Evaluating the Implementations of Competence-Based Assessment and Certification System in TVET: The Case of Ethiopia

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Abstract
This paper evaluates the implementations of assessment and certification in the Ethiopian TVET system based on review of government documents and a descriptive analysis of primary data. The primary data are obtained by administering questionnaires to 184 TVET heads and 547 students/trainees that are drawn from 40 public, private and NGO TVET institutions in Addis Ababa and by administering interviews to 10 key informants. It is found that assessment is being carried out based on regulations/guidelines and assessment tools in accredited assessment centers by accredited assessors. Implementation of the system has directed the effort of stakeholders towards enhancing learners' competence and has influenced learning. As a result, the number of candidates who passed the assessment in Addis Ababa has increased from 14.3% in 2009/10 to 61.7% in 2015. Findings also point out that the implementation of assessment is to some extent in line with some of the principles (criteria) proposed in the theoretical literature. Encouraging practices are observed in terms of linking assessment with the learning outcomes or competence requirements of work place (i.e., national standards) as well as the authenticity, cognitive complexity, directness, consistency, and transparency of assessment. However, quality of internal assessment is hampered due to gaps in institutional capacity especially among smaller TVET institutions. Furthermore, implementation of external assessment is being affected by challenges such as unethical conduct by some assessors; limited accessibility of assessment as a service; capacity (quality) gaps in terms of assessors, assessment tools, materials and machineries; longstanding (but declining) attitudinal problems disfavoring external assessment; weak linkage between the external assessment system and TVET institutions (i.e., delivery); and, possible adverse effects of competence as a single criteria for renewal of accreditation of TVET institutions/programs. Finally, this paper points out some mechanisms that may help address the implementation challenges of a competence-based assessment system in the Ethiopian context.
Keywords: evaluation, competence-based education and training, assessment, certification, TVET

1. Introduction

The recognition to quality of education and training as a decisive means for realizing sustainable development and poverty alleviation has increased over the years since the 1990s (King, 2009, Tarabini, 2010, Wallenborn, 2009). Nevertheless, the concept of quality seems to be slippery. In their earlier research work that reviewed relevant literature, Reeves and Bednar (1994, p. 436) conclude that "no universal, parsimonious, or all-encompassing definition or model of quality exists". Recent works (Wittek and Kvernbekk, 2011, Dennis, 2012) also reaffirm that the concept of quality is an inherently vague concept and continues to be an item of conversation over time. Harvey and Green (1993) grouped the widely differing conceptualizations of quality into five discrete but interrelated categories, namely: quality as exceptional, quality as perfection (or consistency), quality as fitness for purpose, quality as value for money and quality as transformation. As transformation, quality of education and training refers to qualitative change in form or value-added, or more specifically to a 'cognitive transcendence' of participants (learners). This involves 'enhancing the participant' in terms of knowledge, skills and attitudes and 'empowering the participant' - allowing the participants to have an influence on the transformative process (Harvey and Green, 1993). In their discussion of various conceptualizations of quality, Kemenade, Pupius, and Hardjono (2008) also articulate the concept of quality in terms of what they call its constituents: object, standard, subject and values. In terms of standards, quality in education and training refers to conformance to (national) standards.

Outcome-Based or Competence-Based Education and Training (CBET) has been embraced by developed countries (Biemans et al., 2004, Smith, 2010, Velde, 1999) as well as by developing countries (Sturing et al., 2011) as an educational technology or approach to enhance the relevance and quality of education and training. In such a system, learning outcome achievement and competence of learners/students

(rather than the mere attainment of certificates) are key indicators of quality. Such competence is derived from an analysis of the work place and their articulation in national standards. In such a system, national occupational standards are the basis for curriculum design, delivery and assessment.

The difficult task of achieving education and training quality in developing countries requires reforming the education and training system. In such a reform, there is a need for designing and implementing concrete interventions or system that take learning outcomes and competence as central elements of not only curriculum design and delivery, but also assessment and certification of competence. In his paper in which he gave answers to what he calls 'frequently asked questions', Mulder's (2012b) affirms that competence assessment is one of the four elements of CBET. Assessment of learning outcomes is also promoted in other literature that view assessment as a tool that influences instruction-learning and educational effectiveness (Weurlander et al., 2011, Harlen, 2007, Harlen, 2009, Coates and Seifert, 2011, Dochy and McDowell, 1997, Creemers and Kyriakides, 2008, Mulder, 2004).

Before the introduction of the 2008 TVET reform, Technical and Vocational Education and Training (TVET) in Ethiopia suffered from poor quality in most TVET programs and from absence of a system for a systematic and independent assessment and recognition of competence that is obtained through formal, non-formal and informal learning and training (MoE, 2008). To address this and other problems, the government issued the national TVET strategy in 2008 (MoE, 2008) under the auspices of the 1994 Education and Training Policy of Ethiopia (FDRE, 1994) and the 2004 TVET proclamation (HoPR, 2004). With the overarching aim of putting in place an outcome-based TVET system, the national TVET strategy envisaged the design and implementation of various interventions: a national qualifications framework for TVET (ETQF); occupational standards (OS); accreditation system; rearrangements in TVET management and financing; modularization of curriculum; reorganization of instruction-learning; and, introduction of a competence-based system for the assessment and certification of competences.

With respect to assessment and certification, the national TVET strategy envisages that occupational (competence or standards-based) assessment will be conducted internally by TVET institutions and externally by accredited assessors in accredited assessment centers in all occupational qualifications at all levels of the ETQF. External assessment will be followed by certification upon passing the assessment. To this end, the strategy stipulates that TVET authorities at Federal level are responsible for designing and regulating the system while TVET authorities at regional state level are responsible for ensuring proper implementation of the system by state TVET centers of competence (MoE, 2008).

In line with the CBET approach, the *occupational assessment and certification directive* (MoE, 2010c) requires that "the competence requirements in the different qualification levels of the country's vast occupational classifications shall be the basis for the assessment and certification in all industry sectors" (p. 2). The directive also requires that assessment should be more practical rather than being only theoretical and should integrate knowledge, skills and attitudes. In the directive, certification is defined as "a formal process of recognizing that an individual is qualified in terms of the required knowledge, skills and proper work attitudes based on the occupational standards set by industry" (MoE, 2010c, p. 3). This indicates that competence is expected to be the main criteria against which assessment and certification will be effected.

Evaluation research into the implementation of systems/programs (i.e., implementation evaluation) plays a key role in providing empirical evidence regarding the implementation status and challenges of the program or system (Rossi et al., 2004, p. 199). Despite the fact that the design of the Ethiopian TVET system embraces the principles of CBET with respect to outcome-based assessment and certification, independent evaluation research on the implementation of the assessment and certification system is non-existent. Therefore, this paper aims at evaluating the implementation of the TVET system in Ethiopia with particular emphasis on the following two research questions:

i)   Are the interventions that are envisaged in the design of the TVET system in relation to assessment and certification being implemented as per the design?

ii) What implementation challenges/pitfalls are affecting the implementation of the envisaged interventions?

1.   Theoretical and Conceptual Framework
Assessment and Certification of Competence in CBET

An understanding on outcome-based or competence-based assessment and certification system requires understanding the meaning of CBET as an approach that governs the entire education and training system. William G. Spady (1994) defined the approach as follows:

> Outcome-Based Education means clearly focusing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for students to be able to do, then organizing curriculum, instruction, and assessment to make sure this learning ultimately happens.

(pp. 12-13)

This definition implies that in an education and training system that envisages organizing everything around learning outcomes or competence, the assessment and certification of competence and learning outcomes is a necessary ingredient. Based on comparative discussions in Spady (1994, pp. 6-7) and in Harris et al (1995, p. 27), there is key difference between the CBET approach and the traditional approaches. In the CBET approach, credentials or certifications indicate that the holder of the certificate has acquired and is able to practically demonstrate certain competences that are articulated in the national standards. Whereas in the traditional approaches, credentials or certificates simply indicate that the holder of the certificate has successfully completed a course (courses) or achieved a grade (i.e., the certificate does not indicate or guarantee the level of competence achieved). Competence-based assessment also has its base in the philosophical perspective or paradigm known as constructivism or social constructivism. As discussed in Fosnot and Perry (1996), the constructivists perspective promotes performance or practice-based assessment (e.g., through portfolios or projects, apprenticeships, etc).

Drawing on different sources, MacKenzie and Polvere (2009) have provided definitions for terminologies related to assessment (i.e., assessment, assessor, and certification) in their TVET glossary. Accordingly, assessment is defined as "the sum of methods and processes used to evaluate the attainments (knowledge, know-how, skills and competences) of an individual, and typically leading to certification" (p. 61) while an assessor is "a person qualified to carry out assessment" (p.61). In this glossary, certification of skills and competence is defined as "the formal acknowledgement of successful achievement of a defined set of outcomes" (p.62). Hence, learning outcomes and competences are central to assessment in the modern approach.

Concepts of competence and learning outcomes are also central to the conceptualization of quality (Carmichael et al., 2001) as well as to the understanding of CBET and competence-based assessment and certification systems. Based on an exploratory review of the definitions and usage of the concept of competence, Le Deist and Winterton (2005) concluded that the conception of competence in France, Germany, Austria and in many other European countries is multi-dimensional and holistic. In this conception, competence integrates knowledge, skills and behaviours as dimensions of competence. In Le Deist and Winterton's typology of competence, competence refers to cognitive competence (i.e., knowledge and understanding), functional competence (i.e., skills), social competence (i.e., the behavioural and attitudinal aspects of competence), and meta-competence (i.e., the ability to cope with uncertainty and to deal with learning and reflection - learning how to learn).

As reported in Descy and Tessaring (2002), the German or European perspective defines competence as "the proven and individual capacity to use know-how, skills, qualifications or knowledge in order to meet both familiar and evolving occupational situations and requirements" (p. 13). Drawing on the conceptions from VOCED and ILO, the TVET glossary of MacKenzie and Polvere defines competence as "the individual's demonstrated capacity to perform, i.e. the possession of knowledge, skills and personal characteristics needed to satisfy the special demands or requirements of a particular situation". (MacKenzie and Polvere, 2009, p. 63). These two definitions seem to be in conformity with the multi-dimensional and holistic approach as they integrate knowledge, skills and behaviours as dimensions of competence. The implication of holistic conceptualization of competence is that the assessment and certification system should facilitate and enforce the conduct of assessments that integrate learners' knowledge, skills and behaviours (i.e., it should not be only paper-and-pencil based assessment of knowledge).

The European qualifications framework (EQF) defines learning outcomes as "statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined as knowledge, skills and competences (CEDEFOP, 2010, p. 22). Likewise, the TVET glossary of MacKenzie and Polvere (2009, p. 69) articulates learning outcomes as "the set of knowledge, skills and/or competences an individual has acquired and/or is able to demonstrate after completion of a learning process". The fact that both concepts are defined in terms of knowledge, skills and attitudes makes competence and learning outcomes very similar concepts. Hence, competence and learning outcomes are strongly related concepts. Despite the slight difference between the two concepts, what is important is that any assessment system that claims to be outcome or competence-based should aim at determining the extent to which the learner has acquired the knowledge, skills and attitudes that are desired in the national occupational standards.

In their paper that focuses on linking assessment for learning, improvement and accountability in the context of higher education, Coates and Seifert (2011) indicated that there are three approaches to assessment: classroom assessment, institutional assessment, and system-level (national) assessment. It is stated that in the context of student-centered education and training, teachers could use classroom assessment as a sound approach to link the assessments (e.g., assignments and tests) to the learning outcomes. Assessment could be either formative or summative. As explained in Harlen (2007), formative assessment focuses on promoting learning and helping teachers identify areas for improvement in student learning outcomes by providing evidence on the status of students learning in light of the learning objectives or outcomes. In contrast, summative assessment

provides a summary or information on students' achievements at a particular point in time to the students themselves and to other stakeholders including the management, parents, employers, and other teachers for keeping records, certification and accountability purposes. Drawing on different literatures, Harlen (2007) points out that the use of student achievement as indicators for accountability purposes is likely to affect teachers' behavior in conducting formative and summative assessments. It is further argued that assessment needs to take into account certain criteria such as validity (i.e., what ought to be assessed), reliability (i.e., how well achievement is assessed), impact (i.e., impact on teaching and learning), and resources (i.e., costs associated with assessment) of assessment (Harlen, 2007, Harlen, 2009). In an earlier work, Baartman et al. (2006) proposed a framework that consists of 10 criteria for competency assessment programs. The criteria are further explained in the works of Baartman et al. (2007a) and applied in an empirical study by Baartman et al. (2007b) in Dutch vocational schools. Drawing on descriptions in Baartman et al. (2007b, p. 860), the 10 criteria are briefly described (below).

- *Authenticity*: similarity of assessment with the competences required in the work place.
- *Cognitive complexity*: incorporation of higher cognitive skills in assessment tasks.
- *Comparability*: consistency of assessment conditions and scoring to all students and over time.
- *Costs and efficiency*: the time and resources needed for assessment should be lesser as compared to the benefit, which is the improvement in instruction-learning.
- *Directness*: the ability for teachers and assessors to immediately determine whether the student is able to perform in a certain profession or occupation.
- *Educational consequences*: the effects of assessment on instruction-learning.
- *Fairness*: avoiding assessor's bias.
- *Meaningfulness*: the assessment should have value to students, teachers, employers and society.
- *Reproducibility*: decisions on the basis of competency assessments results should be accurate and should not depend on (vary across) situations and assessors.
- *Transparency*: criteria, purpose, and processes of assessment should be clear and understandable to all stakeholders, including students and regulatory bodies.

In their qualitative study that aimed at providing more insight into students' experience and understanding of formative assessments, Weurlander et al. (2011) suggested that formative assessments influence positively the learning process and its outcome because such assessments provide the signal that motivates students to learn and that indicates where they need further improvement. Similarly, Dochy and McDowell (1997) argue that "more use of formative assessment is one way to convince students that assessment has the purposes of indicating their strengths, weaknesses and progress, and guiding them towards their learning goals in addition to verifying their levels of achievement" (pp. 291-292).

As discussed in Dochy and McDowell (1997), wider developments in society have necessitated a shift from what is called the traditional testing culture to what is called the assessment culture. These wider developments in society are the emergence of the information age; technological possibilities through the Internet, multimedia and educational technology; the growing need for flexible labour force in the labour market; the shift towards demand-driven education; and, the growing recognition to lifelong learning. It is elaborated that in the traditional testing culture, instruction-learning and testing are considered as two distinct activities. Whereas in the assessment culture, these two activities are seen as integrated activities and learners are expected to act as active participants in the learning process and create meaning out of it while teachers are expected to provide students with tasks that are interesting and challenging. Drawing on various literatures, Dochy and McDowell (1997) describe the features of the more recent assessment systems: (a) they focus on assessment of achievements and competences of students; (b) they are based on national standards; (c) they use different assessment methods; and, (d) they give greater role for observation by and judgment of the teacher.

Based on a critical review of the historical backdrop of competence-based education as well as a consideration of the social constructivist view of learning, Mulder (2004) outlined 10 theoretical principles for CBET that are further tested and developed in subsequent research works (Wesselink et al., 2007, Wesselink et al., 2010b, Sturing et al., 2011) and prescribed in other research works (Mulder, 2012a, Mulder and Gulikers, 2011) as practical guidelines for the development of comprehensive CBET system. Among these principles, the fifth CBET principle states that students be regularly assessed. This principle requires that assessment be carried out before, during and after the learning process; that assessment be focused on the competence development of students; and that assessments involve vocational practice at all times. The fourth CEBT principle states that knowledge, skills and attitudes (KSA) are always integrated in the learning process and that KSA are assessed as an integrated whole (Sturing et al., 2011). Therefore, an assessment of the implementation of an outcome-based assessment system needs to consider adherence to these principles.

Through their research endeavors over many years, Creemers and Kyriakides (2008) developed a generic model known as the dynamic model of educational effectiveness (DMEE). The DMEE identifies

assessment as one of the eight classroom-level factors that affect student achievement (Creemers and Kyriakides, 2008, Creemers and Kyriakides, 2011). Creemers and Kyriakides (2008) argue that formative assessment needs to be incorporated as an integral part of teaching so that teachers will be able to address their students' learning needs and improve their own teaching practice. Based on descriptions in Creemers and Kyriakides (2008, pp. 116-117), Table 1 shows the multidimensional measurement of this factor.

Table 1: Measurement of 'assessment' in the DMEE in terms of the five dimensions

Dimension	Description of the factor in terms of the dimension
Frequency	The number of assessment tasks and the time they take without hampering the actual time spent on teaching and learning.
Focus	Whether teachers use different ways of measuring student skills and whether the teacher makes more than one use of the information she or he collects (e.g. for identifying needs of students, conducting self-evaluation, for long-term planning, as a starting point for teaching).
Stage	The period at which the evaluation tasks take place (e.g. at the beginning of, during, and at the end of a lesson or unit of lessons) and the time lapse between assessment and feedback.
Quality	The properties of the evaluation instruments (validity, the internal and external reliability, the practicality); the extent to which the instruments cover the teaching content; whether the teachers provide constructive feedback; and, the way students use the feedback.
Differentia-tion	The extent to which teachers use different techniques for measuring student needs and/or different ways to provide feedback to different groups of students by taking into account their background and personal characteristics, such as their thinking style.

Source: Summarized based on descriptions in Creemers and Kyriakides (2008, pp. 116-117).

Challenges to the Implementation of Competence-Based Assessment System
The practical aspect of CBET is not free from challenges or pitfalls. Drawing on various literature and based on their empirical study on competence-based TVET in the Netherlands, Biemans, et al (2004, pp. 531-534) indicated seven possible pitfalls (implementation challenges) of CBET. The pitfalls are also discussed in Biemans, et al. (2009). It is stressed that the challenges to the proper implementation of competence-based assessment system emanate from: a) the fact that practical assessment (as compared to classroom examination) is not only time consuming and labour-intensive, but also requires standardization of observation and development of reliable and valid assessment tools; and, b) the dilemma created in keeping the balance between national standards for assessment and local need for flexibility. In a study entitled 'trends and issues concerning TVET across the globe', Oketch et al. (2009) indicates the supply-side problems/challenges many less-developed countries face in their effort to provide effective TVET. Nevertheless, these authors did not address the challenges pertinent to the implementation of such assessment systems.

Conceptual Framework
Following the holistic and multi-dimensional conceptualization of competence in Le Deist and Winterton's (2005), the operational definition of the concept in MacKenzie and Polvere (2009), and the definition of learning outcomes in Hartel & Foegeding's (2006), this paper recognizes that learning outcomes and competence are key elements of internal and external assessment. In line with Harvey and Green (1993), TVET quality is understood in this paper as transformation of the learner in terms of knowledge, skills and attitude (more broadly, competence). From society's point of view, this paper adopts Kemenade, Pupius, & Hardjono's (2008) conceptualizations of quality as conformance to (national) standards. Similarly, this paper adopts the definition of assessment and certification in the TVET glossary of MacKenzie and Polvere (2009).Table 2 presents the operationalization of the evaluation of the assessment of the implementation status of the assessment system and the challenges encountered.

Table 2: Operationalizing the evaluation of implementation of competence-based assessment system

Focus	Operationalization
Macro-level implementation	Whether the FTVETA (a) has established a national system for occupational assessment and certification; (b) has specified assessment-related rules and procedures; and, (c) controls the system.
Meso-level implementation	Whether the Addis Ababa City Administration is ensuring proper implementation of the system for assessment and certification; and, the challenges to the implementation of the external assessment system in terms of attitudinal problems; accessibility of external assessment service; quality of assessors, assessment tools, and assessment facilities/resources; awareness among trainees on the usefulness of external assessment; fairness/ethics in assessment; feedback on assessment results (integration); and control (review) on the assessment system by TVET authorities.
School-level implementation	This factor measures the extent to which trainers continuously assess trainees' KSA; use different assessment methods and give assessment feedback to trainees and/or their parents. Specifically, it assesses whether: • All trainers assess trainees' performance • The focus of assessment in the program is on enhancing learning/training rather than for grading purposes only. • Assessments in our program take place continuously (i.e., not just at one point). • Trainers carefully design the assessment instruments (e.g., test, assignments). • The assessments cover all training objectives of the units of competence. • Trainers provide students/trainees with constructive assessment feedback • Trainers inform parents of students/trainees about our assessment results. • Trainers use different assessment methods (e.g., quiz, individual and group assignment, project, written exam, etc).

Source: Developed by authors based on the theoretical framework

Methodology

This evaluation research is carried out based on an analysis of secondary data obtained by reviewing documents and primary data obtained from interviews and questionnaires. The interviews are administered to key informants from the Federal TVET Agency (FTVETA), the Addis Ababa TVET Agency (AATVETA), and the Addis Ababa Occupational Competence Assessment and Certification Center (AAOCACC). The questionnaires are administered to heads of TVET institutions (i.e., deans, vice deans, training program managers/coordinators and department heads) and to TVET students/trainees. The secondary data are analyzed using the method of document analysis while the primary data are analyzed through descriptive statistics (including tests of proportion.

The assessment is carried out at macro (i.e., system) level, at meso (i.e., the Addis Ababa City Administration) level; and, at micro (i.e., at TVET institution) level. From 133 TVET institutions (i.e., the sampling frame), 40 TVET (16 public and 24 non-public) institutions were drawn from all (10) sub-cities of Addis Ababa based on the multistage sampling technique. In the first stage, the TVET institutions were stratified based on the ownership status of the institutions (i.e., public versus non-public) as well as the levels of programs that they offer. In the second stage, the TVET institutions were selected using the systematic random sampling technique. As a result, the sample incorporates TVET programs at all levels (level I-V) offered by smaller TVET institutions, polytechnic colleges, university colleges and universities. The sample constitutes 93 TVET heads drawn from public TVET institutions and 91 TVET heads drawn from non-public (i.e., private and non-governmental or NGO) TVET institutions. The sample also consists of 235 students/trainees from public and 312 from non-public TVET institutions.

Majority of the 182 TVET head respondents (81.9 per cent) are males (two did not indicate their gender) and 47.5% of the students/trainees are males. A little more than 66% of the TVET heads are 40 year olds or below, implying that majority are young. The mean age for students/trainees is 21 years. Out of 183 respondents (one missing value), the majority (76%, $z=5.13$) has attained at least undergraduate degree. Among 169 TVET heads (15 respondents did not indicate their job position), 51.5% are department heads, 21.3% are training managers, 14.2% are vice deans, and 13% are deans. Regarding their total work experience in the TVET sector, 65% have over ten years total work experience. Out of 165 respondents (18 are missing values), the majority (78.8 per cent, $z=5.46$) has worked for at least one year in TVET leadership positions. Hence, the sample TVET heads are expected to have adequate knowledge about the implementation of internal and external assessments in the TVET sector.

Results

Implementation of Internal Assessment

To assess the implementation of internal assessment at TVET institution level, four items were included in the questionnaire that was administered to TVET heads. It is found that the proportion of respondents in government and in non-government who agreed and strongly agreed with the statements listed on Table 3 is significantly greater than 50 per cent (i.e., z >1.96). Statistical tests show that there is no significant difference between the proportion of respondents in government and in non-government TVET institutions (i.e., z <1.96).

Overall, the results presented on Table 3 indicate that practice of internal assessment in both government and non-government TVET institutions is continuous (formative) as well as summative; integrates theory with practice; and, is to a greater extent in accordance with OS.

Table 3: TVET heads' opinion regarding the implementation of internal assessment

Questionnaire item	Responses (in %)		
	SA + A	NC	D+SD
Internal assessment is given in line with each unit of competence in the program (n=180)	88.3 (z=7.87)	8.3	3.3
Internal assessments integrate theory with practice (n=180)	88.3 (z=7.87)	7.8	3.9
Trainees take summative institutional assessment before taking national competency test (n=180)	96.7 (z=10.02)	2.8	0.6
Assessment tools are in conformity with OS (n=180)	86.1 (z=7.34)	7.8	6.1

Source: Own survey data, May-July 2015

Note: SA=Strongly Agree, A=Agree, NC=No Comment, D=Disagree, and SD=Strongly Disagree

To assess the views of TVET students/trainees regarding internal assessments in their respective TVET programs, eight items were included in the questionnaire. The results (Table 4) indicate that majority of the sample students/trainees (i.e., significantly greater than 50%) either strongly agree or agree that (a) all trainers assess trainees' performance; (b) the focus of assessment in the program is on enhancing learning/training rather than for grading purposes only; (c) assessments in the program take place continuously rather than being at one point (i.e., assessment is formative); (d) the assessments cover all training objectives of the units of competence in the modules; (e) trainers carefully design the assessment instruments; (f) trainers give students/trainees constructive assessment feedback; and (g) trainers use different assessment methods. However, only 45.6% of the sample students/trainees (i.e., not significantly greater different from 50%) either strongly agree or agree that teachers/trainers inform their parents about their assessment results.

Table 4: Students'/trainees' opinion of on the practice on internal assessment in their schools/institutions

Questionnaire Items	Responses (in %)		
	SA + A	NC	D+SD
All trainers assess trainees' performance (n=547)	74.8 (z=8.47)	9.3	15.9
The focus of assessment in the program is on enhancing learning/training rather than for grading purposes only (n=547)	70.0 (z=6.75)	12.4	17.5
Assessments in our program take place continuously (n=547)	72.0 (z=7.46)	12.6	15.4
The assessments cover all training objectives of the units of competence in the modules (n=547)	69.9 (z=6.72)	14.1	16.1
Trainers carefully design the assessment instruments (n=547)	69.9 (z=6.72)	14.1	16.1
Trainers give us constructive assessment feedback (n=547)	72.8 (z=7.75)	9.1	18.1
Trainers inform our parents about our assessment results (n=547)	45.6 (z=-1.46)	13.5	40.8
Trainers use different assessment methods such as quiz, individual and group assignment, project and written exams (n=547)	70.8 (z=7.03)	8.2	21.0

Source: Source: Own survey data, May-July 2015

Note: SA=Strongly Agree, A=Agree, NC=No Comment, D=Disagree, and SD=Strongly Disagree.

Implementation of the External Assessment and Certification System

The assessment and certification of competence is one of the pillars or elements of an outcome-based TVET system. The TVET strategy envisages that federal TVET authorities will develop and issue directives or guideline. As part of the macro-level implementation, the Ministry of Education (MoE) has issued the *Occupational Assessment and Certification Directive (MoE, 2010c)* as well as working or operational manuals for assessors (MoE, 2010a), for candidates (MoE, 2010b), for assessment centers (MoE, 2010d), and for center of competence (MoE, 2010e). The directive clearly stipulates the roles of various stakeholders involved in the assessment and certification system).

Accordingly, the FTVETA is responsible for conducting regular oversight and control; facilitating the development of assessment tools and the issuance of certificates; assisting the centers of competence (CoCs) in

solving emerging problems; and maintaining and managing database. The CoCs are responsible for accrediting a training institution or a production facility as an assessment center (for 3 years); accrediting qualified practitioners as assessors (for 3 years); assigning supervisors; making sure that appropriate tools are used during assessment; and, issuing qualification certificates to competent candidates. Accredited assessment centers are responsible for accepting and processing candidates' applications, facilitating the conduct of assessment, making available all resources needed, and providing candidates with self-assessment guide and the pre-requisites of the units of competence.

Assessors refer to qualified experts drawn from the world of work and accredited for conducting assessment with the responsibility for assessing and determining whether a candidate possess certain competences or all the competences defined by an occupational qualification. Supervisors' role is to assure the proper conduct of assessment and comply with administrative and technical quality procedures. Finally, the candidate's role is to know and abide with the rules and regulations set for the assessment; choose and apply for an assessment arrangement (by qualification level or by unit/ units of competence); demonstrate competence during assessment session so that he or she gets the qualification certificate.

As required in the *Occupational Assessment and Certification Directive (MoE, 2010c),* the federal TVET authorities have taken practical steps in the form of establishing centers of competence and assessment centers throughout the country. The nature of external (national) competence assessment, and certification system, and its implementation are further elaborated by key informants from AATVETA and AACOCC. Despite the fact that external assessment of competence is a new experience in the TVET sector in Ethiopia, the key informants believe that positive and encouraging changes are happening. They elaborated that the external assessment involves the following elements:

- *Candidates*: after the candidate fills a self-check questionnaire, if she/he mentions that he/she is not able to perform certain units of competence, then he/she is advised to go back to his/her institution and fill the gap before taking the assessment.

- *Assessors*: it is stated that each assessor must have a minimum of three years experience in industry (work place), he/she must be certified (i.e., have passed the national assessment in the qualification filed), has taken training on assessment methodology, and has been exposed to the practical assessment environment before taking on the assignment of assessment.

- *Assessment centers*: those industries or TVET institutions that are accredited by the AACOCC after fulfilling the necessary equipments and machineries and human resources. In Addis Ababa there are 294 assessment centers that are accredited by the competence center.

- *Assessment tools/instrument*: prepared as a draft by industry assessors based on the OS and approved by the FTVETA. For levels I and II, there is no theoretical evaluation. It is fully practical. In level III and above, it is both theoretical and practical.

- *Supervisor*: supervisors are playing their role as specified in the directive. In addition, they receive, document and report any complaints from the candidate. They must have also taken training on the assessment process and environment.
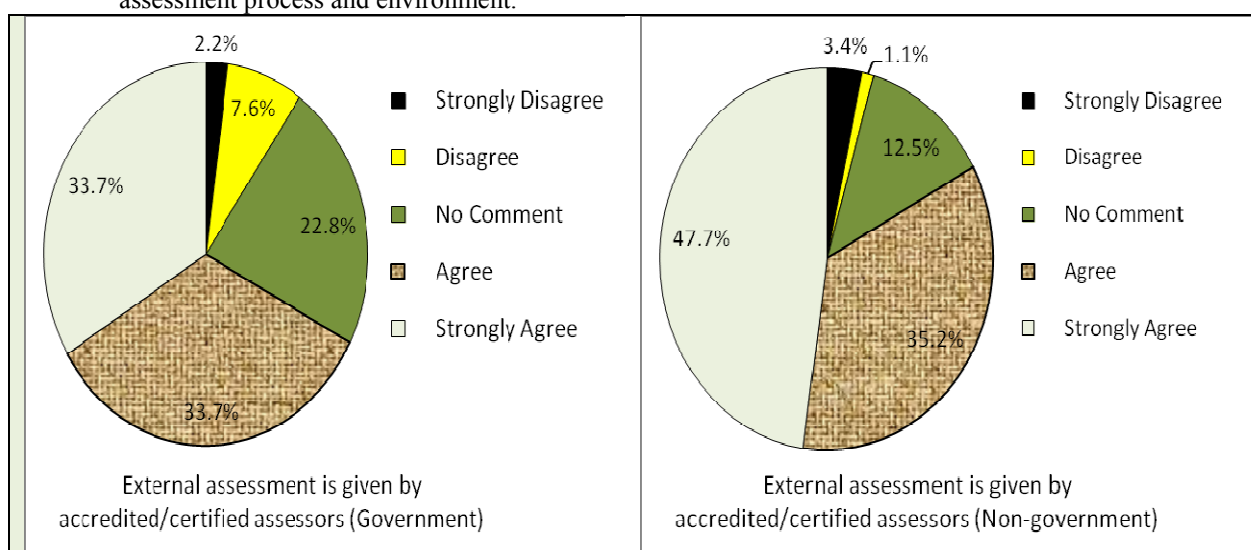

Figure 1: TVET heads' opinion on accreditation/certification of assessors
Source: Own survey data, May-July 2015

The sample TVET heads also expressed their opinion (in the questionnaire) regarding the status of the external assessment system. Figure 1 presents the results on whether or not they think external assessment is

given by certified assessors. Among the 184 respondents, majority (67.4% in government, z=2.4 and 83% non-government, z=4.64) believe that external assessment is given by certified assessors. The sample TVET heads were also asked in the questionnaire to give their opinion regarding other (five) statements concerning the external assessment system.

Based on the results reported on Table 5, there are two findings. First, the proportion of respondents in both government and non-government TVET institutions who agreed and strongly agreed with the statement that 'the external assessment system gives feedback to improve TVET quality' is significantly lower than 50 per cent (z=-0.89). This indicated that the external assessment system is less integrated with TVET delivery. Second, majority of the respondents (z > 1.96) in both government and non-government TVET institutions either agreed or strongly agreed that external assessment is OS-based, integrates theory with practice, and is given in accredited test centers and that trainees have the motivation and willingness to take the assessment.

Table 5: TVET heads' opinion on the external assessment system

Questionnaire Items	Response (in %)		
	SA + A	NC	D+SD
External assessment is based on OS (n=180)	86.7 (z=7.49)	7.8	5.6
External assessment integrates theory with practice (n=180)	79.4 (z=5.84)	13.3	7.2
External assessment is given in accredited test centers (n=180)	82.2 (z=6.45)	13.3	4.4
Trainees have the motivation and willingness to take the external assessment (n=180)	69.4 (z=3.75)	17	13.9
The external assessment system gives us feedback that helps in improving TVET quality (n=179)	45.3 (z=-0.89)	17.9	36.9

Source: Own survey data, May-July 2015
Note: SA=Strongly Agree, A=Agree, NC=No Comment, D=Disagree, and SD=Strongly Disagree

Challenges to the External Assessment and Certification System

Attitude towards external assessment:

The key informants stated that low level of trainee attitude towards and willingness to take the external assessment was a serious challenge. Especially at the beginning of the implementation of the system (i.e., in 2009/10), there was strong resistance not only form trainees but also from trainers. They used to argue that assessment and certification by the TVET institution is adequate and there is no need for national assessment. However, the key informants believe that attitude towards and willingness to be assessed externally is now improving due to continuous awareness creation efforts and persistent implementation of the system. These days, trainees are even demanding it because employers are now demanding certification. Furthermore, during training, a trainee cannot progress vertically from one level to the next without being assessed and certified for the lower level. In addition, almost all trainers are assessed and certified by the center regardless of their educational qualification. Nowadays, trainees and trainers are demanding the efficient provision of assessment and prompt solutions to any complaints in relation to assessors. The key informants indicated that the following changes have occurred:

- The proportion of trainees who passed the assessment in Addis Ababa has increased from 14.3% in 2009/10 to 61.7% in 2015. This has further improved attitudinal problems.
- New occupational fields such as those in Meteorology and Airlines are coming to assessment.
- The number of candidates who have taken the external assessment is also increasing from to time. In 2015, 102,000 candidates have been assessed in Addis Ababa.

In the Ethiopian case, renewal of accreditation of private and NGO TVET institutions/programs depends on the proportion of student/trainees of the school/institutions who passed the test. In 2015, the requirement was that at least 60% of the students/trainees who took the assessment must pass. This linkage between accreditation and assessment result (implying accountability) seems to be less welcome by some private TVET institutions. The interviewees indicated that some investors have even shut down their programs for being unable to meet the threshold and a few others are complaining about the criteria.

Access to external assessment:

Due to the increasing awareness on the importance of and the demand for assessment, accessibility of assessment service has emerged as key challenge. Furthermore, assessment or test centers tend to delay assessment in certain occupational fields when the trainees/candidates who register to take the assessment are few in number.

Quality of external assessment:

Quality of the external assessment system is another key challenge due to (a) inadequate technical and technological competence of assessors; (b) gaps in quality of assessment instruments; (c) inadequate capacity of

assessment/test centers; and, (d) limited linkage and cooperation with productive sectors.

Fairness/ethics of assessors:

The key informants indicated that there have been some claims against assessors. This is in relation to unethical behaviour among some assessors. Apart from being a claim, some assessors have been caught red handed receiving money as a bribe. It is indicated that the root cause of this has been attitudinal problem and the fact that only one assessor conducts the assessment.

Assessment feedback:

The key informant from the AACOCC stated that the center provides periodic feedback to AATVETA (% competent) on the LOA achievements of candidates. This feedback reports the number of candidates assessed and the number of candidates qualified in all occupational fields. Furthermore, the research wing of the center gives skills gap analysis and gives feedback to TVET institutions on specific occupations. However, the key informants from the AATVETA argued that the frequency of feedbacks is limited (once or twice in a year) and that the feedback is so generic that it does not indicate the skill gaps of those individual candidates who are found to be incompetent during the assessment. It seems that the problem is attitudinal and lack of system.

Table 6: TVET heads' ratings on implementation challenges to external assessment

Implementation Challenges	Ratings	
	Pts.	Rank
Poor quality of assessment facilities in assessment centers	-723	7th
National assessment tools not similar with institutional assessment tools	-701	5th
Low occupational competence of external assessors	-708	6th
Unethical conduct among some external assessors (favoritism)	-628	1st
Low awareness among trainees on importance and nature of external assessment	-675	4th
Limited control of TVET authorities over the external assessment system	-657	3rd
Limited integration among COC center, City TVET Agency and Federal TVET Agency	-636	2nd

Source: Own survey data, May-July 2015

Note: The ranks are negative numbers; the smaller the sum, the most significant the challenge is.

Similarly, the questionnaire to the TVET heads also included items on potential challenges to the external assessment system. Based on the aggregated ratings (Table 6.), the four most significance challenges (in their order of importance) are: (i) unethical conduct among some external assessors (favoritism); (ii) limited integration among COC center, City TVET Agency and Federal TVET Agency; (iii) limited control of TVET authorities over the external assessment system; and, (iv) low awareness among trainees on importance and nature of external assessment.

Discussions

As indicated in the theoretical framework (Weurlander et al., 2011, Harlen, 2007, Harlen, 2009, Coates and Seifert, 2011, Dochy and McDowell, 1997), it is argued that in the context of student-centered education and training, formative assessment could be used as a sound approach to link assessments to learning outcomes and as a means for learning. This study has found evidence that confirms linkage between assessment and learning outcomes or competences. In the Ethiopian case, it is a requirement that students/trainees take summative (institutional and national) assessments unless they pass the formative assessments. The findings also confirm the propositions in the DMEE of Creemers and Kyriakides (2008) with respect to assessment. This is because internal (formative) assessments are continuous in nature; focus on learning rather than on grading; integrate theory with practice; and, are broader in scope (competence-oriented) in terms of their coverage of the learning objectives. Furthermore, findings show that (a) assessment tools are standards-based, (b) assessments are based on different assessment methods; and, (c) assessments are followed by feedbacks to the students. Therefore, it can be argued that internal assessment in the study area is in line with the propositions in the literature that promote formative assessments as a tool for learning.

However, there is no strong evidence that indicates that the TVET schools/institutions very well communicate the parents of the students/trainees about internal assessments results of their children. Furthermore, the findings point out that internal assessment is being adversely affected by challenges emanating from limited institutional capacity among some TVET institutions (especially those that offer TVET programs at levels I and II) in terms of TVET teachers/trainers, machinery, equipments and materials have adverse effects on the quality of internal assessments.

As indicated in the theoretical framework, classroom assessment, institutional assessment, and system-level assessment are the three approaches to assessment (Coates and Seifert, 2011). The Ethiopian TVET system also incorporates external (system-level) assessment. Similarly, the results indicate that the external assessment

system is in conformity with the propositions in the CBET literature (Mulder, 2004, Wesselink et al., 2007, Wesselink et al., 2010a, Wesselink et al., 2010b, Sturing et al., 2011). Specifically, it is in conformity with the fourth and the fifth CBET principles. Findings also point out that the external assessment and certification system in Ethiopia has the features of more recent assessment systems that are outlined in Dochy and McDowell (1997). This is because the findings indicate that the system (a) focuses on assessment of achievements and competences of students rather than on fulfillment of certain courses requirements; (b) is based on national standards (OS); (c) uses different assessment methods; and, (d) give greater role for observation by and judgment of the teacher.

The findings also indicate that implementation of the external assessment and certification system is in conformity with some of the criteria proposed in the literature (Baartman et al., 2006, Baartman et al., 2007b, Baartman et al., 2007c, Baartman et al., 2007a). The system promotes authentic assessment by linking assessment with the OS and by conducting assessment in accredited test centers (i.e., industry and some TVET institutions). The criterion of cognitive complexity is met through candidates' demonstration of cognitive and non-cognitive competences during assessment. At the end of the assessment, the assessor immediately determines whether or not a trainee has qualified the assessment (i.e., is found to be competent). This is inconformity with the criterion of directness. As reported in the results (above) the duty of the supervisor is to make sure that the assessment conditions are consistently in accordance with the requirements. This contributes in fulfilling the criterion of comparability (consistency). Furthermore, the procedures to be followed for and during assessment are also clearly communicated including on the website of the center. This implies that the criterion of transparency is served.

The results from the questionnaires and the interviews show that a number of problems are operating as challenges at various levels. The assessment-related challenges of the implementation of CBET systems that are pointed out in the literature (Biemans et al., 2004, Biemans et al., 2009) seem to be occurring to some extent in the Ethiopian case as well. Even though external assessments are guided by national standards (OS), which is a good practice, conducting practical assessment as per the OS has definitely been very costly in terms of time and other resources. In addition, some units of competence are found to be inconsistent with real work situations.

Another practical challenge to competence-based assessment system in Addis Ababa is the weak linkage the AACOCC has with the TVET institutions in giving a timely feedback on competency gaps of those students/trainees who could not pass the assessment. This challenge erodes the criterion of 'educational consequences', which requires that assessment should have effects on instruction-learning. This practice is not also in conformity with the propositions in Weurlander et al. (2011) and Dochy and McDowell (1997) that formative assessments should influence positively the learning process by indicating strengths, weaknesses and progress. Even though it is evident that the practice of competence based external assessment in the study area is redirecting the focus of all stakeholders towards competences, this seemingly small problem has huge adverse effects on the learning process.

Ratings of the sample TVET heads indicate that 'unethical conduct among some external assessors' is the most significant challenge to external assessment system. This obviously is in contradiction with the criterion of fairness. This practice seems to emanate from the fact that assessment is carried out by only one assessor, and that there is weak control from the side of the TVET authorities. As rated by the sample TVET heads, 'limited control of TVET authorities over the external assessment system' is the third most significant challenge as per the ratings of the sample TVET heads. This limitation regarding fairness and control also points out that there is a limitation in terms of transparency.

Based on the findings of this study, additional challenges to the external assessment system include the following. First, attitudinal problems disfavoring the external assessment system are (though declining) existent. Second, the accessibility of external assessment is limited as compared to the growing demand for assessment. Third, the quality of external assessment is suffering from gaps in: (a) the quality (i.e., technical and technological competence) of assessors; (b) the quality of assessment instruments (tools), inadequate capacity of assessment/test centers; and, (c) the linkage and cooperation with productive sectors. Fifth, the fact that renewal of accreditation is linked only to students' national assessment results is causing some problems on the supply side of TVET.

Conclusion

This paper reports that the implementation of the competence-based assessment and certification system is guided supported by necessary directive/guideline. While internal/formative (i.e., continuous and institutional) assessment is being carried out by TVET institutions, external (system-level) assessment is being carried out in accredited assessment centers by accredited assessors under the regulation and supervision of regional CoCs. Based on the findings, it can be concluded that internal assessments are continuous in nature; focus on learning rather than on grading; integrate theory with practice; and, are broader in scope (i.e., not focusing on few learning objectives but on competence). Furthermore, findings show that (a) assessment tools are standards-

based (i.e., linked to national standards), (b) assessments are based on different assessment methods; and, (c) assessments are followed by feedbacks to the students. However, internal assessments are not followed by feedbacks to parents and have quality gaps due to capacity gaps in terms of teachers/trainers, machinery, equipments and materials.

Based on the findings concerning the external assessment and certification system in Ethiopia (particularly in Addis Ababa), it can be concluded that the system (a) focuses on assessment of achievements and competences of students rather than on fulfillment of certain courses requirements; (b) is based on national standards (OS); (c) uses different assessment methods; and, (d) give greater role for observation by and judgment of the teacher. Furthermore, it can be concluded that the system addresses to some extent the principles of authentic assessment, cognitive complexity, directness, comparability (consistency), and transparency. As a result, implementation of the external assessment and certification system has directed the attention and effort of stakeholders towards enhancing learners' competence and has influenced learning.

Nevertheless, the practice of internal assessment needs further improvement in terms of the linkage between the system and the productive sectors (i.e., public and private organizations), fairness, quality, transparency, accessibility, and control. Though declining over time, negative attitudes against external assessment are also there. The fact that the accountability framework only relies solely on external assessment results is affecting private investment in the TVET sector.

Given these implementation challenges, it is imperative to suggest some potential solutions. First, TVET authorities (the government) should:

- Strengthen the human and material resource capacity of TVET institutions (particularly the disadvantaged ones) towards more authentic and quality assessment.
- Enhance the awareness of all stakeholders on the nature and importance of external assessment through (for instance) awareness creation campaigns.
- Increase the number and widen the geographic distribution of CoCs and assessment/test centers to increase access and reduce queues for assessment.
- Enhance the competence and competiveness of TVET trainers and assessors.
- Facilitate the revision of some of the units of competence and the assessment tools (instruments) in light of work place requirements.
- Introduce some control mechanisms that ensure fairness/ethics on the side of assessors. Such mechanisms may include: (a) increasing the number of assessors per each assessment session; (b) strengthening the system for complaint presentation and handling; (c) strengthening periodic and sudden control (e.g., supervision) by TVET authorities; (d) linking the accreditation of assessment centers not only with human and physical capacity but also with the ethical conduct of their assessors; and, (e) administrative and/or legal measures on those unethical assessors.
- Consider introducing a mix of outcome-based and input-based criteria for renewal of accreditation of TVET institutions/programs especially in the short-run (for the relatively infant institutions). As the economy becomes more industrialized, however, accreditation could depend fully on assessment results.
- Enhance the engagement of productive sectors (public and private) in and towards external assessment and work towards the gradual but full ownership/engagement of industry (e.g., through chambers) in assessment and certification. Towards this end, the government needs to lay necessary legal, infrastructural and institutional foundations.

Second, the AACOCC should give more emphasis to the importance of linking assessment with TVET delivery through the provision of prompt and meaningful feedbacks to TVET institutions. To achieve this, the center needs to resort to electronic feedback mechanisms; develop and use a format that will be filled by the assessor(s) immediately after assessment; and, indicate the competence gaps of each individual candidate who is found to be incompetent during the external assessment.

Third, TVET institutions need to communicate parents on the internal assessment results of the children and consolidate their integration with the CoC so that they will be able to continuously improve TVET delivery (instruction-learning) towards better learner (workforce) competence.

Overall, despite the positive achievements, implementation of what is envisaged in the TVET strategy requires further improvement for the assessment system and certification to serve as a key instrument for enhancing and ensuring TVET quality.

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