder this advancement. The naming traditions in Ethiopia, in contrast to those in several European nations, illustrate societal perceptions of skills. In Amharic, the name "Getachew" translates to "Boss" or "Master" in English; in Oromifa, it is "Bulcha," and in Tigrigna, it is "Goitom." The Amharic name "Nugusie" translates to "Kingly" in English, whereas "Motuma" is the equivalent in Oromifa and "Neguse" in Tigrigna. Conversely, German surnames like "Bauer" (Farmer), "Koch" (Cook), and "Mueller" (Miller) indicate a direct correlation with professions and trades (Haileselassie, 2002). No such names, or even slightly similar to ones, exist in Ethiopia. An Ethiopian would find it unimaginable to name his son "Miller," "Smith," or "Cook."

TVET has played a vital role in addressing socio-economic challenges in Ethiopia, informed by several policies, strategies, and operational directives. The tradition of skill transfer originates from ancient informal practices, but the formal incorporation of TVET into Ethiopia's educational system emerged from the 1940s, addressing the technical demands of the post-Fascist Italy invasion period. The first technical school, Addis Ababa Tegbared School, was founded in 1941. As a result, multiple TVET institutions were founded to train a proficient workforce for the growing commercial and industrial sectors, aiding in the country's capacity-building efforts. This period also marked the introduction of formal curriculum and school-based assessment. The subsequent decades saw the establishment of comprehensive high schools that provided a range of vocational training programs in fields including electricity, woodwork, metalwork, automotive technology, home economics, and commerce, together with academic curricula adopted from the United States (Solomon, 2016). In the 1960s, the Ethiopian government and its collaborators, primarily the World Bank, recognized that the education sector was undergoing a crisis. The education sector was generating an excessive number of secondary school graduates who could not be readily integrated into the contemporary economy. Simultaneously, the majority of Ethiopian youngsters of school age lacked access to primary education (Negash, 2006).

In 1972, a comprehensive study known as the Education Sector Review (ESR) was initiated with the aim of overhauling the education system. Especially, in technical and vocational education the study recommends revising technical and vocational education curricula to include practical skills and hands-on experiences, strengthening partnerships through internships and apprenticeships, and integrating occupational ethics and soft skills. Advocating for a national employment policy can address the mismatch between training outputs and industry requirements, while implementing career counseling and job placement services can assist graduates in their job search. Regular assessments and employer feedback ensure alignment with industry needs, preparing graduates for success in the job market (Niehoff & Wilder, 1974). Although, the study yielded valuable recommendations, teachers, students, professional associations, and community members opposed it as soon as it was declared. The authors argued that the study was done in secret

and there was no public discussion, and that some important suggestions were not acceptable to teachers, students, and professionals (Tadesse *et al.*, 2022*).* In 1974, the establishment of the military administration in Ethiopia led to a restructuring of the education system, aligning it with socialist principles. Between the mid-1970s and early 1980s, the Soviet Union and East Germany influenced the implementation of a polytechnic education model. The restructuring of the education system, which included vocational training under a socialist system, was solely a political decision, lacking public demand and the involvement of all-important stakeholders to ensure its alignment with the nation's requirements. Despite the polytechnic reform granting vocational training parity with general education, it failed to mitigate the rampant unemployment among vocational education graduates, similar to the outcomes of the 1960s reforms. This was primarily due to the incongruence between vocational programs and the socio-economic conditions of the nation.

A comprehensive study titled "Evaluative Research of the General Education System (ERGESE)" was initiated in early 1983 with the aim of reforming the education system in order to address the prevailing circumstances. The results indicate that nearly all subjects were inadequately presented, exhibiting a lack of clarity, coherence, and consistency. Students demonstrated a lack of comprehension regarding the objective of education, while teachers expressed dissatisfaction with their job. The study recommends improving teacher training, prioritizing female candidates, implementing comprehensive in-service training programs, improving school facilities, streamlining the Ministry of Education's organizational structure, revising curriculum to align with national needs, improving textbook and teaching material quality, strengthening educational research and evaluation processes, and establishing standardized testing procedures for quality control (MoE, 1986). However, the overthrow of the government before the public release of the results prevented the implementation of the study's recommendations (Fekede & Ketebo, 2023). The establishment of Ethiopian education and training policy in 1994 marked a transformation in the nation's educational reform strategy.

Ethiopia's transitional government formulated the 1994 Ethiopian Education and Training Policy. This procedure entailed collaboration among diverse stakeholders, including the Ministry of Education, educational experts, and representatives from various societal sectors. The objective was to provide a comprehensive framework that addressed the challenges of the current education system and connected it with national development objectives (MoE, 1994). The 1994 Ethiopian Education and Training Policy heralded a change in vocational education strategy, emphasizing TVET's critical role in the nation's human resource development strategy.

> The 1994 Ethiopian Education and Training Policy recognizes TVET as a significant milestone, aiming to produce a competent, motivated, adaptable, and innovative workforce capable of transferring demanded technologies and contributing to national prosperity and social development (MoSHE, 2020: p.6*).*

The Ethiopian government has underscored the importance of TVET in executing their growth and transformation goal. It has allocated financial and human resources to improve the accessibility, quality, and relevance of TVET programs (MoE, 2018). Despite its practical benefits, the 1994 education and training strategy faced criticism due to its perceived "top-down" approach, which lacked public oversight and failed to involve all relevant stakeholders at the time (Fekede & Ketebo, 2023). This "top-down" education and training policy diminished the status of TVET by directing students who were ineligible for college preparatory high schools into TVET instead. Conversely, during polytechnic education, TVET held an equivalent status to general education, attracting high-achieving students to its programs.

The 1994 education and training policy launched an apprenticeship-based industrial attachment program, allowing TVET students to engage with industries and acquire direct practical experience in authentic work environments. The apprenticeship-based industrial attachment system was ineffective primarily due to insufficient employer collaboration, as they were not involved in the policy drafting process (MoE, 2008). The involvement of significant stakeholders, such as employers, in the implementation of vocational programs

at TVET institutions was modest, limited to providing feedback on training modules with the participation of a few industry experts (Solomon, 2016).

The Education and training policy promotes providing primary school dropouts with skill training that is pertinent to local economic development. It promotes 70 percent to 80 percent of high school graduates to pursue TVET to enhance their productivity in the workforce. The TVET reform, however, did not yield the desired outcome. The TVET delivery system is criticized for being supply-driven, utilizing a traditional training system, and focusing on access without industry participation, rather than emphasizing graduate competence. The teacher oversees the school assessment system. An outcome-based TVET plan was designed in 2008 to address the issue of TVET graduates not matching the expectations and demands of economic sectors (MoE, 2008). Notwithstanding, concerns regarding TVET's quality necessitated strategic overhauls, culminating in the outcome-based TVET strategy of 2008.

In the 2008 TVET strategy the demand-driven, outcome-based TVET system has been introduced, and the curriculum based on occupational standards derived from industry requirements was put into effect. It emphasizes occupational competency assessment as the requirement for ascertaining graduate proficiency. The process involved a broad range of stakeholders from both the private and public sectors, as claimed (MoE, 2008). Some studies found that employers were not volunteer to accept some training schemes, for example, placement of trainees for cooperative training in employing organizations (Solomon, 2016).

As stated above, Ethiopian TVET system has tried to change from traditional training to competency-based training in 2008. Competency-Based Education and Training (CBET) is a systematic training and evaluation method that focuses on acquiring skills and knowledge for basic or complex jobs. It emphasizes individual execution, circumstances, and standards. CBET is a results-oriented educational framework for curriculum development and assessment aiming to achieve specific competencies in workplace environments, based on established criteria (ILO, 2020). Moreover, Usoro and Ezekiel

(2017) contended that the established criteria, referred to as occupational standards, promote this educational and training initiative. These occupational standards constitute the basis for developing the training curriculum, assessment, and learning materials. CBET, introduced in the late 20th century, has played a significant role in Ethiopia's TVET system, especially following the 2008 TVET Strategy (MoSHE, 2020). This system has been essential in tackling Ethiopia's socioeconomic challenges.

Further, CBET have been integrated into educational and political debates to create stronger connections between education and the labor market. It focuses on achieving specific outcomes by enhancing learners' competencies, including knowledge, skills, and abilities for successful performance in specific situations (Mulder, 2017). Competence development involves systematic acquisition, enhancement, and broadening of competencies through diverse learning experiences, training programs, and practical application, aiming to empower individuals to meet business and societal needs (Bach & Suliková, 2019). Competence development is ensured (verified) through occupational competency assessment. Occupational competency assessment is the process of gathering data to check a person's knowledge, skills, and attitudes compared to what is expected for their job performance (Technical Education Skill Development Authority (TESDA), 2023).

In countries like Ethiopia, strategic frameworks aimed at ensuring consistency, fairness, and reliability govern the implementation of occupational competency assessment. The Ethiopian TVET policy and strategy underscore the importance of occupational competency assessment and certification systems as foundational elements of the TVET structure, facilitating efficiency and bridging the gap between graduates and the industry. Essential components of this assessment include creating occupational standards, developing assessment tools, establishing independent organizations, recruiting and training assessors, and implementing systems for ongoing assessment and enhancement (MoSHE, 2020).

The Policy and Strategy of TVET envisage that the Ethiopian National Qualifications Framework (ENQF) functions as a system for creating, categorizing, and evaluating qualifications, in addition to recognizing the knowledge and skills acquired. Accredited assessment centers and assessors carry out national occupational competency assessments, with certifications being awarded based on the fulfillment of minimum criteria. The Ministry of Labor and Skill is responsible for designing and regulating the assessment system, which includes the formation of autonomous national and regional Centers of Competence (CoC) certifying organizations. Since its initiation in 2008, Ethiopia has been actively implementing an occupational competency assessment and certification system across various sectors—agriculture, industry development, economic infrastructure, health, mining, labor and social affairs, trade, and hotel and tourism. This initiative aims to enhance the quality and relevance of the workforce, thereby supporting sustained economic growth.

The implementation of occupational competence assessment in Ethiopia is a relatively recent phenomenon. It was piloted in Addis Ababa City and scaled up in all Regional States and City Administrations. The Regional Occupational Competency Assessment and Certification Center activity started officially after the pilot program was conducted in Addis Ababa in 2008 and plays a role in assuring the competency of the workforce for industries. The system has guided by strategies and principles that govern occupational competency assessment in the country. Competency assessment is a crucial element of the occupational competency framework in Ethiopia, designed to ensure that TVET graduates and workers possess the necessary knowledge, skills, and abilities to perform their occupations proficiently (MoSHE, 2020). The occupational competency assessment methodologies in Ethiopia emphasize the importance of employing various assessment methods, including written examinations, practical demonstrations, and workplace observations, to evaluate an individual's abilities (Hayleyesus & Mesele, 2020; Baraki *et al*., 2016). These assessment methods are specifically designed to meet the standards of validity, reliability, fairness, and transparency, which are essential for ensuring the credibility and acceptability of the assessment process (MoSHE, 2020).

The execution of competency assessments, guided by the strategies and principles governing occupational competency assessment, is essential for realizing the objectives of the TVET sector, like promoting skills development and workforce preparedness. A harmonious relationship between TVET training and the assessment system is crucial for improving the accuracy and consistency of assessment results. Harmonizing curriculum, integrating industry requirements, using comprehensive assessment methodologies, and implementing standardized procedures can achieve this, elevating the system's reputation and contributing to the cultivation of a skilled workforce (Yusop *et al*., 2023; Cedefop, 2020).

1.2. Statement of the problem

The TVET and occupational competency assessment in Ethiopia are seen as crucial for the country's overall progress and for enhancing the quality of life by promoting skill development. However, the sector has encountered challenges starting from its policy development, which has a great impact on the effectiveness of the implementations. The evolution of educational policies in Ethiopia, particularly in vocational education and training (TVET) from the 1940s to 2020, shows a strong political influence rather than a focus on actual socio-economic needs. Different governments, including the Imperial, Derg, and EPRDF regimes, have used educational reforms to strengthen their power and pursue ideological aims, often ignoring the country's real socio-economic requirements (Gershberg, Kefale, & Hailu, 2023).

For example, under the Imperial regime, there was an emphasis on using education for modernization. However, this effort was not in tune with the labor market demands, resulting in educated unemployment and inefficiencies (Kiros, 1990). During the Derg era, educational policies were shaped by socialist ideologies, with a focus on political indoctrination rather than on practical and economic needs. The EPRDF regime also used educational reforms to bolster its political and ideological positions, frequently neglecting the actual developmental needs of Ethiopia.

Furthermore, a World Bank report on Ethiopia's TVET highlights that the development of vocational training has often been driven by political and administrative decisions, not by the needs of the labor market. This indicates a disconnect and a lack of understanding of the nation's socio-economic requirements (Krishnan & Shaorshadze, 2013). Overall, while Ethiopia's educational policies, including TVET, have developed over time, they have been heavily influenced by the political agendas of the time, often overlooking a genuine needs-based approach to educational development. In addition, the development of occupational standards failed to address the industry's needs, lacked sufficient assessment tools, and did not integrate occupational competency assessment practices coherently with its strategies and principles. These issues have compromised the sector's efficiency and effectiveness (MoE, 2018). This, in turn, influences the successful execution of TVET and occupational competency assessment.

The occupational competency assessment as main part of TVET is a relatively new concept, it has been implemented for over a decade in Ethiopia. The occupational competency assessment requires the participation of different stakeholders who can contribute their expertise, experience, capacities, and investment to improve the relevance and effectiveness of the Occupational Competence Assessment. If the stakeholders are not working with effective coordination and shared responsibilities, the system will not be effective and efficient to convey the expected results. Besides, the competency assessment system requires a framework that is more consistent with current theoretical understandings of the nature and potential uses of assessment. Gravells (2016) underscored the critical importance of various principles in competency assessment, including validity, reliability, relevance, feedback, sufficiency, and authenticity. These elements ensure that assessments accurately reflect their intended objectives, maintain consistency, align with program goals, support learning, and encompass all necessary competencies as per occupational standards. In addition, World Bank (2023), stated that the effectiveness of occupational competency assessment and certification within TVET in Ethiopia is a significant concern as the country tries to improve worker skills and align training with labor market requirements. Despite the discourse around competency-based training, a significant disparity exists between strategic intentions and practical implementation. This difference

frequently leads to graduates having insufficient skills recognized by employers, causing high youth unemployment rates and a skills mismatch in the labor market. Addressing this issue is crucial for enhancing the employability of TVET graduates and fulfilling the changing demands of various industries in Ethiopia.

Ethiopian TVET system as stated by Ethiopian Educational Road Map (2018) has not brought the desired result expected by government and private sectors. The road map stipulates that even though there are similar implementation manuals developed by the Federal TVET Agency (FTVETA, 2014), there is regional disparity in actual practice and implementation of occupational competency assessment in maintaining quality and standards. TVET institutions have different results of their trainees' competency assessment in terms of variance in the development of curriculum, which is mandated to the trainers in TVET institutions, the trainer's incompetency and lack of industry experience, and the training inputs of institutions. However, the side of occupational competency assessment that has not been properly investigated based on the aforementioned principles of competency assessment is a gray area for the researcher. Some research works in the areas of competency assessment (for example, Baraki *et al.* , 2016; Chekole & Brhanu, 2020; Selamawit, 2014; AAEQOCAA, 2021; and MoE, 2018) The occupational competency assessment system faces weaknesses, including mismatches between assessment and training, industry awareness, insufficient tool development, misconceptions about CoC assessment, lack of specialization, and ethical issues. However, the studies were not conducted comprehensively and deeply in nationwide. Moreover, not focused on detail practices factors related to center of competency agency, occupational standard development, assessment tool development, assessors, supervisors, assessment centers, and candidates. These issues are the critical parts that determined the sector's efficiency and effectiveness.

Furthermore, candidates and TVET trainers have complained that the occupational competency assessment is highly corrupt, and there is a poor conceptualization of the CoC assessment among students and TVET institutions on the assumption that the CoC assessment is a system that blocks students from joining universities. In addition,

international experiences like Germany, Australia, and Kenya (OECD, 2021; Gasskov, 2018; KTVETA, 2019) show that assessment is conducted using more than one assessor, but in the Ethiopian case, conducted using only one assessor, this may create a problem in the quality and reliability of assessment. As a result, to effect change, all of the aforementioned pitfalls must be thoroughly investigated and improved.

The table below presents the 2023 assessments of candidates in economic infrastructure, hotels and tourism, and the health sector from Addis Ababa, Amhara, and Oromia CoCs.

Table 1 : Assessed and Competent Candidates in Addis Ababa, Amhara and Oromia

Name of Regions/City Administration	Name of sectors	Assessed Candidates	Competent Candidates	%
	Hotel and tourism	8883	6396	72
Addis Ababa	Economic Infrastructure	76019	39038	51
	Health	11053	6176	56
	Hotel and tourism	2558	1642	64
Amhara	Economic Infrastructure	5674	3429	60
	Health	69779	28156	40
	Hotel and tourism	27639	11475	42
Oromia	Economic infrastructure	146,410	57817	39
	Health	15928	6398	40
Total		363943	160527	44

Source: (AAEQOCAA, 2023; ACoCA, 2023; OCoCA, 2023)

According to the data from the regional occupational competency assessment and certification agency, the competency rate of candidates in Ethiopia varies across regions, city administrations, and sectors; the reason behind this has not been investigated in detail. Investigating the underlying causes of regional disparities and sector-specific challenges can help make interventions more effective, resulting in a more skilled and efficient work force.

Various researchers, including Biemans *et al*. (2004, 2009) and Rahmah & Muslim (2019), conducted a series of rigorous studies on competency-based occupational assessment. Their focus, however, was on conceptualization, benefits, and pitfalls of the assessment, not on the critical challenges that emanate from strategy and practice. There were few

studies conducted in Ethiopia (for example, Baraki *et al.*, 2016; Solomon, 2016; Selamawit, 2014; Chekole & Brhanu, 2020) regarding competence-based TVET and competency-based assessment. Most studies did not thoroughly explore the issue and did not examine the policies about involving stakeholders and the challenges of putting them into practice compared to international standards; also, they did not completely look at how the strategies and principles of competency assessment relate to what is actually done. The research looked at just one part of competence assessment, so it didn't fully consider how the CoC's organizational structure affects how well the system works. Additionally, the studies focused on Addis Ababa, which means that the context of regional states was not addressed. Since 2008, comprehensive research was not conducted in the area. Moreover, there is no research conducted based on current implementations. In addition to the above rationales, the researcher's experience inspired him to research this issue. For the past ten years, the researcher has worked as a senior expert in occupational competency assessment and has observed issues related to maintaining principles and quality criteria, as well as assessor subjectivity.

In conclusion, prior research on competency assessment in Ethiopia has predominantly emphasized problems including insufficient awareness, misalignment with training, and inappropriate assessment instruments; most of them focus on Addis Ababa. This study, on the other hand, aims to do a comprehensive investigation of the competency assessment system, focusing on policy and strategy development, stakeholders' perception, effectiveness of the system, compliance with strategy and principles, and the practice of key implementers. Furthermore, this research aims to deliver a thorough national overview, addressing gaps in previous studies. Therefore, studying the effectiveness of occupational competency assessment and certification in Ethiopia, bridging the rhetoric and reality, is valuable and worth studying.

1.3. Research Questions

The following are the basic research questions identified to guide the study.

1. How are relevant stakeholders (line ministries, industries, CoC directorates, TVET deans, and trainers) involved and consulted during the formulation and development of Ethiopia's current TVET policy and strategy?
2. How do stakeholders (industries, TVET college deans, trainers, and candidates) perceive the occupational competency assessment and certification systems in Ethiopia?
3. To what extent does the implementation of occupational competency assessment align with established strategy, and guiding principles?
4. What are the key determinants influencing the effectiveness of occupational competency assessment in Ethiopia from the perspectives of stakeholders?

1.4. Objectives of the Study

The general objective of this study is to investigate the effectiveness of occupational competency assessment and certification of TVET in Ethiopia bridging the rhetoric with the reality. Accordingly, the study addressed the following specific objectives:

1. To analyze the involvement and consultation of relevant stakeholders (line ministries, industries, CoC directorates, TVET deans, and trainers) during the formulation and development of Ethiopia's current TVET policy and strategy.
2. To assess stakeholders' perceptions (industries, TVET college deans, trainers, and candidates) of the occupational competency assessment and certification systems in Ethiopia.
3. To investigate the alignment between the implementation of occupational competency assessment and established strategy, and guiding principles.
4. To identify key determinants influencing the effectiveness of occupational competency assessment in Ethiopia from stakeholders' perspectives.

1.5. Significance of the Study

The purpose of this study is to investigate the effectiveness of competency assessment and certification systems in Ethiopia bridging the rhetoric with the reality. This research will greatly benefit the government to inform policy formulation and implementation by engaging key stakeholders, providing insights into more effective TVET strategies on a nationwide scale. It will empower educators with new methods and knowledge, potentially improving training efficacy, assessments, and trainee engagement. It emphasizes the need for systemic reforms within CoC Institutions to promote transparency, equity, and efficacy. The study will enhance training programs for TVET institutions and trainers, providing data-driven insights to refine approaches and better prepare trainees for professional demands. Trainees will benefit from improved learning outcomes, better preparedness for industry demands, and enhanced employment prospects. The study will bridge the gap between educational outputs and industry needs, ensuring curricula remain aligned with evolving sector requirements, creating a more competent and job-ready workforce. The study will contribute to academic discourse by increasing our understanding of occupational competency assessment through looking at different viewpoints, considering specific assessment methods, meeting stakeholder needs, and offering new perspectives for more research and exploration.

1.6 Scope of the study

The major target of the study was to investigate whether the rhetoric on competency assessment and certification systems in Ethiopia matches the reality. There are many parts to the TVET system, such as relevance, quality, equity, and access; research, innovation, and technology transfer; improving facilities and infrastructure; building up institutions' abilities; and monitoring and evaluation (MoSHE, 2020). The researcher has limited this study to content and areas within the scope of the available resources and time. As a result, the study's focus is on occupational competency assessment, which plays a significant role

in improving the TVET system's efficiency and effectiveness and ensuring that graduates meet industry requirements under the pillars of relevance, quality, equity, and access.

The Ethiopian TVET Occupational Standards conduct occupational competency assessments for eight major sectors. This study, however, selected the industry development, economic infrastructure, health, and hotel and tourism sectors. The researcher selected these sectors due to their high candidate assessment rates and well-established assessment systems (AAEQOCAA, 2021). The study used the Ministry of Labor and Skill to examine the policy and strategy, guidelines, and directives for occupational competency assessment and certification. The line ministries (culture and sport, tourism, industry, urban development and construction, and health) used to analyze their level of involvement in TVET policy development and implementation. The researcher selected these line ministries because the majority of the candidates assessed were in these sectors.

The study restricted its scope at the regional state level to the relatively broad and large number of candidates assessed in the Oromia and Amhara regions, the small number of candidates assessed in the Gambella region, the newly emerging Sidama region, and the developed city, and the large number of candidates assessed in the Addis Ababa City Administration. The researcher concentrated the study on candidates who have successfully completed the level 3 competency assessment, as well as assessors and supervisors with over five years of experience in competency assessment. This is because the candidates, having completed levels 1, 2, and 3 competency assessments, are familiar with the system, while the assessors and supervisors, with their extensive experience, have a deeper understanding of it. Furthermore, the qualitative data included directors of CoC Institutions, TVET college deans, trainers, and industry supervisors who have a minimum of five years of experience. Therefore, the respondents better understood the issues incorporated in the questionnaire and interview.

1.7. Limitation of the study

Focusing on five different regions presents a challenge due to a shortage of manpower and financial resources. This situation pushes the researcher to collaborate with five data collectors, one from each region. The role of data collectors was to facilitate the candidates, assessors, and supervisors' filling out of the questionnaire. Further, arranging time with interviewees (CoC Institutions directorates, industry supervisors, CoC focal persons and coordinators, Deans, and TVET trainers) for the researcher to collect the data. The presence of these data collectors was somehow minimizing the impacts of these limitations. The other limitation of this study is the country's security issues and shortage of transport in one assessment center in the Amhara regional state. To reduce the limitation, the researcher conducted in-depth interviews with regional city assessment center TVET deans, trainers, and CoC focal persons, which provided detailed information on the subject.

1.8. Operationalization of concepts

Assessment:	Means a process of determining the qualifications of a candidate in accordance with the requirements of his / her professional standards. It is a process of collecting evidence and making a judgment on whether competence has been achieved (MoLS, 2022).
Assessor:	Means a professional who has been selected from the industry for a ssessment and is accredited by Center of Competency (MoLS, 202 2).
Assessment Supervisor:	An expert working in the Center of Competence who is mandated to supervise the assessment system during the conduct of the assessment (FTVETA, 2014).
Assessment tool:	This refers to the nature of the assessment task given to a candidate, which will provide the assessor with evidence of competence to

	support his/her judgment on whether the candidate possessed the competencies being assessed (FTVETA, 2014).
Candidates:	Is an individual who applies for assessment and fulfills all the requirements for seeking recognition of his/her competencies (FTVETA, 2014).
Center of Competence (CoC):	Is a regional government organization established and recognized to properly and effectively implement assessment and certification activities as delegated by the Federal TVET Agency (FTVETA, 2014).
Certificate of Occupational competence:	A certificate of competency issued by Center of Competence (CoC) on behalf of the Ministry of Labor and skill, which certifies that t he holder has been certified by a professional competency assessm ent system (MoLS, 2022).
Competence:	The possession and application of knowledge, skills, and attitude required to perform the job of occupation as indicated in the occupational standard (FTVETA, 2014).
Competency:	This word denotes the utilization of knowledge, skills, and attitudes necessary to execute a work activity across many contexts and environments, meeting the standards anticipated in the workplace (TESDA, 2023).
Competent:	A test result demonstrates knowledge, skills and attitude in a specific field of study (FTVETA, 2014).
Focal person:	A person who is working in an accredited assessment center, facilitating the assessment system (FTVETA, 2014).
Industry Supervisors:	An expert working in the industry who is in charge of supervising front-line workers (MoLS, 2022).
Industry:	Means small and medium enterprises and professional associations , both governmental and non-governmental or private enterprises, t o provide products and services at the federal and state levels (MoL S, 2022).

Line Ministries	Are government departments or ministries responsible for governing specific sectors, including health, industry, urban development and construction, tourism, and culture and sport.
Occupational Competency Assessment:	Is the process of verifying that a person has reached appropriate professional qualification (MoLS, 2022).
Occupational Competency Assessment Center:	Means a center that is accredited by competent centers for conducti ng professional competency assessment (MoLS, 2022).
Occupational Standard:	A standard defined by experts in an industry sector indicating the competencies and their respective performance criteria that are required for a worker to perform the various tasks of the occupation in the industry (FTVETA, 2014).
Regional Assessors' Panel:	A group of accredited assessors created by regional CoC in consultation with regional industry or professional associations (FTVETA, 2014).
Reality:	Something that is neither derivative nor dependent but exists necessarily. This explains the actual implementation of occupational competency assessment (Virginia State Bar, 2024).
Rhetoric:	Rhetoric is the skill of using words effectively in speaking or writing, exemplified by dishonest offers or politicians presenting problems as non-problems. It explains strategy, principles, and guidelines of occupational competency assessment and certification systems (Lunsford & Ede, 2020).
Shop Assistance:	A person who works in an accredited assessment center, assisting the assessor and in charge of shop equipment (FTVETA, 2014).

1.9. Organization of the study

The structure of this thesis is as follows: Chapter one presents the introduction of the thesis, highlighting the background, the statement of the problem, and the key research questions that directed the study. The chapter described the objectives, significance, and limitations of the study. It also disclosed definitions of key terms that assure conceptual clarifications in the study and, finally, an overview of the structure of the thesis. Chapter 2. In this chapter, we examine competency-based education, contrasting it with traditional training and its history. It discusses methods, advantages, and principles of competency assessment, including occupational competency assessment and certification. The chapter also examines TVET stakeholders and different countries' approaches to these systems, identifying research gaps and providing theoretical frameworks. In Chapter 3, the address outlines the research approach, objectives, design, methodology, data gathering, analysis, reliability, validity, and ethical considerations for a study. It covers sampling techniques, instrumentation, processes, statistical methodologies, and software for quantitative and qualitative data, as well as ethical issues. In Chapter 4, the study's findings are also presented, along with the analysis of data using both descriptive and inferential statistical methods. It presents demographic features and major factors and discusses thematic analysis in qualitative data. The chapter integrates both quantitative and qualitative findings, based on the theoretical framework and relevant literature. It concludes by providing a concise overview of the main findings and their practical and theoretical consequences, laying the foundation for the subsequent conclusions. Chapter five describes the discussion part of the findings with relevant literature. Chapter six presents the summary of findings, conclusion, and recommendation part of the paper. Finally, this thesis presented lists of references and pertinent appendices.

Chapter Two

2. Review of Related Literature

2.1. Introduction

This chapter reviews and summarizes past studies and literature on competency-based education. It begins with an introduction and then explores the idea of TVET and competency-based education. It looks at how competency-based training differs from traditional training and discusses the history and main ideas of competency assessment. The chapter also covers the methods, aspects, and advantages of assessing competency, along with its principles and quality standards. Additionally, it talks about the parts of occupational competency assessment and certification, investigates TVET stakeholders, and gives a summary of how different countries handle these systems. The chapter includes a detailed review of relevant literature, identifies gaps in the research, and ends with the theoretical and conceptual frameworks of competency assessment.

2.2. The Concept of TVET and Competency-Based Education

2.2.1 The Concept of TVET

According to Mulder (2017), the history of Vocational education and training go back to ancient times, preparing individuals for the requirements of the world of work. It goes back to the shifts after the end of the guild system; vocational education and training has its roots in the developments of industrialization and the need for qualified workers there. Hence, at the start of the twentieth century, vocational education and training was mainly directed to the training of narrow and highly standardized skills, following behaviorist models of thought and embedded in Taylor's industrial model.

Technical and Vocational Education and Training (TVET) is a part of education and training that prepares citizens for the world of work in line with changing technology and the labor market by conveying knowledge, skill, and attitudes across different occupations

(MoSHE, 2020; Dawe *et al*., 2020). The core role of TVET is to develop occupational skills and prepare youths for the world of work (Ngozwana, 2022). The realm of employment encompasses both formal and self-employment. To foster self-employment, TVET curricula frequently incorporate courses in entrepreneurship, agricultural science, home economics, hospitality, industrial development, manufacturing, and tourism, aimed at social reproduction and the evolution of vocational practices. These beyond fundamental technical and occupational abilities; they also enhance economic growth and production, which in turn foster political stability, social mobility, and economic liberation. This approach enables individuals to work autonomously and prepares them for lifelong learning, hence enhancing their quality of life in the 21st century (Sarebah & Hazleeza, 2015). TVET plays a vital and indispensable role in the development of countries such as improving system-level governance and engaging social partnership in planning TVET. It serves as the foundation of building the country's socio-economic, technological, and cultural advancement.

Given the significant of TVET, several researches have demonstrated that its contributions include the enhancement of labor skills, job creation, employability, social contribution, poverty reduction, and overall economic and social growth (Oviawe, 2018). Other studies, such as Dixit and Ravichandran (2023), said TVET plays a key role in securing the international competitiveness of nations.

Fawcett *et al*. (2014) classified TVET into three separate models: the liberal market model, the state-regulated bureaucracy model, and the dual system model. UK, Germany, and France TVET models are widely used as TVET models throughout the world. In Europe, England is distinguished by its market model, France by its bureaucratic approach, and Germany by its dual model.

In the liberal market economy model, the supply side reflects the demands of the private sectors, dominated by industries and firms. In this case, the industry sector skills councils decide the types of occupational qualifications that industry and support firms need to train the workforce. The main role of the government is to fund necessary research on

occupational and industry demands for skills and establish skills councils and national qualification frameworks. This model is used by Great Britain and Australia. Under the state-regulated bureaucratic TVET model, TVET is funded by the government. In this case, TVET is a part of the national educational system. TVET exhibits various drawbacks, such as the overemphasis on theory in the curriculum and the insufficient connection between students and the world of work. The national curriculum has a gap to reflect the demand of the labor market. This model is used by countries like France, Italy, Sweden, and Finland.

In addition, the Dual TVET model integrates academic training with practical industry experience. Students allocate a minimum of fifty percent of their training duration at the TVET institution and the remaining fifty percent in the industry, under the supervision of a trained in-company mentor. This framework delivers an extensive education that imparts fundamental and pragmatic skills. These models are used by Germany, Austria, Switzerland, Denmark, and Norway. It is a TVET design, development, and implementation that all include a wide range of public-private partnerships. Thus, a strong connection between the government and trade unions, enterprises financing apprenticeship training, and the government financing the TVET schools. The Ethiopian TVET Model follows a state-regulated bureaucratic system (MoSHE, 2020). The government regulates and funds TVET; companies and industries have a cooperative role, and private TVET institutions are allowed to provide training. To gain a detailed understanding of TVET concepts, it is advisable to discuss TVET policy development in addition to the TVET models.

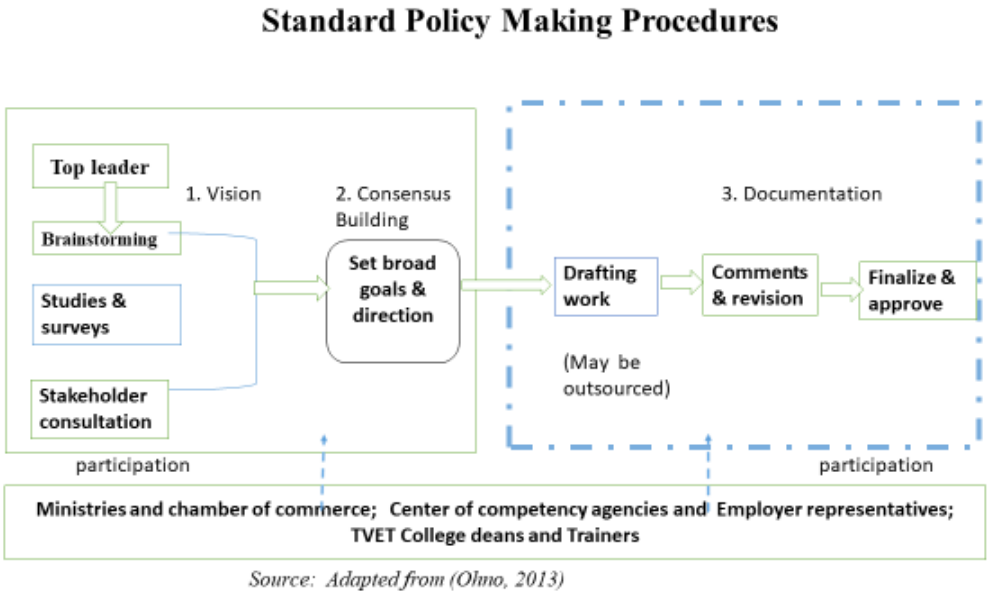
2.2.2. TVET Policy Making Procedures

TVET, as an aspect of the public sector, adheres to the public policy-making process. Public policy includes the decisions and activities implemented by the government to address societal issues. These policies regulate social conflicts, delineate societal standing in relation to other entities, distribute both symbolic and material advantages to societal members, and facilitate revenue collection, typically through taxation (Dye, 2017). Public policies may direct behaviors, create administrative frameworks, distribute benefits, levy

taxes, or include a combination of these activities; in essence, the government has adopted a strategy to tackle public concerns (Martin *et al*., 2021).

The establishment of National Skills Development Policies in Southern and Eastern African countries represents a proactive approach to addressing the skills gap and enhancing workforce capacity. By aligning training with economic needs, promoting inclusivity, and fostering collaboration, these policies aim to create a more skilled and adaptable labor force, ultimately driving economic growth and development in the region. Of the nine Southern African nations, five possess a specific TVET (Technical and Vocational Education and Training) policy, while two are in the process of formulating theirs (Aggarwal *et al*., 2013). The ILO (2021) asserts that countries formulate TVET strategies to involve all stakeholders, cultivating a unified vision for the skills system they intend to create. The national developmental framework guarantees policy consistency, suggests systematic reforms to improve training outcomes, outlines institutional frameworks for the skills system, embraces established best practices, and advocates for political and collective objectives. The primary objective of national TVET efforts is to enhance workforce productivity. Comprehensive TVET policies need to be formulated to encompass a diverse range of stakeholders, including school-aged youth with less work experience, employed workers pursuing on-the-job training, and aspiring entrepreneurs (ILO, 2022). Policy development is a systematic process that begins with policy formulation (MoBSSE, 2020). Policy formulation may require the modification of established norms.

Figure 1: Standard Policy Making Procedure



Source: Adapted from (Ohno, 2013)

Ohno (2013) highlights that the standard policy-making procedure comprises multiple steps: articulating a clear vision, fostering consensus, documenting the process, engaging in brainstorming, executing studies and surveys, consulting stakeholders, establishing overarching goals, drafting proposals, integrating feedback and revisions, and ultimately finalizing and approving the policies. The top leader formulates a vision that acts as a guiding concept during the process. The process entails cooperation among several stakeholders, including governmental bodies, enterprises, educational institutions, and consultants. The policy formulation process is recorded to guarantee transparency and accountability. A principal ministry or agency executes the comprehensive management and coordination of the policy formulation process. Various Asian nations have implemented these processes. A fundamental aspect of TVET policy formulation is obtaining feedback from the labor market to ensure TVET corresponds with the demand for skilled labor. Such feedback is essential for public pre-employment training, less so for private institutions that require market alignment to draw learners, and even less crucial for on-the-job training, which is inherently linked to employment. The Ethiopian system has endeavored to modify these procedures; yet, the execution seems insufficient or lacking in comprehensiveness (MoE, 2018).

Dye (2017) analyzes various policy process models applicable to public policymaking, encompassing rational, and process model as well as institutional, and incremental models. Every individual has a unique context for policy creation. The process model defines the systematic stages involved in creating and executing public policies. This model underscores the significance of organized phases that direct policymakers from issue identification to outcome evaluation. The preliminary process model is essential for understanding the various activities involved in policymaking. These activities include problem identification, agenda setting, proposal development, policy legitimization, policy execution, and policy assessment.

The Institutionalism Model underscores the importance of governmental institutions, which have persistently been a central focus in political science research. Political activities mostly center on distinct political entities, including Congress, the presidency, courts, bureaucracy, states, municipalities, and others. These institutions possess the authoritative capacity to determine, execute, and enforce public policy. Rationalism denotes a doctrine grounded in reason, striving to achieve the maximum social advantage. Governments should adopt policies that yield societal benefits above their associated costs by the largest margin. Conversely, governments ought to refrain from enacting measures when the costs surpass the benefits. This concept of highest societal gain includes two essential principles. Firstly, it is essential that no program is executed if its costs exceed its benefits. Moreover, when evaluating several policy alternatives, it is essential for decision-makers to choose the policy that provides the most benefit in relation to its cost. A policy is deemed logical when the positive disparity between the values it attains and the values it sacrifices exceeds that of any alternative policy option. The incrementalism approach views public policy as an evolution of prior governmental actions, marked by minor and gradual modifications. Incrementalism is a conservative methodology that relies on current programs, policies, and spending as its base. It emphasizes the formulation of new programs and policies, together with modifications to existing ones via enhancements, reductions, or adjustments (Dye, 2017).

The Ethiopian educational policy development shows that the educational roadmap was created under the authority of the Ministry of Education. A panel of experts, comprising representatives from the Ministry of Education, Addis Ababa University, Addis Ababa Science and Technology University, the Oromia Education Bureau, the Department for International Development, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), evaluated the implementation of the prior educational policy. They assessed the strengths and weaknesses and offered recommendations for future policy initiatives (MoE, 2018). The Ministry of Science and Higher Education (MoSHE), as authorized by Proclamation 1097/2018, initiated the development of the new TVET policy. Recognizing the limitations of the 1994 Education and Training Policy and 2008 TVET strategy and the recommendation of the 2018 educational roadmap in addressing current sectoral needs, MoSHE embarked on formulating an updated policy framework (MoSHE, 2020).

The Ministry of Higher Education and Science (MoSHE) delegated the Federal TVET Institute to develop the draft policy. The Federal TVET Institute established a technical working group comprising experts and stakeholders to draft the new TVET policy and strategy. This group operated under the close supervision of the institute and MoSHE's top management to ensure coherence with national objectives. The working group developed a draft policy that emphasized creating a competent, motivated, and adaptable workforce. The draft aimed to align TVET with labor market demands and national development plans. It concentrates on the outcomes of the educational roadmap, past implementation reports, and supplementary materials generated by the Federal TVET Agency. It utilizes both institutional and incremental models, as outlined in the ten-year educational roadmap. The 2008 Technical and Vocational Education and Training (TVET) system lacked a defined policy; however, it included a competency-based TVET strategy developed by the Ministry of Education. The new TVET policy and strategy continued the execution of competency-based TVET is underway, with targeted modifications addressing issues identified in the previous implementation of the strategy (MoE, 2018).

2.2.3 The concept of Competence and Competency

The difference between "competence" (ብቃት) and "competency" (ሙያዊ ብቃት) is complex yet vital, particularly in domains like as education, human resources, and organizational development. Competence is the set of integrated capabilities which consist of content-related clusters of knowledge, skills, and attitudes, to perform jobs effectively. In general overall ability to perform a task effectively (Mulder, 2011). On the other hand, Competency denotes the capacity to do a particular task effectively. It includes specific skills, knowledge, or abilities within a given domain. (Holmes, Tuin, & Turner, 2021). These are "competency" is person-oriented behavioral approach (Mulder, 2016). These are usually assessed through actions exhibited in pertinent contexts, such as performance evaluations or behavioral interviews.

Although these phrases may be used similarly in standard business communication without considerable effect, it is crucial to differentiate them distinctly in specialized conditions. This distinction affects the design of training and development programs and the delineation of job duties within an organization. Diverse methodologies, including 360-degree feedback, gather assessments from an employee's managers, colleagues, and assistants to evaluate competencies. This method aids in identifying and evaluating actions that improve job competency. Conversely, acquiring certifications or qualifications can authenticate proficiency and exhibit a wider range of skills (Parry, 1996). Understanding both concepts and their appropriate implementation ensures that workforce planning and employee development are executed accurately, closely aligning with company objectives and performance criteria (Spencer & Spencer, 1993).

2.2.4. Competency-Based Education and Training

The weak linkage between education and the labor market led to the introduction of the competency-based education philosophy. The content-based college curricula of that era resulted in a one-sided approach and lacked connection to the labor market. Thus, competency-based education started in the United States in the late 20th century. It deeply roots the theory of behaviorism (Mulder, 2017). This learning approach incorporates students' competencies in tasks and addresses the requirements of diverse sectors by employing structured assessments that conform to industry standards (Akinrinola *et al*., 2020). Moreover, Usoro and Ezekiel (2017) asserted that the industry's unique criteria, referred to as occupational standards, push this educational and training initiative. These industry standards constitute the basis for developing the program (curriculum), assessment, and learning materials.

Further, competency-based education and training (CBET) focuses on achieving specific outcomes by enhancing learners' competencies, including knowledge, skills, and abilities for successful performance in specific situations (Mulder, 2017; MoE, 2018). Competency based education includes competence development, which involves the systematic acquisition, enhancement, and broadening of competencies through diverse learning experiences, training programs, and practical application, with the goal of empowering individuals to meet business and societal needs (Bach & Suliková, 2019). In addition, the students would progress at their own pace and demonstrate mastery of important competencies, free from the restrictions of traditional seat-time requirements (Larsen McClarty & Gaertner, 2015). Following this concept, competency-based education implies creating opportunities for students in a meaningful learning environment where the learner can develop integrated, performance-oriented capabilities for handling the core problems in practice.

Competence-based education is based on a competency framework (Mulder, 2017), which serves as a distinct and quantifiable basis for planning, implementing, and assessing educational programs that effectively cater to the requirements of students, employers, and

the wider community. In more detail, Mulder also describe the differences between competence-based and competence-oriented education. Competency-oriented education builds instruction around a competence framework. The structure of the learning process remains largely the same, as it takes time to develop targeted learning outcomes and synchronize assessment methodologies and procedures. Educational activities can be planned based on social constructivism and active pedagogy tenets. On the other hand, competence-based education refers to instruction that bases the educational plan on a competence framework. The framework serves to identify core tasks within the occupation or profession, and these essential competencies are defined. The competencies always consist of clusters of knowledge, skills, and attitudes. As a result, competence-oriented education uses competence frameworks as destinations, whereas competence-based education uses them as road maps. Thus, competency-based education is a much deeper application of the competence philosophy in education than competence-oriented education. The Ministry of Education (2018) backs up the CBET's main goals, which are to set measurable occupational standards, train competent people with transferable skills, connect education and training to skills employers need, create a quality assurance system that everyone trusts, encourage people to learn throughout their lives through progression and transfer, help them reach their full potential, and teach them how to adapt quickly to change.

2.3. The difference between competency-based and traditional training

As discussed in the above literature competency- based training has a strong link with labor market demand. The competency-based training (CBT) approach to technical and vocational education and training (TVET) has been acknowledged as a highly effective method of ensuring that training programs remain relevant to the labor market, as companies, training providers, and skills development systems face the challenge of enhancing the skills of (future) workers (Daru, 2020). It is important to identify the difference between CBT and traditional training.

The subsequent points outline the fundamental distinctions. The primary emphasis of Competency- based training (CBT) is on particular abilities and competences that learners need to exhibit in order to be deemed competent. This approach prioritizes the practical implementation and results rather to only theoretical understanding. Learners follow a self-paced learning approach, advancing only after they have fully acquired the necessary skills. This personalized method enables tailored learning experiences. Assessment in Competency-based training (CBT) is based on performance, specifically examining whether learners can effectively use their mastered abilities in practical situations. These activities generally include interactive demonstrations and practical assessments, and CBT offers adaptability in learning trajectories, enabling learners to select modules that correspond to their professional objectives and personal interests. In contrast, conventional learning often prioritizes theoretical knowledge and subject matter material, usually imparted through lectures and established curriculum. The learning Pace follows a predetermined timetable, where all learners are required to advance through the curriculum at the same pace, irrespective of their unique level of proficiency. Conventional training methods depend on examinations, quizzes, and memorization to evaluate information, sometimes disregarding the actual application of skills. These instructional methods are typically more organized, with a well-defined set of subjects and learning goals that all students are required to adhere to (Acquah *et al*., 2017).

Hence, the 21st-century learning paradigm prioritizes the acquisition of particular skills and competencies above the duration of instructional sessions or conventional evaluation methods. The 21st-century learning paradigm tailors education to each learner's unique requirements and pace, thereby facilitating more personalized learning pathways. It promotes the application of knowledge to real-life scenarios, nurtures critical thinking and problem-solving abilities, and integrates teamwork and communication as fundamental competencies. Competency-based education (CBE) has a preference over traditional learning methods.

In summary, the concept of CBE, according to Kellogg (2018), shows that in competency-based education, learning is constant and time is variable, whereas traditional education

indicates that learning is variable and duration is constant. Competency-based education focuses on the content students learn rather than the time they take to complete the course.

2.4. Historical Foundation, and Concepts of Occupational Competency Assessment and Certification

2.4.1. Historical foundation of occupational competency assessment and certification

Occupational competency assessment is a critical element of competency-based education and training (CBET), aimed at cultivating competencies to fulfill industry requirements. This approach supports individualized progression, enabling the development of comprehensive, performance-focused skills for professional practice, devoid of traditional time-based constraints (MoE, 2018; Larsen McClarty & Gaertner, 2015).

Competency assessments were introduced in the second half of the 20th century in the United States. The competency assessment originated in the 1970s and 1980s, gaining prominence in the subsequent decades of the 1980s and 1990s to bridge the gap between educational outcomes and labor market needs, with a focus on enhancing employability through relevant competency assessments (Mulder, 2017; 2012). Resnick (1994) highlighted the push by progressive educators for competency assessments in public schools to enhance efficiency, aiming at establishing benchmarks for comparison, managing costs, and improving student retention. In occupational competency assessment, Burkett (2018) differentiated between criterion-referenced and norm-referenced testing. Criterion-referenced testing assesses an individual's performance based on a predetermined set of behaviors, whereas norm-referenced testing compares people to a representative sample. Both methods provide trainers with tools to implement remedial interventions. Criteria-referenced testing, which is aligned with CBE by comparing individual performance to established standards. Rahmah and Muslim (2019) advocate for competency certification tests as a means to verify the possession of necessary skills, knowledge, judgment, and personal attributes required in the industry. This means that the background of competency assessments shows how important they are in CBET practices.

It also shows the differences between criterion-referenced and norm-referenced tests, as well as their features and purposes, so that you can understand their pros and cons.

2.4.2. Concept of occupational competency assessment and certification

The definition of Occupational competency assessment is the process of collecting data to evaluate an individual's acquired knowledge, skills, and attitudes in alignment with standards and the expected level of workplace performance (TESDA, 2023). Furthermore, the Australian Department of Training Workforce Development (DTWD) (2016) asserts that competency assessment entails the collection of evidence and the evaluation of an individual's attainment of competence. This verifies that an individual can meet the performance standards anticipated in the workplace, as delineated in the nationally recognized competency standards. In addition, Rahmah & Muslim (2019) occupational competency assessment will ensure that professionals acquire the competence needed by industry and entrepreneurs; and can do work with specified standards. Occupational competency assessment make an individual being professionally competent. Proficient professionals will recollect and utilize facts and skills, assess evidence, generate explanations from existing data, devise and examine hypotheses, and integrate information from a comprehensive and well-structured knowledge repository. Success, whether professional or personal, is contingent upon three factors: knowledge, skills, and attitudes. The three factors are defined as follows: Knowledge is information acquired by education, experience, or association. Skills denote the capacity to execute particular tasks. Examples of talents encompass task execution, effective communication, writing proficiency, instrumental performance, problem-solving capabilities, and dancing ability, among others. The final aspect, attitude, pertains to individuals' responses to specific situations and their overall behavior. For example, proactivity, interpersonal compatibility, optimism, criticality towards others, and arrogance are manifested in attitudes.

Moreover, occupational competence assessment has garnered heightened interest among commercial organizations and professions as it aids in evaluating whether individuals have effectively exhibited the requisite skills, knowledge, behaviors, and abilities in the

workplace. During the evaluation process, assessors analyze whether individuals meet established competency requirements based on their actual performance in designated work roles (Daru, 2020).

According to Mulder (2017) the classification of assessment into three perspectives; assessment of learning, assessment for learning, and assessment as learning. This shows the implications of educational developments for assessment practice. Segers *et al*. (2003) states that assessment of learning emphasizes making the best choices for our students. Assessment of learning involves methods designed to validate students' knowledge, achievement of curriculum objectives, competence, and inform future programs or placements judgments. The word summative assessment is linked to this in the literature. Have our learners attained a specific standard of education? Can we justify choosing the right course of action over them? The credibility of the assessment's decision-making function is highlighted. This viewpoint will provide an overview of numerous classes of evaluation methodologies, each of which assesses competence with varying degrees of authenticity. Popham (2019) discuss the second assessment for learning perspective, noting that the assessment's main focus is on how it affects learning abilities. Assessment for learning is typically conducted daily and is specifically tailored to evaluate the progression of individual learner. Does the assessment offer useful learning feedback? How does the assessment aid in continued education? How might assessment support more in-depth learning techniques or specific developmental goals? Assessment as learning involves students acting as self-evaluators, self-monitoring their learning, and applying assessment data for further learning. It is the final one; in this assessment, the decision function and the learning function are combined into a single, synthetic approach (Clark, 2010). Through the occupation competency assessment of certain proficiencies necessary for different professions.

Nonetheless, executing effective competency-based assessment is difficult (Suhairom *et al*., 2014). The challenges are different according to the context of assessment, but the most challenges are difficulties of competencies to observe directly, and its complex and diversified feature, job scope, and activities of certain business organizations or professions. These have

created difficulty in making sound judgments (Daru, 2020). In the context of Competency Assessment and Certification in the CBET approach, Certifications indicate that the holder of the Certificate has acquired and is able to practically demonstrate certain competencies that are articulated in the national standards. However, in the traditional approaches, credentials or certificates simply indicate that the holder of the certificate has successfully completed a course or achieved a grade (i.e., the certificate does not indicate or guarantee the level of competence achieved. Through the assessment of certain proficiencies necessary for different professions, it is not only quantifies the knowledge and abilities obtained by students but also corresponds with wider educational goals related to guaranteeing preparedness for the labor market.

2.5. Method of occupational competency assessment

The method and timing of assessment will vary depending upon the assessor, the candidate, and the competency being assessed (DTWD, 2016). The method should also be valid, reliable, and feasible. McClarty and Gaertner (2015) identified different approaches for evaluating competence: assessment based on samples of performance, observation of performance in real work settings, and evaluation based on previous learning experiences. These approaches encompass a variety of methods, including simulated exercises and examinations that involve direct observation and evaluation of previous accomplishments using portfolios. The following discussed some methods of competency assessment.

2.5.1. Performance-based assessment

Performance-based assessment (PBA) is an evaluative method that assesses an individual's competences by requiring the display of skills and knowledge in practical situations. This approach prioritizes the utilization of competences over theoretical knowledge, offering a more precise depiction of an individual's capabilities. Performance-based assessment (PBA) is a modern type of assessment that is being promoted by numerous assessment specialists worldwide. Instructional practitioners have shown significant interest in PBA in recent years. Performance-Based Assessment offers several benefits to enhance students'

academic achievement. It is a planned instruction and its connection to students' real-world experiences are essential for enhancing student accomplishment (Gyamfi *et al*., 2023).

2.5.2. Assessment based on direct Observation

Assessment based on direct observation is one of the competency assessment methods; assessors monitor candidates as they perform the task to determine their proficiency in executing it correctly. Practical skills, particularly in clinical areas, frequently employ direct observation for assessing candidates. The technique of direct observation involves the real-time evaluation of an individual's performance while they are actively involved in particular tasks or activities. The aforementioned methodology enables assessors to appraise competencies by considering the tangible conduct and abilities exhibited in real-life scenarios (Miller & Ainsworth, 2021). Although direct observation is a vital instrument in occupational competency assessment, it is crucial to acknowledge these drawbacks to guarantee a balanced and equitable evaluation process. Employing strategies such as utilizing several evaluators, integrating observation with alternative assessment techniques, and establishing explicit criteria can alleviate certain issues.

According to the Department of Curriculum and Professional Development and Bhutan Council for School Examinations and Assessment (2022), where suitable, video recordings might be used to document the firsthand observation. This system produces the least disruption in the learning environment by the assessor and allows for remote accessibility. Nevertheless, the assessor is unable to evaluate the learner's cognitive process via video recording. This deficiency can be addressed by conducting further interviews and questioning.

2.5.3. Assessment based on self-assessment

Assessment based on self-assessment is the process of evaluating an individual by himself. The candidate evaluates themselves according to the standardized competencies applicable to the job tasks. Within competency assessment, the candidate evaluates himself and makes

a decision before proceeding to the holistic evaluation. Before participating in self-evaluation, students initially establish and implement the assessment criteria for the self-assessment. Subsequently, they deliberate on the caliber of their own performance in relation to the evaluation standards and pinpoint their own areas of proficiency and areas for improvement. Following introspection, a self-evaluation conclusion is reached, and this conclusion is continuously adjusted based on various evaluation criteria, feedback, and/or self-reflection (Yan & Carless, 2021). Although self-assessment can foster self-reflection and awareness, it is crucial to recognize its drawbacks. Integrating self-assessment with additional approaches, such as peer reviews or official evaluations, can yield a more comprehensive and precise understanding of an individual's competencies and developmental areas.

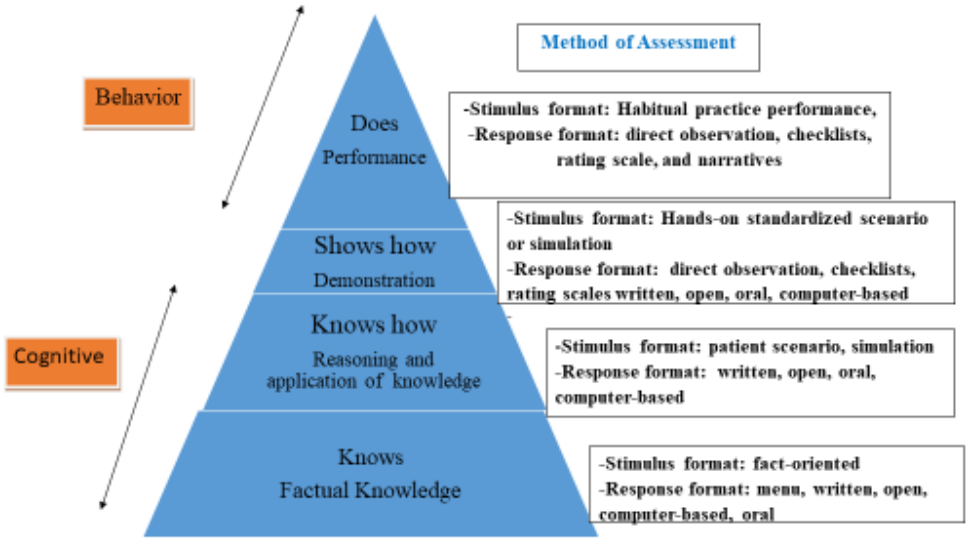
2.5.4. Portfolio assessment

A portfolio assessment is a methodical and structured compilation of information utilized by both the teacher and student to effectively track the development of the student's knowledge, abilities, and attitudes in a particular field of study. A portfolio is an accumulation of students' work that comprises a curated selection of performances. Due to its significant significance in improving students' achievement, portfolio assessment has arisen as an alternate method of evaluating pupils. Potential alternative assessments may encompass the use of reflection through observation and portfolios. Data obtained from portfolios provide a thorough overview to educators, parents, and other interested parties to make informed choices regarding pupils' improved academic achievement (Deeba *et al*., 2023).

To enhance assessment practices, Lockyer *et al*. (2017) recommends employing multiple methods and assessors, thoughtful selection and training of assessors, reevaluation of psychometric roles, and the significance of group dynamics in decision-making processes regarding competence. In CBE, various assessment modes are feasible. The choice of evaluation method can be influenced by the information sought, the level of performance, the learner's stage of knowledge, skill and behavioral dispositions (see Miller's pyramid

(Miller, 1990), and the institution's capabilities. According to Miller's pyramid, professional competence is divided into four stages: "knows," "knows how," "shows how," and "does." The lowest two levels concentrate on students' knowledge or cognitive abilities, while the two upper levels are focused on performance.

Figure 2: Miller's Pyramid of competence



Source: Adapted from (Mulder, 2017).

The pyramid underscores the transition from theoretical knowledge to practical application, emphasizing the path to competence in occupations.

Currently, competency assessment employs various creative assessment approaches, utilizing technologies such as video and simulation. Given many researchers (e.g., Daru, 2020; Jariyathitinant, 2021) concur that competence is a multidimensional construct, it is logical to incorporate a variety of instruments that adequately address all of the aspects. Knowledge tests can be delivered as computer-based, paper-and-pencil tests including multiple-choice and constructed-response items. Affective-motivational characteristics are typically surveyed with rating scales. Cognitive skills that play out in interactions with

situational demands need innovative assessment formats such as video-based performance tests that present authentic situations and require test takers to react to these.

2.6. Dimension of Competency Assessment

The Federal Technical Vocational Educational and Training Agency (2014) in the manual for developing assessment tools stated that competency assessment has four key dimensions: task performance, task management, contingency management, and job environment. Task performance competence, involves criteria of process, product or service, working safety, and labor productivity. Task management competence is about responding to work over all administration from safety to keeping industrial regulations. The third one is contingency management competence involves considering criteria of handling irregularities and problem-solving skills used in daily activities. Job environment competence includes communication skills and teamwork. Therefore, during competency assessment process assessors should consider these four dimensions.

Further, international confederation of midwives (ICM) (2022), substantiate the concept using consistent performance requires four key skills these are: task completion, task management, contingency management, and adaptation to the work environment and job role.

Figure 3 Dimension to determine competence

Source: Adapted from (ICM, 2022)

The assessment process evaluates candidates based on the above key competencies: knowledge and ability to perform required tasks, their capacity to handle multitasking, and their ability to perform tasks in unexpected situations. Assessors take into account the candidate's ability to adapt to similar but different work situations, collaborate, and work well with others.

2.7. Benefits of competency assessment

According to ILO (2020), Competency assessment has lots of benefits in making the education and training process effective, ensuring competence development essential to perform occupational tasks. Essentially, it benefits learners, industries, training colleges, and the learning process.

2.7.1. Benefits for Learners

Competency assessment inform learners about the specific requirements and enhances their preparedness for certain professions. It provides a lucid understanding of the projected requirements from the perspective of the job market. It identifies transferable skills applicable in many professional environments. As a result, learners' employability will improve, making them less marginalized in the job market. Alongside the focus on professional skills, personal growth also receives significant attention. Professional conduct and demeanor are exemplified. Competency-based assessment provides learners with adaptable routes. This suggests not only that a student in formal education has greater prospects to progress towards another credential, but also that persons not currently enrolled in school can more readily enter the educational system based on their degree of achievement. This is especially true when we combine it with systems that recognize prior learning (van Delft *et al*., 2022).

2.7.2. Benefits for Organizations/industries

Mulder (2017) states that competency assessment offers several advantages to an organization/industries. These includes the ability to visibly identify training needs for

employees and managers, improve selection and recruitment processes, establish a basis for comparing employees and their performance, provide a common set of terminology for comparing skill levels, establish a benchmark for individuals to evaluate their skills, and facilitate the implementation of micro-improvement actions that can ultimately lead to a macro-improvement in performance and hence enhance the competitive advantage of the organization or industry. Hence, businesses and industries cooperate in conducting competency assessment to obtain the beneficial outcomes.

Competency assessment helps identify training needs, improve selection and recruitment processes, compare employee performance, establish a benchmark, and facilitate micro-improvement actions. This ultimately leads to macro-improvement, enhancing an organization's competitive advantage and promoting cooperation between businesses and industries. In addition, Axiak, Mamo, and Muscat (2024), stated that competency assessment is crucial for maintaining quality and safety in healthcare and education. It involves assessing skills, knowledge, and abilities, promoting ethical considerations, and enhancing professional development. Successful evaluations improve organizational performance, promote responsibility, and adapt to evolving workforce requirements, fostering public confidence and dedication to quality practice

2.7.3. Benefits for TVET Colleges

Mahmudah and Santosa (2021) argue that industrial development influences competency standards for vocational schools, ensuring graduates can work in their area of expertise. High employment rates among graduates are a result of occupational competency assessments, which ensure TVET programs align with industry standards. These assessments improve learning outcomes, enhance employer confidence, and promote curriculum enhancement. Involving students in these assessments fosters motivation and ownership, facilitating transparent career trajectories. They also contribute to quality assurance procedures and acknowledge earlier learning, benefiting both students and companies. Occupational competency assessments serve as performance evaluation tools for TVET colleges, aiding in the establishment of performance standards and identifying

training-related issues for improvement. Overall, competency assessments are crucial for the success of vocational education (Mariano & Tantoco, 2023).

2.7.4. Benefits for learning process

Scholars have recognized providing constructive student feedback as a crucial element of student learning and a fundamental aspect of teaching. Promptly communicating assessment feedback and enabling students to utilize it to improve their learning is considered crucial for its effectiveness (Williams, 2024). Competency assessments offer essential input on student learning results, allowing educators to tailor teaching approaches, promote self-learning and responsibility for one's own learning, show strengths and weaknesses, and enhance the overall educational standard (Yusop *et al*., 2022).

In general, competency assessment allows individuals to recognize their skill and knowledge deficiencies, fostering self-awareness and personal growth, allowing organizations to align employee competencies with job specifications, offering a framework for skill enhancement and development, improving workplace productivity and efficiency, and promoting ongoing learning and skill advancement.

2.8. Principles and Quality Criteria of competency assessments

The Competency Assessment has principles, procedures, and criteria that governs the implementation process. Gravells (2016) underscored the critical importance of various factors in competency assessment, including validity, reliability, relevance, feedback, sufficiency, and authenticity. These elements ensure that assessments accurately reflect their intended objectives, maintain consistency, align with program goals, support learning, and encompass all necessary competencies as per occupational standards. In their study, Schiersmann et al. (2016) delineated numerous essential quality standards for occupational competency assessment systems. These are authenticity, cognitive complexity, comparability, cost and efficiency, directness, educational implications, fairness, meaningfulness, reproducibility, and transparency. These are discussed as:

Primarily, authenticity guarantees that assessments accurately reflect the competencies necessary in a work environment. Secondly, cognitive complexity entails the integration of complex cognitive abilities in evaluative tasks. The requirement of comparability mandates consistent testing settings and scoring for every student over time. Moreover, cost and efficiency reasons require that the time and resources allocated to assessments produce significant benefits, including improvements in instruction and learning (Baartman *et al*., 2007). Moreover, directness underscores the need for educators and assessors to quickly determine the student's competence in a certain field. The educational implications of assessments should enhance teaching and learning practices. To maintain integrity, it is essential to ensure fairness in reducing assessor biases. Assessments must be significant, providing value to students, educators, businesses, and society as a whole (Tierney, 2016).

Furthermore, reproducibility ensures that competency evaluation results are dependable and uniform, irrespective of varying situations and assessors. Ultimately, transparency is crucial; assessment standards, objectives, and procedures must be explicit and understandable to all stakeholders, including students and regulatory authorities (Aguinis *et al*., 2024).

Adhering to these principles and quality standards is paramount for sustaining the effectiveness and integrity of occupational competency assessment and certification systems. They guide assessors, supervisors, and verifiers in understanding and implementing competency assessments, promoting reflection on practices and beliefs to foster professional growth and development.

Moreover, Cedefop (2015) discussed additional quality criteria in the competency assessment process, as stated in table 2.

Table 2 Quality criteria within assessments process

Quality criteria	Application
Objectivity	-Assessment/examination boards, certification committee (assessment is carried out or at least verified by more than one person) -Students' own teachers or trainers are not assessors -Students' own teachers/trainers assess, but are not part of the decision-making examination committee
Validity	-Exam questions developed by a pool of experts -Assessment is monitored by inspectors and quality monitors
Reliability	-The authentic context for assessment -Assessment tasks developed together with representatives from the world of Work -Assessment aligned to performance criteria set in occupational standards -Assessment tasks have to comply with the assessment scheme set by the awarding body/Chambers/industries that design the qualification. -An assessment task is checked through an internal process at the VET provider level to ensure that it is compliant. -Assessment decisions are checked through an internal and external verification process -Standards on who and how a certificate can be issued

Source: Modified based on Cedefop (2015)

The principle and quality criteria of competency assessment are interrelated and essential components to maintain the quality and effectiveness of the occupational competency assessment and certification system. Thus, maintaining these forms the basis for implementing recognized, reliable, and valid assessment system. In applying these principles and quality criteria assessors, supervisors and verifiers get the opportunity to conceptually understand the basic tenets of competency based assessment and the associated assessment environments, to know their roles in the process, and apply appropriate competency assessment methods. The principles also help actors reflect on their activities and beliefs.

2.9 Elements of Occupational Competency Assessment and Certification system

Occupational Competency Assessment and Certification system involves the interplay of various interrelated and interconnected elements requiring systemic integration of these elements for its effectiveness.

2.9.1. Center of Competency Institutions

The Center of Competency Institutions (CoC Institutions) is an entity dedicated to enhancing the quality of vocational education and training (TVET) programs through the establishment and maintenance of competency standards. These agencies are generally engaged in the evaluation and accreditation of competencies, ensuring that training corresponds with industry standards and that graduates are sufficiently equipped for employment (UNESCO International Institute for Educational Planning, 2020).

The Center of Competency Institutions (CoC Institutions) uses a formal and structured assessment process to evaluate the workforce's proficiency. The country establishes this agency at the regional and city administrative levels to facilitate and implement the Occupational Competency Assessment (OCA) system. The Ministry of Labor and Skill in Ethiopia supervises the establishment of the Center of Competency Institutions and ensures decentralization of its execution by delegating authority to TVET regional offices. The Center of Competency Institutions is in charge of administering competency assessments, accrediting assessment centers and assessors, and certifying individuals (MoLS, 2022).

2.9.2. Occupational Standard (OS)

Occupational standards are a performance benchmarks for each profession, facilitating the evaluation of knowledge, skills, and attitudes (Cedefop, 2022a). All standards need to be grounded in general principles as they pertain to the essential activities individuals must engage in, the requisite understanding and knowledge they should possess, the competencies they are expected to demonstrate, and the context in which they typically

perform their duties. The caliber of knowledge and skills is evaluated by evaluation, which is validated by certification.

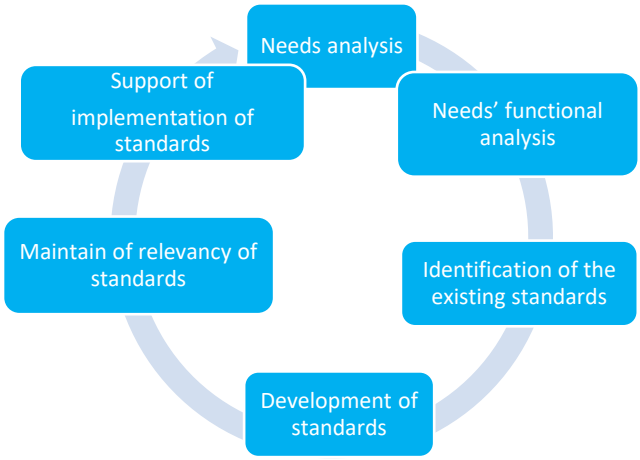
Fretwell, Lewis, and Deij (2001) discussed Occupational standards have been established based on the activities executed by an individual within a particular field of work. The classification systems for occupations and training programs differ; yet, linkages between the two must be recognized when developing standards. Practitioners adjust their practice to account for the many contexts in which they are operating as part of the integrated competency standards' holistic approach. It can also be deduced from watching someone execute on a sufficient set of difficult and demanding tasks. Moreover, Ahmed and Bodner (2017) stated that the competences necessary for a specific work are specified by the OS, which articulates what an individual has to know, recognize, and perform to fulfill a given job function. Organizational, international, and national standards can all be utilized to define OS. Within an organization's competency hierarchy, the OS varies not only between different occupations but also among various job levels.

The OS assists management in enhancing productivity by facilitating the recruitment of new employees and identifying necessary actions to improve the skills of existing personnel. Different tasks of human resources can be effectively handled by managers utilizing a set of well-defined occupational standards that indicate best practices for specific roles. According to Ahmed and Bodner (2017), the development of the occupational standard is a six-step process. The processes include needs analysis, functional analysis, identification of existing related standards, development of standards, maintenance of the relevance of these standards, and implementation of standards.

According to Ahmed and Bodner (2017), the organization's sector and economic forces can influence the needs analysis process. Identifying the needs requires a detailed mapping of the targeted industrial sector or organization, preferably done at the national level. The functional analysis focuses on a detailed map of the organization and clarifies what is needed to perform the organizational mission and objectives. Developing a functional map for a sector, industry, or organization may necessitate the establishment of a working group

with specialists from that domain. To create occupational standards, it's important to set up a working group that includes people from industries that have experience in the formulation of standards and curriculum, as well as industry experts and skill-standards specialists who can clearly explain the technical terms needed to create the standards accurately. The working group requires a facilitator to manage the process.

Figure 4 Steps for establishing an occupational standard



Source: Adapted from (Ahmed & Bodner, 2017).

MoSHE (2021) reports that the development of the Ethiopian Occupational Standards Development Guideline began in July 2009 and underwent an upgrade in March 2014. The guidelines consist of five steps, which include need analysis, functional analysis, identification of the existing OS, development of the OS, and final approval of the OS. The cycle overlooks the fundamental aspects of maintaining the relevance of standards and facilitating their implementation. The figure delineates a systematic procedure for formulating occupational standards, highlighting the significance of stakeholder involvement and ongoing enhancement. By adhering to these procedures, vocational training programs can guarantee that they provide learners with the skills required to satisfy industry requirements, hence improving workforce preparedness. This methodical method

facilitates the establishment of standards that are both appropriate and adaptable to the changing demands of the labor market, ensuring the continued relevance and efficacy of training. Further, the guidelines indicate that survival in a globalized competitive environment demands and anticipates a skilled, motivated, disciplined, adaptable, and innovative workforce as well as technology to promote economic growth and development. According to Ethiopia's Growth and Transformation Plan (GTP), the provision of outcome-based technical and vocational education and training can facilitate the acquisition of such a workforce and the transfer of technology, among other things.

Demand Oriented TVET uses the Occupational Standard (OS) as an indicator of the target or expected outcome for TVET delivery. Accordingly, OS is a key factor in the view of matching the world of work with education and training. The reason is that occupational standard encompasses the competencies that a person must possess to be able to undertake production, service, and decision. Therefore, it is important to create a comprehensive, coherent, integrated TVET system through the adaption and adoption of international best practices into national standards, which could be used to design and develop programs and curricula for formal, non-formal, and informal training delivered in different contexts to a variety of target groups as well as used as a base for Occupational Assessment and Certification systems.

2.9.3. Assessors

Assessors are accredited individuals authorized to evaluate or assess the competencies of a candidate (person) applying for certification (Gasskov, 2018; TESDA, 2023). The individual will demonstrate competence by holding a relevant technical qualification or by showcasing their industrial experience in the relevant technical domains under assessment.

Assessors must be able to reveal that they have demonstrable, relevant, and sufficient technical competence to evaluate and judge performance and knowledge evidence requirements as set out in the relevant unit outcomes and assessment criteria. This will be demonstrated either by possessing a relevant technical qualification or by demonstrating

verified industrial experience in the relevant technical domains to be assessed. At a minimum, the assessor's technical competence must align with the level required by the learner(s) in the units under assessment. The authorized organization, together with the industry, should assign the assessor to perform the assessment (FTVETA, 2014; Gasskov, 2018). The guidelines describe the required qualifications for assessors conducting assessments and address scenarios in which multiple assessors may participate in the assessment, as well as situations where the essential technical and assessment competencies may not be possessed by a single assessor. Further, Assessors are required to participate in validation and moderation processes by reviewing their assessment processes, evidence-gathering tools, evidence records, and judgments to ensure that they comply with the principles of good assessment (valid, reliable, flexible, and fair) and the rules of evidence (valid, sufficient, current and authentic) (Gasskov, 2018).

2.9.4. Assessment Centers

An assessment center is a center authorized to perform assessments that result in the granting of credit or credentials. It is a site that has been accredited for or is deemed appropriate for assessment (such as a training facility, business, or dedicated organization) and has the necessary technology, machines, materials, processes, and assessors is also functional to conduct the assessment there (Gasskov, 2018).

Furthermore, according to MoLS (2022), an assessment center is a recognized industrial training facility that has the capacity to carry out an assessment in accordance with the specifications of occupational standards. The assessment center's testing facility needs to meet the following criteria: the establishment's staff members who oversee evaluation tasks, the assessment clerk, cashier, and supply officer who handles administrative duties in the center, a coordinator who facilitates communication between the center of competency, the assessors, and the management of the center, and technical experts who have been trained and accredited as assessors and possess the necessary skills.

According to FTVETA (2014), the shop-in-charge or shop assistant will set up the workspace, furnish it with tools, supplies, and safety precautions, supply it with power and water, and keep the machinery in good working order for inspections. The availability of the tools needed for evaluations, including a workshop large enough to fit a certain number of candidates, one with the necessary ventilation and lighting systems, an occupational health and safety (OHS) facility, and entrance and departure points that are simple to reach a sufficient supply of water and electricity, as well as enough functional tools, equipment, and materials for the assessment activities' practical tasks (if necessary).

2.9.5. Assessment Tools

Assessment tools known as evidence gathering tools cover both the instrument and the instructions for collecting and interpreting evidence in an assessment process. They form part of the bank of resources used for effective and safe assessment practice in a sector where assessment is conducted within a quality assurance framework (DTWD, 2016; MoLS, 2022). An assessment tool is made up of context and conditions for the assessment, tasks to be administered to the learner; an outline of the evidence to be collected from the candidates, and evidence criteria used to judge the quality of performance, for example, the decision-making rules; and administration, recording and reporting requirements. The tasks assigned to the learner, the framework for evidence collection from the learner, and the criteria for evaluating performance quality are collectively known as the assessment instrument.

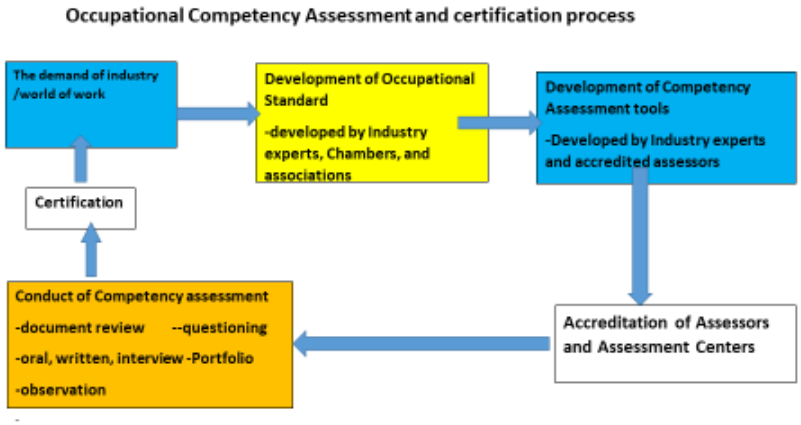
Moreover, Gasskov (2018) stated that an assessment tool needs an observation checklist stipulating the evidence and how it will be collected. For example, Workplace performance observation is employed, accompanied by a brief interview. The assessment instruments may include (a) directives for the candidate to perform specific tasks, (b) critical elements to be monitored during the activity assessment, (c) a framework for documenting results, decisions, and observations, (d) a questionnaire and a checklist for accurate responses from the interview, etc.

Therefore, well-designed assessment tools will help to ensure that the evidence collected is valid, sufficient, authentic, and current. Validity signifies the assessor's confidence in the learner's possession of the skills, knowledge, and attitudes outlined in the module or unit of competency, along with the corresponding assessment requirements. Sufficient implies that the assessor is certain that the quality, quantity, and relevance of the assessment evidence enable a determination of the learner's competency. Authenticity indicates that the assessor is confident the evidence submitted for assessment is the candidates original work, and the assessor must be assured the assessment evidence reflects current competency. This requires the assessment evidence to originate from either the present or the recent past (Brown & Race, 2021).

2.9.6. Occupational Competency Assessment and Certification process

According to TESDA (2023), the figure outlines a systematic process for evaluating and certifying occupational competencies, focusing on the interplay between industry requirements, standard creation, assessment methodologies, and certification. The process begins with identifying the industry's needs, understanding the skills and competencies required for contemporary employment requirements. Occupational standards are established based on these demands, ensuring their reputability and widespread recognition. The next phase involves the development of competency assessment tools, which are developed by industry experts and certified assessors. These tools can include assessments, practical demonstrations, and portfolios. The assessment procedure uses various methods to assess candidates' competencies, including document evaluation, interviewing, oral, written, and interview assessments, and observation. Certification is granted upon successful completion of the assessment, reflecting the individual's demonstrated competencies in the professional domain. Accreditation of assessors and assessment centers is necessary to maintain the integrity of the assessment process. This ensures that only competent individuals conduct assessment and that centers adhere to set criteria (OCAAC, 2012).

Figure 5: Occupational competency assessment and certification process



Source: Adapted (TESDA, 2010)

2.10. TVET Stakeholder

Li *et al*. (2024) stated that a stakeholder is an individual, group, or entity to whom the decision-making and operations of a business, organization, or project are of utmost importance. A stakeholder can be either a constituent of the governing body in which they have a significant interest, or they may lack any official affiliation. In addition to TVET stakeholders that oversee policies within the national TVET system, there are additional key actors who carry out vital tasks in delivering TVET and guaranteeing its effective execution. Each of the latter also have varying levels of structural flexibility at their own level or within their own area of accountability. Specifically, this encompasses the organizations that provide training services and facilitate training programs, such as educational institutions and coordinators of inter-company courses (Hippach-Schneider & Rieder, 2021).

2.10.1. Importance of stakeholders' participation

Stakeholders, comprising educators, practitioners, and service users, offer critical insights that inform competency frameworks. The active participation of stakeholders in competency assessment is essential to guarantee the use and efficacy of frameworks in different industries. Ensuring the involvement of a wide range of stakeholders not only improves the accuracy of assessment but also brings them in line with the requirements of the society and industry (Lepre *et al*., 2021). Moreover, efficient engagement among TVET stakeholders is crucial for sustaining a responsive and adaptable TVET system that can adjust to the swiftly evolving labor market and societal demands. Every stakeholder group possesses a distinct function in the identification, integration, and execution of qualifications and competences essential for future-oriented TVET (Sgarzi, 2021).

2.10.2. Industry involvement

Involvement of the industry as an employing sector plays a crucial role not only in determining what to be assessed and to what level, and also ensuring the quality of occupational competency assessment. Differences in the extent of industry participation in competency assessment greatly impact the acquisition of sector-specific skills. Through active engagement in competence assessment, industries can enhance the alignment of training programs with real job demands, so resulting in a more proficient workforce (Oroszi, 2020). Further, Cedefop (2023), highlights the importance of involvement between TVET institutions and industries to align training with labor market requirements. It emphasizes work-based learning, lifelong learning, and skill enhancement. The TVET sector is evolving, offering tailored programs to meet skills deficiencies. In conclusion, a strong collaboration between TVET institutions and industry is crucial for providing students with the requisite competencies to succeed in the labor market, hence fostering economic development and mitigating unemployment. Insufficient participation can hinder skill development (Selane & Odeku, 2024).

Industrial practitioners in vocational education and training (VET) have a vital role in evaluating competencies, therefore assuring that educational programs are in line with the

practical demands of the working world. This dual evaluation approach, including both internal and external factors, improves the pertinence and efficiency of vocational training (Vachruddin *et al*., 2023). Although industry involvement is advantageous, constraints such as geographical dispersion and short-term project concentration might impede the efficient assessment of competencies. It is essential to overcome these obstacles in order to fully use the potential of collaborative endeavors in the development of competencies.

According to Wolf (2015), although industry-specific assessments might facilitate the development of skills, the dependence on subjective evaluations can create biases that may distort the perceived competence of individuals. This underscores the necessity of implementing uniform evaluation methods to guarantee equitable and precise assessments across several industries.

2.10.3. TVET providers' Involvement

Cedefop (2022b) discussed competency assessment is a fundamental evaluation method used to determine the extent to which TVET graduates have achieved proficiency in skills, knowledge, and work attitude. It needs a close integration with TVET providers.

Competency-based assessment is specifically developed to closely correspond with the skills demand by businesses, so assuring that TVET graduates possess the necessary readiness for employment. These assessments establish explicit standards for the desired outcomes that learners in the TVET providers must attain, therefore improving the clarity and openness of the learning process. This enables students to advance at their individual speed, therefore facilitating customized learning experiences that accommodate various degrees of proficiency. Competency evaluations authenticate learners' abilities by employing practical demonstrations, therefore enhancing professional employability. TVET college level regular assessment offer continuous feedback, allowing learners to pinpoint areas that need enhancement and adapt their learning approaches accordingly. It helps them prioritizes practical abilities and practical applications, adequately equipping students for the requirements of the job market (Gervais, 2016; Bowers & Sabin, 2023).

In conclusion, while the engagement of TVET providers in competency assessment is vital for ensuring graduates meet industry standards, there is significant room for improvement. By focusing on enhancing assessment practices, fostering industry collaboration, and investing in assessor training, TVET institutions can better prepare their graduates for successful careers in a competitive job market. This proactive approach will ultimately contribute to stronger alignment between education outcomes and industry needs, benefiting both graduates and employers (Ana *et al*., 2019).

2.11. Occupational Competency Assessment and Certification system in Selected Countries

Countries have different experiences with competency assessment. According to Cuddy and Leney (2005), competency-based training and assessment, which lead to certified certifications, align with national industry competency or occupational standards and rely on the practical demonstration of workplace knowledge and skills. Through this method, participants in formal and informal training might earn credentials. Additionally, it implied that people, particularly present employees, might receive qualifications in accordance with their existing skills and prior knowledge. To analyze the Ethiopian occupational competency assessment and certification system, it is better to see international experiences of the system from Africa, Asia, and Europe.

Therefore, Africa Kenya was selected, because it is near to Ethiopia most of the social and economic issues are related. Asian the Philippines was selected, because their experts were advised and its experience were taken as benchmark on the implementation of occupational competency assessment in Ethiopia. The rest Germany and Australia were selected, also their experience were used as the benchmark for Ethiopian Occupational assessment and certification. Based on the basic pillars of assessment and certification systems; those are Policy decisions, and practices like Occupational Standard development, Assessors and Assessment Center accreditation, Assessment tool development, quality assurance system (internal and external verification), witness testimony, candidates, and certification systems countries' experiences are discussed below.

2.11.1. The Kenyan Experience

a) Policy Decision

According to Kenya TVET Authority (KTVETA) (2019) the policy decision, the TVET Act (2013) and the Kenya Qualifications Framework Act 2014 have designated the task of provision of TVET Standards and Guidelines to the TVET Authority to regulate curricula development, assessment, training facilities, and trainer's qualifications. Occupational Standards should be industry-driven and based on identified current and future needs of a specific occupation. It is a base for both the training and occupational assessment. The guidelines of the summative assessment show that the criteria of assessment shall keep to the principles of validity, reliability, and fairness. All Kenyan qualifications shall be nationally and internationally recognized.

b) Practice of Occupational Competency Assessment and Certification

Assessors are accredited industry practitioners and trainers conducting assessments. Assessors must be subject matter experts, trained in assessment, and usually possess industry experience. Trainers who are accredited competence assessors shall not assess their trainees.

Trainees are subject to assessment by assessors who are trained and accredited by TVET institutions for the relevant occupational sectors. The number of assessors will be contingent upon the number of qualifications and trainees participating. Smaller companies might need only two assessors, while larger enterprises and training institutes will require a significantly higher number. Assessors and verifiers must also complete a national occupational competency assessment pertinent to their profession and receive training in the system assessment methodology. The workplace or training institution will conduct the assessment, which will then undergo internal verification. Assessment will be conducted on-site, or the training institute will be verified internally. The qualification awarding body, through external verification, trains independent external verifiers to audit workplaces and training institutes, ensuring that all assessments align with national standards. Frequent instruction is required for individuals from

industry or other training institutions for the role of an external verifier. All assessments are based on evidence that meets the stated criteria of the unit or module.

All assessment is based on evidence and this must be sufficient to meet the specified requirements in the unit or module (Republic of Kenya MoE, 2018). Upon evaluating all assessment components (portfolios of evidence, competency interviews, and/or practical activities), the assessor determines whether the submitted evidence sufficiently demonstrates that the unit standards have been fulfilled. The assessor records assessment marks and makes a recommendation to the moderator (KTVETA, 2019). The assessment is conducted in the approved training center.

Regarding the Assessment tools/ Examination questions/ are developed by accredited assessors. Makes special arrangements to cater to the assessment needs of special needs candidates; an accommodation shall not fundamentally lesser the quality of the assessment or change the skills or knowledge being assessed. The grading system of the assessment is scores expressed by the percentage that is from 80-90 the rate is 5 the competency level is Mastery; 65-79 percentage the rate of 4, the competency is proficient; 50-64 percentage the rate of 3, competency level is competent; the percentage is 35-49 the rate 2, not yet competent; finally, below 35 percent, the rate is 1, competency level is the same not yet competent (KTVETA, 2019).

One important aspect of quality assurance in technical vocational education and training is to establish trust and improve the acquisition of skills, as well as promote self-employment and technological advancement within a country. Ensuring quality assurance remains a top priority in establishing a systematic approach is crucial for instilling confidence in the services offered by technical vocational education and training (John & Yusri, 2021). Quality Assurance procedures will be implemented across all components of the system to guarantee that industry standards have been established and maintained in training delivery and assessment. Furthermore, KTVETA (2019) asserted that they have undertaken a post-assessment review to ensure the quality of the Kenyan competency assessment system. The post-assessment review procedure includes moderation and external verification. The

moderation of trainee assessment is a process designed to ensure that marks and grades are valid, reliable, and fair for both trainees and assessors. External verification is conducted to confirm compliance with the established standards for awarding a qualification. External verification is conducted to uphold the overall credibility of the assessment techniques and processes in accordance with the Authority's Standards and Guidelines. External verifiers ascertain the accuracy of the moderator's evaluation of the evidence provided by the assessor.

Finally, the certification shall be issued by officially approved and recognized Certification Agencies. Candidates are both who want to take their prior learning recognition and came from the completion of training. Certificates of Competence will be granted to those who have effectively exhibited the acquisition of skills, knowledge, and attitudes in a specific unit of competence. It will also be granted to individuals evaluated for past learning; a Final Certificate is conferred after a candidate has exhibited proficiency in all units of competence that constitute a Qualification. Candidates will receive the Not Yet Competent (NYC) classification if they demonstrate competence in any or none of the unit standards. According to KTVETA (2019), candidates will receive credits for the unit standards in which they have demonstrated competence.

2.11.2. The German Experience

a) Policy Decision

Germany is one of the European countries that implemented the Occupational Competency Assessment. According to the Federal Ministry of Education and Research (FMoER) (2020), the Vocational Training Revised Act "BerufsbildungsgesetzBBiG" of May 4, 2020, informs policy decisions in Germany. These decisions define the terms and objectives of vocational training, the location of learning, the designation of the training occupation, the length of the apprenticeship, the profile of the training occupation, the training subject, the general training plan, and the examination requirements.

Germany has a dual vocational education and training system founded on a negotiation process involving discussions about competencies and their significance in VET development with officials from the state, chambers of business, and various employer organizations. Over three hundred occupational profiles have been documented within the dual system (Haseloff *et al*., 2017). The main characteristics of the German VET are the dual system as an overarching framework, key qualifications, de-specialization, higher level of abstractness of knowledge and skills, action competence, subject competence, personal competence, social competence, methods, and learning competence. Moreover, work process knowledge, and learning areas as a basis for curriculum framework. Assessment in the dual system is conducted by mid-term and final examinations established by federal and/or local examination boards.

Furthermore, the chambers fulfill many functions, including advising companies, registering trainees, certifying trainers' technical competence, and administering assessments. Upon completion of their instruction, apprentices will undertake examinations administered by these chambers. Such efforts empower the sector to exert significant influence on the curriculum. The chambers also oversee the company's training centers and assess their capacity to deliver or maintain training. Moreover, employee works councils may also engage in the planning and execution of vocational training and the recruitment of trainers (Solga *et al*., 2014). Mulder (2017) also supported that the private sector plays a crucial role in developing professional standards, which in turn are the basis for recognition and validation.

b) Practice of Occupational Competency Assessment and Certification

In German, Assessors have represented by Boards of Examiner. They must consist of representatives of employers and employees in equal numbers and one teacher of a vocational school. Each member has one or several deputies. It shall consist of at least three members whereby two-thirds of the total number of members must be representatives of employers and workers (Rüschoff, 2022; OECD, 2021). Moreover, Haseloff *et al* (2017), the assessment centers on the responsibility taken by the competent chamber for

occupational examinations. It will involve the intercompany vocational training centers owned by the chamber and only in special cases workplaces at companies. At these locations, all examination procedures will take place.

Regarding to Assessment tool development procedures is the responsibility of the examination board. It can entrust other, technically competent persons or companies from vocational schools with the task design. As a matter of principle, the practical tasks are action or customer oriented and connected with an expert talk. After a review by the assigned assessment department at the chamber, the assessment methods, tools, and the package will be confirmed. In Germany tasks, test documents, and necessary semi-finished part pieces for the practical test are often ordered from publishers or competent institutions (such as Christiani, a Technical Institute for Vocational Training) (Rüschoff, 2022).

The Decisions on the scores for the evaluation of individual exam services, the exam as a whole, and the existence and non-existence of the final exam shall be taken by the examination board on the day of assessment. In preparation for the decision, the Chair includes at least two individual officers. The officers should not belong to the same group parties. The members were appointed to document the key processes and take notes of the facts relevant to the evaluation. The examination board has to give clear and constructive feedback on the assessment decision to the candidate (OECD, 2021; Rüschoff, 2022).
In order to assure quality, the Intermediate and final exams are systematically evaluated by the examination boards. In case of apparent problems at training companies or in vocational schools, training consultants of the chamber will get involved in the respective companies and schools. If the training companies are below the standards, the training authorization will be withdrawn. The vocational training committees must decide on appropriate action guidelines and integrate them into the training regulations. For this, it is necessary that both local and state levels, responsible for the vocational training institutions, work together (GIZ, 2013).

In the case of Certification, trainees receive three certificates from different bodies when they pass their final examination these are a final certificate from the relevant chamber, a

part-time vocational school, and the company providing the in-house vocational training. If the trainees have qualified/for their duties, they have an option to claim legally to have these certificates. In the case of the training certificate, trainees have the choice between a basic and an extended certificate (Hoeckel & Schwartz, 2010).

2.11.3. The Australian Experience

a) Policy Decisions

Australian experience stated by (Gasskov, 2018) describes the policy decision by an executive agency or legal agency within the public service act 1999 of the commonwealth. Occupational standards are therefore the "evidence-based benchmarks of competent performance in the workplace which have been agreed by a representative sample of employers and other key stakeholders" the industry has a responsibility for the development. Assessments must be conducted by qualified assessors who, at a minimum, possess qualifications one level higher than the level they are assessing.

b) Practice of Occupational Competency Assessment and Certification

Assessors need to prove they have the right skills and knowledge to evaluate performance and evidence based on the specific unit outcomes and assessment criteria. A valid technical degree or relevant work experience in the technical areas being evaluated will be enough proof. A valid technical degree or demonstrated work experience in the evaluated technical disciplines will serve as evidence. The technical proficiency of the assessor must, at the very least, match that demanded of the learner(s) in the units being evaluated (Gasskov, 2018).

Simons and Yaringa (2014) also said that assessors need the right job skills for the level they are evaluating, up-to-date industry skills related to the assessment, and knowledge about vocational training and education to guide their training and assessment methods. Industry experts may also be involved in the assessment judgment, working alongside the

trainer and/or assessor to conduct the assessment. According to Gasskov (2018) Assessors are required to participate in validation and moderation processes by reviewing their assessment processes, evidence-gathering tools, evidence records, and judgments to ensure that they comply with the principles of good assessment (valid, reliable, flexible, and fair) and the rules of evidence (valid, sufficient, current and authentic).

Concerning the assessment centers, simulate the environment anticipated in the industry. Where relevant, the machinery, tools, materials, equipment, and resources utilized must correspond to industry standards, and there must be adequate equipment/resources available for each candidate to individually demonstrate their competency. Gasskov (2018).

The Australian Skills Quality Authority (2019c) states that an assessment tool consists of the assessment's context and conditions, the tasks given to the student, a description of the evidence to be collected from the candidate, and the criteria used to evaluate the quality of performance (i.e. the rules for making assessment decisions). In the case of assessment tools, their proper functioning may require an "observation checklist" specifying the evidence and how it will be collected. Assessment tools /instruments are specific activities designed to be used for the assessment. Collecting different types of evidence requires different assessment tools. A specific combination of assessment methods, tools, time schedules, etc. is part of the assessment strategy. Assessment methods are approaches to the information gathering required for assessment Gasskov (2018). Besides this variety of assessment methods should be used in the process of establishing competency to ensure assessment is not narrowly based on tasks but embraces all aspects of work performance in a holistic, integrated approach.

Internal quality assurance (internal verification) must be conducted by qualified verifiers who, at a minimum, possess the Level 4 Award in "Internal Quality Assurance of Assessment Processes and Practices." They must possess technical knowledge of the domain under assessment. External quality assurance (External Verification) must be carried out by persons that as a minimum must hold the Level 4 Award in "External Quality

Assurance of Assessment Processes and Practices." They should have technical awareness of the area being assessed (Simons &Yaringa, 2014).

2.11.4. The Philippines Experience

a) Policy Decision

Philippines experience as stated by Asian Development Bank (ADB, 2021) As Manager of the TVET Sector Technical Education and Skill Development Agency (TESDA) Structure is made of a Policy-Making Body composed of the TESDA Board with the Secretariat as its implementing arm. To ensure a market-driven approach to workforce education and training the composition of the 22-man TESDA Board is dominated by the 15 Private Sector representatives coming from the labor, employer, TVET Provider, and investor groups, while the 7 other are cabinet members coming from the labor, education, trade, science and technology, local government departments, and TESDA. To allow TESDA better power in delivering its legal and societal mandate, TVET has strategically situated in the Philippine education sector through the four - Level TVET Qualification Framework well placed within a proposed Philippine National Qualification Framework. The national occupational skills standards have been prepared by industry groups authorized by TESDA. The Authority will establish and execute a certification and accreditation program that permits private industry groups and trade associations to conduct sanctioned trade tests, while local government units will promote these trade testing activities in accordance with the guidelines established by the Authority.

b) Practice of Occupational Competency Assessment and Certification

Regarding the practice of competency assessment and certification ADB (2021) discussed that Occupational Competency Assessment has conducted by accredited industry assessors and assessment centers are both accredited TVET institutions and industries. The conduct of competency assessment has performed by collecting evidence by demonstration, questions like oral, written, and interview. Further, portfolio and observation are used. The

Secretary of Labor and Employment shall identify the occupational trades requiring required certification. The Authority shall award certificates pertaining to the national trade skills testing and certification system via the TESDA Secretariat.

In general the experiences of the countries are summarized as: according to Kenyan experience shows the TVET Act provides the comprehensive legislative structure for the system. Industry stakeholders are the primary drivers behind the establishment of Occupational Standards (OS). Assessors include of industry experts and trainers, industry assessors designated to develop assessment tools. TVET training centers serve as designated assessment centers, where candidates for evaluation include both trainees and workers who are seeking certification. The assessment procedure has both theoretical and practical elements, which are officially endorsed by a governmental entity. Quality assurance is maintained through the involvement moderators and external verifiers.

In the Germany experience, Act of Vocational Education establishes the legislative basis of the system. Occupational Standards (OS) formulation is the exclusive responsibility of the Chambers. Assessors, who are industry experts serving on a board of examiners, participate in the development of assessment tools. Assessment centers are situated within the training facilities of the Chambers. Prospective candidates for assessment encompass both trainees and employees who are willing to take part. The assessment procedure mandates that candidates must attain a score of more than 50% in both the theoretical and practical aspects, with the Chambers acting as the accreditation authority. The responsibility for quality assurance is with the Chambers and the board of examiners.

The Australian experience shows that the legality of the system is further supported by a Vocational Act. Stakeholders in the industry are the ones who are responsible for the establishment of Occupational Standards (OS). Assessors, who are professional members of the industry, are involved in the process of developing assessment tools. Assessment centers are typically found within the confines of industrial training institutes. Trainees and workers who are willing to participate in the assessments are both considered candidates for the assessment. In addition to being certified by the industry, the assessment procedure

takes into account both theoretical and practical requirements. Internal and external verifiers conduct quality assurance.

Finally, the Philippines experience indicates that TESDA Act defines the legal framework of the system. An Occupational Standards (OS) development is jointly owned by a government entity and an accredited industry committee. Assessment tools are developed through collaboration between assessors from both the industry and TESDA. The assessment centers are situated in both industry settings and TVET institutions. Potential candidates for competency assessment encompass both trainees and workers who express their willingness to take part. The assessment procedure includes both theoretical and practical criteria and is granted certification by the governmental authority.

All four countries underscore the significance of industry players in formulating Occupational Standards and ensuring quality assurance; however, they vary in their legal frameworks and assessment methodologies. Kenya, Germany, and Australia emphasize centralized or industry-specific methodologies, while the Philippines advocates for partnership between government and industry. These variances reflect the different socio-economic conditions and educational requirements of each country.

2.12. Empirical Related Literature Review

The competency assessment and certification system is essential for ensuring graduate competency and enhancing workforce capabilities. Many scholars conducted diverse empirical studies. This section addresses empirical research findings that concentrate on competency assessment. Wilkinson (2012) emphasizes the exclusive focus on competency assessment tools for registered nurses, highlighting the absence of multidimensional self-reporting instruments. Comprehending the prerequisites for ongoing competency is crucial for clinical nurses, as is awareness of professional registration requirements. The document acknowledges that no single tool can assess all elements associated with competency, necessitating the use of professional judgment in evaluations. The study advocates for

continuous critical examination of evaluation tools and highlights the possibility of creating more comprehensive instruments to facilitate registered nurses' professional development and education.

In addition, the study conducted by Jacqulyn *et al*. (2012), on efficacy of competency-based learning (CBL) and assessment in advancing student professional development. It specifically targeted students enrolled in an undergraduate industrial technology program at a Midwestern university. Significant professional growth gains were observed among students, as demonstrated by the disparities between their first and final competency assessments. Self-assessments indicated that students regarded their professional advancements as superior to those evaluated by their colleagues, implying a possible bias in self-evaluation. Peer assessments, however, demonstrated collective advancements in professional development, suggesting that although self-assessments may be exaggerated, there is a consensus on overall enhancement. The deployment of CBL and assessment promotes professional development among students and facilitates further academic exploration of its efficacy and application across many educational contexts.

Another study on competency assessment, which is conducted by Leigh *et al*. (2007) showed that no singular assessment model can adequately evaluate all professional competencies, underscoring the necessity for a variety of evaluations to achieve a thorough review. It examines the significance of many assessment attributes, including validity, feasibility, practicality, fidelity, and relevance, especially at various phases of professional growth. The paper evaluates and compares assessment methodologies across several healthcare professions, such as nursing, dentistry, and medicine, with those in psychology, highlighting notable disparities in licensing evaluations. It records the candidate fees and the annual number of applicants assessed in different professions, offering insights into the financial dimensions of competency tests. The paper proposes strategies for creating novel assessments in psychology, considering unique requirements and financial constraints, but also drawing insights from the experiences of other healthcare disciplines. Emphasize the complexities of competency assessment and the need for tailored strategies across various professional environments. The study evaluates different competency assessment models,

underscoring their validity, feasibility, and relevance within healthcare professions, while stressing the necessity for supplementary evaluations customized to professional development stages. Murphy *et al*. (2007) also studied on stakeholders' perceptions are shaped by the perceived efficacy of assessment forms, the diversity of traits evaluated, and the overall validity, reliability, acceptability, and feasibility of the assessment system.

Bulan and Bacasdoon (2024) the paper examines maritime competency assessment, underscoring discrepancies between theoretical concepts and practical applications, and stresses the necessity for integrated techniques to improve assessment effectiveness. Ensuring seaman competency is critical for safety; however, existing evaluation techniques result in inconsistencies due to differing state implementations. The study advocates for a comprehensive approach that merges authentic and computer-based exams to improve evaluation techniques. The assessment framework must incorporate both theoretical and practical elements, while surpassing the minimum criteria. It is essential to address the shortcomings of both assessment methodologies to provide a comprehensive evaluation framework for seafarers. The findings can inform the development of more standardized and effective assessment practices in maritime education and training institutions.

Moreover, the study conducted by Austin (2019) emphasizes that the principles of competency assessment frequently differ from real-world practices, resulting in misconceptions and inefficiencies across many industries, hence requiring a more comprehensive approach to professional development. The study challenges the dominance of competency in pharmacy education and practice, advocating for the development of alternative frameworks. The authors contend that although competency is essential, it is inadequate for comprehensively grasping the intricacies of professional practice. They underscore the necessity for collaboration among educators, regulators, and practitioners to cultivate a more thorough comprehension of competency. The paper asserts that a more sophisticated approach to competency, incorporating developmental support, is vital for the future of the pharmacy profession.

The other empirical study shows that critical factors in competency assessment include diverse methodologies, different evaluators, assessor selection and training, psychometric principles, and group dynamics. The Significance of Continuous Assessment In a competency-based medical education (CBME) framework, ongoing evaluations by qualified assessors are critical to providing appropriate feedback for learning and measuring competence. Employing a variety of tests administered by different assessors is critical for a thorough evaluation of trainees' progress. The article emphasizes the importance of assessor training as a crucial component to ensure the significance and efficacy of evaluations. The article advocates for a reevaluation of psychometrics, proposing its more effective integration into the assessment and decision-making processes. Effective group decision-making techniques are critical for making educated decisions about trainees' advancement, ensuring that evaluations are equitable and thorough. The proficient application of technology can improve information management, monitor progress, and enable audits, fostering transparency in the evaluation process. Dynamic Environment: CBME must adjust to the changing requirements of the healthcare system, persistently aiming to enhance assessment methodologies for both education and evaluation (Appelbaum & Roth, 2023).

In addition, study conducted by Hailu *et al*. (2014) Principal factors influencing competency assessment include departmental affiliation, anticipated outcomes, frequency of assessments, and candidates' awareness of their rights and responsibilities. The competency evaluation deemed a significant number of candidates incompetent, indicating a need for improvement across multiple domains. The research discovered multiple determinants of competency, including the respondent's department, anticipated outcomes, the quantity of skills undertaken, and candidates' awareness of their rights and responsibilities.

Recent studies on competency assessment have a limited scope, focusing mainly on specific cohorts and financial aspects. The literature lacks integrated assessment methodologies, indicating a need for more comprehensive studies. The findings are also not generalizable across different educational contexts, highlighting a need for more

research on competency-based assessment techniques. Future research should focus on effective competency assessment practices to enhance educational methods and improve the theoretical framework and practical implementations of competency assessment.

2.13. Theoretical and Conceptual Frameworks of Competency Assessment

2.13.1. Theoretical Frameworks of Competency Assessment.

Theories of occupational competency assessment concentrate on assessing the abilities, knowledge, and behaviors necessary for proficient performance in certain occupations. These theories are crucial for formulating frameworks that direct the assessment and improvement of occupational abilities. This part presents essential theories and concepts pertinent to occupational competency assessment.

1. Behaviorist learning Theory

Behaviorists defines that learning is a permanent change in behavior that comes from experience. Their goal is to figure out what changes are wanted to happen in learners, how to make these changes happen, and how to measure certain behaviors through observation, which leads to a valued judgment (Mwakalinga & Leandry, 2021). Furthermore, the behaviorism theory perceives learning and education as alterations in an individual's behaviors, emphasizing exploration and trial-and-error until achieving a favorable outcome. It disregards internal processes and emphasizes a passive, stimulus-response process.

Skinner emphasizes four key aspects: succinct learning steps, continuous rewards, prompt feedback, and stimulus discrimination for success (Burhanuddin *et al*., 2021). The behaviorist theory on competency assessment has significantly influenced traditional assessment methods. Its emphasis on observable behaviors, reinforcement, and the segmentation of tasks into smaller components has resulted in clear and objective methods for assessing learning.

2. Cognitive learning theory

Cognitive learning theory is an educational framework that focuses on how individuals acquire, process, and retain information (Mayer, 2024). It emphasizes cognitive abilities, such as memory and attention, and cognitive development, which refers to the progression of cognitive faculties from infancy to old age. Cognitive control, including working memory, inhibitory control, and cognitive flexibility, is a key component of this theory. Research often uses longitudinal studies to evaluate cognitive changes over time in educational settings.

Vygotsky's social constructivism emphasizes the role of social interaction and cultural context in cognitive development. Piaget's framework outlines four stages of cognitive development: sensorimotor, preoperational, concrete operational, and formal operational. This stages are sequential and building upon on each other. The Zone of Proximal Development (ZPD) highlights the need for support in education. These concepts provide a comprehensive understanding of the interaction between cognitive processes and learning events (Khan, Adnan, & Raza, 2023).

Kane and Bejar (2014) asserted that Cognitive Learning Theory could improve competency assessment techniques by highlighting the significance of comprehending students' cognitive processes. It emphasizes model-based techniques, including learning progressions and cognitive diagnostic models that facilitate the evaluation of student development and performance. These frameworks transition from conventional unidimensional scoring methods to more dynamic methodologies, allowing instructors to more effectively discern pupils' strengths and weaknesses. The incorporation of cognitive theories into competency assessment design seeks to deliver significant feedback that can guide instruction and enhance effective learning settings. The publication emphasizes the necessity for thorough review of assessment validity to guarantee that interpretations and applications of assessment results are substantiated by evidence.

3. Constructivist Learning theory

Competency assessment ideas are based on constructivist learning theory, which emerged as a response to the gaps in behaviorism theories in Western philosophy. Constructivism is a philosophical and pedagogical approach that highlights the learner's active involvement in developing his or her understanding and knowledge (Fosnot, 2013). Constructivism, in contrast to the behaviorist approach, suggests that humans actively build their understanding of the world by drawing on their previous experiences and interactions rather than passively acquiring knowledge (Ertmer & Newby, 2017; Schunk, 2020). In the competence assessment framework, the constructivist perspective manifests itself by emphasizing authentic assessment, which refers to the evaluation of an individual's competence in applying their knowledge and abilities in real-life circumstances rather than simply memorizing information (Gulikers *et al*., 2021; Mulder, 2017).

Learner-centered approaches prioritize competence assessment, which involves the learner actively engaging in the assessment process through self-assessment, reflection, and active participation. This approach aligns with the constructivist principle, which emphasizes the student's essential role in the learning process (Boud & Falchikov, 2019). A holistic assessment involves assessing an individual's competence by considering the integration and application of various information, abilities, and attitudes rather than focusing on isolated and disconnected components (Vitello *et al*., 2021; Mulder, 2017). Competency assessment ideas, which come from constructivist learning theory, stress how important it is for the learner to be involved, for assessments to be real and relevant, and for a full evaluation of all skills (Vitello *et al*., 2021). Thus, it integrates competency assessment concepts with constructivist learning theory, demonstrating its compatibility with modern educational approaches that value active student involvement and growth. Constructivism is a concept that can be divided into three main categories: cognitive constructivism, social constructivism, and radical constructivism. The categories are differentiated based on different assumptions across many dimensions, as outlined by Muller *et al*. (2017).

a) Cognitive Constructivism

Cognitive constructivism places emphasis on the learner's problem-solving skills, specifically their ability to express, demonstrate, and explain their understanding. Assessments within this framework are based on predetermined criteria or competency benchmarks, aligning with the focus on competency-based Technical and Vocational Education and Training (TVET) and competency assessment presented in Sarfo's research (2023). Cognitive constructivism asserts that knowledge acquisition is an adaptive process resulting from the active cognition of the individual learner. These specific epistemological focuses result in principles that maintain the external nature of knowledge and the belief that an independent reality exists and is accessible to the individual. Knowledge, from the cognitive constructivist perspective, is the outcome of precise internalization and (re)construction of external reality. The outcomes of this internalization process are cognitive processes and structures that precisely align with those present in the real world. This assertion, that reality is comprehensible to the person, distinguishes cognitive constructivism from both social and radical constructivism. The philosophical underpinnings of competency assessment reveal the interconnection between cognitive constructivism and competency assessment frameworks, as cognitive constructivists encourage active, problem-solving learning and evaluation.

b) Radical Constructivism

The constructivists range from cognitive constructivism at one extreme to radical constructivism at the opposite end. Radical constructivism believes that knowledge generation is an adaptive process that results from the individual learner's active cognition, leading to a mind grounded in experience rather than one that reflects an objective reality. Moreover, a contemporary movement within radical constructivism acknowledges social interactions as a source of knowledge (Haryadi *et al*., 2016). These particular epistemological emphases provide fundamental principles that maintain the intrinsic nature of knowledge and the idea that, although an external reality may exist, it remains unknown to the individual. Our senses, which inadequately represent external forms (e.g., objects,

social interactions), mediate our perception of these forms, rendering reality incomprehensible. Therefore, even though we derive knowledge from experience, we cannot claim that what we produce accurately reflects reality or the external world (Cheli, 2018).

A learner learning to solve problems can be considered as having knowledge that was produced with an emphasis on both structure and meaning, claims radical constructivism. The student may experience a problem-solving activity like ideal. The student would develop a personal understanding of the many ideal steps through interaction with the ideal experiential. Although the student's understanding of the various steps may differ from that of the teacher or the standards and textbook, it is internally consistent and makes sense to the learner. Additionally, when using the ideal experiential, the student would be looking for a workable solution to the problem rather than the "right" one as established by the textbook or teacher. The student's individual comprehension and practical mental model of the problem-solving process are the focus of radical constructivism, as shown in this instance (Liang, 2019).

c) Social Constructivism

Social constructivism falls midway between the radical constructivists' creation of a unique and coherent reality and the cognitive constructivists' transmission of a known reality. Social constructivism emphasizes the social nature of knowledge and holds that language use and social interaction produce knowledge, making knowledge a shared experience as opposed to an individual one (Haryadi *et al*., 2016). The social constructivist theory of learning is used in the holistic approach to competency and the fundamental premise of this first social psychology approach states that knowledge transfer occurred through the process takes place through social and environmental interactions (Thomas *et al*., 2014). Additionally, because this social contact always takes place in a socio-cultural context, Social constructivism prioritizes active participation, dialogue, and the sharing of information among students. According to social constructionism, universal truths or falsehoods, moral judgments, and objective distinctions between right and wrong are

inherently unknowable. Each individual constructs their own cosmos by interpreting their perceptions of reality. Language, communication, and speech are products of social construction. Instead of being the sensory reality of radical constructivists or the objective reality of cognitive constructivists, truth in this context is a socially produced and accepted fact that results through "co-engagement in cultural activities (Saleem *et al*., 2021).

As stated in literature part, competency-based education is the educational program in TVET that is built around a competence framework and serves to identify core tasks within the occupation or profession, consisting of clusters of knowledge, skills, and attitudes that are measured against predetermined standards. Further, Competency assessment is a process that comprises different stages of competence. These are "knows" and "knows how," which describe knowledge of a certain task and explain the steps of performing the task. The next stage is "Show How" and "Does" which focus on demonstrating how he/she performs a certain duty of the task using integrated knowledge, skills, and attitudes against a set of standards.

Therefore, cognitive constructivist classroom, students learn to identify and define each step as well as how to use them to attain at the best relevant solution to a problem. Cognitive learning perspectives force students to learn through problem solving. Contrary to radical constructivism and social constructivism, cognitive constructivism measures a student's ability to define, describe, demonstrate, and explain what they have learned in the same way that it is determined by standards, textbooks, or teachers, as well as their ability to apply what they have learned. In other words, assessments of students are based on preset learning criteria or competency requirements. This somewhat aligns with competency-based TVET and competency assessment. As a result of the foregoing debate, competence-based education and occupational competency assessment in this study have proposed cognitive constructivist views of learning.

2.13.2. Conceptual Frameworks of Competency Assessment

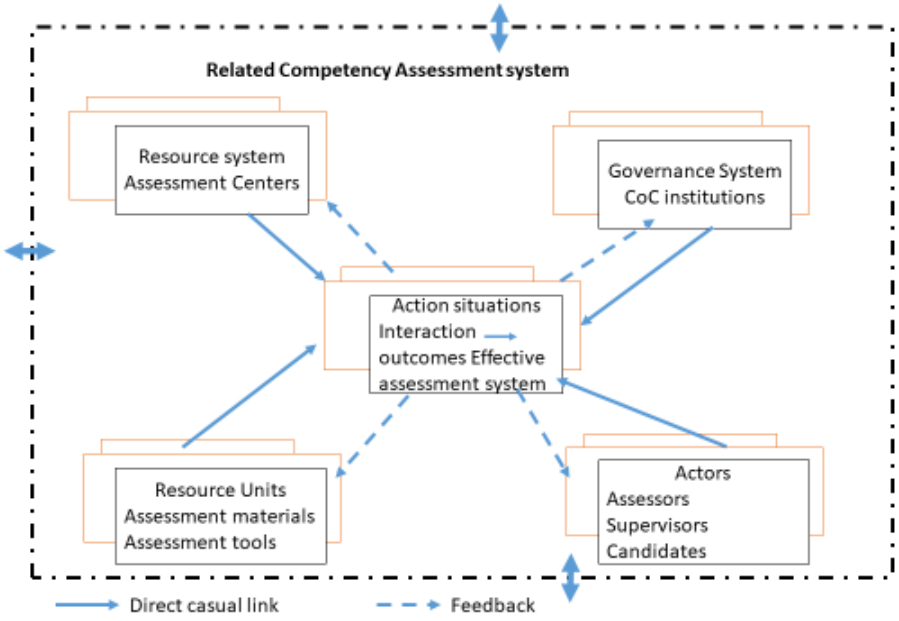
A conceptual framework is a collection of related ideas arranged in a way that makes them simple to explain to others. The schematic diagram is what displays the study's included

variable a collection of related ideas arranged in a network or plane that collectively offer a complete grasp of a research subject. The ideas that make up a conceptual framework provide mutual support, articulate each other's respective phenomena, and create a framework for a certain philosophy. Competency assessment system, which is based on Ethiopian TVET policy, functions at the intersection of many societal sectors, particularly the education sector and the labor market industry. A large stakeholder group must be involved in steering and implementing it (MoSHE, 2020).

Following in the above theoretical discussion the study of occupational competency assessment falls within the cognitive constructivist perspective. Moreover, based on the above literature concepts of competency assessment and certification this paper also recognizes that competency assessment is the key element of competency-based education. According to Gravells (2016) and Cedefop (2015), the quality, principles, four key assessment dimensions, and required criteria of occupational competency assessments discussed in this paper are crucial in ensuring the effectiveness of occupational competency assessment in relation to Social-Ecological System framework (SESF).

The Social-Ecological Systems Framework (SESF) is a comprehensive framework supports the quality and effectiveness of competency assessment through interactions and outcomes in social-ecological systems (SES). It offers a thorough perspective on complex systems and their interconnections. The framework considers interactions across societal, organizational, and individual levels, highlighting the importance of understanding the interplay and feedback loops among these levels. This approach enables the analysis of how the implementation process is shaped by variables within and between layers, providing a comprehensive perspective on complex systems and their interconnections.

Figure 6: Conceptual framework of the study



Source: Adapted from (McGinnis and Ostrom, 2014).

The Action Situations are crucial in competency assessments, influencing their implementation and practice. The system consists of two linked systems: the Resource System and the Governance System. The Resource System includes Assessment Centers and Tools, providing necessary resources for executing assessments. This ensures assessors have the necessary resources to evaluate candidates accurately. The Governance System comprises institutions that formulate norms and regulations governing assessment methods, preserving the quality and integrity of the process. The system involves several actors, including assessors, supervisors, and candidates. Assessors evaluate candidates, while supervisors manage the process. Candidates' experiences are crucial to the system's efficacy. Thus, competency assessment is influenced by various factors, such as institutional capacity center of competency, assessors, supervisors, assessment centers, assessment tools, and candidates. These factors can impact the effectiveness of the system, either positively or negatively. The principles, procedures, and criteria governing the implementation process are crucial.

Chapter Three

3. Research Design and Methodology

3.1. Introduction

This chapter provides an overview of the research approach utilized in the current study. The study objectives and questions served as the guiding framework for the investigation. Then outline the research design, encompassing the selection of the research methodology. Subsequently, a comprehensive illumination of the data-gathering methodologies is provided, encompassing the sampling techniques, instrumentation, and processes employed. The next section examines how the data was analyzed, covering the statistical methods and software used for quantitative data, as well as the approach taken for qualitative data analysis. This study also considers concerns related to reliability, validity, and ethical issues.

3.2. Research Paradigm

According to Creswell & Creswell (2018), worldviews, designs, and methods collectively contribute to a research approach that is typically quantitative, qualitative, or mixed. The paradigm rests on four philosophical assumptions: transformative knowledge claims, post-positivist knowledge claims, constructivism and pragmatic knowledge claims.

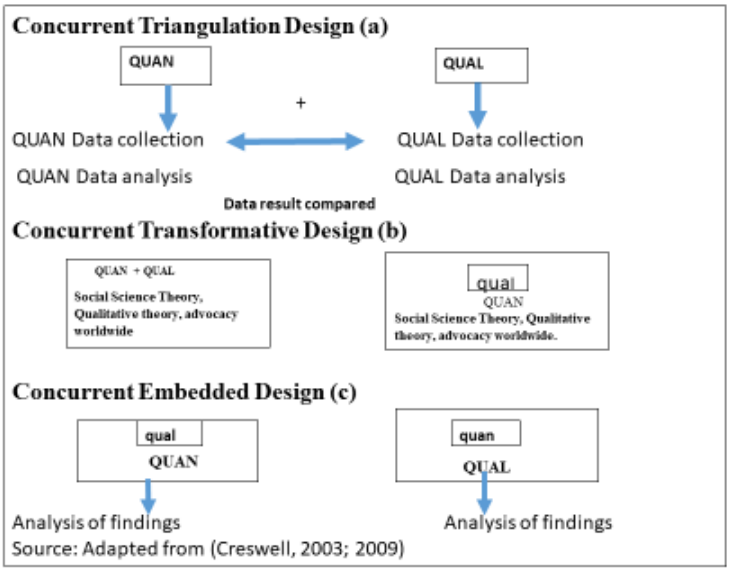
Pragmatism is a research paradigm in education that focuses on practical outcomes and solutions to real-world problems rather than advancing theoretical knowledge. It is suitable for research that requires flexibility in methodology and the integration of multiple perspectives to address complex educational issues. It is suitable for research that aims to generate knowledge that is directly applicable in real-world settings, supports the integration of diverse viewpoints and methodologies, and acknowledges the role of values in research. Pragmatism is also suitable for research that requires methodological flexibility and is an iterative process of learning and problem-solving (Creswell & Clark, 2017). Thus, pragmatism aligns effectively with the research objectives by fostering a practical, adaptable, and contextually pertinent approach to comprehending occupational

competency assessment and certification. By integrating quantitative and qualitative methods, comprehensive evidence was gathered that reflects the complexities of occupational competency assessment, ultimately enhancing the system's effectiveness.

3.3. Research Design

Creswell (2003; 2009) categorizes various mixed-methods that the researchers can employ in their proposed study. He identified the basic mixed methods designs as sequential and concurrent strategies. Sequential strategies conduct data collection through two phases, first quantitative and then qualitative or vice-versa. i.e., one after the other. Concurrent strategies involve conducting the data collection process simultaneously. The concurrent strategies classified into three categories: concurrent triangulation design, concurrent transformative design, and concurrent embedded design. The researcher discuss these designs from both a figurative and literal perspective, exploring the forms of data collection and analysis, as well as the challenges of interpretation and validity.

Figure 4: Basic Concurrent Mixed Method Research Designs



In the above figure capitalization denotes a weight or priority placed on the study's analysis, interpretation, and quantitative or qualitative data. Capitalization indicates that an approach or method is emphasized. A QUAN/qual representation indicates that the qualitative methods are embedded in a quantitative design. A mixed-methods study may equally emphasize qualitative and quantitative data or may prioritize one over the other.

A) Concurrent Triangulation Strategy

Concurrent triangulation strategy is one of the six mixed method models most of researchers are familiar. A concurrent triangulation technique means collecting both quantitative and qualitative data at the same time and then comparing them to see how they match or differ (Creswell, 2009). This technique involves the concurrent gathering of quantitative and qualitative data during a single phase of the research study. The two datasets should ideally have equal weights, but in practice, one may occasionally take precedence over the other. This mixing approach entails combining different types of data, namely converting one data type into another for ease of comparison, as well as merging or contrasting the results of two databases in the discussion or interpretation phase. Despite the emergence of solutions in the literature, such as conducting further data collection to address differences, a researcher may remain unsure about how to resolve conflicts that develop when comparing results in this design (Creswell, 2009).

B) Concurrent Transformative Strategy

The researcher's decision to pursue a certain theoretical perspective and a simultaneous collection of both quantitative and qualitative data establishes the foundation for the concurrent transformative approach. Concurrent models, including triangulation and embedded design, are used to reinforce this perspective (Creswell, 2003; 2009). The design parts of a triangulation technique or an embedding approach can be combined in a concurrent transformative paradigm, where both types of data are gathered at the same time in one phase and can have the same or different levels of importance. The data will be

combined, linked, or integrated throughout the mixing process. The concurrent transformative model possesses similarities with the triangulation and embedding models, thereby inheriting both their strengths and weaknesses.

C) Concurrent Embedded Strategy

The concurrent embedding strategy of mixed methods, according to Creswell (2003; 2009), involves collecting both quantitative and qualitative data at the same time during one data collection period. A secondary database assists the processes while the primary method controls the project. Whether qualitative or quantitative, the secondary method sits beneath the primary approach and holds less importance. This mixed-methods paradigm is appealing for several reasons. The two forms of data can be gathered simultaneously by a researcher during a single data collection process. It offers the benefits of both quantitative and qualitative data for a study. Moreover, by mixing the two methodologies in this way, a researcher can acquire insights from various levels of the study or different sorts of data. The main limitation is in the unequal priority of the two methodologies, leading to unequal evidence within the study, which may hinder the interpretation of the final conclusions (Creswell, 2009). In the design phase of an effective concurrent embedding approach, it is essential to consider an appropriate sample size for both quantitative and qualitative data to ensure validity.

This study employed a mixed research approach with concurrent embedded design, because it was supported to address complex problems, and the use of either quantitative or qualitative approaches approach is inadequate to address this complexity and to have an expanded understanding of research problems (Creswell, 2009; 2014). The concurrent embedded design is one of the most applied a mixed-methods design that the researcher collect the two types of data simultaneously, during a single data, collection phase. The study integrates the benefits of both quantitative and qualitative data, enabling the researcher to obtain insights from various data kinds or levels within the study while also facilitating the use of guiding theoretical frameworks. The concurrent embedded design was chosen for this study due to the previously mentioned advantages. The study sites

consist of four regional states and one city administration, which are located in distant areas. Collecting both quantitative and qualitative data simultaneously offers significant benefits in terms of saving time and financial resources. The primary data collection method employed is quantitative, with additional data gathered through interviews, document reviews, and observations to provide a more comprehensive understanding of the quantitative results.

3.3. Study Site

This study was conducted in Ethiopia in four regional states and one city administration (Oromia, Amhara, Gambella, Sidama Regional States, and Addis Ababa City Administration). The 2023 statistical data from regional CoC Institutions showed that the accredited industry assessment centers/TVET Colleges in the four regional state and Addis Ababa City were as follows: Oromia region 313, Amahara region 84, Gambella 6, Sidama 2 and Addis Ababa 25. These assessment centers are mostly available in relatively developed towns of regional states. Furthermore, the CoC Institutions are also available in the capital city of regional states. For this study, Bahirdar and Gonder from Amahara regional state; Adama, Bishoftu, and Shashemene from Oromia Regional State, Hawassa from Sidama Regional State; Gambella town from Gambella Regional State and, Arada, Yeka and Nefasilk lafto sub-cities from Addis Ababa City Administration were selected as data collection sites. Five CoC Institutions and 14 assessment centers were selected using purposive sampling. The selection of the sites was to address all scenarios of the country, involving samples from advanced city (Addis Ababa), relatively developed and wider regions (Oromia and Amhara regions and towns), developing regions (Gambella region/Gambela town, and newly emerging regions (Sidama region/Hawassa town).

Figure 5: Location of Study Area

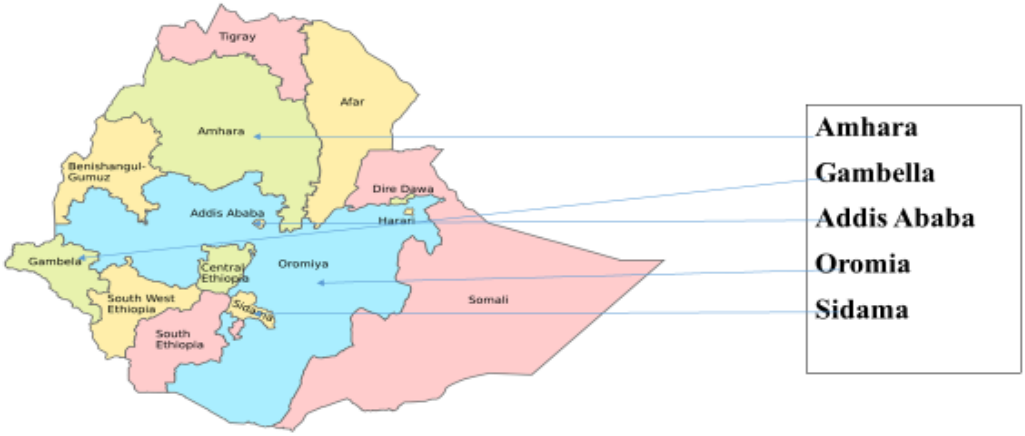


Figure 6. Location of the Study Area.

Source: (Wikipedia, 2023).

3.4. Source of Data

Data were collected both from primary and secondary sources. The primary data was collected from experienced directorates, assessors, industry and CoC supervisors, TVET deans, trainers, candidates, shop assistances, and focal persons. Besides, as a secondary source, TVET policy and strategy, international benchmark documents, Occupational Assessment and Certification Directives, government guidelines pertinent to national occupational standards, books, reports, and occupational standards in sector mapping were consulted to have better insight into the current situation to enrich the findings of the study.

3.5. Population, Sample Size, and Sampling Techniques

In this study, population refers all Candidates who are completed level three assessment, because they were experienced in taking competency assessment of level I, II, and III. They were aware of the detail practice of competency assessment. First the sample identified purposively from the total population, and next took randomly. Assessors and CoC

supervisors who were more than five years' experience identified purposively from the total population, because they were rich experience in competency assessment. For the qualitative data Industry Supervisors, Directorates, Shop Assistances, TVET Deans, trainers, and Focal Persons were selected purposively from the total population, because of their rich experience understand the competency assessment well and their position were directly related to the task of competency assessment to collect ample data. They are operating in the five selected regional state and Addis Ababa City.

This study utilized, random, and purposive, method. For the sampling of the study, out of 5 Regional/City Administration CoC Institutions 5, were selected using available sampling, because the government structure indicated that in each region there is one regional CoC Agency. Out of 38 accredited assessment centers, 14 were selected from selected Zones, using random sampling to give equal chances. Similarly, 15 industries were selected those are participating in the occupational competency assessment; all of the 11 Polytechnic colleges were included in the study. This data is summarized in the Table 3 below.

Table 3 Sampling Frame

Name Regional states/City Administration	Regional/City Administration CoC Institutions	Accredited Assessment Centers more than five years' experience.	Selected Assessment centers more than five years' experience	Industries participating CoC assessment in 3 sectors	Polytechnic Colleges in selected Zones	Selected Polytechnic Colleges	Federal line ministries
Oromia	1	10	3	3	3	3	Labor and Skill, Culture and Sport; Tourism, Health, Industry, and construction
Amhara	1	10	3	3	3	3	
Gambella	1	6	3	3	1	1	
Sidama	1	2	2	3	1	1	
Addis Ababa	1	10	3	3	3	3	
Total	5	38	14	15	11	11	6

Source: Researcher, 2023

Further, Ethiopian TVET policy and strategy, guidelines and directives of occupational competency assessment, and international benchmarks documents of Germany, Australia, Kenya, and the Philippines were reviewed for gaining experiences on the practice of

occupational competency assessment which could be useful for Ethiopia. These countries were selected, because of the following reasons. Germany, Australia, and the Philippines have served as a benchmark for Ethiopian Competency-based TVET and Competency assessment. Kenya has also implemented competency-based programs with more or less similar experience and socio-economic level of development. Line ministries, regional states, and city administration purposive sampling was used. Purposive or judgmental sampling is a strategy in which particular settings persons or events who have experienced the central phenomenon or important topic being addressed in the study (Creswell & Clark, 2017). From the line ministries, the researcher selected culture and sport, tourism, industry, construction, and health at the federal ministry level because the study's scope directly relates to these line ministries' areas of occupation, such as culture and sport, tourism, health, construction, and industry development.

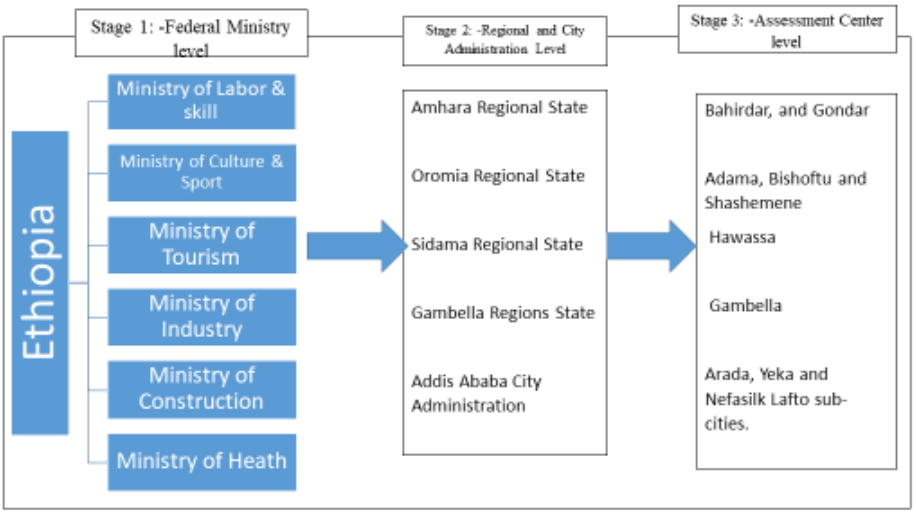
Addis Ababa City Administration was selected because it has a large number of candidates' assessed and extensive experience in conducting competency assessments. Regarding regional states, the Oromia and Amhara regions were selected due to the large number of TVET institutions and candidates assessed. Out of the newly established and small number of candidates assessed, Sidama and Gambella were randomly selected, respectively. Moreover, towns from regional states were selected with the same scenario: that they have CoC head centers, better transportation access, and relatively better security than other zones.

In addition, the sampling technique for accredited assessment centers, industries served as assessment centers, and polytechnic colleges were selected using purposive sampling because they have engaged directly in competency assessment practice. Accredited assessment centers with more than five years' experience, because their better experience in conducting competency assessment and industries that have experience working with CoC Institutions, and polytechnic colleges that have experience of delivering training from level one up to five and conducting competency assessment with the same levels were purposefully incorporated in the study. The study selected a total of 51 organizations from

four regional states, one city administration, and five federal institutions. Directorates, assessors, industry supervisors, assessment supervisors, focal persons, shop assistants, candidates, TVET deans, and trainers were involved in the study.

Figure 6: Multi-phase sampling

A parallel sampling approach within a multi-phase framework denotes a procedure in which multiple sample operations transpire concurrently within the same phase of the investigation. The different samples are independently selected at different stages this method can improve the efficacy and depth of data collection.



Source: Own Survey, 2023.

Taro Yamane's formula helped figure out how many people to include in the study, showing a clear and reliable way to choose candidates, assessors, and supervisors. By aiming for a 95% confidence level, it ensures that the sample accurately reflects the larger population, with a high degree of certainty in the study's findings. This strict statistical method made it easier to evenly divide the sample size among each region, and city administration was represented proportionally based on its population. In addition, for the population with numbers less than a hundred, the researcher used the census sampling method. This made sure that the data collection process for the Ethiopian competency assessment was sound and fair.

$$n=\frac{N}{1+N(e)2}$$

Where;
n=sample size,
N=population size,
e=the error of sampling (precision) (Yamane, 1973).

Furthermore, the researcher employed census sampling for groups with a limited number of populations. To acquire relevant and valuable data Candidates who have completed the level 3 competency assessment were included because they are experienced in taking assessments of levels 1, 2, and 3, and they have ample information about the competency assessment system. The simple random sampling method was used to select candidates from the purposive group to represent the population. The large sample size enhanced the robustness and mitigated the bias effect. Assessors and CoC supervisors have more than five years' experience because they have adequate experience to give ample information and examine occupational competency assessment. The simple random sampling method was used to select assessors and CoC supervisors from the purposive group to represent the population. The large sample size enhanced the robustness and mitigated the bias effect. In addition, for the selection of interviewees, purposive sampling was used.

Table 4 Sample size for quantitative data collection in all study areas

No	Regions	Assessors who have more than five years' experience and active		Supervisors who have more than five years' experience and active		Candidates who complete level 3 assessment					
							Sample size				
		Target Population	Sample size	Target Population	Sample size	Target Population	Health	Economic infrastructure	Industry	Hotel &tourism	Total
1	Addis Ababa	480	218	105	83	8762	92	249	23	19	383
2	Amhara	360	189	65	65	10331	93	250	23	19	385
3	Oromia	330	180	76	76	11200	93	251	23	19	386
4	Sidama	25	25	15	15	425	84	62	21	39	206
5	Gambella	30	30	16	16	623	120	73	46	5	244
	Total	1225	642	277	255	31341	482	885	136	101	1604

Source: Researcher, 2023

Table 4 presents the comprehensive sample size for quantitative data collection throughout all study areas, including assessors, supervisors, and candidates from five regions: Addis Ababa, Amhara, Oromia, Sidama, and Gambella. The data is divided into three primary groups, each with its designated population and sample size.

In the table 5 below, provides a detailed description of the sample size for qualitative data collection using purposive sampling method. This comprehensive overview outlines the distribution of CoC Assessment Directorates, TVET polytechnic deans, Trainers, Industry Supervisors, AC focal Persons, and AC shop assistance across various regions, highlighting their experience levels and active participation in the assessment process.

Table 5 Sample size for qualitative data collection.

No	Regions	CoC Assessment Directorates	TVET polytechnic Academic Deans	Trainers more than 5 years' experience for focus group discussion	Industry Supervisors more than 5 years' experience.	AC focal Persons more than 5 years' experience	AC shop assistance more than 5 years' experience	Total
1	Addis Ababa	1	4	1 group (8 members)	4	3	2	14 & 1 FGD
2	Amhara	1	2	1 group (8 members)	2	1	2	8 & 1FGD
3	Oromia	1	2		2	1	2	8
5	Sidama	1	1		1	1	1	5
6	Gambella	1	2		1	1	1	6
	Directorates from 5 line ministries and Labor & Skill ministries	6	-		2 from Federal chamber of commerce	-	-	8
	Total	11	11	2 FGD	12	7	8	49 & 2FGD

Source: Researcher, 2023

3.6. Data Collection Instruments

Data collection instruments are tools used to gather data from research participants (Mukherjee, 2019). In this study, the selection of data collection instruments was based on several factors, including the nature of the data sought, the context of the data sources, and the research design employed. This study utilized a mixed-methods approach, combining

quantitative and qualitative techniques. Data were collected through questionnaires, unstructured interviews, focus group discussions (FGDs), observations, and document analysis. Questionnaires served as the primary data collection tool, while the other methods provided supplementary data. The data collection was carried out by the researcher, assisted by a team of five Assistants, one from each region.

3.6.1. Questionnaires

For this study, a self-structured rating questionnaire was employed, as it facilitates flexible responses and allows for the determination of frequencies (Creswell & Clark, 2017). Assessors, CoC supervisors, and candidates utilized a five-point Likert scale to evaluate their perceptions of the conceptualization and practice of occupational competency assessment and certification. The questionnaire included closed-ended questions, with items rated on a scale ranging from Strongly Disagree to Strongly Agree. This design was intended to accurately capture respondents' feelings on the issues raised. Additionally, open-ended questions were incorporated to elicit more in-depth insights regarding competency assessment. As outlined in Section 3.5, the researcher distributed questionnaires to a total of 1,315 candidates, 526 assessors, and 235 supervisors across various selected study sites according to their sample size.

3.6.2. Interview

An interview provides an opportunity for an interviewee to verbally express his or her thoughts, feelings, experiences, views, and opinions and offer suggestions about the issue being studied (Creswell& Creswell, 2018). An interview is appropriate for the researcher to support quantitative data (Powney & Watts, 2018). In this study, interviews were used to collect in-depth information on the practices and challenges in occupational competency assessment and certification. A total of 49 interviews were conducted with directorates, industry supervisors, shop assistants, and focal persons. During the interview session, an audio recorder was used to capture responses accurately, avoid response loss, transcribe fully, and for ease of analysis.

3.6.3. Focus Group Discussion (FGD)

Focus groups are widely used in marketing, social sciences, and health research for investigating complex issues. They provide a more delicate data collection and reveal social norms and collective opinions, allowing for more detailed understanding of individual attitudes (Kumar & Singh, 2021). In this study, the focus group discussions (FGDs) aimed to gather comprehensive data from trainers in technical and vocational education and training (TVET) colleges regarding the practice of competency assessment in Ethiopia. The discussion guide was made using research questions about how stakeholders are involved in making TVET policies and strategies, how people feel about competency assessment, how assessment practices fit in with established strategies and principles, and factors influencing these practices. Trainers from Nefasilk Polytechnic College in Addis Ababa and Bahirdar Polytechnic College in the Amhara Region were selected for participation. Each FGD included eight trainers, who engaged in open discussions, sharing their insights and experiences. The collaborative approach aimed to enhance the collected data, providing a more comprehensive understanding of competency assessment processes in Ethiopian TVET institutions. The researcher used the FGD to triangulate the findings from in-depth interviews, questionnaires, observation, and document review.

3.6.4. Observation

In addition to the questionnaire and interview, non-participant observation was used to collect data directly by being present in assessment centers to see the adequacy of facility and infrastructure in the workshops of assessment centers rather than asking questions. The principal objective of assessment center observations is to see the reality of assessment vis-à-vis the principles of assessment (Gravells, 2016). Observing the actual gap in the assessment resources, supports to identify major bottlenecks and challenges in the assessment and certification system. Observation data helped to triangulate the information obtained through questionnaires and interviews. Research questions about how assessment centers align with established standards informed the creation of the observation guide. It

was arranged with each assessment center to determine which period/time of day is appropriate to collect data using an observation checklist without interfering with the conduct of the assessment in the workshop and to watch the workshops' facilities. The researcher conducted observations in 14 assessment centers.

3.6.5. Document Review

The document review aimed to analyze competency assessment practices in the Ethiopian TVET system. It was created to gather information from multiple sources, like TVET policy and strategy, competency assessment guidelines, international best practices, and the system's principles and theories. The tool was structured with an introduction, sections, and a data extraction analysis framework aligned with research objectives and questions. In its application, select the relevant documents based on predetermined criteria, extract pertinent information using the tool, and synthesize the data using common themes and insights. This method assists the researcher to construct meaning from the text in light of the research objectives and questions. The tool was used to validate and check the consistency of the data, which were obtained through an interview and a questionnaire.

Table 6 Research Questions, Data Sources, and Data Collection Methods

Research Question	Type of Data	Data Source	Data collection methods
1. How are relevant stakeholders involved and consulted during the formulation and development of Ethiopia's current TVET policy and strategy?	Qualitative	• Directorates from Ministry of Labor and skill. • Directorates from the line ministries. • Directorates from CoC Institutions • Polytechnic college deans and trainers. • Policy and Strategy Documents, guidelines.	• Unstructured Interview • Document review • FGD

Research Question	Type of Data	Data Source	Data collection methods
2. How do stakeholders perceive the occupational competency assessment and certification systems in Ethiopia?	• Quantitative • Qualitative	• Industries experts. • TVET institutions deans • Trainers • Candidates who took the assessment	• Questionnaire • Unstructured interview • FGD
3. To what extent does the implementation of occupational competency assessment align with established strategies, and principles?	• Quantitative • Qualitative	• Assessors • Both CoC and Industry Supervisors • Candidates • CoC directorates • Shop assistances • Assessment center focal persons. • Polytechnic college deans and trainers	• Questionnaire • Unstructured interview • Document review • FGD • Observation
4. What are the key determinants influencing the practice of occupational competency assessment in Ethiopia from the perspectives of stakeholders?	• Quantitative • Qualitative	• Assessors • Both CoC and Industry Supervisors • Candidates • CoC directorates • Shop assistances • Assessment center focal persons. • Polytechnic college deans and trainers	• Questionnaire • Unstructured interview • FGD

Source: Researcher, 2023

3.7. Data Collection Procedures

The researcher conducted face-to-face and phone discussions with the Ministry of Labor and Skill, line ministries (Tourism, Culture and Sport, Industry, Urban Development and Construction, and Health), as well as regional and city administration CoC institutions. The researcher gathered information from various industry supervisors, polytechnic colleges, assessment centers, directorates, supervisors, assessors, focal persons, candidates, shop assistants, TVET deans, and trainers.

The institutions assigned the appropriate staff to streamline the questionnaire completion process and schedule the interview at a convenient time. They also took the responsibility of coordinating the observation of assessment centers during the candidate assessment phase. On the designated day, the researcher interviewed all relevant parties, including the directorates, industry supervisors, focal persons, shop assistants, and TVET deans. The researcher also conducted focus group discussions (FGDs) with trainers in two regions. The researcher collected data using a questionnaire from assessors, supervisors, and candidates. The researcher also carried out observations about the facilities of the assessment centers, employing a checklist to collect data.

3.8. Data analysis

This study used both quantitative and qualitative data analysis, utilizing a mixed-method and concurrent embedded design. Creswell (2014) asserted that the study collected both types of data simultaneously, researcher can gain an in-depth perspective on study problems by assessing quantitative and qualitative data individually and combining findings, thereby enhancing the validity and relevance of the findings. Descriptive statistics like percentage, mean, and standard deviation and inferential statistics, including one-way ANOVA, were used as data analysis techniques to analyze the quantitative data captured through a questionnaire. Specifically, one-way ANOVA was used to examine differences in competency assessment practices among the four regions and one city administration. Independent T-tests were used to assess perception differences between assessors and CoC supervisors; candidates and CoC supervisors in research question three and four. The researcher also used correlational and multiple regression analyses to examine the relationship and impact of independent variables (CoC Institutions, Assessors, Supervisors, Assessment Tools, Assessment Centers) on dependent variables (effectiveness of competency assessment).

Qualitative data from interviews, focus groups, document reviews, and observations were put through narrative analysis to show how complex the experiences and points of view of the participants were. To find the main themes, field notes and careful transcription of

qualitative data were used. These themes were then put together in a way that made sense with the research questions. Triangulation, which combines qualitative and quantitative data, made the analysis more reliable and in-depth in understanding the data. This method underscored the multifaceted nature of competency assessment practices and perceptions among regional states, candidates, assessors, and CoC supervisors in Ethiopia.

3.9. Reliability and Validity

Reliability is an instrument's consistency or reproducibility, with internal consistency being the most important. This method allows researchers to assess qualitative and quantitative data, enhancing the credibility and relevance of the findings (Creswell& Creswell, 2018). As to Abate (2020), the issue of validity was also be critical where both internal and external validity are treated. External validity was the level to which the findings of the study can be generalized to a population other than those directly involved in the inquiry. Moreover, internal validity refers to the extent to which the outcomes of studies result truly from the variables that are focused on rather than from other variables that are not systematically treated. This study has ensured the validity and reliability of the data throughout the research process. Particularly, in the data analysis process, the issue of credibility, and authenticity of the findings were considered. It is also important to understand what validity and reliability mean in the research process. This is because both validity and reliability are critical features of any research in ensuring the production of robust and credible outcomes (Sürücü & Maslakçi, 2020).

The survey questionnaire was designed to investigate the effectiveness of occupational competency assessment (OCA) practices and the alignment of OCA with strategies in the Ethiopian context. In Ethiopia, the OCA system is governed by strategies and principles that influence the daily practices of competency assessment. These strategies establish specific competencies, assessment methods, criteria for competence assessment, qualifications required for assessors, and the execution of OCA practices. Adherence to these established strategies and principles ensures uniformity, impartiality, and

trustworthiness within the system (MoSHE, 2020). To enhance the face validity of the survey instrument, the researcher enlisted two university professors with experience in research on competency-based education and training to evaluate the questionnaire. These experts refined the wording, item length, and overall format to improve its clarity, comprehensiveness, and representation of the key dimensions of occupational competency assessment practices and strategies. The Cronbach alpha coefficient, a statistical tool for assessing internal consistency reliability, (George & Mallery, 2016) was used to evaluate the questionnaire's reliability. The questionnaires for assessors, supervisors and candidates achieved acceptable global alpha coefficient ranging from 0.709 to 0.872, high internal consistency, showing that the items accurately measure the intended constructs related to OCA practices and strategies (see Table 7a and Table 7b below).

Table 7a Cronbach alpha result

Variables	Respondents			
	Assessors		Supervisors	
	Cronbach's Alpha Result	Items	Cronbach's Alpha Result	Items
CoC institutions	0.831	12	0.789	7
Occupational Standards	0.783	5	0.821	5
Assessment Tools	0.807	5	0.842	5
Assessment System	0.824	9	0.765	9
Assessment Centers	0.787	7	0.709	7
Aggregated	0.806	38	0.785	33

Source :Research Data, 2023

The study used Cronbach's Alpha to assess the reliability of certification or compliance measures within institutions. The results show that the 'CoC institutions' variable has substantial internal consistency, with assessors rating 0.831 and supervisors 0.789, signifying that the survey items are reliable and uniformly understood. The 'Occupational Standards' variable has strong dependability, with alpha values of 0.783 for assessors and 0.821 for supervisors, indicating a marginally greater consistency among supervisors in comprehending or applying these standards. The "assessment tools" have high dependability, with scores of 0.807 for assessors and 0.842 for supervisors. This signifies that the instruments accurately assess the desired results. Simultaneously, the "Assessment

System" as a whole, including tools, processes, and criteria, demonstrates robust internal consistency, though slightly lower for supervisors (0.765) than for assessors (0.824). It has strong internal consistency. The "assessment centers," representing the physical or organizational environments where assessments were conducted, exhibit lower reliability scores (0.787 for assessors and 0.709 for supervisors). This reflects less consistency, particularly among supervisors, potentially indicating operational or perceptual differences within these centers. Aggregated data across all variables indicates strong overall dependability, with scores of 0.806 for assessors and 0.785 for supervisors, confirming the overall quality of the survey instrument (George & Mallery, 2016).

Table 7b: Cronbach alpha result

Variables	Candidates	
	Cronbach's Alpha Result	Items
Assessment Tools	0.872	6
Assessment Centers	0.871	4
Assessors	0.871	4
Supervisors	0.872	4
Assessment Process	0.869	4
Aggregate	0.871	22

Source: Research Data, 2023

The Cronbach's alpha scores for various assessment parts show that all candidate-related factors are very consistent, meaning the tools used are reliable. With Alpha ratings always above 0.869, candidates see both the tools and the assessment methods, including the roles of assessors and supervisors, as being done the same way. With Alpha ratings consistently exceeding 0.869, candidates regard both the instruments and the assessment processes, including the functions of assessors and supervisors, as uniformly executed. It was quite high, enough to judge the instrument as reliable for the study.

To check the practicability of the study, a pilot test was conducted in the South Ethiopian Region at Sodo Polytechnic College, where 67 candidates, 11 assessors, and 22 supervisors completed the questionnaire. Inconsistencies were identified in five questions from assessors and supervisors and four items from candidates, leading to the revision and refinement of the questionnaire. This assessment center was different from the sample of

the main study. Before conducting a large-scale study, researchers suggest examining the validity of the instrument through a pilot study (Creswell, 2014).

3.10. Ethical Consideration

The researcher adhered to the law by receiving ethical approval from the Institutional Review Board at Addis Ababa University (Approval Code: CEBS_IRC_C&I_002/2024). In line with the principles of research ethics, transparency was paramount. The initial step was the supporting letter from Addis Ababa University's Department of Curriculum and Instruction, used to collect data from different institutions. Then information was provided to the Ministry of Labor and Skills regarding the purpose and procedure of the study in oral and written form. To facilitate the collection of information, form their office, line ministries, and regional CoCs. Before any data collection, participants were informed, both verbally and in writing, about the research's intent, methods, and processes.

Allen and Wiles (2016) discussed that the informed consent of the participants is required for their involvement in any research projects. To preserve respondent confidentiality, personal identifiers such as names were deliberately omitted from the questionnaires, ensuring anonymity. A detailed consent form was presented to each participant to seek their oral permission to participate in my study. This form outlined the study's purpose, contact details of the researchers, potential benefits, and any associated risks. Each participant provided oral informed consent to participate in the research activities. Rigorous standards were maintained during the documentation and reporting phase, ensuring that data representation was objective and unbiased. Additionally, all sources and references used in the research were appropriately credited and cited.

Chapter Four

4. Data Analysis and Interpretation

4.1. Introduction

This chapter presents the findings derived from the analysis of the data and offers an interpretation of the results in keeping with the research objectives and questions described in Chapter 1. The initial section of the chapter provides a descriptive analysis of the data, whereby the demographic features of the study participants are presented, along with an overview of the major factors identified. Subsequently, the researcher proceeds to conduct detailed descriptive and inferential statistical analysis, whereby the hypotheses are tested and the correlations between the variables are examined utilizing suitable statistical methodologies. Within regard to qualitative data, this chapter provides an overview of the thematic analysis procedure, emphasizing the primary themes that arose from the interviews or focus group discussion. In order to bolster the interpretation of the findings, pertinent quotations from the participants have been used.

Accordingly, the chapter presents a full perspective of the study problem by integrating both quantitative and qualitative findings, when appropriate. The analysis of the findings is based on the theoretical framework and relevant literature, as outlined in Chapter 2. The chapter ends by providing a concise overview of the main findings and examining their practical and theoretical consequences, so establishing the foundation for the subsequent discussion and conclusion chapter.

4.2. Demographic Characteristics of Respondents

4.2.1 Sex, Age, and Sector of Candidates Assessed

The primary objective of competency assessment is to ascertain whether the candidates possesses the necessary level of competency. The gender, age, and sector of candidates

assessed have a distinct impact on the perception of competency assessment. Table 8 summarizes the data about gender, age, and sector of candidates assessed.

Table 8 Sex, Age, and Sector of candidates assessed

Items		N	%
Sex	M	734	55.8
	F	581	44.2
	Total	1315	100
Age	17-25	610	46.4
	26-35	656	49.9
	36-45	49	3.7
	>45		
	Total	1315	100.0
Sector Candidate Assessed	Economic infrastructure	675	51.3
	Health	436	33.2
	Industry Development	150	11.4
	Hotel and Tourism	54	4.1
	Total	1315	100.0

Source: Research Data, 2023

Table 8 describes the distribution of candidates assessed according to their gender, age, and sector. Out of the 1,604 distributed questionnaires, 1,315 (82%) were returned, and they were valid. A total of 1,315 individuals were evaluated, with males comprising 55.8% (734 candidates) and females 44.2% (581 candidates), reflecting a relatively equal gender distribution but somewhat skewed toward males. This little male predominance may indicate a gender bias in the assessed sectors or reflect wider labor force participation. The age distribution indicates that the predominant group of candidates is aged 26-35 (49.9%), followed by those aged 17-25 (46.4%), while only 3.7% of candidates are aged 36-45. Significantly, there are no candidates beyond 45 years of age, which may be recognized as caused by such things as career transitions, restricted access to official assessments, or an

emphasis on certifying a younger labor force. The majority of candidates were assessed in the economic infrastructure sector, including 51.3% (675 candidates), followed by the health sector at 33.2% (436 candidates). The industrial development and hotel and tourism sectors make up a smaller proportion, accounting for 11.4% (150 candidates) and 4.1% (54 candidates), respectively. This distribution emphasizes that economic infrastructure and health are the primary domains of competency assessment, perhaps owing to their vital significance in national development and job creation. The markedly lower proportion of candidates assessed in the hotel and tourist sector may suggest that there are fewer trainees from TVET colleges entering this sector. The occurrence of candidates aged 17-35 indicates that occupational competency assessments predominantly focus on younger individuals, likely corresponding with skill certification prerequisites for early-career professionals. The lack of candidates over 45 years old raises questions about whether older professionals are voluntarily abstaining from exams or if systemic obstacles hinder their involvement. The nearly equal gender representation indicates a positive trend in labor participation; nevertheless, further analysis is required to comprehend potential discrepancies across other industries. The strong emphasis on economic infrastructure and health sectors indicates that these areas attract many trainees, whereas industry development and hotels and tourism have fewer trainees enrolled in TVET colleges.

4.2.2 Sex, Age, Educational Qualification, and Service year of Assessors and Supervisors

As sex, age, educational qualification, and service year of assessors and supervisors directly influence the administration of competency assessment, the composition of the assessors and supervisors is presented in Table 9 below. Out of the 624 distributed questionnaires for assessors, 526 (84.3%) were returned, and out of the 255 distributed questionnaires for supervisors, 235 (92%) were returned; they were both valid. Male assessors and supervisors' respondents were 57% and 61.3%, respectively, while female assessors and supervisors' respondents were 43% and 38.7%, respectively. This finding suggests the need to promote greater gender equality in the roles of both assessors and supervisors, as these findings could potentially enhance the assessment process by

incorporating a broader variety of perspectives. The majority of assessor and supervisor respondents fall within the 31-40 age category (48% and 44.3%), followed by the 20-30 category (36% and 32.8%), respectively. The proportion of assessors and supervisors aged 40 and beyond was 16% and 23%. The age distribution indicates that the majority of assessors and supervisors belong to the mature middle-age group. In addition, the majority of assessors (88%) and supervisors (81.7%) have accumulated 6 to 10 years of experience. This data implies a consistent, knowledgeable, and adequately experienced staff was actively involved in the assessment procedure. Furthermore, the majority of assessors and supervisors had master's degrees (51% and 67.7%, respectively), and those with bachelor's degrees were 43.5% and 32.3%. The remaining 5% of assessors possessed TVET-specific qualifications. This educational background indicates that a few assessors possess an unfavorable level of education, which was below the guidelines of competency assessment (MoLS, 2022), which stipulates, 'The assessors should have a higher qualification than the candidates.' These factors had an impact on the quality of competency assessment. Nevertheless, the proportion of assessors and supervisors who have more than 16 years of experience (1% and 1.7%, respectively) indicates a few experienced assessors and supervisors, which leads to a shortage of institutional memory.

Table 9 Sex, Age, Educational Qualification, and Service year of Assessors and Supervisors

Items	Categories	Assessors		Supervisors	
		N	%	N	%
Sex	M	301	57	144	61.3
	F	225	43	91	38.7
	Total	526	100	235	100.0
Age	20-30	187	35.6	77	32.8
	31-40	253	48.1	104	44.3
	>40	86	16.3	54	23.0
	Total	526	100	235	100.0
Educational Qualification	"TVET"	27	5.1	---	---
	"BA"	229	43.5	76	32.3
	"MA"	270	51.4	159	67.7
	Total	526	100	235	100.0
Service Year	6-10	462	87.8	192	81.7

	11-15	59	11.2	39	16.6
	>16	5	1	4	1.7
	Total	526	100	235	100.0

Source: Research data, 2023

Based on the data presented in Table 9, there is an uneven distribution of genders, with male assessors and supervisors being more common. These assessors and supervisors are mostly young to middle-aged, have good educational backgrounds, and have consistent but maybe limited experience. By addressing the gender disparity, promoting more specialized training, and establishing mentorship programs, the effectiveness and inclusiveness of the assessment process in the TVET framework might be improved.

4.3. Stakeholders (Ministries, Industries, CoC directorates, TVET deans, and trainers) involvement and consultation during the formulation and development of Ethiopia's 2020 TVET policy and strategy.

This section presents an analysis of data collected through interviews with various groups of respondents, focusing on their engagement with TVET practice, particularly in the 2020 development of TVET policy and strategy. The researcher conducted interviews with federal line ministries, chambers of commerce and sectoral associations, TVET deans, regional CoC agency representatives, industry supervisors, CoC focal persons, and shop assistants. The researcher also conducted focus group discussions with TVET trainers. The purpose of the interview and FGD was to investigate the depth of stakeholders' engagement in the formulation of TVET policies and strategies and assess the efficacy of awareness-building initiatives in Ethiopia. The stated objectives served as the basis for the analyses.

4.3.1 Stakeholders (Ministries, Industries, CoC directorates, TVET deans, and trainers) involvement and consultation during the formulation and development of Ethiopia's 2020 TVET policy and strategy.

The Ethiopian TVET policy and strategy development process manifested varying levels of stakeholder engagement. Stakeholder involvement ranged from active participation in

decision-making to merely receiving information about policy changes after their formulation. Based on a comprehensive review of the vision presented by senior leadership in policy, strategy, and development guidelines, several essential steps emerged in the formulation process. Initially, there was the establishment of a unified vision from the top leadership. Following was a consensus-building phase, wherein broad goals and directions were set, encompassing brainstorming sessions among pertinent ministries and agencies, an in-depth collection and analysis of international best practices, and dialogues with non-governmental stakeholders. The final phase involves documentation. Drafts for these documents originated from varied backgrounds, including government officials, academics, and consultants. Throughout this stage, there was a strong emphasis on engaging all stakeholders in the drafting and commentary process.

According to UNESCO (2021b), stakeholder engagement is at three levels: macro, meso, and micro. In this study, the macro level consists of the Ministries of Health, Urban Development and Construction, Culture and Sport, and Tourism, as well as the Chamber of Commerce. The macro level of this study concentrates on providing ideas that align with their middle-level human resource demands, thereby shaping the policy and strategy of TVET. Employers and regional CoC Institutions engage at the meso level to bridge the TVET system with their needs. The micro level includes TVET college deans and trainers, the pioneer implementers of the policy; they share experience from previous policy implementation and generate better ideas to include in the current development of the policy. When the ideas of these stakeholders are well integrated, there will be effective policy implementation.

Interview responses from the *MO1* and *MO2* shed light on the collaborative nature of this procedure. For instance, the interviewed *MR2* confirmed his active participation in both the drafting and commentary phases of the policy and strategy formulation.

> *The Ministry of Industry developed a comprehensive ten-year strategy to address the needs of middle-level human resources. Significant contributions have been made in devising pedagogical strategies for TVET students across different levels. Additionally, they have prioritized the integration of ICT to*

> *enhance educational support, the introduction of entrepreneurial courses into the curriculum, the value of short-term training, and the advancement of a sustainable green economy*.

On a related note, the *MR1* confirmed their contribution to the formulation of the 2020 TVET policy and strategy. The *MR1* representative who was interviewed said the following in relation to this:

> *The Ministry of Health previously highlighted concerns with the former competency assessment approach, particularly in terms of level-based assessments, health occupation certification, and training delivery systems. He underscores the involvement of the ministry in the TVET policy and strategy development. Further, he suggested that graduates undergo a nationwide competency assessment before entering the workforce*.

The *MR1* mentioned, "Although they contributed their knowledge to the drafting of the policy, the sector has not yet taken on the leadership role." On the other hand, the MR4 pointed out that their involvement in the TVET policy and strategy development was not comprehensive, as not all pertinent sections participated. For example, *MR4* offered their insights on incorporating indigenous knowledge into policy directions.

> *This expertise has been recognized and incorporated into both the policy and curriculum. However, stakeholders like the Art Wing have no significant affiliation and did not participate in the development of the TVET policy and strategy.*

Interview responses from the *MR5* and *MR3* highlighted that the ministries were not involved in the drafting and review of the policy and strategy. Their absence is surprising, given the ministry's significant contribution to the nation's GDP and employment generation. The *MR5* further remarked:

> *The tourism industry is pivotal in generating employment opportunities and mitigating unemployment rates. It substantially boosts the nation's gross domestic product (GDP). However, it is noteworthy that hiring practices within this sector tend to favor nepotism over the competency of graduates. Regrettably, even with the ministry's urging, issues pertaining to human capital development remain overlooked in the current policy. Additionally,*

> *there is a noticeable integrity deficit in institutions operating at the ministerial level.*

The interviewed *MR3* also remarked:

> *The development of the TVET policy and strategy did not involve a consensus-building approach, drawing upon broad objectives and directions from various brainstorming sessions. Although the construction sector possesses a legal framework to establish standards for middle- and lower-level occupations and oversee industry training, they have not participated in the recent TVET policy and strategy formulation.*

In contrast to the previous statements about participation, a *MR6* offered a different perspective. She stated,

> *The policy was crafted by the Ministry of Science and Higher Education to address the gaps identified in the educational roadmap. This roadmap underwent thorough discussions down to the grassroots level of the educational system. Stakeholders from all tiers were actively involved, and awareness was disseminated correspondingly at every level. In the end, the policy received approval from the Minister of Science and Higher Education*.

As can be inferred from the above references, it is noteworthy that while the developer of the policy, MoLS, claims comprehensive stakeholder involvement, only the Ministry of Industry (MoI) took proactive measures. Specifically, the MoI conducted a forecast survey on labor force needs for the upcoming decade. Other ministries, unfortunately, did not engage in such forward-thinking activities, thus neglecting their roles in the formulation of TVET strategies and policies. Further, the statement highlights that while ministries possess a significant vested interest in cultivating medium- and lower-level human resources within the labor market, their participation in policy and strategy formulation is overlooked, and the process itself may exhibit deficiencies in terms of integrity. This implies a requirement for greater acknowledgment of their position and proficiency, along with enhancements in the openness and responsibility of policy-making procedures within the ministries.

Line ministries play a pivotal role as key stakeholders in TVET. Operating within their respective legal frameworks, they lead and coordinate their sectors down to the grassroots

level. Crucially, they understand their specific human capital needs. As per the data sourced, the Ministry of Culture and Sport, Ministry of Health, and Ministry of Industry were actively involved in shaping TVET policy and strategies. The MoLS further corroborated their contributions. Conversely, the Ministry of Urban Development and Construction and the Ministry of Tourism indicated a lack of engagement in this policy and strategy development. They also displayed limited awareness of the same.

Feedback from regional Center of Competency (CoC) directorates indicated disparities in stakeholders' engagement. Interviewed representatives from the Amhara and Sidama regional states confirmed their active participation in the formulation of TVET policies and strategies. For example, *CR2* provided further insights, mentioning, "In Amhara, stakeholders contributed during the drafting of the education and training roadmap, especially on the TVET topic, offering valuable comments. Unfortunately, the integration of these insights fell short of expectations."

In contrast, *CR1*, *CR4*, and *CR3* indicated that they were sidelined during these discussions. An interviewee from the *CR4* elaborated on this sentiment, highlighting their exclusion from the policy and strategy formation processes as follows:

> *During the formulation of the current TVET policy and strategy, experienced professionals were not actively involved in the drafting and review process. However, senior officials did contribute. The involvement of industries was notably limited, especially at the regional level.*

Stakeholder engagement in the policy and strategy formulation process is not merely a good-to-have element but an essential one, as emphasized by the World Bank and other reputable authorities (World Bank *et al*., 2023). This idea comes from the belief that strong involvement from stakeholders is crucial for solving problems that may have stopped past efforts and for improving current policies and strategies. Further, the Technical and Vocational Education and Training (TVET) policy underscores the establishment of autonomous national and regional TVET Centers of Competence (CoC) certification entities (MoSHE, 2020). Serving as the primary agents of TVET policy and strategy execution, these bodies hold significant influence.

Incorporating the insights and expertise of a diverse array of stakeholders—including government entities, academic institutions, industry professionals, and civil society representatives—enriches the policy and strategy formulation process. This comprehensive approach augments the chances of drafting a well-rounded and actionable blueprint to propel TVET initiatives forward. Thus, the active involvement of stakeholders is not merely desirable but imperative to overcome historical implementation hurdles and pave the way for robust TVET systems. However, there is a noticeable gap in stakeholder participation at the CoC directorate level. A limited number of CoC Agency officials have been engaged, indicating a lack of holistic involvement.

Regarding participation, insights were also gleaned from interviews with regional TVET polytechnic deans and trainers. Those from Addis Ababa City Administration, Oromia, and Gambella regional states remarked that they were not involved in shaping the TVET policy and strategy. In contrast, interviewees *TDR2* and *TDR5* expressed that they played an active role by offering feedback and revisions to the draft. An interview with the *TDR2* elaborated on their participation by noting:

> *Actively provided feedback on the draft policy. During its formulation, it undertook survey research to guide policy and strategy development. Among the many issues addressed in the policy, two significant changes stood out: the shift from level-based to holistic assessment, where students are evaluated as they transition from their academic program to the workforce, and the transformation of the grading system from a mere "competent" designation to a scaled grading approach. Nevertheless, the policy overlooks crucial matters, such as incentives for industries participating in cooperative training and competency assessment.*

The focus group discussion with the trainers highlighted that, despite being key implementers, they were not involved in the initial drafting and feedback stages of the policy-making process, making it less interactive. For example, TR1 shared the following insights:

> *Trainers have been invited to attend seminars hosted by the Minister of Labor and Skill to increase awareness of existing policies. However, the policy appears to have been directly adopted from other countries without tailoring*

it to the unique context of Ethiopia. It was formulated using a top-down, non-participatory approach.

Data from regional industry representatives indicates that industry participation at the regional level was limited. Representatives interviewed from the Addis Ababa, Amhara, Oromia, Gambella, and Sidama regions noted an absence of meaningful engagement in TVET policy and strategy formation, although minor regional variations were observed. An extract from an interview with a participant from *IR1* illustrates the perspectives of others.

> *There is a clear discrepancy between the training system focused on building competencies for trainees and the actual demands of the market. This results in a mismatch between the skills of graduates and what the industry requires. Many colleges are ill-equipped to address these industry needs. Moreover, industries have not been sufficiently involved in shaping TVET policy and strategy to bridge these gaps.*

The development of TVET (Technical and Vocational Education and Training) policy and strategy, when disconnected from employer engagement, may not align with the needs of companies. As a result, many companies might perceive TVET as having limited relevance (Kis and Park, 2012). However, industries are key stakeholders in TVET. Data gathered from the regional states, such as Addis Ababa, Oromia, Amhara, Sidama, and Gambella, indicates a lack of substantial engagement by these industries in TVET policy and strategy formulation.

Interviews conducted with *ECR1* and *SR1* revealed that, while both the chamber and sectoral associations play significant roles in skill development, they were not deeply involved in the TVET policy and strategy development process. He further noted:

> *Though the Ethiopian Chamber of Commerce actively collaborates with the sector to advocate for its needs and scrutinizes trade and investment regulations and involves TVET graduates to address industry requirements, its involvement in the TVET matters has been lacking since 2008. While the chamber was not directly involved in designing the current policies, it did provide feedback on the*

educational blueprint. The prevailing strategy has led to ineffective governing boards and remains ambiguous about the private sector's role. The industry's lack of expertise in occupational standards and competency evaluations stems from a limited awareness of the TVET policy and strategy. No tangible incentives exist, and the environment is not conducive to industry participation. Consequently, the Chamber of Commerce's engagement in the TVET policy and strategy formulation has been limited.

The government and private sector are collaborating on training objectives, policies, and governance, aiming to incorporate industries in decision-making and policy formulation. However, the analysis of the above interview and focus group discussion indicated that most of the stakeholders of TVET, such as TVET trainers, CoC agencie's, and industry representatives, were not involved in policy formulation. The Ministry of Labor and Skills is focusing on raising awareness rather than actively involving entities like the Ethiopian Chamber of Commerce and Sectorial Association. This oversight could hinder the relevance of the TVET system and its effectiveness in policy implementation.

4.3.2. Awareness and Consensus Building among Stakeholders in the development of TVET policy and strategy in Ethiopia.

Stakeholder awareness is crucial in the development and implementation of policies and strategies, especially in areas such as Technical and Vocational Education and Training (TVET). In Ethiopia, efforts to foster understanding and consensus among stakeholders have produced varied outcomes, as illustrated by feedback from various ministries.

Feedback from Key Ministries: Officials from the Ministries of Industry, Health, and Culture and Sport confirmed their awareness of the recently introduced TVET policy and strategy. These officials emphasized their active participation in the process, noting, "We attended workshops aimed at raising awareness, and a consensus was achieved during the drafting and review of the policy and strategy."

Conversely, officials from the Ministry of Urban Development and Construction and the Ministry of Tourism have highlighted a lack of awareness about the new TVET policy and strategy, which hinders effective implementation and support. This shortcoming is due to a lack of stakeholder integration and collaboration. To address this, communication strategies should involve all relevant stakeholders through regular meetings, workshops, and informational sessions. Active participation from representatives of various ministries is crucial for consensus building on the TVET policy and strategy. The Ministry of Labor and Skills should collaborate with relevant agencies to develop a comprehensive awareness campaign.

Regional Insights: Feedback from the *CR1, CR2, CR3, CR4,* and *CR5* suggests a need for more inclusive awareness initiatives. These respondents voiced concerns over their limited understanding of the TVET policy and strategy.

The varied responses from these ministries and regional entities underline the importance of comprehensive stakeholder engagement in policy and strategy development. Effective awareness campaigns and improved inter-ministerial coordination can ensure that all relevant parties are consulted and informed, thereby driving the successful implementation of the TVET policy and strategy in Ethiopia. In this regard, interview data from *CR1, CR2, CR4,* and *CR5* revealed the following:

> *There is a lack of adequate awareness regarding the TVET policy and strategy. While agencies and clusters within these regions have undergone five days of training on the current TVET policy and strategy, this duration is insufficient for a comprehensive understanding of the policy's fundamental issues.*

Regarding awareness, the CoC director in the Gambella regional state has further stated that “they have not participated in awareness-creation workshops and lack a clear understanding of the TVET policy and strategy.”

Responses from *TDR1, TDR2, TDR3, TDR4,* and *TDR5* indicated that "they have taken part in awareness-creation workshops and are well-informed about the TVET policy and strategy." However, the focus group discussion with trainers revealed the contrary, as they expressed a lack of clear understanding of the TVET policy and strategy.

Interview data from all sampled areas, with the exception of the *IR4*, highlight a deficiency in awareness regarding the current TVET policy and strategy. This was further corroborated by *IR1* during the interviews.

> *During cooperative training and competency assessments, private industries placed a higher emphasis on ensuring trainees and protecting expensive machinery than on nurturing the future workforce. Even though the new policy and strategy documents were crucial, their distribution was inadequate. Moreover, the efforts to raise awareness regarding the policies and strategies produced were not thorough.*

The feedback from TVET deans in study areas, while demonstrating involvement in awareness-creation workshops, highlights a substantial disparity between administrative knowledge and practical comprehension among trainers. This inconsistency indicates that, despite formal training, the intended communication of the TVET policy and strategy has not adequately reached all stakeholders. The focus group talks reveal a troubling absence of understanding among trainers, compromising the policy's aims. Furthermore, the interview data reveals a lack of understanding, notably inside industries, with the exception of Sidama, underscoring the necessity for extensive communication initiatives. The primary concern arises from private firms emphasizing machinery protection rather than trainee skill development, indicating a biased approach to skill development. Finally, the limited distribution of policy papers and lack of awareness initiatives indicate systemic shortages in the implementation process, hampering the overall efficacy of the TVET framework. This analysis highlights the necessity for enhanced communication techniques and a comprehensive devotion to promoting a trained workforce that meets industry demands.

4.4. Stakeholders' perception of occupational competency assessment and certification systems in Ethiopia

This section presents the results of a data analysis on stakeholders' (industries, TVET dean's, trainers, and candidates) perceptions of occupational competency assessment and certification systems in Ethiopia.

4.4.1 Candidates' Perception of the Benefits of Competency Assessment

The questionnaire data concerning candidates' perceptions of competency assessment benefits are presented in Table 10 below.

Table 10 Candidates' Perception of the Benefits of Competency Assessment; N=1315

Items	Mean	SD
Value of Assessment for Society and Candidates	3.89	1.12
Assessment for Employment Opportunity	3.41	1.28
Assessment for Identifying Skill Gaps	3.39	1.37
Assessment for Certification	3.10	1.46
Assessment for Self-Confidence	2.96	1.47
Assessment for Competitiveness	2.85	1.40
Supporting Employers to have Competent Workers	2.71	1.36
Supporting Teachers in Identifying Training Gaps	2.56	1.28
Assessment is Simple and Workable	2.17	1.23
Assessment Adapts to Technological Changes	2.76	1.33
Assessment Aligns with the World of Work	2.21	1.16
Valuing Time and Resources for Assessment	2.16	1.11
Assessment Motivates Further Education	2.36	1.21
Taking Assessment Due to College Requirements	2.41	1.28
Taking Assessment for Satisfaction	2.18	1.13
Assessment Brightens Future Careers	2.41	1.30
Assessment Improves Creativity and Thinking	2.38	1.28
Psychological Readiness for Assessment	2.52	1.33
Benefits of Taking Assessment Outweigh Not Taking It	2.66	1.33
Aggregated Mean	2.69	1.29

Source: Research data, 2023.

Expected Mean = 3.00, on a Five-Point Likert Type Scale, where 1 represents "strongly disagree" and 5 represents "strongly agree". Source: (Kothari, 2019).

The mean score for "Value of Assessment for Society and Candidates" stands at 3.89 (SD = 1.12), notably higher than other recorded mean scores, as illustrated in Table 10 above.

This suggests respondents largely recognize the significant value assessments hold for both society and candidates. Conversely, 15 items, including "Assessment for Self-Confidence," "Competitiveness," and "Alignment with the World of Work," have mean scores ranging from 2.17 to 2.96, all falling below the expected mean value (3.00). Notably, the scores for "Valuing Time and Resources for Assessment" and Assessment Aligns with the World of Work are considerably below the anticipated mean, reflecting a widespread reluctance to heavily invest in preparing for competency assessments. The result reflects a generally subdued view of the relevance of competency assessment practices in real-world contexts.

Overall, respondents positively perceive the value of assessments for society (M=3.89; SD=1.12), candidate employment opportunities (M=3.41; SD=1.28), and skill gap identification (M=3.39; SD=1.37), but their views on certification assessments (M=3.10; SD=1.46) are only average and negatively skewed toward aspects like competitiveness, employer support, and alignment with technological and work-related changes. The aggregate mean (M = 2.69, SD = 1.29) portrays an overall negative perception towards occupational competency assessment. Nevertheless, a significant portion of respondents acknowledges the inherent benefits of such assessments.

According to the data in Table 10, while respondents agreed on the usefulness of competency assessments for candidates and society in theory, in practice, most of them have a negative view because the assessments lack relevance to the world of work, do not correspond with job specifications, fail to offer adequate feedback, exhibit technical issues, and are biased. Qualitative feedback from major stakeholders further echoes this sentiment, raising concerns about the efficacy and integrity of competency assessments.

Results of one-way ANOVA

The Ministry of Labor and Skills (MoLS, 2022) developed a similar standard for competency assessment in Ethiopia. We expect regional CoC Institutions to consistently practice the system. Table 11 presents candidates' perceptions across regions.

Table 11 Differences in perception of candidates among Regional Center of Competency

Dependent Variable: Perception of Candidates										
	(I) Regional COC	(J) Regional COC	M	SD	Mean Difference (I-J)	Std. Error	Sig.	df	F	Eta Square
Tukey HSD	Addis Ababa (M=2.63, SD=.53)	Amhara	3.26	.71	-.631*	.043	.000	4	156.487	0.073
		Oromia	2.83	.46	-.197*	.044	.000	1310		
		Gambella	2.06	.35	.566*	.050	.000	1314		
		Sidama	2.58	.50	.050	.048	.836			

*. The mean difference is significant at the 0.05 level.

Source research data, 2023.

The researcher conducted the study in one city administration and four regions in Ethiopia: Addis Ababa, Amhara, Oromia, Sidama, and Gambella. The researcher utilized a one-way ANOVA test to examine the variance in candidates' perceptions across these areas. The results showed a significant difference in how the competency assessment candidates from the city administration compared to those from the regions ($F(4, 1310) = 156.487$, $P < .05$, $2np2 = 0.073$). Post hoc testing revealed significant differences between the regions, with mean scores for Addis Ababa at 2.63 (SD = .53), Oromia at 2.83 (SD = .46), Amhara at 3.26 (SD = .71), Sidama at 2.58 (SD = .50), and Gambella at 2.06 (SD = .35). These results suggest that, while overall candidates had a negative perception of the competency assessment's benefits, significant regional differences were evident. Specifically, the Amhara region exhibited a relatively positive perception compared to others, whereas Gambella had the least favorable view.

The calculated F-value of 156.487 represents the disparity between regional means relative to the dispersion within the regions. The reported significance level ($P < 0.05$) confirms that the observed differences between the regions are statistically significant. However, the mean difference between Addis Ababa and Sidama is 0.50 with a standard error of .048, which is not statistically significant at the 0.05 level ($p = .836$), indicating no substantial difference in perception scores between these two regions. This result suggests similarities in competency assessment practices between Addis Ababa and Sidama. The eta-squared

partial (2np2) value of 0.073 shows that perception explains 7.3% of the differences in the regional CoC scores, indicating a moderate effect. The post hoc tests confirm statistically significant variability among the regions, highlighting individual differences among candidates, variations in the contextual factors of competency assessment, and discrepancies in training programs across regions.

4.4.2. Stakeholder perception on benefits, efficiency, and relevance of competency assessment

The researcher conducted interviews to investigate the perceptions of stakeholders, including TVET deans, employers, and CoC focal persons. The researcher also held focus group discussions (FGDs) with trainers. The study looked at how deans from TVET institutions feel about the benefits, usefulness, and efficiency of competency assessment. The interview findings revealed that most of them agreed that competency assessment is important for TVET candidates, industries, and society as a whole. However, they have concerns about the current state of the procedures employed to conduct competency assessments. A *TDR1* further elaborated as follows:

> *Several factors contribute to the problem, including limited public acceptance, incoherence with industrial requirements, and a lack of skill gap analysis. The dean also observes an excessive focus on certification rather than skill assessment and initiative for innovation*.

The focal persons of the Center of Competency have also acknowledged the value of competency assessment, at least in theory, noting its "significant value for upgrading students' skills and maintaining the quality of training." They viewed, however, that the practical implementation faces challenges like corruption, ethical issues, candidate anxiety, and a lack of motivation. For example, *CFR2* provided their specific insights as follows:

> *The system also lacks coherence with industry demand, raw materials and equipment, and limited accessibility. Some assessors evaluate more than 20 candidates in one session, and conducting assessments quarterly each year adds to the candidates' burden and anxiety.*

The review of the aforementioned responses and quotations recommends conducting a skill gap analysis, maintaining assessment standards, and implementing skill development measures to align the candidates' competencies with industry demands. Enhancing attitudes toward competency assessment is critical for overcoming obstacles and improving individual and social advantages.

The interviewed employers acknowledged the benefits of competency assessment for society and industry, even using it as a hiring criterion. However, they express dissatisfaction with the quality of the trainees. *IR1* provided a specific insight as follows:

> *Employers have observed issues like certification fraud, a shortage of assessment resources, and assessor incompetence. This leads to additional training for new graduates, wasting time and resources, and obscuring the full benefits of competency assessment. This situation prompts industries to question their relevance and value.*

The analysis of the above responses and quotes suggested that maintaining access, quality, and relevance to competency assessment is critical to creating a positive perception of competency assessment's benefit, efficiency, and relevance.

The focus group discussion with *TR1* revealed a negative perception of occupational competency assessment due to non-adherence to established principles and regulations. The participants provided their comments and insights on this issue as presented below:

> *According to the TVET trainers, the assessment system often employs incompetent, unethical assessors due to partiality. They criticized the system for failing to meet essential standards such as work alignment, fairness, transparency, and accuracy, as well as for not adequately evaluating competency. They also noted that TVET training does not cover all occupational standards, leading to a testing-focused system.*

Further, the focus group discussion with *TR2* revealed that the system lacks clear differentiation between assessed and unassessed candidates. The participants noted that:

> *The assessment system, primarily focused on certification, neglects industry standards, wastes training resources, and overloads assessors, resulting in*

subpar competency assessment and questionable assessor competencies, making the system discouraging.

The review of the focus group discussion shows that the way competency assessment systems are used does not align well with the principles of competency assessment and industry standards, resulting in negative views from stakeholders.

In conclusion, qualitative data collected through interviews with TVET college deans, CoC focal persons, and employers revealed that while they recognize the value of competency assessment, they have a low perception of its benefits, efficiency, and relevance. These findings align with the negatively skewed perceptions observed among candidates in the quantitative result (Table 10). Respondents generally exhibit a skewed attitude, leaning toward a negative view regarding the benefits of competency assessments. Furthermore, the qualitative data highlighted various implementation challenges in Ethiopia, including ethical concerns with assessors, candidates' anxiety, systemic corruption, failure to meet industry demands, a lack of standards, and the issue of forged certificates. These factors contribute to the major stakeholders' negative perception of competency assessment in Ethiopia.

4.5. Alignment of Occupational Competency Assessment Practices with Strategy and guiding principles in Ethiopia

This section outlines the results of analyzing data on how well occupational competency assessment practices match important strategies, and principles in Ethiopia. The researcher employed a mixed-method approach, gathering data through surveys and interviews from a diverse group of respondents, including assessors, CoC supervisors, CoC directorates, industry representatives, TVET polytechnic deans, and trainers. The analyses were conducted using descriptive and inferential statistics in accordance with the study objectives.

4.5.1 The extent of the practices of competency assessment align with the strategy and guiding principles of occupational competency assessment in Ethiopia.

The data from the questionnaire captured supervisors' perceptions regarding the practice of the Center of Competency (CoC). Table 12 showed how supervisors rated different parts of CoC practices, such as the organization's autonomy, the training for assessment methods, how often assessors meet with stakeholders, responsibility and accountability in assessment systems, how assessment results are shared with TVET institutions, the fairness and motivation of supervisor pay, and how often supervisors are evaluated on their performance. With 235 participants, the average score of 2.77 (on a scale from 1 to 5) indicates that supervisors feel there is a gap between actual practices and ideal competency assessment strategies and principles.

Table 12 Supervisors perception on the practice of Center of Competency (N = 235)

Items	Mean (M)	Standard Deviation(SD)
Organization of CoC autonomous to execute the mission	2.81	1.27
Assessment methodology training has enough time to understand the content	3.36	1.22
Assessors and Stakeholders have Quarterly meeting	3.01	1.28
There is Accountability of Assessors in Assessment systems	2.74	1.45
CoC Center has deliver the assessment result to TVET institutions	2.33	1.17
Payment of supervisors is fair and motivational	2.66	1.28
There is Supervisors performance Evaluation regularly	2.49	1.60
Aggregated Mean	2.77	1.32

Source: Research Data, 2023

The average score (M=2.77, SD=1.32) shown in Table 12 indicates a noticeable difference in how supervisors at Centers of Competency (CoC) in Ethiopia view the alignment of competency assessment practices with the set strategies and principles. It was also clear that the time allocation for content comprehension was sufficient (M=3.36, SD=1.22). Other important factors—like the accountability of assessors, the impact of assessments on education, CoC institutions working independently, supervisors getting fair and motivating

pay, and their overall significance (all averages < 3)—do not match the basic strategies and principles of competency assessment.

Additionally, the average score for quarterly meetings between assessors and stakeholders stands at 3.01, reflecting a neutral stance toward this practice. This result indicates the absence of a robust mechanism to promote regular engagement between key stakeholders. The aggregated mean score of 2.77 across all evaluated factors further underscores a significant divergence between the operational practices at the organizational level and the ideal strategies and principles envisioned for competency assessment within CoC institutions. This analysis is anchored by insights into the CoC's role in conducting competency assessments across Ethiopia, as outlined in the 2022 guidelines by the Ministry of Labor and Skills (MoLS).

Table 13, which surveys assessors' perspectives on CoC practices, complements this evaluation, offering a broader view of the challenges and perceptions within the competency assessment landscape in Ethiopia.

Table 13 Assessors perception on practice of Center of Competency, N = 526

Items	Mean (M)	Standard Deviation(SD)
Organization of CoC autonomous to execute the mission	2.91	1.30
Assessors refresher training to be conducted together with industry	2.75	1.29
Knowledge of Supervisors is sufficient compared to the criteria of quality and principles of assessment	2.85	1.53
Time allocated to assessors methodology training is adequate	3.27	1.30
Trainers of Assessment Methodology are competent	3.20	1.51
Assessors and other stakeholders conduct quarterly meeting on performance of assessment	2.46	1.39
Supervisors Accountability Assured in the assessment system	2.59	1.35
Supervisors assigned in Assessment Center have competence with occupation	2.46	1.33
CoC Center has send Assessment result to college this has good impact on training	2.70	1.367
Assessors' payment is adequate and motivational.	2.15	1.18
Monitoring and Evaluation has conducted to Assessors performance.	2.40	1.24
Aggregated Mean	2.70	1.34

Source: Research Data, 2023

Table 13 reflects that assessors within Centers of Competency (CoC) institutions have positive views on their training and work environment, with scores exceeding the expected mean. However, there are areas that need improvement, such as the independence of the CoC's organization, supervisor knowledge, quarterly meetings, supervisor responsibility, sharing of assessment results, fairness of pay, and thoroughness of monitoring and evaluation. These findings suggest a disconnect between CoC institutions' practices and ideal competency assessment strategies.

Interviews with CoC directorates, polytechnic college deans, and industry supervisors revealed structural and autonomy challenges facing the CoC Agency. Issues include a lack of independent operational capacity at federal and regional levels and potential conflicts of role, especially in locations like Addis Ababa. Focus group discussions with trainers from polytechnic colleges showed that there wasn't a strong system for holding people accountable, that supervisors and assessors weren't always qualified, and that CoC Institutions weren't giving the TVET system any feedback. These findings revealed a misalignment between the structural, operational, and policy frameworks governing CoC Institutions, the objectives of effective competency assessment, and the broader goals of the Ethiopian TVET system.

Table 14 provides insights into the perceptions of supervisors and assessors regarding the development of occupational standards, with responses from 235 supervisors and 526 assessors.

Table 14. Perceptions of Supervisors and Assessors on Occupational Standard Development (Supervisor N=235; Assessors N=526)

Items	Respondent Group	Mean (M)	Standard Deviation (SD)
Full industry participation in OS development and revision	Supervisors	1.73	0.64
	Assessors	2.68	1.32
Participation and leadership of occupational association leaders in OS development and revision	Supervisors	2.11	1.04
	Assessors	2.69	1.26
Sectoral association participation in OS development and revision	Supervisors	2.13	0.96
	Assessors	2.49	1.43
OS development and revision based on demand from the world of work	Supervisors	2.69	1.24
	Assessors	2.51	1.25
OS development and revision based on international benchmarks	Supervisors	3.25	1.18
	Assessors	3.22	1.30
Aggregated Mean	Supervisors	2.30	0.78
	Assessors	2.70	1.31

Source: Research Data, 2023

Analysis of the data reveals that among the aspects surveyed, only the item related to "OS development and revision based on international benchmarks" received a rating above the threshold mean of 3.00. The other four aspects—namely, the participation of industries, occupational associations, sectoral associations, and the alignment with the demands of the world of work—were rated below the expected mean of 3.00 on a scale of one to five. The result suggests that the development and revision of Ethiopian TVET occupational standards have predominantly focused on aligning with international benchmarks rather than tailoring the standards to the specific context and requirements of the country's labor market. Consequently, there appears to be a significant gap between the current practices of competency assessment and the strategies, principles, and theories that would ideally guide such processes, indicating a need for a more contextualized approach in the development of occupational standards.

The analysis in Table 15 utilizes an independent samples T-test to explore the differences in perceptions between supervisors and assessors concerning the development of occupational standards (OS). This statistical approach is instrumental in examining whether there is a statistically significant disparity in the mean values of these two distinct groups.

Table 15 Independent Samples T-Test analysis between supervisors and assessors

		Levine's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Congruence about OS	Equal variances assumed	54.445	.000	5.691	586	.000	.41459	.07284	.27152	.55766
	Equal variances not assumed			6.351	583.569	.000	.41459	.06528	.28638	.54280

Source: Research Data, 2023

The data reveals a significant difference in perceptions between supervisors and assessors regarding the development of Occupational Standard (OS) and its implementation and effectiveness. Despite the shared recognition of the importance of aligning OS with international benchmarks, there is a significant variance in how each group perceives the implementation and effectiveness of these standards. This discrepancy could be attributed to the diverse organizational backgrounds and occupational roles of assessors compared to the more homogeneous environment of supervisors, as well as varying degrees of industry involvement, sectoral engagement, and occupational association participation in OS development (MoLS, 2022).

The findings underscore the critical feedback from CoC directorates, polytechnic college deans, and industry supervisors concerning the inadequacy of industry, sectoral, and occupational association involvement in OS development. The Labor and Skill Ministry also employs inexperienced and potentially incompetent industry workers for OS development, which does not align with national workforce requirements and contradicts the TVET policy and strategy's emphasis on market demand and local reality.

In conclusion, while the development of OS still aligns with the overarching policy and strategy, there is significant room for improvement in terms of industry involvement and alignment with local market demands and realities.

Table 16 provides an overview of the perceptions of supervisors and assessors regarding the assessment tools used in occupational standards and competency assessments.

Table 16 Perceptions of Supervisors and Assessors on Assessment Tools (Supervisors N= 235; Assessors N=526)

Items	Respondent Group	Mean (M)	Standard Deviation (SD)
Assessment tool development with Assessors panel	Supervisors	2.00	0.92
	Assessors	2.56	1.19
Assessment tools are similar with competencies of workplace	Supervisors	2.43	1.19
	Assessors	2.80	1.27
Assessment tools measure Cognitive thinking	Supervisors	2.79	1.19
	Assessors	2.97	1.25
Assessment tools validated by Ministry of Labor and Skill	Supervisors	3.22	1.16
	Assessors	2.98	1.27
Utilization and handling of assessment tools is secured and not easily found in the hands of candidates	Assessors	1.94	0.76
Aggregated Mean	Supervisors	2.60	0.70
	Assessors	2.65	1.15

Source: Research Data, 2023

As seen in Table 16 above, the responses to nearly all items were negative, with mean scores < 3, indicating skepticism or dissatisfaction among supervisors and assessors regarding the current state of assessment tools. The item "Assessment tools validated by the Ministry of Labor and Skill" received a relatively more favorable response from supervisors (mean 3.22) compared to assessors (mean 2.98), suggesting that the validation process by the Ministry has some merit. However, the overall aggregated mean scores for both groups (supervisors, M = 2.60, SD = 0.70; assessors, M = 2.65, SD = 1.15) reflect a broader concern regarding the alignment of practice with the principles and rhetoric of competency assessment as indicated in TVET policy and strategy (MoSHE, 2020). A specific concern highlighted is the security and handling of assessment tools; assessors indicated that these tools were too easily accessible to candidates (mean = 1.94, SD = 0.76), potentially compromising the integrity of the assessment process.

Feedback from interviews with key stakeholders, including CoC directorates, deans, industry supervisors, and Polytechnic College trainers, further underscores the challenges faced, among which is related to aligning the tools with occupational standards or the required competencies for the workplace. One of the Polytechnic College trainers, for instance, commented that

> *The assessment tools do not align with occupational standards or the required competencies in the world of work. Version scarcity is another issue that results in the repeated use of the same version.*

The findings point to a significant gap between the current practices of assessment in the Ethiopian TVET system and the principles of competency assessment, such as relevance, sufficiency, authenticity, and clarity (MoSHE, 2020; Gravells, 2016).

Table 17 presents the perceptions of supervisors and assessors regarding various elements of the assessment system within the context of occupational competency. The table reflects responses from 235 supervisors and 526 assessors on several critical aspects of the assessment process.

Table 17 Perceptions of Supervisors and Assessors on Assessment System (Supervisors N= 235; Assessors N=526)

Items	Respondent Group	Mean (M)	Standard Deviation (SD)
More than one assessor conducting assessment	Supervisors	2.28	1.04
	Assessors	2.08	1.12
Assessment has value for stakeholders	Supervisors	2.45	1.25
	Assessors	3.83	1.15
Consistency in competency assessment results	Supervisors	2.34	1.24
	Assessors	2.33	1.26
Assessment result verification	Supervisors	2.53	1.24
	Assessors	2.67	1.32
Assessors refresher training	Supervisors	2.85	1.35
	Assessors	2.47	1.23
Candidate preparation by assessment system	Supervisors	2.82	1.31
	Assessors	2.74	1.46
Candidate understanding of OS	Supervisors	3.06	1.31
	Assessors	3.15	1.32
Consistency of assessment conditions	Supervisors	2.86	1.27
	Assessors	2.74	1.38
Clarity of assessment system	Supervisors	3.03	1.33
	Assessors	3.31	1.27
Aggregated Mean	Supervisors	2.86	0.76
	Assessors	2.81	1.14

Source: Research Data, 2023

As shown in Table 17 above, assessors and supervisors largely agreed on two items: the clarity of the assessment system and the candidates' understanding of Occupational Standards (OS), indicating a moderate level of alignment. Assessors perceived the 'assessment system's value to stakeholders' more positively than supervisors. However, most of the items were rated below the mean value of 3.0, indicating concerns about the alignment of the assessment system with established strategies and principles of competency assessment. The aggregated mean scores (mean scores 2.86 and 2.81) indicate that both groups perceived that the assessment system does not fully meet the expectations or requirements of competency assessment principles. This misalignment raises questions about the effectiveness of the current assessment practices in capturing the competencies needed in the workplace accurately.

Interview responses from CoC directorates, deans, industry supervisors, and Polytechnic College trainers revealed significant challenges in maintaining fairness, comparability, and reproducibility within the assessment system. The variance in assessment results across situations and assessors, inconsistency in assessment conditions, and a lack of internal and

external verification highlight systemic issues that compromise the quality and fairness of competency assessments. A dean from one of the polytechnic colleges pointed out several issues:

> *Assessors' judgments differ based on the circumstances due to the absence of internal and external verification processes. Additionally, assessors fail to adequately prepare candidates from a psychological standpoint. The system is also not fully understood by key stakeholders, leading to societal dissatisfaction with the competency assessments. Complaints from candidates are not properly resolved. Moreover, the candidates evaluated do not meet the industry's requirements, and there is a lack of ownership of the system by the industry itself.*

Table 18 below provides insights from supervisors and assessors on assessment centers practices, including accreditation collaboration, reaccreditation frequency, facility adequacy, candidate proximity, coordinator and assessor presence, and occupational ethics. Supervisors (M=3.29; SD=1.22) and assessors (M=3.08; SD=1.30) acknowledged the value of accreditation processes involving CoC and industry experts, while managers rated them more favorably. Reaccreditation every three years was acknowledged positively, with assessors (M=3.38; SD=1.16) showing slightly higher ratings. Supervisors (M=3.36; SD=1.25) perceive AC facilities as adequate for conducting assessments, while assessors (M=2.68; SD=1.26) view them less favorably. Supervisors (M=3.16; SD=1.24) rated the proximity of ACs to candidates moderately, while assessors (M=2.76; SD=1.43) rated it less. The presence of a coordinator was seen favorably by both supervisors and assessors. The availability of assessors was considered unfavorable by both supervisors and assessors. Finally, the occupational ethical performance of AC shop assistants was rated more favorably by assessors (M=3.29; SD=1.21) than supervisors (M=3.00; SD=1.35).

Table 18 Perception of supervisors and assessors on practice of assessment Center (AC), Supervisors, N=235; Assessors, N=526

Items	Respondent Group	Mean (M)	Standard Deviation (SD)
AC accreditation has given together with CoC experts and Industry experts	Supervisors	3.29	1.22
	Assessors	3.08	1.30
AC has given accreditation and reaccreditation after 3 years	Supervisors	3.33	1.33
	Assessors	3.38	1.16
AC has adequate facilities based on occupation to conduct the assessment	Supervisors	3.36	1.25
	Assessors	2.68	1.26
AC has proximity to the candidates	Supervisors	3.16	1.24
	Assessors	2.76	1.43
AC has a coordinator	Supervisors	3.48	1.20
	Assessors	3.35	1.25
AC has an assessor	Supervisors	2.89	1.37
	Assessors	2.16	.98
AC shop assistance have an occupational Ethics	Supervisors	3.00	1.35
	Assessors	3.29	1.21
Aggregate Mean	Supervisors	3.20	.83
	Assessors	2.96	1.23

Source: Research data 2023

The aggregate mean scores reflect moderate agreement with AC practices by supervisors and slightly unfavorable ratings by assessors, indicating areas for improvement in aligning practices with principles, strategies, and theories.

Interviews with CoC directorates, deans, industry supervisors, and Polytechnic College trainers revealed a gap between TVET policy intentions and the operational realities of assessment centers. Most assessment centers are located within TVET colleges, with inadequate facilities that fail to meet industry standards. This discrepancy highlights the need for policy practice and facility provision enhancements to better align assessment centers with industrial requirements. The findings suggest a comprehensive review and reform of the assessment system to align with principles of occupational competence assessment. Enhancing the system's alignment with these principles will contribute to a more reliable and effective assessment process that better serves the needs of trainees, trainers, employers, and society at large.

Table 19 presented the results of an independent samples test, specifically examining the discrepancy in means between assessors and supervisors within the context of assessment center practices.

Table 19 Independent Samples Test

		Levine's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Congruence about Assessment Center	Equal variances assumed	1.670	.197	-2.917	586	.004	-.20248	.06940	-.33878	-.06617
	Equal variances not assumed			-2.899	449.083	.004	-.20248	.06984	-.33972	-.06523

Source: Research data 2023

The significant difference in means highlights the perceptual divergence between assessors, who are perceived to undertake assessments with comprehensive responsibility, and supervisors, who are viewed as overseeing and facilitating the assessment process. This analysis contributes to our understanding of operational dynamics within assessment centers, as detailed in the referenced MoLS study (2022).

Table 20 presents the outcomes of a one-way ANOVA conducted to examine variations in congruence concerning CoC, OS, assessment tools, assessment systems, and assessment centers among five Ethiopian regional states. The analysis reveals statistically significant differences across all investigated variables, with p-values uniformly recorded at .000 for each. This uniformly low p-value signifies the presence of significant differences among the regions under study.

Table 20 One-way ANOVA Test

		Sum of Squares	df	Mean Square	F	Sig.
Congruence about COC	Between Groups	39.976	4	9.994	18.151	.000
	Within Groups	200.417	364	.551		
	Total	240.393	368			
Congruence about OS	Between Groups	45.699	4	11.425	13.879	.000
	Within Groups	299.622	364	.823		
	Total	345.321	368			
Congruence about Assessment Tool	Between Groups	37.008	4	9.252	17.414	.000
	Within Groups	193.394	364	.531		
	Total	230.402	368			
Congruence about Assessment System	Between Groups	48.405	4	12.101	21.766	.000
	Within Groups	202.373	364	.556		
	Total	250.777	368			
Congruence about Assessment Center	Between Groups	76.286	4	19.072	42.625	.000
	Within Groups	162.865	364	.447		
	Total	239.151	368			

Source: Research data 2023

Specifically, the F-values reported for congruence about CoC, OS, assessment tool, assessment system, and assessment center are 18.151, 13.879, 17.414, 21.766, and 42.625, respectively. These values indicate a strong statistical significance, thereby leading to the rejection of the null hypothesis, which posits no differences among the groups.

The results underscore a notable variance in perceptions of congruence across the regions, counter to the Ministry of Labor and Skill's (MoLS, 2022) assertion that the assessment system has been uniformly applied across all regions. The discrepancies highlighted by this analysis suggest a divergence in the implementation or perception of these assessment practices at the regional level, pointing to the need for a more harmonized approach to ensure consistency and fairness in the assessment processes across the Ethiopian regions.

The findings of this study on competency assessment practices have revealed both the alignment and divergence of these practices with the country's strategic and principled

frameworks. Certain activities within the Ethiopian competency assessment framework—such as assessor methodology training, international benchmarking, accreditation of assessment centers, AC shop assistance's ethics, and societal values—are commendably in line with the intended strategies and principles. However, there are discrepancies: This discrepancy primarily stems from structural deficiencies, a notable lack of autonomy at the CoC Agency, and its mergers with other organizations, which collectively hinder the agency's capacity to furnish technical and vocational education and training institutions with essential feedback and support.

The Ethiopian assessment system faces considerable challenges in maintaining fairness, comparability, and reproducibility, attributable to the employment of single assessors, uneven decision-making processes, and the absence of both internal and external verifiers. Furthermore, the system does not meet industry expectations and suffers from a lack of stakeholder awareness. A misalignment between the TVET policy and the actual operational realities of assessment centers, predominantly housed within TVET colleges contrary to the strategic recommendation for industrial workplace settings, underscores a consistency issue in the system's adherence to competency assessment's theoretical frameworks.

Notably, the study has identified significant regional disparities in competency assessment practices within Ethiopia, despite claiming the presence of a uniform assessment system. These regional variations in the execution and evaluation of assessments could potentially undermine the system's overall consistency and fairness.

4.6. The key determinants of the implementation of an occupational competency assessment in Ethiopia

This section presents the results of a data analysis of the key determinants of the implementation of an occupational competency assessment through CoC institutions. CoC institutions are responsible for assessing candidates and granting certification, and they are autonomous to carry out their mission with maximum effectiveness and efficiency. The researcher employed a mixed research method, gathering data through questionnaires and

interviews with a wide range of respondents, including assessors, CoC supervisors, industry representatives, TVET polytechnic deans, and trainers. The researcher conducted analyses using descriptive and inferential statistics, guided by the research questions. Additionally, the researcher identified the correlations between the variables and pinpointed the variables that had the greatest impact on the assessment system's effectiveness.

4.6.1 Key determinant factors make occupational competency assessment effective.

Table 21 presents a summary of the viewpoints of supervisors and assessors regarding the key factors that have an impact on CoC institutions.

Table 21 Perceptions of Supervisors and Assessors on Factors Related to CoC Institution

Influencing factors	Respondent Group	Mean (M)	Standard Deviation (SD)
CoC has Institutional Autonomous to perform its missions	Supervisors	2.71	1.29
	Assessors	2.97	1.15
CoC has a functional board.	Supervisors	2.43	1.28
	Assessors	2.26	1.15
Regional Industry Body perform with CoC	Supervisors	1.97	0.91
	Assessors	2.31	1.22
Zonal or Sub-city industry body Perform with CoC	Supervisors	2.41	1.19
	Assessors	2.24	1.17
Assessment is similar with work place competency	Supervisors	2.08	0.96
	Assessors	2.77	1.21
Assessment feedback is given for TVET institutions	Supervisors	3.00	1.32
	Assessors	2.43	1.16
Registrars experts have required ethics for the work	Supervisors	3.38	1.23
	Assessors	3.36	1.22
Aggregated Mean	Supervisors	2.57	1.17
	Assessors	2.62	1.18

Source: Own survey, *2023*

As can be observed from Table 21 above, except for the ethical performance of the registrars' experts (mean=3.38 and 3.36), all items were rated as unfavorable (mean<3), indicating that supervisors and assessors are dissatisfied with CoC institutions' current situation. Though the Ministry of Labor and Skill states that all Centers of Competency Assessment have the autonomy to perform their duties in collaboration with key stakeholders (MoLS, 2022), the aggregated mean scores for both groups (supervisors M = 2.57, SD = 1.17; assessors M = 2.62, SD = 1.18) indicate that these items can hinder competency assessment practice.

Research suggests that competency assessment centers should collaborate with industries to employ qualified assessors and use their workplaces as assessment centers. The National Association of Manufacturers' 2022 report highlights the need for skilled individuals in crucial positions. Some firms use competency testing institutes to assess skills, inform hiring, and develop (Smith & Johnson, 2023). However, the data showed that the connection between competency assessment centers and industries is weak, as shown by the low ratings of the items 'Regional Industry Body performs with CoC' and 'Zonal or Sub-city Industry Body performs with CoC,' which have average scores below 3, suggesting that improvements are needed.

Interviews with directors of regional CoC Institutions revealed a lack of institutional autonomy and unfair, non-transparent assessor recruitment practices. Furthermore, the sector suffers from a lack of full and adequate ownership of industry and expertise, regional inconsistencies, reliance on individual assessors, and a certification process that fails to present qualified candidates on the organizational website to assist end users. For example, a *CR1* emphasized his perspective, stating:

> *The CoC Agency faces institutional challenges, including the lack of a supportive board that links the system to the industry. Assessors are redundant, and the clustering process burdens candidates who must travel a long distance for assessments.*

Further interviews with TVET deans about CoC institutions revealed that an inefficient board and non-industry assessors hinder the system's transition to the industry. Assessment centers struggle with facility concerns such as the lack of a generator power supply for occupations needing computers and machines for practical exams, and the cluster system does not prioritize candidates. The system lacks transparency, assessors receive no capacity training, and assessments occasionally halt abruptly. TVET colleges receive no skill gap analysis. A *TDR4* expressed his perspective as follows:

Structural decentralization benefits CoC Institutions, while TVET institution autonomy, budget restrictions, and corruption hinder success. Using TVET colleges as assessment centers can make it difficult for these organizations to maintain machinery and manage training programs.

Interviews with CoC focal persons reveal cluster organization issues affecting candidates traveling for exams, governance difficulties, and risk to assessment quality. Rising raw material costs limit the institute's budget for TVET colleges, and most factors negatively impact competency assessment. Further, interviews with industry representatives reveal that most factors negatively impact assessment practice, including the CoC institution's inability to execute missions, lack of industry board structure, low industry participation, non-transparent assessor recruitment process, and inappropriate use of only one assessor.

The analysis of the aforementioned responses and quotes suggests that the majority of factors affecting competency assessment in CoC institutions are unfavorable, with a lack of institutional autonomy, industry linkage, and a single assessor being key determinants. These challenges need to be addressed to improve the effectiveness of competency assessments in CoC institutions.

Table 22, below, which presents supervisors and assessors' views on factors related to assessment tools, offers a broader view of the practice of assessment tools within the competency assessment landscape in Ethiopia.

Table 22 Perceptions of Supervisors and Assessors on Factors Related to Assessment tools

Factors Related to Assessment tools	Respondent Group	Mean (M)	Standard Deviation (SD)
Assessment Tools preparation based on OS	Supervisors	2.72	1.26
	Assessors	2.92	1.27
Assessment Tools Secured by COC	Supervisors	3.27	1.16
	Assessors	3.41	1.30
Assessment Tools Secured by Assessment Centers	Supervisors	3.08	1.18
	Assessors	3.10	1.28
Language of Assessment tool is clear and easily understandable	Supervisors	2.56	1.20
	Assessors	3.26	1.16
Assessment tool questions are deep and measure logical thinking	Supervisors	3.11	1.29
	Assessors	2.35	1.19
Aggregated Mean	Supervisors	3.00	1.20
	Assessors	3.01	1.24

Source: Own survey, 2023

As presented in table 22 above, CoC institutions and assessment centers perceive positive factors regarding assessment tools. Assessors rated assessment tools as not easily accessible and clear to understand (M = 3.26, SD = 1.16). Supervisors have a lower perception of clarity and understandability of assessment tools (M = 2.56, SD = 1.20), suggesting room for improvement. Assessors respond unfavorably to deep, logical thinking questions (M = 2.35, SD = 1.19), indicating a need for improvement. The data analysis emphasizes the importance of aligning assessment tools with industry demands and ensuring secure implementation. Both supervisors and assessors rated the alignment of assessment tools with occupational standards negatively. It indicates that the assessment tool did not meet industry demand. The overall aggregated mean scores for supervisors (M = 3.00, SD = 1.20) and assessors (M = 3.01, SD = 1.24) suggest that most factors related to assessment tools slightly positively influence the practice of the assessment system. However, there are still areas that require improvement.

Table 23 provides the responses of candidates' perspectives on assessment tool issues, offering a broader perspective on the competency assessment field in Ethiopia, emphasizing the importance of these tools.

Table 23 Perceptions of candidates on Factors Related to Assessment tools (N=1315

Items	Mean (M)	Standard Deviation (SD)
Assessment tools fitting with the demand of Industry	2.40	1.17
Assessment tool questions are clear and easily understandable	2.33	1.13
Assessment tool instruction are clear	2.99	1.35
Time given in the Assessment tool fits with given projects	2.94	1.25
Assessment tool question measure deep thinking	2.32	1.16
Assessment tools are secured	2.32	1.17
Aggregated Mean	2.55	1.21

Source: Own survey, 2023

As observed in Table 23 above, candidates have rated all items below the expected mean value, i.e., mean <3, suggesting that the assessment tools were not prepared properly to measure the purpose they were developed for in terms of ‘fitting to industry demands’

(mean=2.40; SD=1.17). The clarity and understandability of assessment tools: Assessors and supervisors generally perceive items slightly positively, while candidates perceive them negatively. This discrepancy reflects the limitations of the current assessment tool and the need for competency assessment improvement in Ethiopia.

In the interview with the CoC Agency's directorates, they replied that assessment tools were insufficiently aligned with occupational standards, had limited versions, and failed to accurately measure candidates' knowledge, skills, and attitudes, particularly in hard skills like construction, design, and computerized parts. Quantitative data from candidates supports these findings.

The feedback from TVET deans indicated that the assessment tools were inconsistent with occupational standards, lacked adequate time for practical projects, and provided inadequate time for automated assessments to corroborate results. A *TDR4* said, "*The assessment tool was deficient in its version, incompatible with occupational standards, and inadequately developed with respect to local machines and materials."*

Interviewed CoC focal persons have also mentioned the following challenges regarding assessment tools: insufficient time for actual tasks, lack of coherence with professional requirements, and improper dimensions. Focus group discussions made with trainers also showed that the assessment tools lack clear criteria and are incompatible with industry demand. In addition, interviewed industry representatives responded that the assessment tools do not meet industry demands or occupational standards.

The analysis of responses and quotes indicates that the respondents rated the majority of factors affecting competency assessment in relation to assessment tools unfavorably, which implies that the assessment tools were not designed in the proper manner that fits their purpose. Data shown in Tables 22 and 23 indicate that assessment tools do not match occupational standards, updated versions are scarce, assessment criteria are unclear, practical project time is insufficient, and requirements are poorly specified.

Table 24 provides an overview with supervisors' and assessors' perspectives on assessment centers.

Table 24 Perceptions of Supervisors and Assessors on Factors Related to Assessment Centers

Items	Respondent Group	Mean (M)	Standard Deviation (SD)
Assessment has been given with Accredited industry Assessment Centers	Supervisors	2.97	1.18
	Assessors	2.31	1.27
Assessment has been given with Accredited TVET institutions	Supervisors	3.41	1.27
	Assessors	3.70	1.03
Assessment Centers have required materials and facilities according to the OS	Supervisors	3.33	1.30
	Assessors	2.27	1.09
Assessment Centers have focal persons to facilitate the assessment	Supervisors	3.23	1.19
	Assessors	3.60	1.22
Assessment Centers have shop assistance	Supervisors	3.30	1.15
	Assessors	3.64	1.19
Shop assistance has Occupational Ethics	Supervisors	3.19	1.22
	Assessors	3.67	1.13
Assessment Centers are Proximate to Candidates	Supervisors	3.02	1.14
	Assessors	2.54	1.26
Aggregated Mean	Supervisors	2.7	1.00
	Assessors	2.6	0.96

Source: Own Survey, 2023

Table 24 above demonstrates that both supervisors and assessors have evaluated competency assessments performed in accredited industry assessment centers with a rating below 3, signifying a shortage of industry assessment centers. Assessors view the distance between centers and candidates as an impediment, leading to scores below 3.00, while supervisors regard it marginally positively (M=3.02; SD=1.14). Both assessors and supervisors assigned ratings exceeding 3.00 to elements such as the accreditation of TVET institutions, focal persons, shop assistance, and commitment to occupational ethics, but they assessed the remaining items poorly. The low average scores of supervisors (mean = 2.70) and assessors (mean = 2.60) suggest that assessment centers are operating in an unfavorable work environment, which negatively impacts the quality of assessment practice.

Table 25 Perceptions of Candidates on Factors Related to Assessment Centers

Items	Mean (M)	Standard Deviation (SD)
Assessment Centers equipped with required facilities based on standards	2.24	1.14
Working tools and machinery in the Assessment Center are standardized and functional	2.13	1.05
Assessment Centers have focal persons that give adequate information	3.01	1.38
Assessment Centers are near to the candidates	2.24	1.13
Aggregated Mean	2.41	1.18

Source: Own Survey, 2023

As indicated in Table 25 above, candidates evaluated nearly all items negatively (mean values <3). The exceedingly low aggregate mean value (2.41) indicates that candidates perceived the working circumstances of the assessment centers as inadequate for conducting quality competency assessments that accurately assess their competencies. The Ministry of Labor and Skills (2022) and Thornton and Lievens (2019) underscore the need for consistency in administration and scoring procedures for ensuring reliability and validity. Nonetheless, the data revealed that the majority of assessment centers are TVET institutions deficient in standards and accessibility to candidates, highlighting the necessity for enhanced standards and facilities. Furthermore, the researcher performed observations in the assessment facility. The findings revealed that the workshop dimensions were inadequate to accommodate the specified number of candidates, lacking sufficient ventilation, lighting, occupational health and safety facilities, and accessible entry and exit points, as well as functional equipment, tools, instruments, and materials for practical assessments. In summary, the majority of assessment centers lack adequate competency assessment resources in alignment with established standards and assessment principles.

For quality competency assessment, assessors must possess certain competencies such as technical expertise and industrial experience, impartiality, and free from conflicts of interest or biases. Table 26 presents the view of supervisors and candidates on the quality of assessors measured in different dimensions.

Table 26 Perceptions of Supervisors and Candidates on Factors Related to Assessors

Items	Respondent Group	Mean (M)	Standard Deviation (SD)
Assessors' Competency is adequate to assess Candidates	Supervisors	2.76	1.15
	Candidates	2.13	0.95
Assessors have Occupational Ethics	Supervisors	2.33	1.13
	Candidates	2.21	1.03
Assessment is conducted by more than one assessor	Supervisors	2.75	1.23
	Candidates	2.23	1.14
After completing the assessment, the assessors provide clear feedback to the candidate	Supervisors	2.66	1.07
	Candidates	2.26	1.13
Assessors have Industry Experience	Supervisors	2.77	1.20
Assessment is conducted by TVET Trainer	Supervisors	2.94	1.28
Assessment is conducted by Industry Assessor	Supervisors	3.04	1.25
Renew/revoke the accreditation of assessors based on the result of monitoring and evaluation	Supervisors	2.7	1.00
Aggregated Mean	Supervisors	2.73	1.19
	Candidates	2.21	1.06

Source: Own Survey, 2023

Table 26 illustrates that the mean scores for all questions varied between 2.13 and 2.77, indicating poor ratings. This suggests that both supervisors and candidates believe the assessors involved in competency assessment lacked the necessary competencies to perform competency assessments effectively. This is closely associated with the validity and reliability (acceptability) of the assessment results that assessors provide for determining the competence level of candidates.

International experiences and principles of assessment suggest that multiple assessors with industry experience should conduct assessments (Wesselink *et al*., 2017). The data in Table 26 indicates that single assessors without industry experience often conduct assessments (supervisors' mean = 2.75; candidates = 2.23). The aggregated mean scores for both supervisors (M = 2.73) and candidates (M = 2.21) suggest less qualified assessors were involved in the assessment process in practice, implying a negative influence on the quality of competency assessments.

Table 27 Independent Samples T-Test Analysis between Supervisors and Candidates

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig	t	Sig.
Factors related to assessors influencing competency assessment	Equal variances assumed	6.077	.014		
	Equal variances not assumed			3.794	.000

Source: Own Survey, 2023

The study reveals a significant difference in perceptions between supervisors and candidates regarding factors influencing competency assessments related with quality of assessors. The average disparity is 0.02960, with a standard deviation of 0.00780. The supervisor's mean score is 2.73, while the candidate's score is 2.21. This discrepancy is due to supervisors recruiting and training assessors, who have a direct conflict of interest with the candidates they assess (MoLS, 2022).

Regarding the competencies of assessors, interviews conducted with CoC directorates revealed that assessors involved in assessment lacked assessment-related competencies, professional ethics; focus on financial benefit, transparency, corruption, industry experience, consistency, and fair decisions made by individual assessors. A *CR4* noted that:

> *"Assessors' agreement with supervisors is a positive factor, but other issues such as lack of competency, professional ethics, financial gain, and single assessors negatively impact the practice."*

Assessors are vital in evaluating skills, knowledge, and talents in a fair, objective, and reliable manner. Focus group discussions revealed critical factors affecting competency assessment practice, including single assessors assessing 30 candidates per session, suspicions of corruption, incompetence, lack of industry recruitment, lack of commitment to psychological preparation, and unethical behavior among some assessors.

The analysis of responses and quotations reveals that the majority of factors impacting competency assessment practices by assessors exert a detrimental effect, consistent with the findings illustrated in Table 26. The issues encompass insufficient assessor skills, absence of professional development for assessors, reliance on single assessors for evaluations, and a lack of transparent feedback for candidates.

In assessment process, supervisors oversee competency assessment systems, evaluating and managing candidate grievances. Table 28 presented the responses of assessors and candidates on factors affecting supervisors, highlighting the importance of competent supervisors in assessment.

Table 28 Perceptions of Assessors and Candidates on Factors Related to Supervisors

Items	Respondent Group	Mean (M)	Standard Deviation (SD)
Assessment supervisors are competent in skills assessment methodology and principles	Assessors	2.64	1.34
	Candidates	2.21	1.09
Assessment Supervisors handle complaints of candidates	Assessors	3.07	1.21
	Candidates	2.21	1.06
Assessment Supervisors are committed and ethical in follow-up of the assessment process	Assessors	2.66	1.30
	Candidates	2.96	1.34
Competency of Supervisors is related to occupations of assessment	Assessors	2.21	1.18
	Candidates	-	-
Aggregated Mean	Assessors	2.65	1.26
	Candidates	2.46	1.16

Source: Own Survey, 2023

The analysis indicated that only the dimension of supervisors' handling of complaints exceeded the 3.00 threshold, which candidates strongly opposed. The other three areas—supervisors' skills in assessment methods, their commitment and ethics, and their relevant job skills—each scored below the expected 3.00, which negatively affected competency assessment performance in Ethiopia.

In summary, the practical environment for CoC institutions, assessment centers, assessors, supervisors, and assessment tools significantly influenced the efficacy of competency assessments, which are mostly inadequate in the competency assessment practices of Ethiopia's TVET system.

4.6.2. The correlation and impact of determinant factors on Effectiveness of Competency Assessment

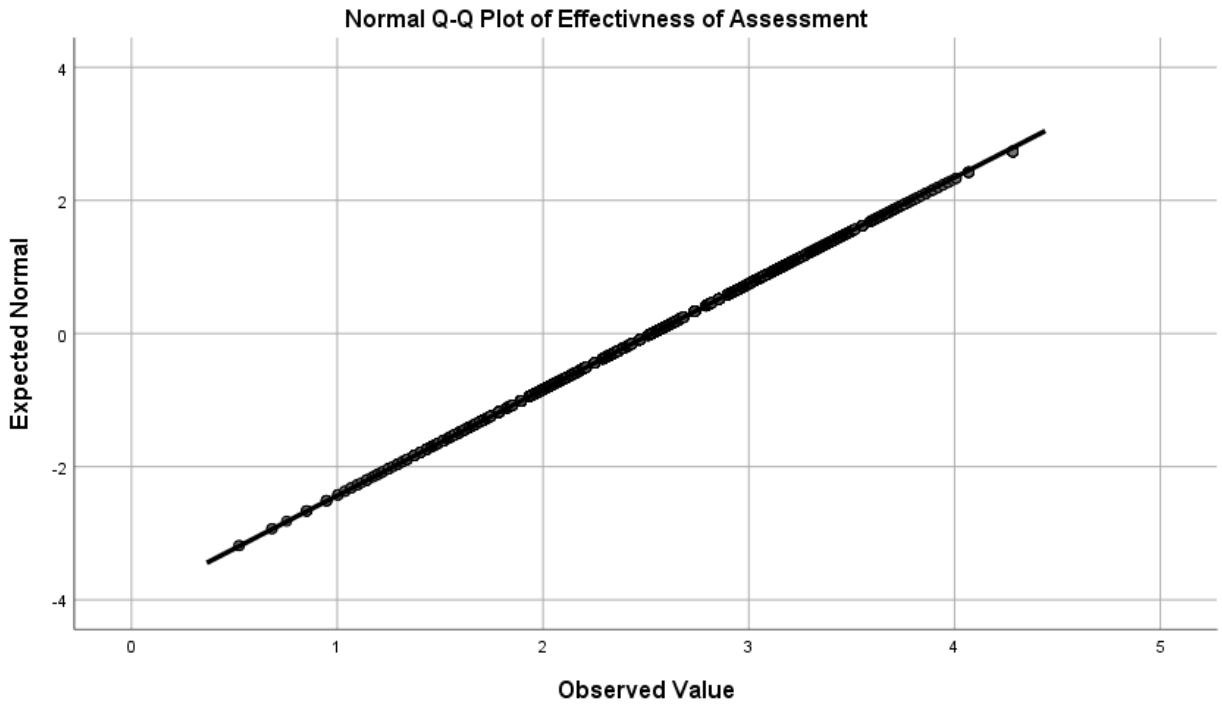
Multiple Linear Regression Analysis

Conduct multiple regression analysis to determine the impact of the independent variable on the dependent variable. Multiple regressions are employed to assess the overall model fit (explained variance) and the individual contribution of each predictor variable to the total explained variance. This section employs multiple regression analysis to ascertain the statistically significant association between the effectiveness of competency assessment and factors associated with CoC institutions, assessment tools, assessment centers, assessors, and supervisors. Furthermore, you may build an equation that illustrates the correlation between the dependent variable (effectiveness of competency assessment) and the independent variable (factors). This segment of the study incorporates a regression model to evaluate hypotheses. The hypothetical statement is constructed based on the five variables utilized in this study to derive the results. A confidence interval of less than 95% was employed for all hypotheses in the investigation. Brown (2015) asserts that the proper application of a multiple regression model necessitates the fulfillment of many critical assumptions to validate the model's use. To guarantee the reliability and fairness of the regression results, the assumptions of the regression analysis are verified. The conclusions and generalizations regarding the theory are valid solely when the hypothesis of the analysis has been tested and demonstrated to be dependable. Prior to doing multiple regression analysis, researcher has confirmed that the data satisfies the essential assumptions for reliability and validity. The subsequent assumptions of multiple linear regression are evaluated utilizing SPSS version 26.

1. Linearity assumption*:* Linearity characterizes the dependent variable as a linear function of the independent variable (Brown, 2015). Moreover, linearity denotes the extent to which variations in the dependent variable correspond to alterations in the independent variable. Evaluate the linearity assumption by creating a normal probability plot to examine the relationship between each independent variable (factor) and the dependent variable

(efficiency of competency assessment). The standardized result in the normal probability plot of the regression is positioned along the typical diagonal line extending from the lower left corner to the top right corner in Figure 11 below:

Figure 7: Linear relationship



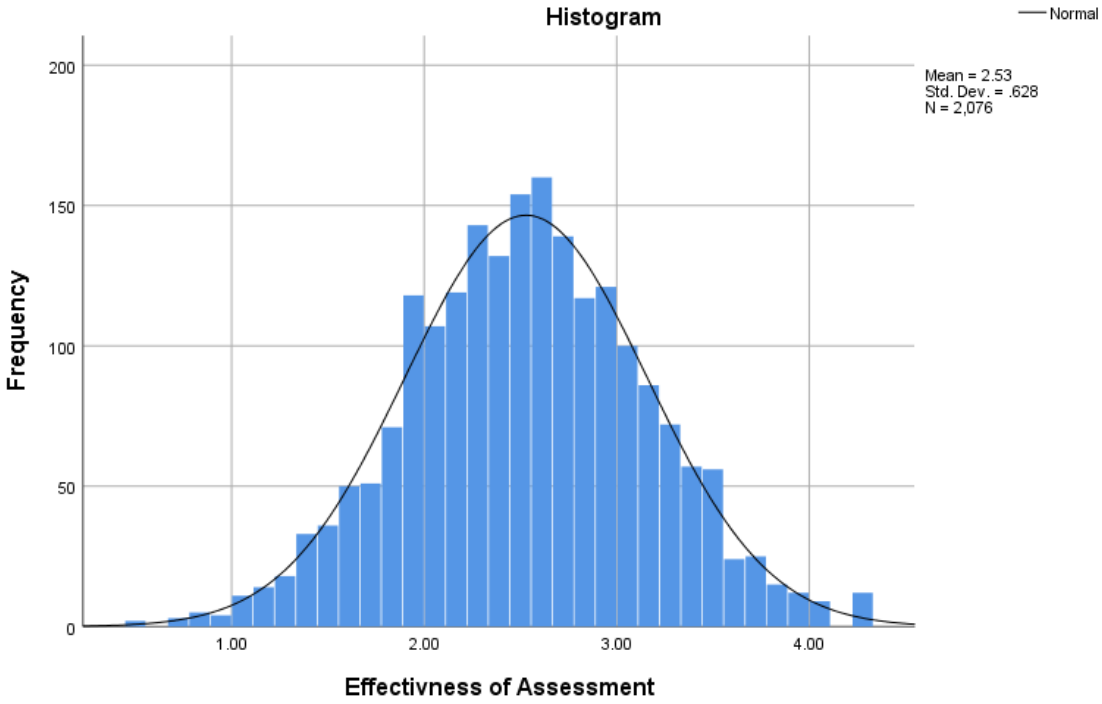
Source: Researcher, 2023

The visual observation of the normal probability plot indicates a linear relationship between each independent variable and the dependent variable of this study, as illustrated in the above figure. The plot contains data points, represented as small circles that indicate the actual quantiles of the observed data, while a straight reference line represents the ideal normal distribution. If the data follows a normal distribution, the points should lie close to this line. In this case, the data points align closely with the reference line, suggesting that the dataset follows a normal distribution. There are no significant deviations or outliers, further supporting the assumption of normality. Based on this Q-Q plot, it can be concluded

that the effectiveness of assessment data appears to be normally distributed, making it suitable for parametric statistical methods that rely on this assumption.

2. Normality assumption: Normality refers to a symmetrical bell-shaped distribution, where the central fractional frequency is the highest and the extreme frequencies are smaller. Multiple regression assumes that the variables exhibit a normal distribution. This scenario indicates that the error is normally distributed, and the residual values resemble a normal curve. The standard method for assessing the normality assumption is through a histogram with an overlaid normal curve.

Figure 8: Normality Assumption Test



Source: Researcher, 2023

The distribution appears approximately normal, with a peak around a score of **2.5** and a slight right skew. Key statistical values are provided in the top-right corner: the mean score is **2.53**, the standard deviation is **0.628**, and the total sample size is **2,076**. The presence of a normal curve suggests that the data is close to a normal distribution, though there is a

slight skewness. Overall, the histogram indicates that most assessment effectiveness scores cluster around the mean, with fewer occurrences at the lower and higher ends of the scale.

The histogram illustrates the distribution of the dependent variable "Effective Competency Assessment" based on 2076 observations. This investigation is a thorough study based on the characteristics of the histogram. The histogram exhibits a bell-shaped curve, indicating a normal distribution. This sign signifies that the values for "Effective Competency Assessment" are symmetrically distributed around the mean. The standard deviation equals 0.628. This value signifies that the scores are fairly dispersed around the mean. The majority of scores are anticipated to reside within the interval of roughly 1.90 to 3.16 (mean ± 1 standard deviation). The sample size of 2,076 renders the findings statistically robust. An extensive sample size improves the accuracy of mean and standard deviation computations. The histogram indicates that the peak frequency of scores occurs near the middle (2.5), with a progressive decrease in frequency towards both the lower (1) and upper (5) extremes of the scale. This pattern validates the trend of normal distribution.

3. Multi-collinearity assumption*:* Linear regression presupposes that the data is either univariate or multivariate. Prior to presenting a regression model, it is essential to ensure that there is no excessive multi-collinearity among the independent variables in the model. An accurate relationship between at least one independent variable and a predicted variable, or a combination of independent variables, may lead to erroneous conclusions regarding the relationship between dependent variables and predictive factor variables (Kyriazos and Poga, 2023). When independent variables exhibit strong correlation, it becomes challenging to ascertain the specific contributions of each variable in forecasting the dependent variables' outcomes. The diagnostic agents of collinearity can assist researchers in addressing issues related to the potentially ambiguous correlation matrix.

Shrestha (2020) states that tolerance is the reciprocal of the VIF. A lower tolerance increases the likelihood of multi-collinearity among the variables. A VIF value of 1 signifies that the independent variables are uncorrelated with one another. A VIF value between 1 and 5 indicates substantial correlation among the variables. The critical threshold for VIF ranges from 5 to 10, indicating the presence of highly linked variables.

If VIF is between 5 and 10, multi-collinearity exists among the predictors in the regression model, whereas a VIF greater than 10 signifies that the regression coefficients are poorly estimated due to multi-collinearity.

Table 29 Multi-collinearity Test Result

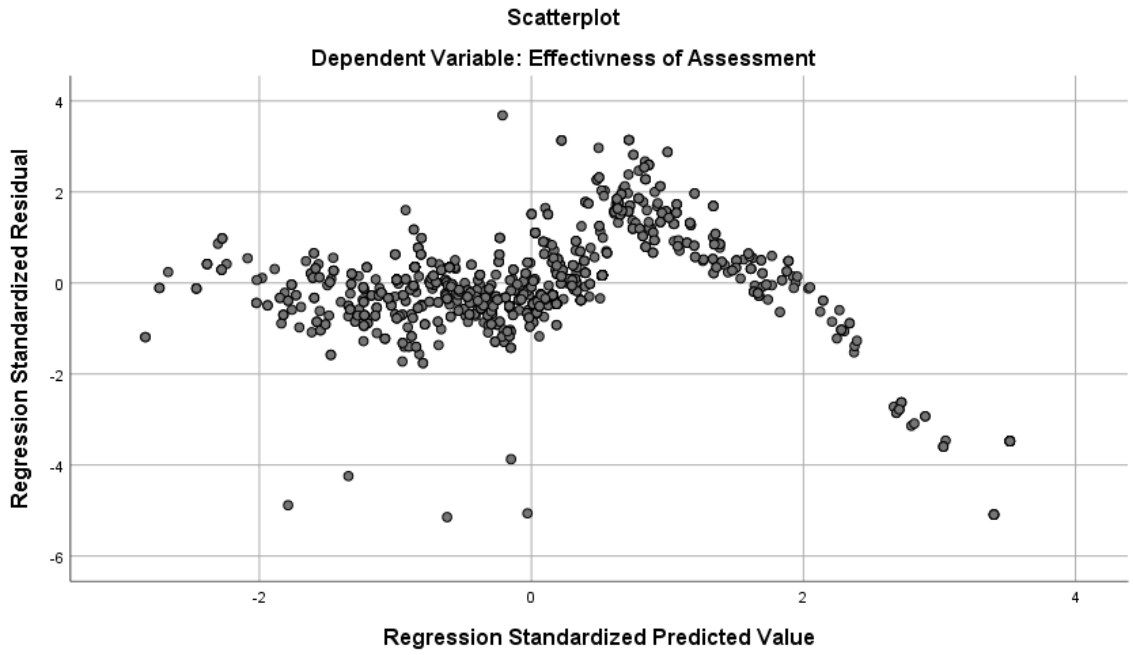
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CoC Institutions	.542	1.844
	Assessment Tool	.539	1.857
	Assessment Centers	.517	1.935
	Assessors	.592	1.689
	Supervisors	.603	1.659

Source: Researcher, 2023

The multi-collinearity test table 29 demonstrates that the multiple linear regression model does not face multi-collinearity issues. This conclusion is due to the variance inflation factor (VIF) values being below 2.0, significantly lower than the standard threshold of 10, and the tolerance values exceeding the 0.1 threshold. This means that each independent variable has enough variance to be ignored by other model variables. The VIF value ranges from 1.659 to 1.935, while the variable's tolerance spans from 0.517 to 0.603. Consequently, independent (predictor) variables do not exhibit overlap or strong correlation. They exhibit no multi-collinearity issues that could impede the prediction of multiple linear regression models.

4. Homoscedasticity assumption*:* Assumptions of uniform estimation indicate equivalent error variance across all layers of independent variables. This indicates that the errors are perpetually distributed among the variables. The visual examination of standardized residual plots can be validated through the visual assessment of standardized residual parcels alongside standardized regression predicted values. If the dispersion is non-uniform, heterothermic heat is exhibited. Fan and butterfly configurations represent common patterns of infringement. Consequently, researchers have generated a scatter plot of standardized waste utilizing the SPSS software package.

Figure 9: Homoscedasticity Assumption Test



Source: Researcher, 2023

As shown in Figure 13, the standardized residuals in this study are uniformly distributed, and the conclusion is that heteroscedasticity is not a serious problem with the data.

Ideally, for a well-fitting regression model, the residuals should be randomly and symmetrically distributed around zero, without forming a distinct pattern. However, in this scatterplot, the residuals exhibit a curved pattern, suggesting potential issues with linearity, heteroscedasticity, or model specification. The presence of non-random clustering and deviations from a uniform spread implies that the assumption of homoscedasticity may be violated, meaning that the variability of residuals changes across different levels of the predicted values. This pattern indicates that a nonlinear model or a transformation of variables might be more appropriate for better model fit.

5. Autocorrelation Test*:* This condition occurs when the residues are interdependent. The multiple linear regression technique necessitates minimal or absent autocorrelation in the

data. If the covariance of the error terms over time is zero, autocorrelation among the residuals is absent. The Durbin-Watson test is employed to assess autocorrelation. The SPSS software provides a Durbin-Watson option in the regression analysis feature for calculating results. Consequently, the researcher employed the Durbin-Watson test to assess autocorrelation. The Durbin-Watson statistic ranges from 0 to 4; a value near 2 suggests the absence of autocorrelation.

The table in this text consists of three columns: "R," "F," and "DF," which represent the correlation coefficients and degrees of freedom (DF) of independent and dependent variables. The F ratio indicates the model's fit to the data, while DF represents the number of independent values that can be changed without breaking constraints. The "Sig. F" column indicates the statistically significant relationship between the two variables, with a P-value of less than 0.05 indicating a significant relationship.

Table 30 Autocorrelation Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.990[a]	.980	.980	.08827	.980	13108.947	5	1309	.000	1.600

a. Predictors: (Constant), COC Institutions, Assessment Tools, Assessment Centers, Assessor, Supervisors
b. Dependent Variable: Effectiveness of Competency Assessment

Source: Researcher, 2023

The Durbin-Watson statistics indicate a residual independence assumption, with a Durbin-Watson value of 1.600. The five full tests indicate no major data problems that could violate the multiple regression assumptions. A multiple regression analysis was done to see how well the model works, how much the independent variable can predict the dependent variable, and whether each independent variable's regression coefficient is statistically significant. The results suggest no major data problems could lead to serious violations of the multiple regression assumptions.

Table 31 Model Summary result

Model	R	R Square	Adjusted R Square	SE	Change Statistics					Durbin-Watson
					R Square Change	F Change	df 1	df 2	Sig. F Change	
1	.990[a]	.980	.980	.08827	.980	13108.947	5	1309	.000	1.600

a. Predictors: (Constant), Supervisors, Assessors, Assessment Tools, CoC Institutions, Assessment Centers

b. Dependent Variable: Effective Assessment System

Source: Researcher, 2023

The regression analysis model demonstrates a strong positive linear relationship between predictors and dependent variables, specifically the Effective assessment system. It explains 98% of variation, with R-squared values of 0.980 and 0.98, indicating strong population generalization. The model's R Square Change is 0.980, indicating all predictor factors account for 98% of variation. The F Change value of 13108.947 indicates high statistical significance, indicating that adding predictors improves the model's forecasting. The model was estimated using 2,076 observations and has five predictors. The model is robust, accounting for 98% of variability, and is highly specific and applicable to the entire population. These numbers highlight the importance of predictors in understanding competency assessment effectiveness.

As shown in Table 32, the effectiveness of Competency assessment had significantly positive and high associations with factors related to Assessment Center (r = .799), assessment tool development and handling (r = .778), CoC institutions (r=.752), assessors (r=.748), and supervisors (r= .674) at $p < .01$.

The observed relationships suggest that improving one aspect, such as Assessment Tools, can have a beneficial impact on other aspects, such as Assessment Centers and Effective Competency Assessment. Despite falling below the middle of the scale (3), the mean scores indicate a generally positive impression of the factors, suggesting possible areas for development. The interdependence above underscores the need of adopting a

comprehensive strategy to enhance competency assessment within the framework of the research.

Table 32 Mean, standard deviation, and Inter-Correlations among the study variables

Variables	1	2	3	4	5	6	M	SD
1. CoC Institutions	1						2.46	0.78
2. Assessment Tools	.559**	1					2.74	0.75
3. Assessment Centers	.458**	.596**	1				2.59	0.85
4. Assessors	.579**	.513**	.550**	1			2.29	0.75
5. Supervisors	.381**	.330**	.577**	.436**	1	.	2.56	0.88
6. Effective Competency assessment	.752**	.778**	.799**	.748**	.674**	1	2.53	0.63

N= 2076, **. Correlation is significant at the 0.01 level (2-tailed).
Source: Researcher, 2023.

The study uses multiple regressions to analyze the effectiveness of a competency assessment system. Beta coefficients measure the strength and direction of variable relationships, and standardized coefficients allow for direct comparisons discussed in Table 33 below.

Table 33 Regression coefficients of effectiveness of competency assessment

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	SE	Beta			Tolerance	VIF
1	(Constant)	-.065	.010		-6.363	.000		
	CoC Institutions	.206	.004	.271	51.649	.000	.542	1.844
	Assessment Tool	.202	.005	.232	43.967	.000	.539	1.857
	Assessment Center	.206	.004	.259	48.071	.000	.517	1.935
	Assessors	.205	.004	.244	48.590	.000	.592	1.689
	Supervisors	.199	.004	.255	51.177	.000	.603	1.659

a. Dependent Variable: Effective Assessment system

Source: Researcher, 2023

Table 33, indicated statistical analysis complements earlier descriptive and correlational findings by offering causal inferences within the limits of a non-experimental design. All core assumptions of regression—linearity, normality, homoscedasticity, independence of residuals, and absence of multi-collinearity—were tested and met, validating the use of multiple regression for this context. Additionally, the final regression equation can be formulated as follows (using unstandardized coefficients):

Effectiveness = -0.065 + 0.206(CoC) + 0.202(Assessment Tools) + 0.206(Assessment Centers) + 0.205(Assessors) + 0.199(Supervisors). This equation quantitatively demonstrates how changes in each factor predict changes in competency assessment effectiveness.

Further, the study finds that "Influencing factors related to CoC Institutions" have the greatest impact on Effectiveness, followed by "Assessment Centers" with the second-largest standardized coefficient. The predictor "Assessment Tool" has relatively the least impact. All t-values show significant contributions, indicating each predictor variable significantly affects Effectiveness of competency assessment. The model has no substantial multi-collinearity issues, and the coefficients table shows that "CoC institutions" showing the highest standardize effect. "Assessment Centers" predict the effective assessment system in second place. Other components also contribute significantly (Keith, 2019). The model appears well-defined, highlighting key competency assessment system success factors. Therefore, prioritizing the resolution of CoC institutional issues and following other predictors are crucial.

Chapter Five

5. Discussion of the Findings

5.1. Introduction

The preceding chapter focused on the presentation and analysis of the study derived from both quantitative and qualitative data, which culminated in the study's findings. This chapter discusses assessing the main findings of the study in accordance with the study's objectives. The achievement of the study's objective will be assessed in relation to relevant literature, guided by the following research questions:

1. How are relevant stakeholders (line ministries, industries, CoC directorates, TVET deans, and trainers) involved and consulted during the formulation and development of Ethiopia's current TVET policy and strategy?
2. How do stakeholders (industries, TVET college deans, trainers, and candidates) perceive the occupational competency assessment and certification systems in Ethiopia?
3. To what extent does the implementation of occupational competency assessment align with established strategies, and principles?
4. What are the key determinants influencing the effectiveness of occupational competency assessment in Ethiopia from the perspectives of stakeholders?

5.2. Stakeholders (Ministries, Industries, CoC directorates, TVET deans, and trainers) involvement and consultation during the formulation and development of Ethiopia's 2020 TVET policy and strategy.

This section addresses the first research question that includes stakeholders' involvement and consultation on TVET policy and strategy development. The study found that the process of developing the Ethiopian TVET policy and strategy did not include enough participation from important stakeholders, which is necessary to make the policy and strategy suitable for the job market. In addition, data gathered from the regional states, such as Addis Ababa, Oromia, Amhara, Sidama, and Gambella, revealed a lack of substantive involvement by these industries in TVET policy and strategy formulation.

This suggests that without employers' engagement, TVET policy and strategy may not adequately align with the requirements of employing companies. Thus, many companies might perceive TVET as having limited relevance (Kis and Park, 2012). A systematic review of stakeholder participation in competency assessment frameworks also found that there wasn't enough diversity in the stakeholders who were involved (Lepre *et al*., 2021). Typically, practitioners, academics, employers, certifying organizations, and policymakers are involved, but service users and inter-professional colleagues often receive little attention. The authors suggest involving a wider range of stakeholders to ensure the implementation and effectiveness of the competency assessment framework.

According to UNESCO (2020), it is advantageous to involve the private sector in the development of targeted objectives of TVET through public-private partnerships (PPP). This approach is in alignment with the overarching goals of ensuring relevance and quality. While government representatives are adept at managing the formal aspects of designing training objectives, policies, and governance, the inclusion of private sector representatives introduces a unique perspective. Such involvement can lead to innovative ideas and effective methodologies for regular operations. Thus, there is a strong emphasis on incorporating industries in decision-making processes, in the formulation of TVET policies, and in their subsequent implementation. In addition, Pinnow (2019) highlighted that stakeholders such as trade unions and associations express significant interest in vocational training issues, influencing vocational training policy in their favor. In the Ethiopian scenario, there appears to be a gap in stakeholders' engagement. Data suggests that the Ministry of Labor and Skills has focused on raising awareness about the developed policy document rather than actively involving entities like the Ethiopian Chamber of Commerce and Sectorial Association from the very beginning in the policy development process. This oversight could pose significant challenges not only to the relevance of TVET but also to the effectiveness of policy implementation.

In addition, the "TVET Sector Strategic Plan, 2023-2032" underscores the significance of stakeholder involvement in improving the efficacy of technical and vocational education

and training (TVET). Collaboration among governmental bodies, industry stakeholders, and educational institutions is crucial for enhancing the TVET sector, as it promotes a multi-stakeholder strategy to devise complete solutions. Involving diverse stakeholders through dialogues and consultations facilitates the identification of obstacles and potential enhancement methods. Public-private partnerships are promoted to improve program quality and ensure training fits with market requirements. Feedback systems are essential for fostering ongoing development, whereas advocacy initiatives seek to enhance awareness of the significance of TVET, thereby increasing enrollment and involvement. These notions collectively establish a unified framework for tackling the difficulties encountered by the TVET sector (Lamsal & Bajracharya, 2023).

Like many African nations, Ethiopia grapples with a negative public perception of Technical and Vocational Education and Training (TVET). Often, TVET is associated with low-status occupations, inadequate wages, and limited opportunities for personal growth. This perception stems in part from a quality deficit, which hinders TVET graduates from effectively competing in the labor market. Consequently, students who do not qualify for higher education view TVET as a fallback (MoE, 2008). To address this perception, both the 2020 and 2008 Ethiopian TVET strategies have prioritized raising awareness (MoE, 2008; MoSHE, 2020). However, as observed in the findings, it's evident that the Ministry of Labor and Skills hasn't effectively communicated the 2020 TVET policy and strategy to key stakeholders, including pioneer implementers, trainers, and industry representatives in Ethiopia. This suggests certain limitations in the policy formulation process. To bridge these gaps, it is imperative for the relevant authorities to ramp up engaging awareness-creating campaigns targeting pertinent stakeholders. Additionally, the authorities should strive to foster consensus and incorporate stakeholder feedback into upcoming regulations and guidelines. Such feedback could include industry incentives for those providing their facilities for cooperative training and competency assessments.

The research revealed a discrepancy between the formulation of TVET policies and employer involvement, which could potentially lead to a misalignment with industry requirements and a decline in the relevance of the TVET system. Involving many

stakeholders in discussions helps identify issues and potential improvements, while public-private partnerships align training with market demands. Strong feedback mechanisms and advocacy programs are crucial for enhancing TVET awareness and enrollment. The TVET policy formulation in Ethiopia needs to be enriched with diverse perspectives from industry representatives and service users. Customizing training programs to meet local sector requirements can enhance the employability of graduates. Incorporating sectoral groups and trade unions in competency assessments can ensure that evaluations accurately represent labor market realities. By addressing these issues, policymakers can create a more inclusive, relevant, and efficient TVET system that meets the growing demands of the Ethiopian labor market. Consulting and involving relevant stakeholders is crucial for graduates to demonstrate employability skills, knowledge, and attitude in the job, which in turn leads to graduate employment (Geressu, 2017).

5.3. Stakeholders' perception of occupational competency assessment and certification systems in Ethiopia.

This section addresses the second research question, which dealt with stakeholders' perception of occupational competency assessment. The primary objective of competency assessment is to verify that professionals adhere to industry benchmarks, with the aim of achieving expected performance levels nationally. The study revealed that competency assessment, while valuable for societal development, is often perceived negatively due to its lack of relevance, insufficient feedback, technical deficiencies, and inherent biases. It also found that competency evaluations are a waste of resources and do not enhance creativity or improve future job prospects. Key stakeholders are worried about how well competency assessments work and their fairness, with problems like ethical concerns, candidate stress, corruption in the system, and lack of standards leading to unfavorable views of these assessments in Ethiopia. The evidence indicates that different people have different perspectives on competency assessments because of their personal assessment experiences, societal standards, cultural values, and the perceived relevance of education and training (Rahmah & Muslim, 2019; Gasskov, 2018).

In Ethiopia, there is an active discussion among candidates, TVET college deans, trainers, CoC focal persons, and employers about the efficacy of the occupational competency assessment system. The evidence in the present study revealed that employers frequently observed skill deficits in new industry entrants, suggesting a potential discrepancy between assessments and actual job requirements. This has resulted in dissatisfaction among candidates and a perception within industries that competency assessments may not consistently reflect workforce quality. The main sources of unfavorable perceptions of occupational competency assessments include a lack of relevance to the industry, insufficient feedback, resource wastage, ethical concerns, and candidates' anxiety. The researcher addresses these issues in the following manner:

Relevance to the industry: Stakeholders described that competency assessment did not align with actual job demands. This misalignment may make it seem that the assessments don't accurately assess candidates' skills or the job's reality. Research indicates that to enhance employability and job preparedness, effective competency assessments need to closely align with industry requirements (Baraki, 2016). The relevance of competency assessment is vital for industries to identify and recruit suitable candidates, improve hiring decisions, and support career advancement. In a competitive job market, employers seek candidates with the necessary education, experience, and understanding of the job demands. Relevant competency assessments provide information about a candidate's skills, which helps with hiring and ensures the success of the organization (Braňka, 2016). However, this study indicated that employers were forced to provide additional training to new graduates certified by competency assessments, revealing a relevance gap with industry needs.

Feedback and Technical Issues: The effective assessment processes must have positive feedback mechanisms to facilitate continual progress (Woya, 2019). Wisniewski *et al.* (2020) also identified feedback as a crucial learning and goal-achieving element, yet its impact can vary. To improve their teaching and learning processes by analyzing skill gaps in candidates, TVET institutions need feedback from assessments. This approach benefits both the candidates and the overall educational quality. However, the way candidates and

TVET institutions were evaluated in Ethiopian TVET did not get enough feedback, which is necessary for candidates to strengthen their skills and for institutions to improve the quality of training. Furthermore, technical difficulties during assessments can compromise their integrity and adversely affect the quality of assessments, such as when assessment tools are not aligned with industry demand and more than 10 candidates are assessed per single assessor. Even though MoLS (2022) stated that one assessor evaluates ten candidates per session in the competency assessment directives. Despite recognizing the benefits of competency assessment in theory, stakeholders, including deans, CoC focal persons, employers, candidates, and trainers, view the practice of competency assessments skeptically.

Resource Wastage: Quantitative data from the study revealed that numerous stakeholders regard competency assessments as a waste of resources, lacking in promoting creativity or facilitating career development. This feeling is reflected in studies that challenges the efficacy of contemporary assessment techniques in fostering significant skill improvement (Shiri *et al*., 2023).

Ethical Concerns and Corruption: The study highlighted ethical issues pertaining to assessors and systemic corruption, which further erodes faith in the competency assessment process. Problems like forged certifications and the absence of standardized assessment criteria foster stakeholders' unfavorable perception. Prior research has indicated that integrity in assessment procedures is essential for preserving public trust and ensuring that evaluations accurately represent genuine competencies (Hayward & O'Donnell, 2024).

Anxiety Among Candidates: Data about anxiety encountered by candidates during assessments might adversely affect their performance and perspective of the procedure. Literature indicates that high-stakes examinations might induce considerable stress, thereby impeding candidates' ability to exhibit their genuine competencies (Jerrim, 2023).

In summary, the findings of this study indicated that disparity between theoretical goals and practical realities, along with ethical issues and insufficient feedback systems, fosters

a widespread adverse perception among stakeholders. Addressing these difficulties is crucial for improving the effectiveness and integrity of competency assessments throughout the country.

According to Gravells (2016), valid, relevant, sufficient, and authentic are some of the most important principles for a good competency assessment. These principles underline that assessment practices should measure what they intend, align with program goals, aid teaching and learning, and be clear and consistent. Popaham (2019) emphasized the role of competency assessment in education, employment, and professional development, offering benefits to individuals, businesses, and society. Further, Van Melle *et al*. (2019) highlight in competency assessment the need to deliver tailored, timely, meaningful, and actionable feedback to effectively steer candidates' learning. The assessment practice in Ethiopian TVET, however, revealed that the competency assessment in practice is not motivational to the trainees to further education and the teachers to identify training gaps.

Further, Henrich (2016) conducted a study, which revealed that employers have a limited understanding of the competency-based education (CBE) model and competency assessment, yet they hold strong expectations for the competency of new recruits and recent college graduates. Companies are keen to learn more about the CBE paradigm. In addition, Curnow *et al*. (2021) and Noe (2017) described competency assessment as an effective tool for identifying skill gaps and improvement areas. It streamlines the selection process, reduces recruitment time, and ensures candidates meet the required qualifications. Tailored assessments allow employers to make informed decisions for a skilled and capable workforce. Yet, the findings suggest that the system does not always assess candidates according to stated standards, leading to inefficiencies.

5.4. The alignment of the practice of occupational competency assessment with occupational competency assessment strategy and guiding principles in Ethiopia.

This part addresses the third research question, dealing with the alignment of practice occupational competency assessments with planned strategies. The results revealed that practices such as providing assessment methodology training and competency for trainers

are coherent with planned strategies. However, there is a significant gap between the current practices of competency assessment in the Ethiopian TVET system and the principles of competency assessment, such as relevance, sufficiency, authenticity, and clarity (MoSHE, 2020; Gravells, 2016). These principles make competency assessment meet its international standards. Each of these principles is discussed as follows:

5.4.1. Relevance

The literature emphasizes the necessity of connecting competence assessments with the practical skills that employers anticipate candidates will exhibit in the job. The primary source of competency assessment is the Occupational Standards (OS), from which the assessment tools were derived. Respondents rated the participation of industries, occupational and sectoral associations in the development of occupational standards as below average, indicating a lack of alignment with workplace needs on a scale of one to five. Furthermore, the qualitative analysis also revealed a lack of participation of industry, sectoral, and occupational associations in the development of occupational standards. The development and updating of Ethiopian TVET occupational standards have mostly concentrated on conforming to international benchmarks rather than adapting the standards to the specific context and needs of the national labor market. Consequently, a significant disparity appears to exist between the current implementation of competency assessment and the strategies, principles, and theories that should guide it. This indicates that the formulation of occupational standards needs to be more participative, inclusive, updated, and contextualized. Research validates that integrating industry feedback into curriculum development and assessment enhances relevance (Campbell, 2016).

Further, the study revealed that, though the respondents agreed with the above-stated challenges, there was a significant difference in perceptions between supervisors and assessors regarding the development of OS and their implementation and effectiveness. This difference may have arisen due to their distinct organizational roles. Role theory posits that the designated responsibilities within an organization shape individuals' views and assessments. Supervisors, as employees of the CoC Agency, are required to oversee the

assessment system and daily activities linked to competency assessment and may possess a more thorough awareness of the system's aims and intended outcomes. This expansive viewpoint may help them perceive the development of OS and effectiveness more favorably than assessors, who could concentrate on their immediate experiences and obligations (Dwyer & Kearney, 2021).

Moreover, competency assessments are frequently affected by the particular contexts in which they occur, differences in the work environment, the nature of the tasks assessed, and the attributes of the individuals tested can all result in varying conclusions. Assessments performed in high-stress circumstances may provide different outcomes than those in controlled settings, affecting the perceived competency of individuals (La Chimea, Kanji, & Schmitz, 2020).

5.4.2. Sufficiency

Competency assessments should provide a comprehensive assessment of a candidate's competency. As revealed in the study, the occupational competency assessment in Ethiopian TVET did not measure the full range of competencies required. For instance, assessments neglected soft skills, cognitive thinking, problem-solving abilities, and workplace-related competencies, all of which employers highly value. Research advocates for an all-inclusive assessment approach that includes formative and summative assessments (Yusop *et al*., 2022).

5.4.3. Authenticity

Authentic competency assessments simulate real-world tasks and challenges. Rusalam *et al*. (2019) described that project-based assessment, internships, and portfolio assessments should be used instead of traditional assessments because they let candidates show what they can do in real-life situations. On the other hand, current practices in Ethiopia, even though the working documents allow portfolio assessment, frequently depend on conventional assessment methodologies that fail to represent the details of the workplace.

5.4.4. Clarity

Clear competency assessment standards and expectations are crucial for effective learning and assessment. In this context, the majority of respondent candidates conveyed negative sentiments regarding the clarity and comprehensibility of the assessment tools. Lack of clarity results in ambiguity, perhaps causing anxiety and hindering candidates' performance. Research emphasizes the imperative for transparent and comprehensible assessment tools and standards that clearly define candidates' expectations, therefore enhancing their understanding and performance (Black & Wiliam, 2018). Muller et al. (2017) emphasized the necessity for a more integrated and coherent strategy in creating assessment tools that accurately represent the competencies specified in occupational standards. Adopting this methodology will enhance the efficacy of TVET programs and ensure their alignment with local and industry standards. This approach aligns with cognitive constructivism learning paradigms, emphasizing the development of problem-solving skills. The difference between assessed competencies and industry standards indicates an urgent necessity to revise and enhance the assessment tools and standards to more effectively meet the needs of the Ethiopian workforce and industry demands.

In general, addressing the observed gaps in Ethiopian TVET occupational competency assessment processes is vital for enhancing educational achievements and matching them with labor market requirements. The present study indicated that reforms emphasizing relevance, sufficiency, authenticity, and clarity could markedly improve competency assessments. Engaging with industry stakeholders, integrating varied assessment techniques, and guaranteeing transparency can facilitate a more efficient TVET system in Ethiopia. This ongoing dialogue in educational research underscores the necessity for systemic changes that can bridge the gap between current practices and best practices in competency assessment.

Regarding assessors, international experience indicates that a group of examiners, which includes representatives from employers, employees, and trainers, conducts assessments (Pilz, 2016). Further, the expertise and experience of individual assessors significantly

influence the results of competency assessments. Research demonstrates substantial variations among assessors in assessing identical competencies, resulting in variable outcomes. This inconsistency may stem from subjective interpretations of assessment criteria, which may not be uniformly comprehended or implemented by all evaluators (Bader & Laskin, 2021). In the Ethiopian case, however, only one assessor is conducting the assessment (MoLS, 2022). Furthermore, the Ethiopian case lacks both internal and external verification. Such practices violate the principle of fairness, which affects quality and leads to partiality, potentially reducing the credibility of the assessment process (Schiersmann *et al*., 2016). In addition, the study revealed that the assessment system failed to adhere to the principles of comparability and reproducibility, resulting in varying assessment results based on situations and assessors, as well as inconsistent assessment conditions in terms of place and time. The inconsistency of assessment conditions may result in discrepancies in candidate assessment results, favoring some candidates over others. The circumstances in which assessments are performed can vary considerably over time and place. Alterations in assessment processes, inconsistencies in available resources, and variations in institutional regulations can all lead to inconsistent assessment conditions. This irregularity hinders the results of competency assessments conducted in different places (Wilkerson & Messick, 2021).

In conclusion, the results of these findings are significant for the domain of occupational competency assessment. Inconsistent assessment results can create uncertainty among stakeholders, such as employers, educators, and policymakers, who depend on these assessments to make educated decisions regarding training, employment, and professional development. The absence of reproducibility in assessments might hinder the formulation of solid competency standards, hence impacting workforce quality and efficacy. To address these problems, it is crucial to establish standardized assessment frameworks that prioritize comparability and reproducibility. These efforts may entail formulating explicit rules for assessors, employing objective assessment instruments, and guaranteeing that all assessors get thorough training on the assessment criteria and procedures. Such indicators can improve the reliability of competency assessments.

The findings of this study indicated that most of the assessment centers in Ethiopia are TVET institutions rather than industry assessment centers; they lack industry standards, indicating there is limited industry involvement. The studies conducted by Woyessa and Arko-Achemfuor (2021) on the mapping of the TVET curriculum in building construction in Ethiopia revealed a deficiency in industry engagement. Furthermore, the research by Hayleyesus and Mesele (2020) regarding industry involvement in the conduct of occupational competency assessment in Addis Ababa City revealed that industries played a minimal role in conducting occupational competency assessment. Thus, both studies support the above findings.

5.5. The key determinants of the implementation of an occupational competency assessment in Ethiopia

This part addresses the fourth research question about the key determinant influencing the practice of occupational competency assessment. The study discovered that most factors affect competency assessment under the category of CoC institutions. These problems, such as a lack of institutional autonomy, poor industry linkage, and relying on a single assessor per session, are key determinants. These challenges need to be addressed to improve the effectiveness of competency assessments in CoC institutions. On the other hand, literature has shown that organizations should have autonomy and focus on business development, client satisfaction, competitiveness, operational execution, and financial performance improvement (Chiwawa *et al*., 2021). Further, MoLS (2022) describes the Center of Competency Agencies, which operates independently at federal and regional levels. However, in Addis Ababa, the city administration's CoC institution has shared its structure with quality controls of general education; it negatively influenced competency assessment practices and undermined its integrity and credibility.

The lack of institutional autonomy can significantly hinder the efficacy of competency assessments. Institutions lacking the autonomy to develop their own assessment strategies may find it challenging to integrate their programs with industry standards and the particular requirements of their candidates. This limitation may result in a disparity

between the skills acquired and those demanded in the labor market, consequently influencing the competency of graduates (Tambwe, 2017). In addition, the absence of strong connections with industry partners is another significant concern. When CoC institutions fail to engage with industry stakeholders, they do not get competent assessors and well-equipped assessment centers for conducting assessments. This disconnect could lead to inefficient competency assessment programs that do not prepare candidates well enough for real-world problems, which would negatively influence their competency assessments (Vachruddin *et al*., 2023).

Further, the findings of the study revealed that the relationship between competency assessment centers (CACs) and industries was found to be below expectation, indicating a need for change. The relationship between CACs and industries is essential for ensuring that assessed skills and competencies correspond with the actual needs of the world of work. When CACs inadequately connect with industry bodies, it may result in a disparity between the skills being developed and those required by employers. This disconnection can hinder the employability of graduates and the overall efficacy of workforce development activities (Hayleyesus & Mesele, 2020). In addition, the study revealed that there is a lack of partnership and support between CACs and regional and zonal industry bodies. They indicate that stakeholders perceive industry bodies as inadequately engaged in the competency assessment process, perhaps resulting in a lack of relevance in the assessed skills (Vachruddin *et al*., 2023). This scenario may result in graduates failing to meet workforce demands, which could ultimately affect productivity and economic growth.

Recent literature endorses the idea that good partnership between educational institutions and industry is crucial for cultivating pertinent competencies. Lassnigg (2017) underscores the necessity of matching educational achievements with industrial standards to improve employability. Mariah *et al*. (2025) suggested that strong partnerships between CACs and industry can result in more effective training programs that address the changing requirements of the job market. In summary, the findings of this study about the poor linkage between competency assessment centers and industry underscore a crucial area for

improvement. By resolving the identified gaps and enhancing the competency assessment system, we can strive to develop a more effective competency assessment framework that satisfies the requirements of both industries and the workforce. This change is crucial for improving the relevance of skills assessments and subsequently aiding economic development.

On the other hand, relying on a single assessor instead of multiple assessors for competency assessments may induce bias and limit the variety of perspectives in the assessment process. This method may result in discrepancies in the assessment of competencies, as more than one assessor may implement detailed procedures and possess divergent norms and expectations. Research demonstrates that a team of assessors can yield a more equitable and thorough appraisal of a candidate's competencies, hence improving the dependability of the assessment process (Berendonk *et al*., 2012). Further, Lockyer *et al*. (2017) emphasize the significance of professional development for assessors to stay updated with assessment techniques and best practices; however, the present study indicated that incompetence, unethical behavior, and insufficient professional development of assessors had a negative impact on the effectiveness of competency assessment. In conclusion, it is vital to address these detrimental aspects in order to enhance competency assessments at CoC institutions. Improving institutional autonomy, promoting industry linkages, and employing a multi-assessor methodology and professional development of assessors could significantly improve the quality and relevance of competency assessments.

As a key determinant of the competency assessment system, the assessment tool is vital to discuss. Gasskov (2018) suggests that assessment tools should include an observation checklist, instructions for activities, a process for documenting outcomes, a questionnaire, and a checklist for analyzing interviewee responses. These tools verify evidence validity, reliability, authenticity, and currency, but the present study indicated that assessment tools did not meet industry demands, deepen logical thinking, and are not easily understandable.

Recent literature on assessment tools highlights their importance in verifying evidence of validity, reliability, authenticity, and currency. However, a significant concern raised in the present study is that many of these tools do not meet industry demands, fail to deepen logical thinking, and are often not easily understandable. The findings are discussed in detail as follows:

Validity and Reliability: Assessment tools are crafted to ensure that they accurately measure what they are intended to measure (validity) and yield consistent outcomes over time (reliability). However, the literature indicates that while certain tools assert high validity and reliability, they may lack thorough testing in real-world contexts, raising concerns regarding their efficacy in practical applications (Franklin & Melville, 2013).

Authenticity and Currency: Authenticity refers to the extent to which an assessment accurately represents activities and settings in the real world of work. Literature emphasizes the importance of current evaluations using the latest standards and methods. Regrettably, the world of work does not align most existing assessment tools with its demands. This imbalance could lead to assessments that don't adequately prepare candidates for real-world problems, which would make them less useful (Rusalam *et al*., 2019).

Logical Thinking: An essential feature of assessment tools is their capacity to promote logical reasoning and problem-solving skills. However, the findings indicate that numerous methods fail to promote profound cognitive engagement, which is crucial for cultivating critical thinking skills in learners (Redondo Jr, Tadeo, & Bueno, 2024).

Understandability: The complexity of certain assessment tools can hinder their value. Uncertainty in tools can compromise their effective use by educators or learners, thereby reducing their overall efficacy (Black & Wiliam, 2018).

According to Henry *et al*. (2017) and MoLS (2022), competency assessment supervisors are responsible for making sure that the assessment processes are valid, reliable, and fair.

However, the findings indicate that supervisors are perceived as incompetent, unfair, and lacking commitment, thus degrading the quality of competency assessments in practice. The effectiveness of competency assessment is influenced by the working environment for CoC institutions, assessment centers, assessors, supervisors, and assessment tools, all of which are deemed inadequate in the TVET system in Ethiopia.

Chapter Six

6. Summary, Conclusions, and Recommendations

6.1 Summary of findings

The study aimed to examine the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. The objective is to comprehend the practice and principal factors influencing the execution of a competency-based assessment system. The research questions are:

1. How are relevant stakeholders (line ministries, industries, CoC directorates, TVET deans, and trainers) involved and consulted during the formulation and development of Ethiopia's current TVET policy and strategy?
2. How do stakeholders (industries, TVET college deans, trainers, and candidates) perceive the occupational competency assessment and certification systems in Ethiopia?
3. To what extent does the implementation of occupational competency assessment align with established strategy, and guiding principles?
4. What are the key determinants influencing the effectiveness of occupational competency assessment in Ethiopia from the perspectives of stakeholders?

The concurrent embedding design of mixed methods was chosen, whereby both quantitative and qualitative data are gathered simultaneously. The data were largely gathered via quantitative methods, while supplementary data obtained through interviews, focus group discussions, document reviews, and observations elucidate the quantitative findings in further detail. Data were obtained from both primary and secondary sources. The primary data were gathered from experienced directorates, assessors, industry and CoC supervisors, TVET deans, trainers, candidates, shop assistants, and focal persons. The researcher also looked at other materials like TVET policy documents, international standards, guidelines from the government about job standards, and various books and reports to better understand the situation and improve the study's results. The researcher

employed purposive sampling for the line ministries, regional states, and city government. The line ministries of culture and sport, tourism, industry, urban development and construction, and health were chosen because the majority of candidates assessed are in these sectors.

The researcher selected the Addis Ababa city government as the most developed city and Oromia and Amhara as the more advanced regional states. The researcher also identified Sidama as a newly established region and Gambella as a developing region. Moreover, towns and cities were chosen based on the same criteria: the presence of CoC head centers, adequate transportation connections, and comparatively better security relative to other zones. Furthermore, accredited assessment centers were selected for their more than five years of experience with the CoC Agency and polytechnic colleges, as well as their ability to train and assess competency from levels one to five. For the study, the researcher selected 51 organizations from four regions, one city administration, and other federal agencies. Directorates, assessors, industry representatives, assessment supervisors, focal persons, shop assistants, candidates, and TVET deans and trainers from a population of 32,892—there are 2,550 and 2 groups of trainers for FGD.

This study employed descriptive statistics, such as percentages, means, and standard deviations, alongside inferential statistics, including one-way ANOVA, to investigate variations in competency evaluation techniques across different areas. Independent t-tests were employed to evaluate views between assessors and CoC supervisors. Additionally, correlational and regression analyses were employed to examine the relationship and impact of independent variables on dependent variables. Narrative analysis was employed for qualitative data obtained from interviews, focus group discussions, document reviews, and observations, elucidating the complexities and subtleties of participants' experiences and perspectives. Field notes and thorough transcription of qualitative data were employed to discern salient themes, which were structured in accordance with the study's aims. The amalgamation of qualitative and quantitative data via triangulation fortified the analysis, facilitating a more comprehensive and nuanced interpretation of the data. This method

highlighted the complex nature of competency assessment methods and perspectives across regional states, candidates, assessors, and CoC supervisors in Ethiopia.

Based on analysis of the data, the following results were obtained for each of the basic research questions:

6.1.1. Stakeholders' involvement in TVET Policy and Strategy Development in Ethiopia.

1. The examination of interviews, focus group discussions, and document reviews from main and secondary data sources reveals that, despite the policy developer Ministry of Labor and Skill (MoLS) asserting extensive stakeholder engagement, only the Ministry of Industry (MoI) undertook proactive initiatives. The MoI performed a forecast survey regarding labor force requirements for the forthcoming decade. Regrettably, other ministries failed to participate in such progressive initiatives, ignoring their responsibilities in the development of TVET programs and policies. The statement emphasizes that, although ministries have a substantial interest in developing medium- and lower-level human resources in the labor market, their involvement in policy and strategy formulation is neglected, and the process may lack integrity. This requires more recognition of their status and expertise, as well as better transparency and accountability in ministry policy-making.

2. MoLS has a responsibility to raise awareness and initiate meaningful engagement among line ministries in the development of TVET policy and strategy. The line ministries, such as the Ministry of Health (MoH), Ministry of Culture and Sport (MoCS), Ministry of Urban Development and Construction (MoUDC), and Ministry of Tourism (MoT), are also responsible for developing a lower- and middle-level manpower strategic plan as a benchmark for MoI. Line ministries serve as essential stakeholders in Technical and Vocational Education and Training (TVET). They guide and orchestrate their industries at the grassroots level while adhering to their own legislative frameworks. They comprehend their particular human capital requirements. The MoCS, MoH, and MoI

were instrumental in formulating TVET policies and initiatives. The MoLS additionally validated their contributions. In contrast, the MoUDC and MoT show insufficient involvement in the formulation of this policy and approach. They exhibited a restricted understanding of the matter.

3. Integrating the ideas and knowledge of various stakeholders, including governmental bodies, academic institutions, industry experts, and civil society members, enhances the policy and strategy development process. This thorough approach enhances the likelihood of creating a complete and practical plan to further TVET efforts. Consequently, the active engagement of stakeholders is essential to surmount prior implementation challenges and establish resilient TVET systems. Nonetheless, a significant deficiency exists in stakeholder engagement at the CoC directorate level. A restricted number of CoC agency officials have participated, signifying insufficient comprehensive engagement.

4. Insights regarding participation were also obtained via interviews with deans and trainers of regional TVET polytechnics. Representatives from the Addis Ababa City Administration, Oromia, and Gambella regional states stated that they were not engaged in the formulation of the TVET policy and strategy. In contrast, interviewing *TDR2* and *TDR5* indicated that they actively contributed by providing input and amendments to the draft.

5. The focus group discussion with the trainers revealed that, although they are essential implementers, they were excluded from the initial writing and feedback phases of the policy-making process, resulting in a lack of interactivity.

6. According to data from regional industry leaders, there were constraints on industry involvement at the regional level. Interviewed representatives from the Addis Ababa, Amhara, Oromia, Gambella, and Sidama regions indicated a lack of substantial involvement in the formulation of TVET policies and strategies, notwithstanding some small regional discrepancies.

7. Interviews with the *ECR1* and *SR1* showed that while both groups play an important role in skill development, they were not heavily involved in creating TVET policies and strategies.

8. Awareness among stakeholders is essential for the formulation and execution of policies and initiatives, particularly in the realm of Technical and Vocational Education and Training (TVET). In Ethiopia, initiatives to promote understanding and consensus among stakeholders have yielded diverse results, as evidenced by input from multiple ministries.

9. Officials from the Ministries of Industry, Health, and Culture and Sport acknowledged their awareness of the newly implemented TVET policy and plan. These officials underscored their active involvement in the process. In contrast, representatives from the Ministry of Urban Development and Construction and the Ministry of Tourism indicated a deficiency in knowledge of the new TVET policy and strategy. This gap was linked to difficulties in stakeholder integration and collaboration.

10. Regional Insights: Feedback from the *CR1*, *CR2*, *CR4*, and *CR5* indicates a necessity for enhanced inclusive awareness activities. The respondents expressed apprehensions regarding their inadequate comprehension of the TVET policy and strategy.

11. The diverse reactions from various ministries and regional entities emphasize the significance of thorough stakeholder involvement in policy and strategy formulation. Efficient awareness campaigns and enhanced inter-ministerial coordination may guarantee that all pertinent stakeholders are synchronized and informed, thereby facilitating the smooth execution of the TVET policy and strategy in Ethiopia.

12. Responses from the TVET deans in Addis Ababa, Oromia, Amhara, Sidama, and Gambella reveal their participation in awareness-creation workshops and their comprehensive understanding of the TVET policy and strategy. Nevertheless, the trainers' focus group discussion indicates a divergent viewpoint, as they articulated an absence of clear comprehension regarding the TVET policy and strategy.

13. Interview statistics from all sampled regions, excluding the sectorial industry representatives, indicate a lack of awareness concerning the current TVET policy and strategy.

6.1.2. Stakeholders' perception of occupational competency assessment and certification systems in Ethiopia

1. The respondents hold a favorable view of the societal value of assessments, candidate employment prospects, and the identification of skill gaps; however, their opinions on certification assessments are moderate and predominantly negative regarding competitiveness, employer support, and alignment with technological and workplace changes. The overall mean (M = 2.69, SD = 1.29) indicates a negative sentiment toward occupational competency assessment. Nonetheless, a substantial segment of responders recognizes the intrinsic advantages of these assessments.

2. Quantitative data indicates that respondents theoretically acknowledge the benefits of competency assessments for candidates and society; however, in practice, their perceptions are predominantly negative due to the tests' irrelevance to job functions, misalignment with job requirements, insufficient support or feedback, technical issues, biases, and disregard for contemporary workplace dynamics. Qualitative feedback from key stakeholders reinforces this sentiment, expressing apprehensions regarding the effectiveness and integrity of competency assessment.

3. The study found a significant difference in competency assessment candidates between city administration and regions, with significant disparities observed. The mean scores

were recorded in Addis Ababa, Oromia, Amhara, Sidama, and Gambella. Despite candidates generally viewing the competency assessment's advantages unfavorably, geographical disparities were evident. The Amhara region had a more positive perception, while Gambella had the least favorable view. These findings highlight the need for improved training and assessment methods in these regions.

4. The study revealed that guaranteeing access, quality, and relevance in competency assessment is crucial for cultivating a positive perception of its benefits, efficacy, and importance.

5. The focus group discussion with TVET trainers in the Addis Ababa City Administration and Amhara Regional State uncovered a negative perception of occupational competency assessment, attributed to non-compliance with established principles and regulations; additionally, the system lacks a clear distinction between assessed and unassessed candidates.

6. The result of qualitative data obtained from interviews with TVET college deans, CoC focal persons, and employers indicated that, although they acknowledge the importance of competency evaluation, their perception of its benefits, efficiency, and relevance is little. These findings correspond with the negatively skewed perceptions noted by the candidates in the quantitative results. Respondents typically display a skewed perspective, favoring a negative opinion of the advantages of competency assessments. Moreover, the qualitative data underscored several implementation issues in Ethiopia, such as ethical concerns with assessors, candidates' anxiety, and systemic corruption, failure to meet industry demands, a lack of standards, and the issue of forged certificates. These variables influence the major stakeholders' negative perception of competency assessment in Ethiopia.

6.1.3. The alignment of the practice of occupational competency assessment with occupational competency assessment strategy and guiding principles in Ethiopia.

1. The supervisors' response to the study revealed a notable inconsistency between the operational practices at the organizational level and the ideal strategies and principles

intended for competency assessment within CoC institutions. This research is based on insights into the CoC's function in executing competency assessments throughout Ethiopia, as specified in the 2022 guidelines issued by the Ministry of Labor and Skills (MoLS).

2. Assessors in Centers of Competency (CoC) institutions hold positive views regarding their training and work environment, with ratings surpassing the anticipated mean. Nonetheless, certain aspects require enhancement, including the autonomy of the CoC's organization, supervisor expertise, quarterly meetings, supervisor accountability, dissemination of assessment results, equity in compensation, and comprehensiveness of monitoring and evaluation. These findings indicate a disparity between the practices of CoC institutions and optimal competency assessment strategies.

3. Interview results with CoC directorates, polytechnic college deans, and industry supervisors disclose structural and autonomous issues confronting the CoC Agency. Challenges encompass insufficient autonomous operational capability at both federal and regional tiers, as well as possible role conflicts, particularly in areas such as Addis Ababa. Focus group discussions with polytechnic college trainers reveal a lack of a comprehensive accountability structure, deficiencies in the competencies of supervisors and assessors, and the inadequacy of CoC Institutions in providing effective feedback to the Technical and Vocational Education and Training system. The findings indicate a need to reevaluate the structural, operational, and policy frameworks of CoC Institutions to better match with the aims of effective competency assessment and the overarching objectives of the Ethiopian TVET system.

4. The study shows that Ethiopian TVET occupational standards have primarily focused on aligning with international benchmarks rather than tailoring them to the specific context and requirements of the country's labor market. This results in a significant gap between current competency assessment practices and the strategies, principles, and theories that would ideally guide such processes. The other four aspects, such as industry participation, occupational associations, sectoral associations, and alignment with work demands, were rated below the expected mean of 3.00. Further, the qualitative finding also indicated that

interviewed CoC directorates, polytechnic college deans, and industry supervisors confirmed that there is insufficient participation from industry, sectoral, and occupational associations in OS development. The Labor and Skill Ministry recruits inexperienced and potentially unqualified industry people for OS development, which is inconsistent with national labor needs and violates the TVET policy and strategy's focus on market demand and local conditions. The situation suggests a need for a more contextualized approach in developing occupational standards.

5. The Levine's Test for Equality of Variances reveals a significant difference in variances between supervisors and assessors regarding the development of Occupational Standards (OS). The data shows a mean difference of 0.41459, rejecting the null hypothesis. The discrepancy can be attributed to diverse organizational backgrounds and occupational roles of supervisors and assessors.

6. The study found that both supervisors and assessors expressed skepticism or dissatisfaction with the current state of assessment tools. Supervisors perceived the validation process by the Ministry of Labor and Skill as good practice. While assessors expressed concerns about the alignment of practice with competency assessment principles and rhetoric. The security and handling of assessment tools were a specific concern, with assessors stating that they are too easily accessible to candidates, potentially compromising the integrity of the assessment process. Further, interviews with key stakeholders reveal challenges in competency assessments, with tools criticized for not aligning with occupational standards and required competencies, and repeated use due to scarcity undermining their validity and reliability.

7. The study reveals that assessors and supervisors agree on two items aligning moderately with competency assessment strategies and principles: the clarity of the assessment system and candidates' understanding of occupational standards. However, most items received ratings below the mean value of 3.0, indicating concerns about the alignment of the assessment system with established competency assessment strategies. This misalignment raises questions about the effectiveness of current assessment practices in accurately

capturing workplace competencies, raising concerns about the system's value to stakeholders.

8. International experience shows that a board of examiners conducts assessments, but in Ethiopia, only one assessor conducts the evaluation, violating fairness, quality, and nepotism (Pilz, 2016; MoLS, 2022; Schiersmann *et al*., 2016). In addition, qualitative findings indicated that the assessment system faces challenges in maintaining fairness, comparability, and reproducibility, as evidenced by feedback from CoC directorates, deans, industry supervisors, and Polytechnic College trainers. Systemic issues include variance in results, inconsistency in conditions, and a lack of internal and external verification.

9. The study found that supervisors and assessors had mostly similar opinions on AC procedures, but assessors had slightly less positive opinions. This shows that practices can be made better by making them more in line with established guidelines and providing additional training for assessors. By fostering a more unified understanding of the procedures, organizations can enhance overall effectiveness and improve the assessment experience for both supervisors and assessors. held principles, strategies, and theories. There is a discrepancy between TVET policy intentions and the operational realities of assessment centers. Most centers are within TVET colleges, with inadequate facilities that do not meet industry standards. This highlights the need for policy practice and facility provision enhancements to align assessment centers with industrial requirements. The results suggest that the whole assessment system should be looked at and changed to make it more in line with the rules for evaluating occupational competence. This would make the assessment process more reliable and useful.

10. The study reveals significant differences in perceptions of congruence across Ethiopian regions, contradicting the Ministry of Labor and Skills' claim of uniform application of the assessment system. These discrepancies suggest regional divergence in implementation and perception, indicating a need for a harmonized approach to ensure consistency and fairness in assessment processes across Ethiopian regions.

11. The study on Ethiopia's competency assessment practices reveals alignment and divergence with the country's strategic frameworks. Activities like assessor methodology training, international benchmarking, and accreditation of assessment centers, AC shop assistance ethics, and societal values align with the intended strategies and principles.

6.1.4. The key determinants of the implementation of an occupational competency assessment in Ethiopia

1. Except for the registrar's performing their activities ethically, most aspects were unfavorable. Supervisors and assessors are dissatisfied with the current situation of CoC institutions, as indicated by mean scores. The Ministry of Labor and Skill states that all CoCs have the autonomy to perform their duties in collaboration with stakeholders. One thing that both groups' mean scores (supervisors' M = 2.57, SD = 1.17; assessors' M = 2.62, SD = 1.18) show is that these things (CoC institutions' autonomy, the presence of a functional board, regional and zonal industry bodies working with CoC institutions, and the fact that the assessment is similar to workplace competency) can make competency assessment less useful. The qualitative data also supported the majority of factors affecting competency assessment in CoC institutions that are unfavorable, including the inability to execute missions, a lack of industry board structure, low industry participation, a transparent assessor recruitment process, and the inappropriate use of only one assessor. These challenges need to be addressed to improve the effectiveness of competency assessment in CoC institutions.

2. The study reveals that CoC institutions and assessment centers perceive positive factors regarding assessment tools, with assessors reporting secure tools and clear language. Supervisors have a lower perception of clarity and understandability, suggesting room for improvement. Assessors also respond unfavorably to deep, logical thinking questions, indicating a need for improvement. The data analysis emphasizes the importance of aligning assessment tools with industry demands and ensuring secure implementation. The overall aggregated mean scores suggest that most factors related

to assessment tools slightly positively influence the practice of the assessment system, indicating areas for improvement.

3. Candidates perceive unfavorable factors related to assessment tools, like fitting with the demands of the industry, questions being clear and easily understandable, time allotment, and measuring deep thinking with a mean score below the expected 3.00. Assessors and supervisors generally perceive items positively, indicating areas for improvement. Interviews with CoC agency directorates, TVET deans, CoC focal persons, industry representatives, and trainers were conducted. FGDs show that the majority of factors affecting competency assessment—in relation to assessment tools—have a negative influence. Assessment tools do not match occupational standards, updated versions are scarce, assessment criteria are unclear, practical project time is insufficient, requirements are poorly specified, have limited versions, and fail to accurately measure candidates' knowledge, skills, and attitudes, particularly in hard skills like construction, design, and computerized parts.

4. The study reveals that supervisors and assessors negatively rate competency assessments conducted in accredited industry centers due to a lack of accreditation. Lower scores indicate discrepancies in availability. Assessors perceive distance between centers and candidates as a hindrance, resulting in scores below 3.00. However, items with a mean score greater than 3.00, such as accreditation of TVET institutions, focal persons, shop assistance, and adherence to occupational ethics, suggest positive impacts on competency assessment implementation.

5. The effectiveness of competency assessments was negatively impacted by factors such as functionalities, standardization of working tools, and the proximity of assessment centers to candidates, with a mean score of 2.41. The Ministry of Labor and Skills (2022) and Thornton and Lievens (2019) emphasize the importance of uniformity in administration and scoring processes for reliability and validity. However, most assessment centers are TVET institutions lacking standards and proximity to candidates, indicating a need for improved facilities and standards.

6. The study reveals that supervisors and candidates' perceptions of assessors' competency, adherence to occupational ethics, involvement of multiple assessors, clear feedback, industry experience, and accreditation renewal or revocation have a negative impact on the competency assessment system. The data suggests that single assessors without industry experience often conduct assessments, with the mean scores for both supervisors and candidates indicating a negative influence on the practice of competency assessments.

7. Interviews with CoC directorates revealed that competency assessment practice is negatively impacted by factors such as assessor incompetence, lack of professional ethics, financial benefit focus, transparency, corruption, lack of industry experience, inconsistency, and unfair decisions. Focus group discussions also highlighted issues like single assessors assessing 30 candidates per session, suspicions of corruption, incompetence, lack of industry recruitment, commitment to psychological preparation, and unethical behavior among some assessors.

8. The study found that the supervisors perceived incompetence, unfairness, and lack of commitment negatively impact the practice of competency assessments. However, literature like Henry *et al*. (2017) and MoLS (2022) highlights that competency assessment supervisors are crucial for ensuring validity, reliability, and fairness.

9. The regression model summary shows a strong positive linear relationship between predictors and dependent variables, specifically the effective assessment system. It explains 98% of variation, with R-squared values of 0.980 and 0.98 indicating strong population generalization. The model's R-square change is 0.980, indicating all predictor factors account for 98% of variation. The F Change value of 13108.947 indicates high statistical significance, indicating that adding predictors improves forecasting. The model is robust, specific, and applicable to the entire population.

10. The study revealed that "influencing factors related to CoC institutions" showed the highest standardized effect on the effectiveness of competency assessment, followed by "assessment centers" with the second largest standardized coefficient. The predictor

"Assessment Tool" has the least impact. Prioritizing resolution of CoC institutional issues and following other predictors is crucial.

11. The research showed that keeping ethical standards, safely handling assessment tools, the accreditation process, and getting help from focal persons and shop assistants all had a positive effect on the assessment process in TVET institutions. However, there are also negative aspects, such as the absence of a functional board, lack of collaboration between regional industry bodies, and institutional autonomy. The preparation of assessment tools is not aligned with occupational standards, affecting the quality and relevance of the process. Assessments are not similar to workplace competency, reducing the effectiveness of outcomes. Accredited assessment centers are not meeting required standards, and working tools and machinery are not standardized. Inconsistent feedback from assessors, adherence to occupational ethics, and adequate competency are critical issues.

6.2. Conclusions

The efficacy of technical and vocational education and training (TVET) depends on the collaborative synergy among various stakeholders. Active stakeholder engagement not only fortifies the TVET policy framework but also guarantees its effective implementation. However, a comprehensive examination of the TVET policy landscape in Ethiopia uncovers a multifaceted situation. Ministerial engagement is about fifty percent, with the exception of the Ministry of Industry, which does not possess a thorough analysis of workforce demand for middle-level personnel. The formulation of the TVET policy involved substantial engagement from the Sidama and Amhara regional CoC Institutions, notably not adequately involving regions like Addis Ababa, Oromia, and Gambella. Moreover, the viewpoints of polytechnic college deans and trainers, essential to the TVET ecosystem, appear to be inadequately reflected. A pronounced engagement gap is apparent across industries, notwithstanding their crucial significance to TVET. Active stakeholder engagement in the development of Ethiopian TVET policies and initiatives was minimal. Furthermore, many ministerial stakeholders and key TVET policy agents, like trainers and

industry representatives, have gaps in awareness of the current policy directions. This non-inclusive strategy for stakeholder participation presents significant challenges to policy execution.

Although stakeholders acknowledge the significance of competency assessments, existing difficulties have adversely affected their perception. Principal difficulties encompass doubts regarding the assessment's relevance and validity, inadequate communication about its advantages, and misconceptions about the function of competency assessment in academic and professional progression. External pressures, like the significant implications of competency assessment for university admissions or employment, along with views of inequality, the candidate's burden, and anxiety, intensify this adverse perspective. Although stakeholders recognize the significance of competency assessments, they observe performance issues such as skill mismatches between assessed candidates and industry demands, inconsistencies between declared standards and actual assessment, and resource inefficiencies, highlighting a deficiency in relevance and efficacy within the existing system.

The study on competency assessment practice in Ethiopia has revealed both the congruence and disparity of these practices with the intended strategies and theoretical frameworks. Although specific activities within the Ethiopian competency assessment framework—such as assessor methodology training, international benchmarking, tool validation, system comprehension, accreditation of assessment centers, ethical coordination, and societal values—align commendably with the intended strategies and principles, a significant portion of the competency assessment practices fails to produce the expected results. This discrepancy primarily arises from structural deficiencies, such as a lack of autonomy at the CoC Agency and its mergers with general education quality assurance and accreditation institutions, which collectively impede the agency's ability to provide TVET institutions with necessary feedback and support.

The Ethiopian competency assessment system encounters significant challenges in ensuring fairness, comparability, and reproducibility due to reliance on single assessors per

session, inconsistent decision-making procedures, and the lack of internal and external verifiers. Moreover, insufficient stakeholder awareness hinders the system's alignment with industry standards. There is a gap between the TVET policy and how assessment centers actually work, mainly because these centers are mostly found in TVET colleges instead of the suggested industrial workplaces, showing a problem with how well the system follows the rules for competency assessment.

The study has discovered considerable regional differences in competency assessment methods in Ethiopia, despite a standardized assessment framework. The regional discrepancies in the implementation and assessment of evaluations may jeopardize the system's overall uniformity and equity.

From the data analysis and discussion, several critical conclusions may be derived concerning the factors related to CoC Institutions, including assessment tools, assessment centers, assessors, and supervisors. All the identified factors have a significant effect on the effectiveness of competency assessment. Primarily, CoC Institutions lack institutional autonomy, impeding their operational efficacy. Furthermore, there is a lack of a governing board to supervise the work of CoC Institutions. The lack of adequate communication between regional and zonal industry organizations and CoC Institutions results in incoherence between industry requirements and competency assessment methodologies. Furthermore, TVET institutions lack feedback on competency assessment, constraining their capacity to enhance the quality of training programs. The assessment tool lacks standards due to its ambiguous terminology, inadequate design for evaluating logical reasoning, and limited availability.

Furthermore, although the majority of TVET institutions function as assessment centers, supervisors are often uncommitted. Not using multiple assessors may expose the assessment practice to biased results and unwanted non-ethical practices and behaviors, which corrupt the competency assessment process.

CoC institutions have the highest standardized effect on the effectiveness of competency assessment, an area that requires significant attention to address its problems. The assessment centers, which are crucial for enhancing the effectiveness of competency assessments, hold the second-largest coefficient, while the predictor, the assessment tool, has the least impact.

6.3. Recommendations

6.3.1 Theoretical Recommendation

The study draws its assumptions from the cognitive constructivist theory and conceptual framework, which shaped its framework. Cognitive constructivism places emphasis on the learner's problem-solving skills, specifically their ability to express, demonstrate, and explain their understanding. Assessments within this framework are based on predetermined criteria or competency benchmarks, aligning with the focus on competency-based technical and vocational education and training (TVET) and competency assessments. Competency assessment is a basic pillar of competency-based education and critical to ensuring the candidates have the required skill, knowledge, and attitude based on predetermined standards. The assumption of the study is that the competency assessments for TVET are effective and bridge the rhetoric with the reality. The study's findings provide slight support for the assumption that meaningful stakeholder involvement in policy and strategy development, as well as stakeholder perception of competency assessment, are consistent. The assumptions are mostly unfavorable, and most of the practices of competency assessment are not in line with the strategy and principles of competency assessment of TVET. The results indicated that important factors influencing the effectiveness of competency assessment, like CoC institutions, assessment tools, assessment centers, assessors, and supervisors, are not being carried out as outlined in the strategy and principles. They do not support the assumption being mentioned.

Therefore, the Ministry of Labor and Skill suggested filling the gap in the practice of cognitive-constructivism theory. The cognitive constructivism-based competency assessment system works better; it would be best to use a broader approach that focuses on deep learning and critical thinking. Reducing the number of candidates evaluated per session allows assessors to provide individual attention and feedback. Furthermore, providing assessment centers with standardized instruments and resources will enable candidates to successfully display their knowledge and skills. Setting up a structured system that emphasizes problem-solving and critical thinking in assessments will be more in line with cognitive constructivism, helping candidates shape their perceptions to be more positive about competency assessments, enhance their understanding, and use what they have learned more deeply.

6.3.2. Recommendation for Policy and Practice

6.3.2.1. Policy Recommendations

- The result of the study indicated that stakeholder engagement in the development of TVET policy and strategy in Ethiopia was not at the required level. The Ministry of Labor and Skills (MoLS) creates collaborative platforms for stakeholders, including line ministries (Ministry of Health, Industry, Urban Development and Construction, Tourism, and Culture and Sport), the Ethiopian Chamber of Commerce, and sectoral associations, which represent the commercial sector, to discuss the challenges and provide solutions. MoLS creates a national TVET advisory body by including these relevant stakeholders and holding regular workshops and forums to facilitate dialogues, provide explicit policy directives, and gather significant insights.

- The MoLS recommended developing different guidelines that need to be made using an open and inclusive approach. The guidelines and working document should include the delegation of the assessment system to sectoral institutions, such as the Ministry of Health for health-sector occupations and the Ministry of Urban Development and Construction for construction-sector occupations. These steps

make the assessment process more thorough and give people a sense of ownership over their involvement in the TVET system.

- The ministries in areas such as health, tourism, culture and sport, and urban development and construction should align their middle-level human capital initiatives with the TVET vision.

- The MoLS needs to come up with innovative measures, like creating a regional TVET advisory body that includes relevant stakeholders, such as the Bureau of Health, Industry, Construction, and private industries, to enhance the involvement of regional industries and sector bureaus.

- MoLS suggested starting a broad awareness program to help primary TVET players, especially regional and city administration government officials, work together on important tasks like setting up an independent regional CoC agency to enhance competency assessment methods nationwide.

- MoLS recommended introducing changes to occupational standards and improving the quality of assessment tools so they are in line with industry standards. They also provide training and support for regional CoCs, encourage collaboration between industries, regularly review the assessment system, and set up incentive systems for industries to offer their workplaces as assessment sites and assign qualified experts to be assessors.

- The study underscores considerable regional disparities in perceptions of the competency assessment system in Ethiopia, contradicting the Ministry of Labor and Skills' claim of uniformity. To solve these inconsistencies, it is advisable to standardize assessment centers, standardize assessor training, provide a feedback system for stakeholders, and formulate a harmonization strategy to synchronize practices across areas.

- The disparity between theoretical goals and practical realities, along with ethical issues and insufficient feedback systems, fosters a widespread negative perception among stakeholders on occupational competency assessments. The Ministry of Labor and Skills recommended developing and implementing clear ethical guidelines for competency assessments. Provide training for assessors on fairness and bias mitigation to promote transparency and equity. Employ technology to optimize assessment processes and improve feedback acquisition. Digital platforms can offer timely data and analytics to guide decision-making.

6.3.2.2. CoC Institutions Level of Recommendation

- Regional CoC Institutions are essential for upholding the quality of TVET. To enhance attitudes positively, CoC Institutions and TVET institutions should emphasize transparent information sharing regarding the assessments' significance to candidates' educational and professional routes. Offering performance comments enables candidates to comprehend their strengths and areas needing enhancement. Further, CoC Institutions suggested delivering constructive feedback to TVET institutions about the candidates' results.

- For restoring faith in the system, CoC Institutions should be transparent, foster equity, and build their efficacy. This approach entails explicit communication, uniform training, periodic evaluations, an appeal mechanism, engagement of external verifiers, pre-assessment orientations, and optimal utilization of assessment resources. The execution of these modifications can markedly enhance perceptions of fairness, precision, and general attitudes toward assessment programs among all stakeholders. Ultimately, conducting skill gap analyses for TVET development programs and advocating for a transparent methodology can shape stakeholders’ perspectives.

- The findings revealed that negative impacts of competency assessment practice include assessor incompetence, lack of ethics, corruption, lack of industry experience, inconsistency, and unfair decisions. CoC Institutions are advised to improve assessor training in ethics and industry expertise, implement strict ethical standards, and develop comprehensive monitoring systems. Moreover, decreasing the candidate load every session will allow for more comprehensive evaluations, while enhancing openness and resolving corruption issues through reporting procedures can cultivate trust. Engaging industry specialists in the assessment process and offering psychological support to candidates will supplement the legitimacy and efficacy of the assessments.

- The CoC Institutions are recommended to work with regional and city government officials to address structural obstacles and reduce role conflicts, ensuring the autonomy of the CoC Institutions. Further, to ensure uniformity and integrity, CoC Institutions should use specific industry assessment centers. Accredited assessment centers near candidates would enhance accessibility and convenience, promoting increased participation rates. It is essential to address concerns such as reliance on single assessors, inconsistency in decision-making, and the absence of both internal and external verifiers. The competence, training, and objectivity of assessors also play a significant role in the accuracy and fairness of competency assessments. Supervisors play a critical role in overseeing and supervising the competency assessment procedures, creating frameworks, providing guidance, and maintaining uniformity in practices. Implementing these recommendations will enhance the integrity and credibility of competency assessments, ensuring fairness and consistency in the evaluation process.

6.3.2.3. Assessment Center level of Recommendation

- To enhance the efficacy of the competency assessment system, the assessment centers suggested furnishing them with standardized equipment and cutting-edge technology to guarantee a contemporary and efficient assessment process. The

organization can ensure consistency and reliability in evaluations by equipping in-house assessors with adequate training and familiarity with its goals and objectives. Ultimately, implementing a comprehensive orientation and awareness campaign for candidates is crucial, as it will facilitate their understanding of the assessment procedure, alleviate anxiety, and improve their entire experience. By employing these strategies, assessment centers can provide a more efficient and conducive environment for candidates, resulting in improved outcomes for the TVET system.

- To enhance the quality of accredited assessment centers that presently do not satisfy required standards and lack standardized working tools and equipment, CoC Institutions should focus on creating explicit operational standards and performing frequent monitoring and evaluation. Standardizing assessment equipment will assure uniformity, while training personnel on these standards will improve overall efficacy. Moreover, enabling resource sharing among centers, establishing a feedback mechanism for candidates and assessors, and engaging industries in the formulation of standards will enhance the effectiveness of the assessment process.

6.3.2.4. Recommendation for Future research

The aim of the current study is to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed to understand the context and key determinants of implementing a competency-based assessment system. This study is comprehensive; it contributes to the literature on competency assessment and provides pertinent implications for all stakeholders. However, currently, the MoLS, adhering to the previous level-based assessment, is initiating a Level IV competency assessment. This assessment encompasses all competencies from Level I to IV and is conducted in a single session using similar procedures. This study did not cover the holistic Level I-to-Level IV competency assessment that was conducted in a single session. Future research should delve into these aspects to provide a more comprehensive understanding and further improve the competency assessment process.

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List of Publications

Publication 1: Enhancing Stakeholders' Engagement TVET policy and Strategy development in Ethiopia. (This article is part of research topic, which is research question one).

Publication 2: Stakeholders' Perception on Occupational Competency assessment and Certification system in Ethiopian TVET program. (This article is part of research topic, which is research question two).

Publication 3 : Alignment of TVET Occupational Competency Assessment Practices with Strategic Goals in Ethiopia. (This article is part of research topic, which is research question three).

Publication 4 : Key Determinants of Successful Occupational Competency Assessment of TVET in Ethiopia. (This article is part of research topic, which is research question four).

Appendices

Appendix A: CoC Supervisors Questionnaire

Addis Ababa University

School of Graduate Studies

Department of curriculum and Instruction

Questionnaire to be filled by CoC Supervisors

The purpose of this Questionnaire is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system. The success of this study depends on your responsible, sincere and timely response.

Please note that:-

- No need of writing your name
- Where alternative answers are given please circle the letter of your choose
- Please describe well in answering the open ended questions.

Thank you for using your time to complete this questionnaire.

Part I: Demographic

1. Name of the Regional/City Administration CoC----------Name of Assessment Center----------
2. Supervisors Sex a) M b) F
3. Age a) 20—30 b)31—40 c) above 41
4. Educational Qualification a) TVET b) BA/BSc c) MA d) Ph.D.
5. Year of service in the CoC a) 1—5 b) 6—10 c) 11-15 d) above 16
6. Years of service as Supervisor a) 1—5 b) 6—10 c) 11-15 d) above 16

Part II: The extent of congruence between the practice of occupational competency assessment and its strategy, theories, and principles

The following points on occupational competency assessment strategy, theories, and principles have been stated below. They identify their extent of correspondence with the practice of occupational competency assessment. Please mark one of the responses that best fits your opinion by putting a (✓) mark against the scales of measurement indicated below.

5= Strongly Agree
4 = Agree
3 = Undecided
2 = Disagree
1= Strongly Disagree

№	Items	5	4	3	2	1
A	Center of Competency (CoC)					
1.	The organization of CoC is autonomous to execute the mission.					
2.	Training of assessment methodology has sufficient time to understand all the contents.					

№	Items	5	4	3	2	1
3.	There is quarterly meeting of assessors and other stakeholders discuss with problems and recommend possible solutions					
4.	There is accountability of assessors to occupational competency assessment					
5.	The payment for supervisor is fair and motivational					
6.	The CoC has send organized information of assessment result to institutions and it has effects on the training of institutions.					
7.	There is Supervisors performance Evaluation regularly					
B	Development of Occupational Standards (OS)					
1.	Full industry participation in OS development and revision					
2.	Participation and leadership of occupational association leaders in OS development and revision					
3.	Sectoral association participation in OS development and revision					
4.	OS development and revision based on demand from the world of work					
5.	OS development and revision based on international benchmarks					
C	Assessment Tools					
1.	Assessment tool development with Assessors panel					
2.	Assessment tools are similar with competencies of workplace					
3.	Assessment tools measure Cognitive thinking					
4.	Assessment tools validated by Ministry of Labor and Skill					
5.	Utilization and handling of assessment tools is secured and not easily found in the hands of candidates					
D	Assessment process					
1.	More than one assessor conducting assessment					
2.	Assessment has value for stakeholders					
3.	Consistency in competency assessment results					
4.	Assessment result verification					
5.	Assessors refresher training					
6.	Candidate preparation by assessment system					
7.	Candidate understanding of OS					
8.	Consistency of assessment conditions					
9.	Clarity of assessment system					
E	Assessment Centers (AC)					
1.	AC accreditation has given together with CoC experts and Industry experts					
2.	AC has given accreditation and reaccreditation after 3 years					
3. .	AC has adequate facilities based on occupation to conduct the assessment					
4.	AC has proximity to the candidates					
5.	AC has a coordinator					
6.	AC has an assessor					
7.	AC shop assistance have an occupational Ethics					

- ✓ Please describe some other points you think can indicates the congruence or the absence of congruence between the practice of occupational competency assessment and its strategy and principles

  _____

  _____

Part III: The factors influencing the implementation of occupational competency assessment in Ethiopia. The following identified factors influence the Practice of occupational competency assessment and certification system. Please indicate your level of agreement for the following statements by putting a (✓) mark against the scales of measurement indicated below.

5 = Strongly Agree
4 = Agree
3 = Undecided
2 = Disagree
1= Strongly Disagree

№	Key determinants of the implementation of occupational competency assessment in Ethiopia	5	4	3	2	1
A	Factors related to Center of Competency (CoC)					
1.	Autonomous Center of Competency (CoC) to execute its mission					
2.	Establishment and functionality of CoC Boards					
3.	Establishment and functionality of Regional Industry body.					
4.	Establishment and functionality of Zone/Sub-City industry body working with CoCs					
5.	Similarity of assessment with the competencies required in the workplace.					
6.	Feedback on the assessment results of candidates from CoCs to training institutions					
7.	Registrars have a required work Ethics.					
B	Factors related to Assessors					
1	The ability of assessors to determine the candidate's competence.					
2	Industry Experience of Assessors					
3	Professional Ethics of Assessors					
4	Conducting assessment by multiple Assessor.					
5	Conducting assessments by trainers.					
6	Conducting assessments by accredited industry assessors.					
7	Renew/revoke the accreditation of assessors based on the result of monitoring and evaluation.					
8	After completing the assessment, the assessors provide clear feedback to the candidate.					
C	Factors related to Assessment tools					
1	The assessment tool (project) is prepared based on the occupational standard.					
2	Assessment tasks have to comply with industry requirements.					
3	Assessment tools are secured by CoCs and Assessment Centers					
4	Assessment tools are clear and easily understandable					
5	Assessment tools measure logical reasoning and deep thinking.					
D	Factors Related to Assessment Centers (AC)					
1. 1	Conducting assessments by accredited industry AC					
2.	Conducting assessments through accredited TVET training institutions.					
3.	The necessary materials and facilities for AC are based on occupations					
4.	Availability of a coordinator in AC, to facilitation the competency assessment.					
5.	Availability of shop assistants, who prepare workshop facilities, equipment, tools, and materials.					
6.	Shop assistants work ethics					
7.	The proximity of AC to the candidates.					
E	Effectiveness of competency assessment					
1	CoC institutions demonstrate the capability to effectively manage and oversee the competency assessment system.					

№	Key determinants of the implementation of occupational competency assessment in Ethiopia	5	4	3	2	1
2	Utilized assessment tools are designed to measure the competencies of candidates accurately.					
3	Assessment centers have the tools necessary to thoroughly assess candidates' skills and abilities in a controlled setting.					
4	Assessors possess the necessary expertise to evaluate and determine the competencies of candidates effectively					

1. Please list some other factors you believe influencing the implementation of an occupational competency assessment in Ethiopia.

_____

_____

_____

Thank you!

Appendix B: Assessors Questionnaire

Addis Ababa University

School of Graduate Studies

Department of curriculum and Instruction

Questionnaire to be filled by Assessors

The purpose of this Questionnaire is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system. The success of this study depends on your responsible, sincere and timely response.

Please note that:-

- No need of writing your name
- Where alternative answers are given please circle the letter of your choose
- Please describe well in answering the open ended questions.

Thank you for using your time to complete this questionnaire.

Part I: Demographic

4. Name of the Regional/City Administration CoC----------Name of Assessment Center----------
5. Sex a) M b) F
6. Age a) 20—30 b)31—40 c) above 41

4. Educational Qualification a) TVET certificate b) BA/BCS c) MA d) above MA

5. Year of service in the industry a) 1—5 b) 6—10 c) 11-15 d) above 16

6. Years of service as assessor a) 1—5 b) 6—10 c) 11-15 d) above 16

Part II: The extent of congruence between the practice of occupational competency assessment and its strategy, theories, and principles

The following points on occupational competency assessment strategy, theories, and principles have been stated below. They identify their extent of correspondence with the practice of occupational competency assessment. Please mark one of the responses that best fits your opinion by putting a (✓) mark against the scales of measurement indicated below.

5= Strongly Agree

4 = Agree

3 = Undecided

2 = Disagree

1= Strongly Disagree

№	Congruence between the practice of occupational competency assessment and its strategy, theories, and principles	5	4	3	2	1
A	Center of Competency (CoC)					
1.	Organization of CoC autonomous to execute the mission					
2.	Assessors refresher training to be conducted together with industry					
3.	Knowledge of Supervisors is sufficient compared to the criteria of quality and principles of assessment					
4.	Time allocated to assessors methodology training is adequate					
5.	Trainers of Assessment Methodology are competent					
6.	Assessors and other stakeholders conduct quarterly meeting on performance of assessment					
7.	Supervisors Accountability Assured in the assessment system					
8.	Supervisors assigned in Assessment Center have competence with occupation					
9.	CoC Center has send Assessment result to college this has good impact on training					
10.	Assessors' payment is adequate and motivational.					
11.	Monitoring and Evaluation has conducted to Assessors performance.					
B.	Development of Occupational Standards (OS)					
1.	Full industry participation in OS development and revision					
2	Participation and leadership of occupational association leaders in OS development and revision					
3	Sectoral association participation in OS development and revision					
4	OS development and revision based on demand from the world of work					
5	OS development and revision based on international benchmarks					
C	Assessment Tools					
1.	Assessment tool development with Assessors panel					
2.	Assessment tools are similar with competencies of workplace					
3.	Assessment tools measure Cognitive thinking					

№	Congruence between the practice of occupational competency assessment and its strategy, theories, and principles	5	4	3	2	1
4.	Assessment tools validated by Ministry of Labor and Skill					
5.	Utilization and handling of assessment tools is secured and not easily found in the hands of candidates					
D.	Assessment process					
1	More than one assessor conducting assessment					
2	Assessment has value for stakeholders					
3	Consistency in competency assessment results					
4	Assessment result verification					
5	Assessors refresher training					
6	Candidate preparation by assessment system					
7	Candidate understanding of OS					
8	Consistency of assessment conditions					
9	Clarity of assessment system					
E.	Assessment Centers (AC)					
1	AC accreditation has given together with CoC experts and Industry experts					
2	AC has given accreditation and reaccreditation after 3 years					
3	AC has adequate facilities based on occupation to conduct the assessment					
4.	AC has proximity to the candidates					
5.	AC has a coordinator					
6.	AC has an assessor					
7.	AC shop assistance have an occupational Ethics					

- ✓ Please describe some other points you think can indicates the congruence or the absence of congruence between the practice of occupational competency assessment and its strategy and principles

_____

_____

_____

Part III: The factors influencing the implementation of occupational competency assessment in Ethiopia. The following identified factors influence the Practice of occupational competency assessment and certification system. Please indicate your level of agreement for the following statements by putting a (✓) mark against the scales of measurement indicated below.

5= Strongly Agree

4 = Agree

3 = Undecided

2 = Disagree

1= Strongly Disagree

№	Key determinants of the implementation of occupational competency assessment in Ethiopia	5	4	3	2	1
A	Factors related to Center of Competency (CoC)					
1	Autonomous Center of Competency (CoC) to execute its mission					
2.	Establishment and functionality of CoC Boards					
3.	Establishment and functionality of Regional Industry body.					
4.	Establishment and functionality of Zone/Sub-City industry body working with CoCs					
5.	Similarity of assessment with the competencies required in the workplace.					
6.	Feedback on the assessment results of candidates from CoCs to training institutions					
7.	Registrars have a required Ethics.					
B	Factors related to Assessment tools					
1	The assessment tool (project) is prepared based on the occupational standard.					
2	Assessment tasks have to comply with industry requirements.					
3	Assessment tools are secured by CoCs					
4	Assessment tools are secured by Assessment Centers					
5	Assessment tools are clear and easily understandable					
6	Assessment tools measure logical reasoning and deep thinking.					
C	Factors Related to Assessment Centers (AC)					
1.	Conducting assessments by accredited industry AC					
2.	Conducting assessments through accredited TVET training institutions.					
3.	The necessary materials and facilities for AC are based on occupations.					
4.	Availability of a coordinator in AC, to facilitation the competency assessment.					
5.	Availability of shop assistants, who prepare workshop facilities, equipment, tools, and materials.					
6.	Shop assistants work ethics					
7.	The proximity of AC to the candidates.					
D	Factors related to Supervisors					
1.	The competency of supervisors is related to the occupation of giving supervision.					
2.	Knowledge of the supervisor on the principles of assessment and assessment methodology.					
3.	Supervisors' commitment to follow up on the implementation of the assessment task.					
4.	Handling of complaints raised by the candidates					
E	Effectiveness of competency assessment					
1	CoC institutions demonstrate the capability to effectively manage and oversee the competency assessment system.					
2	Utilized assessment tools are designed to measure the competencies of candidates accurately.					
3	Assessment centers have the tools necessary to thoroughly assess candidates' skills and abilities in a controlled setting.					
4	Supervisors possess the necessary expertise to oversee the competency assessment system during the course of the assessment.					

- ✓ Please list some other factors you believe influencing the implementation of an occupational competency assessment in Ethiopia.

_____

_____

Thank you!!

Appendix C: Candidates Questionnaire

አዲስ አበባ ዩኒቨርሲቲ
ድህረ ምረቃ ፕሮግራም
የሥርዓተ ትምህርት ክፍል
ለተመዛኞች የተዘጋጀ መጠይቅ

የዚህ ጥናት ዓለማ በኢትዮጵያ የሙያ ብቃት ምዘና ሥርዓት በተለያዩ ሰነዶች የሚባለውና አሁን ካላው አፈጻጸም አንጻር አንጥሮ መለየት እና ምዘናው ትግበራ ላይ አፈጻጸሙ ላይ ተጽእኖ የሚፈጥሩ ጉዳዮችን መረዳትን ዓላማን ታሳቢ ያደረገ ነው። በተጨማም የጥናቱ አላማ ለሶስተኛ ዲግሪ ትምህርት ማሟያ ጥናትና ለትምህርት ዓላማ የሚደረግ ነው። የዚህ መጠይቅ ስኬት በእርስዎ ግልጽነት ላይ የተመሠረተ ነው።

እባክዎ መጠይቁን ሲሞሉ

- **ስም መጻፍ አያስፈልግም**
- **አማራጭ መልስ ሲያገኙ መልስዎን ያክብቡ**
- **በክፍት ቦታዎች አስተያየቶን በደንብ ይግለጹ፣**

ስለትብብርዎና ስለጊዜዎ በጣም እናመሰግናለን።

ክፍል አንድ : የተመዛኙ አጠቃላይ መረጃ

1. **የሠለጡነበት ተቋምት ስም**----------
2. **ፆታ** **ሀ. ሴት** **ለ.ወንድ**

3. **ዕድሜ** **ሀ. ከ17-25** **ለ. 26-35** **ሐ.36-45** **መ. ከ45 በላይ**
4. **የተመዘኑበት ሙያ ዓይነት**----------

ክፍል ሁለት፡ የሙያ ብቃት ምዘና ስርዓት በተመዛኞች ዘንድ ያለውን አስተሳሰብ ሁኔታ መረዳት ፣

በእርስዎ አመለካከት ትክክለኛ ነው በሚሉት ሃሳብ ላይ ከታች በተገለፀው መሠረት የ"✓" ምልክት በማድረግ በተሰጠዎት የመለኪያ ሚዛን (Scale) ላይ ምላሽዎን ይስጡ።

5= **በጣም እስማማለሁ** 3= **አልወሰንኩም**
4 = **እስማማለሁ** 2= **አልስማማም**
1 = **በፍፁም አልስማማም**

ተ.ቁ	*ተመዛኞች ስለሙያ ብቃት ምዘና ያላቸው አስተሳሰብ*	*5*	*4*	*3*	*2*	*1*
1.	**ለህብረተሰቡና ለተመዛኙ ጠቃሚ ነው።**					
2.	**ስራ የመቀጠር ዕድልን ይፈጥርልኛል፣**					
3.	**የክህሎት ክፍተቴን እንዲለይ ያስችለኛል፣**					
4.	**የተመዘንኩት የሙያ ብቃት ማረጋገጫ የምስክር ወረቀት ለማግኘት ሲል ነው፣**					
5.	**በራስ መተማመን ሞራሌን ይገነባል፣**					
6.	**በስራው ዓለም ውስጥ ተወዳዳሪ እንዲሆኑ ያደርግኛል፣**					
7.	**ለቀጣሪ ድርጅት ብቁ ሰራተኛ እንዲያገኙ ይረዳቸዋል፣**					
8.	**ለመምህራን የስልጠናውን ሂደት ክፍተት እንዲያውቁ ይረዳል፣**					
9.	**ለሙያ ብቃት ምዘና ጊዜና ገንዘብ መጠቀም ጠቃሚ ነው**					
10.	**የሙያ ብቃት ምዘና ሥርዓት ተመዛኞች ወደ ዩኒቨርስቲ ገብተው ቀጣይ ትምህርት እንዲማሩ ያበረታታል።**					
11.	**ምዘናውን የሚወስደው ኮሌጁ ስለሚያስገድደኝ ነው**					
12.	**ምዘናውን የሚወስደው ሳቢና ስለምወደው ነው።**					
13.	**ምዘናው ቀላልና ተመዛኙ ያለ ችግር የሚሰራው ነው።**					
14.	**የወደፊት ህይወቴንና ጉዞየን ብሩህ ያደርጋል፣**					
15.	**ምዘናው ፈጠራንና አመክናዊ አስተሳሰብን ያሳድጋል፣**					
16.	**ከዘመናዊ ለውጦች ጋር እንዲጓዝ ያደርገኛል፣**					

ተ.ቁ	ተመዛኞች ስለሙያ ብቃት ምዘና ያላቸው አስተሳሰብ	5	4	3	2	1
17.	ምዘናው ከስራው ዓለም ጋር ይጣጣማል፣					
18.	በአንድ ምዘና ብቁ ባልሆን እንኳን በማንኛውም ጊዜ በድጋሚ ለመመዘን ስለምፈቀድ በስነ ልቦና ረገድ ዝግጁ ነኝ፡፡					
19.	መመዘን ካለመመዘን የተሻለ ጥቅም አለው፣					

20. በሙያ ብቃት ምዘና አስተሳሰብ ጋር ተያያዥነት ያላቸው ሌሎች ነጥቦች ካሉ ይግለፁ፡፡

ክፍል ሦስት: የሙያ ብቃት ምዘና አፈጻጸም ላይ ተጽእኖ የሚፈጥሩ ጉዳዮች፣

በእርስዎ አመለካከት ትክክለኛ ነው በሚሉት ሃሳብ ላይ ከታች በተገለፀው መሠረት የ"✓" ምልክት በማድረግ በተሰጠዎት የመለኪያ ሚዛን (Scale) ላይ ምላሽዎን ይስጡ፡፡

5= በጣም እስማማለሁ
4 = እስማማለሁ
3= አልወሰንኩም
2= አልስማማም
1 = በፍፁም አልስማማም

ተ.ቁ	የሙያ ብቃት ምዘና አፈጻጸም ላይ ተጽእኖ የሚፈጥሩ ጉዳዮች	5	4	3	2	1
ሀ	የምዘና መሳሪያን /Assessment tool/ በተመለከተ					
1.	የሙያ ብቃት ምዘናው ከኢንዱስትሪው ፍላጎት ጋር ይጣጣማል፣					
2.	የሙያ ብቃት ምዘና ጥያቄዎች ቋንቋቸው ግልጽ በቀላሉ መረዳት የሚያስችሉ ናቸው					
3.	የሙያ ብቃት ምዘና ጥያቄዎች ትዕዛዝ ግልጽ ናቸው፡፡					
4.	ለሙያ ብቃት ምዘናው የተሰጠው ጊዜ ለምዘናው የተሰጡትን ኘሮጀክቶች ከግምት ውስጥ ያስገባና በቂ ነበር፡፡					
5.	የሙያ ብቃት ምዘና ጥያቄዎች ጥልቅ የአስተሳሰብ ክህሎትን ይለካሉ፣					
6.	የሙያ ብቃት ምዘና ጥያቄዎች በ CoC ሚስጢራዊነታቸው የተጠበቀ ነው፡፡					
ለ	የምዘና ጣቢያን በተመለከተ					
1	የሙያ ብቃት ምዘና ጣቢያዎች ለምዘና አስፈላጊው ቁሳቁስ የተሟሟላላቸው ናቸው፡፡					
2	በምዘና ጣቢያው ያሉ የሥራ መሳሪያዎች ደረጃቸውን የጠበቁና የሚሠሩ ናቸው፡፡					
3	በምዘና ጣቢያዎች ምዘናውን የሚያስተባብር መረጃ የሚሠጥ ባለሙያ የተሟላ ነው፡					
4	በምዘና ጣቢያዎች ለተመዛኙ ቅርብ ናቸው፣					
ሐ	የሙያ ብቃት መዛኝን በተመለከተ					
1	በአንድ መዛኝ ብቻ የሚሰጠው ምዘና ፍታዊ ነው					
2	የመዛኙ የምዘና ሂደት ፍትሀዊ፣ ውጤታማና ከምዘና በኋላ አሳማኝ ግብረመልስ የሚሠጥበት ነው ፡፡					
3	መዛኞች የብቃት ችግር የሌውም/ላትም፣					
4	መዛኞች የስነ ምግባር ችግር የለባቸውም፣					
መ	የምዘና ሱፐርቫይዘርን በተመለከተ					
1	የምዘና ሱፐርቫይዘር የምዘናውን ሂደት በአግባቡ የሚከታተል ቅሬታዎችን በሚገባ የሚያስተናግድ ነው፡፡					
2	የምዘና ሱፐርቫይዘር የብቃት ችግር የሌውም/ላትም፣					
3	የምዘና ሱፐርቫይዘር የስነ ምግባር ችግር የሌውም/ላትም፣					
4	የምዘና ጣቢያ ሾፕ ረዳት የስነ ምግባር ችግር የሌውም/ላትም፣					

6. የሙያ ብቃት ምዘና አፈጻጸም ሂደት ላይ አሉ የሚሏቸውን ተጸኢኖ የሚፈጥሩ ጉዳዮች ተጨማሪ ቢገልጹ፣

እናመሰግናል!!

Appendix D: Interview Protocol for Federal Ministry Level Competency assessment Directorates

School of Graduate Studies

Department of curriculum and Instruction

Interview Protocol for Federal Ministry Level competency assessment Directorates

The purpose of this Interview is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system. The success of this study depends on your responsible, sincere and timely response

Participation of relevant stakeholders on the current Ethiopia's TVET policy and strategy formulation and development.

1. Would you please tell me about your participation in the development of the policy and strategy of TVET if you had any? What was your role during the policy formulation and strategy development?
2. Can we discuss about the overall involvement and participation of stakeholder during the process of the policy and strategy of TVET?
3. How do you judge the level of awareness created for you about the current TVET policy and strategy?
4. How do you judge the level of awareness of relevant stakeholders about the current TVET policy and strategy?
5. Is there attention given to occupational competency assessment in the policy and strategy of TVET? How?
6. Could you please give me a brief overview of your organization participation on the new occupational standard development?
7. How do your sector use the current occupational standard?
8. Would you please tell us additional points about the industry's ownership of the sector?

Thank you so much!

Appendix E: Interview Protocol for CoC competency assessment

Directorates

Addis Ababa University

School of Graduate Studies

Department of curriculum and Instruction

Interview Protocol for CoC competency assessment Directorates

The purpose of this Interview is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system. The success of this study depends on your responsible, sincere and timely response

I. Participation of relevant stakeholders on the current Ethiopia's TVET policy and strategy formulation and development.

9. Would you please tell me about your participation in the development of the policy and strategy of TVET if you had any? What was your role during the policy formulation and strategy development?
10. Can we discuss about the overall involvement and participation of stakeholder during the process of the policy and strategy of TVET?
11. How do you judge the level of awareness created for you about the current TVET policy and strategy?
12. How do you judge the level of awareness of relevant stakeholders about the current TVET policy and strategy?
13. Is there attention given to occupational competency assessment in the policy and strategy of TVET? How?

II. Practice of occupational competency assessment and certification system vis-à-vis the policy, strategy, and principles

1. How do you explain and justify the institutional structure of CoC to execute its mission and work with industries to develop ownership of industries?
2. Is the assessment process in line with requirements in strategy and principles of occupational competency assessment?
3. Is the industries work environment serve as an assessment center?
4. Do you believe that the assessment system is transparent to all stakeholders? Why and how?

III. Factors influencing the implementation of occupational competency assessment in Ethiopia.

1. Would you please discuss organizational factors that influences the implementation of occupational competency assessment?
2. How do assess and explain factors influencing the occupational competency assessment related to assessors?
3. Are there factors related with Assessment tools which influence the implementation of occupational competency assessment? How?
4. How do you judge and explain factors influencing the occupational competency assessment related to supervisors?
5. Would you please discuss factors that influences the implementation of occupational competency assessment related to candidates?
6. Please tell us any additional point about factors that influences the implementation of occupational competency assessment.

Thank you so much?

Appendix F: Interview Protocol for Industry Supervisors

Addis Ababa University

School of Graduate Studies

Department of curriculum and Instruction

Interview Protocol for Industry Supervisors

The purpose of this Interview is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system. The success of this study depends on your responsible, sincere and timely response

I. Participation of relevant stakeholders on the current Ethiopia's TVET policy and strategy formulation and development.

1. Would you please tell me about your participation in the development of the policy and strategy of TVET if you had any? What was your role during the policy formulation and strategy development?
2. Can we discuss about the overall involvement and participation of stakeholder during the process of the policy and strategy of TVET?
3. How do you judge the level of awareness created for you about the current TVET policy and strategy?
4. How do you judge the level of awareness of relevant stakeholders about the current TVET policy and strategy?

II. Perception of Occupational Competency Assessment and Certification systems in Ethiopia.

1. How do you look the importance of occupational competency assessment for society and Candidate?
2. How do perceive about the compatibility between the occupational competency assessment with world of work?
3. Has it a contribution to quality of TVET training? How?
4. How do perceive the competency assessment is a requirement for joining University? Why?
5. How do perceive the competency assessment is a requirement for job recruitment? Why?
6. How do you perceive about occupational competency assessment and classroom examination?
7. Is competency assessment has a contribution to the candidate competitiveness and future career? How?

8. Are you believe on competency assessment is simply wasting time and money? How?
9. Please tell us any additional point about your perception of occupational competency assessment.

III. Practice of occupational competency assessment and certification system vis-à-vis the policy, strategy, and principles of competency assessment

1. How do you explain and justify the institutional structure of CoC to execute its mission and work with industries to develop ownership of industries?
2. Is the assessment process in line with requirements in strategy and principles of occupational competency assessment?
3. Is the industries work environment serve as an assessment center?
4. Do you believe that the assessment system is transparent to all stakeholders? Why and how?

IV. Factors influencing the implementation of occupational competency assessment in Ethiopia.

1. Would you please discuss organizational factors that influences the implementation of occupational competency assessment?
2. How do assess and explain factors influencing the occupational competency assessment related to assessors?
3. Are there factors related with Assessment tools which influence the implementation of occupational competency assessment? How?
4. How do you judge and explain factors influencing the occupational competency assessment related to supervisors?
5. Would you please discuss factors that influences the implementation of occupational competency assessment related to candidates?
6. Please tell us any additional point about factors that influences the implementation of occupational competency assessment.

Thank you so much?

Appendix G: Interview Protocol for labor and skill ministry assessment Directorates

Addis Ababa University

School of Graduate Studies

Department of curriculum and Instruction

Interview Protocol for labor and skill ministry assessment Directorates

The purpose of this Interview is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system. The success of this study depends on your responsible, sincere and timely response

I. Participation of relevant stakeholders on the current Ethiopia's TVET policy and strategy formulation and development.

1. Would you please tell me about your participation in the development of the policy and strategy of TVET if you had any? What was your role during the policy formulation and strategy development?
2. Can we discuss about the overall involvement and participation of stakeholder during the process of the policy and strategy of TVET?
3. How do you judge the level of awareness created for you about the current TVET policy and strategy?
4. How do you judge the level of awareness of relevant stakeholders about the current TVET policy and strategy?
5. Is there attention given to occupational competency assessment in the policy and strategy of TVET? How?

II. Practice of occupational competency assessment and certification system vis-à-vis the policy, strategy, and principles

1. How do you explain and justify the institutional structure of CoC to execute its mission and work with industries to develop ownership of industries?
2. Is the assessment process in line with requirements in strategy and principles of occupational competency assessment?
3. Is the industries work environment serve as an assessment center?
4. Do you believe that the assessment system is transparent to all stakeholders? Why and how?

III. Factors influencing the implementation of occupational competency assessment in Ethiopia.

1. Would you please discuss organizational factors that influences the implementation of occupational competency assessment?
2. How do assess and explain factors influencing the occupational competency assessment related to assessors?
3. Are there factors related with Assessment tools which influence the implementation of occupational competency assessment? How?
4. How do you judge and explain factors influencing the occupational competency assessment related to supervisors?
5. Would you please discuss factors that influences the implementation of occupational competency assessment related to candidates?

Thank you so much?

Appendix H: Interview Protocol for shop assistance of assessment centers

አዲስ አበባ ዩኒቨርሲቲ

ድህረ ምረቃ ፕሮግራም

የሥርዓተ ትምህርት ክፍል

የምዘና ጣቢያ ለሾፕ ረዳቶች የተዘጋጀ ቃለ መጠይቅ መምሪያ

የዚህ ጥናት ዓለማ በኢትዮጵያ የሙያ ብቃት ምዘና ሥርዓት በተለያዩ ሰነዶች የሚባለውና አሁን ካላው አፈጻጸም አንጻር አንጥሮ መለየት እና በምዘናውን ትግበራ ላይ አፈጻጸሙን የሚያደናቅፉና የደግፉ ጉዳዮችን መረዳትን ዓላማን ታሳቢ ያደረገ ነው። በተጨማም የጥናቱ አላማ ለሶስተኛ ዲግሪ ትምህርት ማሟያ ጥናትና ለትምህርት ዓላማ የሚደረግ ነው። የዚህ ጥያቄ ስኬት በእርስዎ ግልጽነት ላይ የተመሠረተ ነው።

1. የሙያ ብቃት ምዘና ሁሪያ ያሎት አስተሳሰብ ምን ይመስላል

1. **የሙያ ብቃት ምዘና ለህብረተሰቡና ለተመዛኙ ካለው ጥቅም አኳያ እንዴት ያዩታል?**
2. **የሙያ ብቃት ምዘና የተመዛኙን ቀጣይ ትምህርትና የወደፊት ህይወት ከመለወጥ አንጻር እንዴት ያዩታል?**
3. **የሙያ ብቃት ምዘና ከስራው ዓለም ፍላጎት ጋር ያለው አንድነትን እንዴት ይረዳሉ?**
4. **የሙያ ብቃት ምዘና ጊዜና ገንዘብ ከማባከን አንጻር እንዴት ይመዝኑታል?**
5. **ለቴ/ሙያ ስልጠና ጥራት ከማሳደግ አንጻር ያለው አስተዋጽኦ እንዴት ያዩታል?**
6. **ለዩኒቨርሲቲ መግቢያ መስፈርት መሆኑ ትክክል ነው ብለው ያስባሉ? ለምን?**
7. **የሙያ ብቃት ምዘና ክፍል ውስጥ ከሚሰጠው ፈተና አንጻር ልዩነቱን እንዴት ያዩታል?**
8. **ምዘናው ፈጠራንና አመክናዊ አስተሳሰብን ከማሳደግ አንጻር ያለውን ሁኔታ እንዴት ያዩታል?**
9. **ተጫማሪ ሃሳብ ካሎት ቢገልጹልን፣**

2. **የሙያ ብቃት ምዘና አፈጻጸም ላይ አሉታዊና አዎንታዊ ተጸኢኖ የሚፈጥሩ ጉዳዮች**

1. **የሙያ ብቃት ምዘና አፈጻጸም ላይ አሉታዊና አዎንታዊ ተጸኢኖ የሚፈጥሩ CoC በኩል ያሉ ጉዳዮችን ቢገልጹ፣**
2. **የሙያ ብቃት ምዘና አፈጻጸም ላይ አሉታዊና አዎንታዊ ተጸኢኖ የሚፈጥሩ በምዘና ጣቢያ በኩል ያሉ ጉዳዮችን ቢገልጹ፣**
3. **የሙያ ብቃት ምዘና አፈጻጸም ላይ አሉታዊና አዎንታዊ ተጸኢኖ የሚፈጥሩ በመዛኝ በኩል ያሉ ጉዳዮችን ቢገልጹ፣**
4. **የሙያ ብቃት ምዘና አፈጻጸም ላይ አሉታዊና አዎንታዊ ተጸኢኖ የሚፈጥሩ በሱፐርቫይዘር በኩል ያሉ ጉዳዮችን ቢገልጹ፣**

5. **የሙያ ብቃት ምዘና አፈጻጸም ላይ አሉታዊና አዎንታዊ ተጸኢኖ የሚፈጥሩ በምዘና መሳሪያ በኩል ያሉ ጉዳዮችን ቢገልጹ፣**
6. **የሙያ ብቃት ምዘና አፈጻጸም ላይ አሉታዊና አዎንታዊ ተጸኢኖ የሚፈጥሩ በተመዛኝ በኩል ያሉ ጉዳዮችን ቢገልጹ፣**
7. **ሌሎች ተጫማሪ ጉዳዮች ካሉ ቢጨምሩ፣**

እናመሰግናል!!

Appendix I: Interview Protocol for TVET polytechnic college deans

Addis Ababa University

School of Graduate Studies

Department of curriculum and Instruction

Interview Protocol for TVET polytechnic college deans and trainers

The purpose of this Interview is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system. The success of this study depends on your responsible, sincere and timely response

I. Participation of relevant stakeholders on the current Ethiopia's TVET policy and strategy formulation and development.

1. Would you please tell me about your participation in the development of the policy and strategy of TVET if you had any? What was your role during the policy formulation and strategy development?
2. Can we discuss about the overall involvement and participation of stakeholder during the process of the policy and strategy of TVET?
3. How do you judge the level of awareness created for you about the current TVET policy and strategy?
4. How do you judge the level of awareness of relevant stakeholders about the current TVET policy and strategy?
5. Is there attention given to occupational competency assessment in the policy and strategy of TVET? How?

II. Perception of Occupational Competency Assessment and Certification systems in Ethiopia.

1. How do you look the importance of occupational competency assessment for society and Candidate?
2. How do perceive about the compatibility between the occupational competency assessment with world of work?
3. Has it a contribution to quality of TVET training? How?
4. How do perceive the competency assessment is a requirement for joining University? Why?
5. How do perceive the competency assessment is a requirement for job recruitment? Why?
6. How do you perceive about occupational competency assessment and classroom examination?

7. Is competency assessment has a contribution to the candidate competitiveness and future career? How?
8. Are you believe on competency assessment is simply wasting time and money? How?
9. Please tell us any additional point about your perception of occupational competency assessment.

III. Practice of occupational competency assessment and certification system vis-à-vis the policy, strategy, and principles

1. How do you explain and justify the institutional structure of CoC to execute its mission and work with industries to develop ownership of industries?
2. Is the assessment process in line with requirements in strategy and principles of occupational competency assessment?
3. Is the industries work environment serve as an assessment center?
4. Do you believe that the assessment system is transparent to all stakeholders? Why and how?

V. Factors influencing the implementation of occupational competency assessment in Ethiopia.

1. Would you please discuss organizational factors that influences the implementation of occupational competency assessment?
2. How do assess and explain factors influencing the occupational competency assessment related to assessors?
3. Are there factors related with Assessment tools which influence the implementation of occupational competency assessment? How?
4. How do you judge and explain factors influencing the occupational competency assessment related to supervisors?
5. Would you please discuss factors that influences the implementation of occupational competency assessment related to candidates?
6. Please tell us any additional point about factors that influences the implementation of occupational competency assessment.

Thank you so much?

Appendix J: FGD questions for TVET polytechnic college trainers

Addis Ababa University

School of Graduate Studies

Department of curriculum and Instruction

Focus group discussion question for TVET polytechnic college trainers

The purpose of this FGD is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system. The success of this study depends on your responsible, sincere and timely response

I. Participation of relevant stakeholders on the current Ethiopia's TVET policy and strategy formulation and development.

3. Would you please tell me about your participation in the development of the policy and strategy of TVET if you had any? What was your role during the policy formulation and strategy development?
4. Can we discuss about the overall involvement and participation of stakeholder during the process of the policy and strategy of TVET?
5. How do you judge the level of awareness created for you about the current TVET policy and strategy?
6. How do you judge the level of awareness of relevant stakeholders about the current TVET policy and strategy?
7. Is there attention given to occupational competency assessment in the policy and strategy of TVET? How?

II. Perception of Occupational Competency Assessment and Certification systems in Ethiopia.

8. How do you look the importance of occupational competency assessment for society and Candidate?
9. How do perceive about the compatibility between the occupational competency assessment with world of work?
10. Has it a contribution to quality of TVET training? How?
11. How do perceive the competency assessment is a requirement for joining University? Why?
12. How do perceive the competency assessment is a requirement for job recruitment? Why?
13. How do you perceive about occupational competency assessment and classroom examination?

14. Is competency assessment has a contribution to the candidate competitiveness and future career? How?
15. Are you believe on competency assessment is simply wasting time and money? How?
16. Please tell us any additional point about your perception of occupational competency assessment.

III. Practice of occupational competency assessment and certification system vis-à-vis the policy, strategy, and principles

17. How do you explain and justify the institutional structure of CoC to execute its mission and work with industries to develop ownership of industries?
18. Is the assessment process in line with requirements in strategy and principles of occupational competency assessment?
19. Is the industries work environment serve as an assessment center?
20. Do you believe that the assessment system is transparent to all stakeholders? Why and how?

VI. Factors influencing the implementation of occupational competency assessment in Ethiopia.

21. Would you please discuss organizational factors that influences the implementation of occupational competency assessment?
22. How do assess and explain factors influencing the occupational competency assessment related to assessors?
23. Are there factors related with Assessment tools which influence the implementation of occupational competency assessment? How?
24. How do you judge and explain factors influencing the occupational competency assessment related to supervisors?
25. Would you please discuss factors that influences the implementation of occupational competency assessment related to candidates?
26. Please tell us any additional point about factors that influences the implementation of occupational competency assessment.

Thank you so much?

Appendix K: Observation Checklist to Assess Availability of resources required for competency assessment in Assessment Centers

Addis Ababa University

School of Graduate Studies

Department of curriculum and Instruction

Observation Checklist to Assess Availability of resources required for competency assessment in Assessment Centers

The purpose of this Observation Checklist is to collect data to investigate the rhetoric and reality of the occupational competency assessment and certification system in Ethiopia. It also aimed at understanding the context and factors influencing the implementation of a competency-based assessment system.

No	Materials	Adequate available	Inadequate available	Not available at all
1	Sufficient size of workshop that can accommodate specified number of candidates			
2	Equipped with the required ventilation and lighting facilities			
3	OHS facility and easily accessible entrance and exit points.			
4	Sufficient number of functional equipment, tools, instruments, and materials for the practical projects included in the assessment activities			
5	Sufficient supply of electric power and water (if necessary).			

Appendix L: Interview code classification

Interviewed Ministerial Organizations	Code Anonymized
Respondent from Ministry of Health	MO1
Respondent from Ministry of Industry	MO2
Respondent from Ministry of Urban development and Construction	MO3
Respondent from Ministry of Culture and Sport	MO4
Respondent from Ministry of Tourism	MO5
Respondent from Ministry of Labor and Skill	MO6
Respondent Directorates from Ministries	
Respondent Directorate from Ministry of Health	MR1
Respondent from Directorate Ministry of Industry	MR2
Respondent from Directorate Ministry of Urban development and Construction	MR3
Respondent from Directorate Ministry of Culture and Sport	MR4
Respondent from Directorate Ministry of Tourism	MR5
Respondent from Directorate Ministry of Labor and Skill	MR6
Respondent CoC Director	
Respondent Addis Ababa CoC Director	CR1
Respondent Amhara CoC Director	CR2
Respondent Gambella CoC Director	CR3
Respondent Oromia CoC Director	CR4
Respondent Sidama CoC Director	CR5
Respondent TVET Deans	TDR
Respondent Addis Ababa TVET Dean	TDR1
Respondent Amhara TVET Dean	TDR2
Respondent Gambella TVET Dean	TDR3
Respondent Oromia TVET Dean	TDR4
Respondent Sidama TVET Dean	TDR5
Focus Group discussion of Trainers	

FGD Addis Ababa Trainers	TR1
FGD Amhara Trainers	TR2
Respondent Regional State Industry representatives	
Respondent Addis Ababa industry representative	IR1
Respondent Amhara industry representative	IR2
Respondent Gambella industry representative	R23
Respondent Oromia industry representative	IR3
Respondent Sidama industry representative	IR4
Respondent Chamber of Commerce and Sectorial Association representatives	
Respondent Ethiopian Chamber of Commerce representative	ECR1
Respondent Sectorial Association representative	SR1
Respondent CoC focal persons	
Respondent Addis Ababa CoC focal person	CFR1
Amhara CoC focal person	CFR2
Respondent Gambella CoC focal person	CFR3
Respondent Oromia CoC focal person	CFR4
Respondent Sidama CoC focal person	CFR5