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Competency-Based Training (CBT): An Introductory Manual for Practitioners

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Foreword

As companies, training providers and skills development systems are challenged to improve (future) workers' skills, the competency-based training (CBT) approach to technical and vocational education and training (TVET) has been recognized as a highly effective way of ensuring that training programmes remain relevant to the labour market.

The CBT approach is demand-driven, and focuses on the skills and competencies that a learner can demonstrate – in a practical way – for a given occupation. CBT is particularly relevant to the future of work, where workers will continue to learn throughout their careers in a modular approach. It is of crucial importance that the competencies resulting from this continuous training are signalled, acknowledged and then matched to specific responsibilities, while being adequately valued.

Even though CBT has sometimes been included in TVET programmes in the region, it has not yet been fully integrated in a systematic and comprehensive way into the entire training programme cycle. This training manual aims to address this shortcoming, and is the first of its kind in the region to provide TVET trainers and developers with a basic understanding of the steps involved in designing a competency-based programme. It shows how to implement such a programme, measure its impact and update it.

I hope that this manual will find a practical application in the Arab region and contribute towards the progressive reform of the TVET system, while helping to reduce skills mismatches and improve the labour market. As new evidence and findings emerge on the implementation and outcomes of the CBT approach in the region, it is anticipated that revised versions of this manual will be released in the coming years.

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The text also draws on number of prior publications by the ILO, including:

- ILO. 2013. Inclusion of People with Disabilities in Vocational Training: A practical Guide. https://www.ilo.org/gender/Informationresources/WCMS_230732/lang--en/index.htm.
- ILO. 2015. Manual on Skills Testing and Certification: Jordan. https://www.ilo.org/beirut/publications/WCMS_358358/lang--en/index.htm.
- ILO. 2016. Compendium on Skills Needs Anticipation. https://www.ilo.org/employment/Whatwedo/Projects/WCMS_534345/lang--en/index.htm).
- ILO. 2019. Guidelines for Non-Formal Market-Based Skills Training in Lebanon. https://www.ilo.org/beirut/publications/WCMS_666243/lang--en/index.htm.

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Abbreviations

CBT	Competency-based training
CUDBAS	Curriculum development based on vocational ability structure
DACUM	Developing a curriculum
GAC	General area of competence
ILO	International Labour Organization
OJT	On-the-job training
OSH	Occupational safety and health
PES	Public Employment Services
PLAR	Prior learning assessment and recognition
RPL	Recognition of prior learning
TVET	Technical and vocational education and training
WBL	Workplace-based learning

Glossary

Adult learning	Adult learning (andragogy) includes those processes and practices specific to adults gaining knowledge or expertise, based on self-directed learning.
Assessments	A systematic process of measuring/evaluating and documenting an individual or group's level of knowledge, skills and attitudes.
Assessment evidence	The information gathered during the assessment process that determines whether an individual or group is competent. In CBT assessments, evidence is directly linked to the demonstration of competence and the ability of the trainee to perform to a certain standard.
Competency	The demonstrated ability to apply knowledge, skills and attitudes in order to successfully complete work activities to a defined standard of performance, as expected in a real-life workplace environment.
Competency-based training (CBT)	CBT is a structured training and assessment system that allows individuals to acquire skills and knowledge in order to perform work activities to a specified standard.
Competency standard	Competency standards are benchmarks to assess the knowledge, skills and attitudes required by an individual in order to perform in the workplace. These benchmarks are combined together to form units of competencies.
DACUM	Developing a curriculum is a quick and cost-effective method of occupational analysis that uses a focus group to facilitate a storyboarding process in order to conduct a thorough analysis of a given occupation.
Delphi method	The Delphi method involves a questionnaire sent to a group of experts over several rounds. After each round, anonymous responses are aggregated and shared with other experts, who are allowed to adjust their responses. The process continues until the group believes they have reached consensus.
Learner-centred approach	learner-centred approach, principles, practices, assessment, etc. are all about organizing teaching, learning and assessment based on the learner's personal characteristics, needs and interests. (see http://www.ibe.unesco.org/en/document/glossary-curriculum-terminology). It changes the learning experience from one where the learner is a passive recipient of the knowledge dispensed by the instructor, to one where they take an active part in the learning process, and the instructor's role is only to facilitate the process. This approach guides educational reform at all levels.
National qualifications framework	A formal national structure for classifying qualifications by level, based on learning outcomes and descriptors.
On-the-job training (OJT) and workplace-based learning (WBL)	WBL refers to learning that occurs when workers, including apprentices, produce real goods and services. OJT refers to training undertaken at the workplace as part of practical training provided by technical and vocational education and training (TVET) or other educational institutions.

Self-directed learning	Self-directed learning is when students initiate their own learning process by identifying their learning needs, goals and strategies, and evaluating their learning outcomes.
Standard detailed task analysis	A process to analyse tasks by breaking them into elements that help identify performance steps and standards, the tools and equipment needed, related knowledge, safety and health information, etc., in order to develop instructional materials.
SWOT analysis	A rapid analysis undertaken to identify strengths, weaknesses, opportunities and threats (SWOT).
Units of competency	Each unit of competency identifies workplace requirements, as well as the knowledge and skills of the competency (including language, literacy and numeracy).
TVET institutions	TVET institutions or providers include TVET schools, TVET colleges, TVET institutes, and TVET centres, together with national, local, and sectoral bodies and councils for TVET.

Introduction: Understanding CBT

THE OVERALL PURPOSE OF THIS MANUAL IS TO PROVIDE GUIDANCE TO TVET DEVELOPERS, TVET ADMINISTRATORS AND INSTRUCTORS ON THE DESIGN, DELIVERY AND ASSESSMENT OF COMPETENCY-BASED TRAINING (CBT) PROGRAMMES. The manual encompasses the minimum knowledge that practitioners should possess on delivering CBT for lower- to mid-level skilled occupations. Efforts have been made to ensure that the manual is relevant to the Arab states. Some parts (e.g. on adult learning and the learner-centred approach) are not specific to CBT, but are required for the successful implementation of a CBT programme. Also, there are many national versions of CBT – the intention here is to focus on the core elements of a lower-skilled competency-based programme without giving preference to any national model. The main parts of the manual include:

- understanding key CBT concepts;
- conducting labour market and skills-gap analyses;
- identifying the competency requirements of an occupation;
- translating the required competencies into a CBT programme or curriculum;
- implementing CBT programmes into TVET institutions and the workplace;
- assessing CBT efficiently;
- validating CBT programmes.

COMPETENCE IS A COMPLEX CONCEPT WITH MANY DEFINITIONS. For the purpose of this manual, a competency is defined as the demonstrated ability to apply knowledge, skills and attitudes in order to successfully complete work activities to a defined standard of performance, as expected in a real-life workplace environment. Under this definition, knowledge is defined as possessing the required information for a task [1]. Skills are the ability to carry out a task with pre-defined results, often within a given amount of time with limited energy. An attitude is the stance or approach undertaken by an individual towards a certain idea, object, person, or situation, as conditioned by their system of principles, beliefs and habits. Competencies are classified into: (a) technical/professional competencies; and (b) transversal/general competencies (skills and attitudes the individual is expected to display while performing tasks), which are also coined as life skills/ core work skills/soft skills/employability skills, etc. They are important for specific occupations, but also for strengthening labour mobility.[2]

CBT IS A STRUCTURED TRAINING AND ASSESSMENT APPROACH THAT ALLOWS INDIVIDUALS TO ACQUIRE THE SKILLS AND KNOWLEDGE TO PERFORM SIMPLE OR COMPLEX TASKS TO A SPECIFIED STANDARD. CBT is focused on: (1) the performance of tasks and duties by an individual; (2) the conditions in which they are to perform these tasks and duties; and (3) the standard to which they are to perform. CBT is an outcome-based learning system for developing curricula. Training and assessment is

1 Knowledge is further classified between declarative and tacit knowledge, and one of the roles of the instructor is to identify the tacit knowledge and make it explicit.

2 See the list of additional readings at the end of this chapter for the MENA region's life skills framework.

centred around learners achieving certain competencies according to clearly defined criteria and undertaken within workplace-like conditions. CBT is, therefore, a form of training that is specifically focused on achieving competence. Training is typically divided into small units that are dedicated to the mastery of a specific competency, and articulated together into more complex structures. Once students are able to demonstrate the mastery of a given competency, they then proceed to the next unit.

CBT is replacing traditional training and learning methods, which are often undertaken within a course or subject. These have tended to mostly focus on knowledge without the mastery of real-life industry skills or any consideration for labour market performance. Instead, CBT attempts to be market-relevant, since it is based on information about the needs of the labour market and, in return, signals to employers the available skills and employability of jobseekers.

FOR THIS MANUAL, A TRAINING PROGRAMME IS CONSIDERED FULLY COMPETENCY-BASED IF IT HAS THE FOLLOWING CHARACTERISTICS:

- Competencies are derived from an occupational analysis that has been verified by practitioners and endorsed by industry.
- Theoretical and practical training sessions are shaped around the list of agreed knowledge, skills and attitudes, as per competency standards.
- A participant's programme completion is based on the satisfactory mastery of all competencies to the standard of a real workplace environment.

SOME OTHER CHARACTERISTICS ALSO SUPPORT THE SUCCESS OF A COMPETENCY-BASED PROGRAMME, BUT ARE NOT SPECIFIC TO IT:

- The selection of occupations is based on a thorough understanding of the labour market.
- Theoretical and practical training sessions use adult learning strategies and learner-centred principles.
- Competencies to be learned include skills that relate to dealing with malfunctions – to the standard of a real workplace environment.
- Training is comprised of a flexible modular structure, with a self-paced approach to the curriculum design and delivery.
- The content of theoretical knowledge is not redundant (i.e. content remains relevant and essential, and not repeated across the curriculum).

THERE ARE MANY BENEFITS OF USING A CBT APPROACH FOR BOTH EMPLOYERS AND TRAINEES. Some are outlined in table 1.

Table 1. Benefits of the CBT approach for employers and trainees	
Benefits for employers	**Benefits for trainees**
CBT strengthens the role of employers/industry in identifying the required competencies and standards, as well as the design, development, planning, implementation, and assessment of training programmes.	CBT informs trainees exactly what is expected of them, and improves their readiness for jobs, since it is focused on mastering specific skills, and builds their confidence through preparedness for real work.
CBT facilitates recruitment by identifying the competencies required for an occupation or job.	CBT identifies transferable skills that can be used in different workplaces, improving employability and easing the transition from training to work, as well as enhancing mobility in the labour market.
Competency-based job descriptions provide greater flexibility in assigning work, and allow jobs that require similar competencies to be grouped together under a single job description. This lengthens the life cycle of job descriptions and makes them easier to write.	CBT facilitates international and regional accreditation of training programmes, thus improving employment opportunities for those who have completed such training.
CBT builds organizational capacity and facilitates staff development by identifying the exact skills that require improvement.	CBT offers participants more flexible learning options. Trainees also may be given the opportunity to self-assess and correct their performance as they develop.

AN INCLUSIVE TVET PROGRAMME CONTRIBUTES TO THE SOCIAL OBJECTIVES OF A MORE INCLUSIVE SOCIETY AND A MORE FORMAL LABOUR MARKET. Since CBT focuses on competencies, it draws the attention away from those learner characteristics or traits that are not relevant to task performance (e.g. sex, age, or disability). In this sense, it helps reduce discrimination. In addition, competency-based testing and certification allow for the recognition of prior learning (RPL) through testing and certification of skills acquired outside of a training programme. This is particularly useful as an entry point for the formalization of jobs in the informal economy.

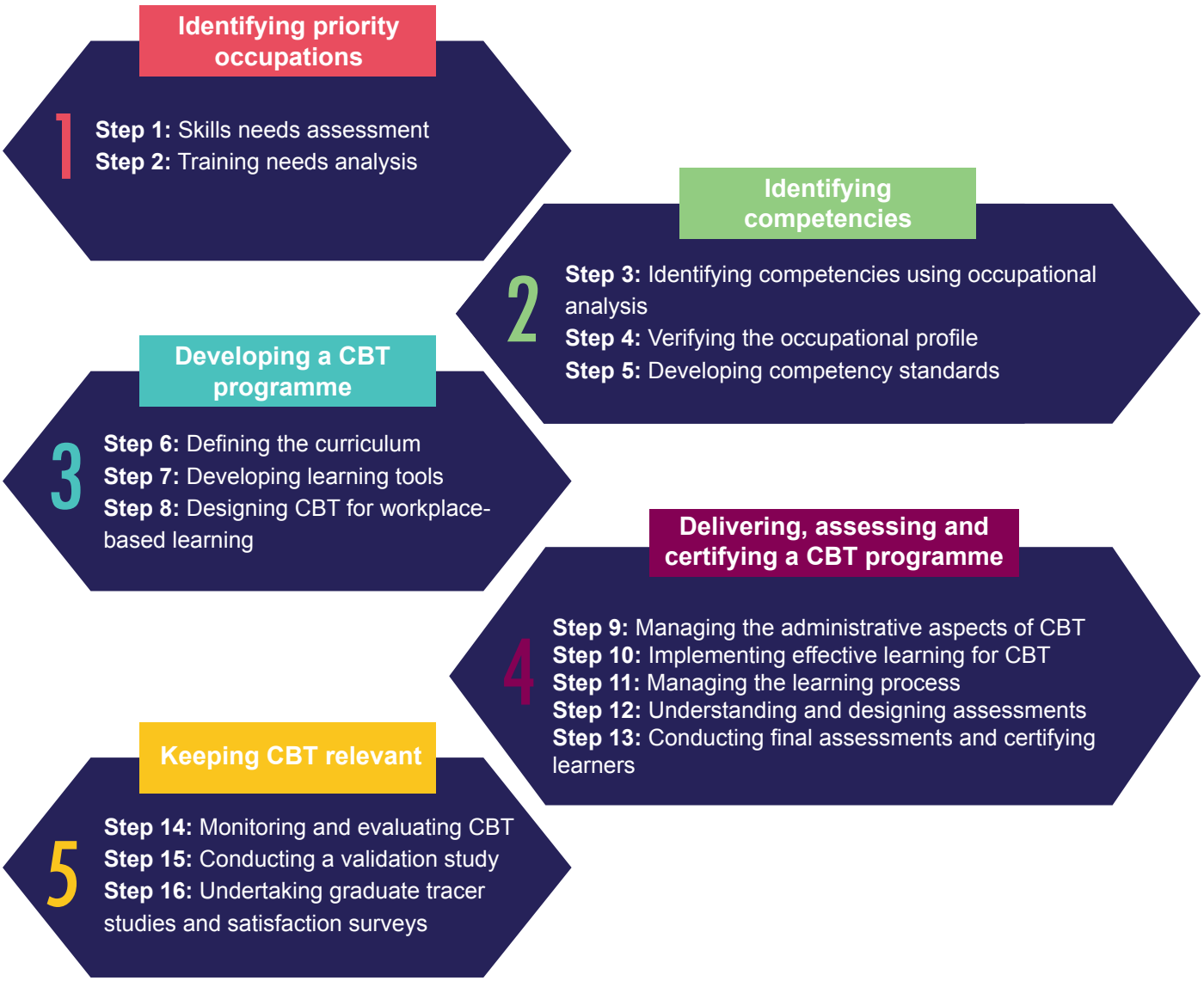
A CBT PROGRAMME ALLOWS FOR THE SET-UP OF A NATIONAL QUALIFICATIONS FRAMEWORK. A national qualifications framework is a national policy that regulates education and training qualifications. It compares different qualifications and indicates how one can progress from one level to another, within and across qualifications, and even across vocational and academic sub-sectors (Tuck 2007). This is strongly aligned with CBT since the mastery of a competency is the basis for progressing to the next competency or level. Furthermore, within a national qualification framework, the various types and levels of education and training can be recognized and integrated so as to allow for seamless pathways between them. In this sense, a national qualification system encourages and facilitates lifelong learning, since the learner can return to training and resume their studies – even after working for some time.

IN THE ARAB STATES, CBT HAS ONLY BEEN PARTIALLY IMPLEMENTED, MAINLY BECAUSE OF DEFICITS OF GOVERNANCE THAT WOULD LINK TRAINING PROVIDERS WITH THE PRIVATE SECTOR. In a drive to shift to outcome-based training, much work has been done to identify the competencies relevant to the labour market. However, more remains to be done to build governance systems that will institutionalize these processes.

AFTER USING THIS MANUAL, PRACTITIONERS SHOULD BE ABLE TO:

- identify priority occupations;
- identify competencies and competency standards;
- design and develop a CBT programme;
- deliver and assess a CBT programme;
- monitor a CBT programme and certify participants;
- know how to keep CBT programmes relevant.

THIS MANUAL COVERS THE FULL PROCESS INVOLVED IN DEVELOPING, IMPLEMENTING AND EVALUATING A CBT PROGRAMME. Each chapter has been written with specific readers in mind. However, readership is unlikely to be limited to these readers. The following diagram outlines the five chapters of the manual, which are designed around a total of 16 proposed steps to implement CBT. Note that these steps are not necessarily listed in a strict sequence, as some are actually implemented simultaneously.



Additional readings

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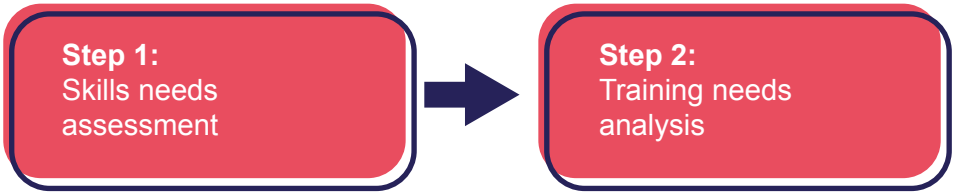
1. Identifying priority occupations

THIS CHAPTER DESCRIBES THE PROCESS OF IDENTIFYING PRIORITY OCCUPATIONS AS THE FIRST STAGE OF UNDERTAKING CBT. Identifying priority occupations for CBT involves gaining a strong understanding of the products and services in demand in a given economy, the related occupations (either for employment or self-employment), and any unmet training needs. If the actual labour market's needs and opportunities have not been identified in advance, training is unlikely to result in improved employability. In fact, training that is not market-based may lead to worse employment outcomes, as well as an increased sense of alienation from the labour market for jobseekers. At the same time, CBT needs to fit the aspirations, willingness, and capacity of the training group it is intended for, and identify cost-efficient ways to ensure that all participants can benefit equally.

Intended readers: curricula developers, instructors, private-sector representatives

THIS IDENTIFICATION IS PROPOSED IN TWO STEPS THAT ARE CRUCIAL TO IDENTIFY OCCUPATIONS A CBT SHOULD FOCUS ON:



Step 1: Skills needs assessment

SKILLS MISMATCHES OCCUR WHEN THERE IS A DIFFERENCE BETWEEN THE SKILLS DEMANDED BY THE LABOUR MARKET, AND THE SKILLS POSSESSED ON THE SUPPLY SIDE BY POTENTIAL (OR CURRENT) WORKERS. "Skills mismatch" refers to a lack of matching between the demand for skills in the labour market and the supply – determined by education and training systems. They can take various forms, including over-skilling and under-skilling, skills gaps for certain sectors or occupations, and skills obsolescence, which all have an impact on (a) the productivity of the company, (b) the skills being used and the possible private and public waste of resources for training individuals on skills they will not use. Skills mismatches make it difficult for employers to find and hire workers who are competent and possess the right skill set to fill job vacancies. This mismatch can contribute to the unemployment rate. For the purpose of CBT, it is important to ensure that the competencies and skills in focus are relevant to and required by the current (and future) labour market.

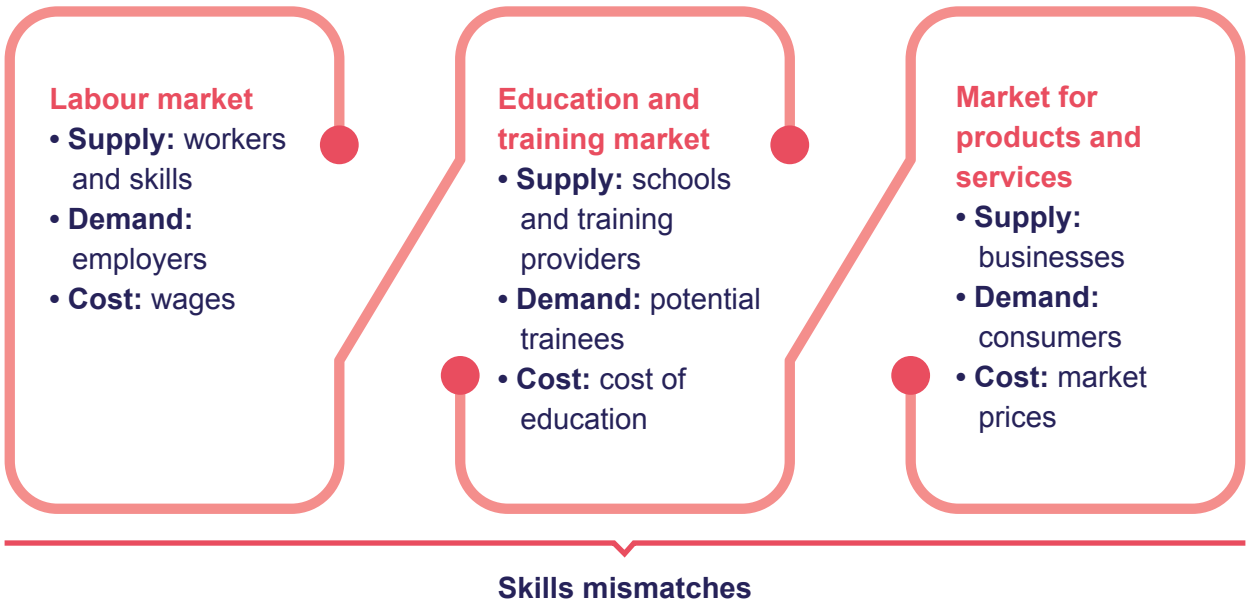
BOTH OVER-SKILLING AND UNDER-SKILLING CAN LEAD TO ECONOMIC AND SOCIAL CONSEQUENCES. Skills mismatches can consist of either: (1) over-skilling, whereby people work in positions below their skill level; or (2) under-skilling, which signals a lack of investment in human capital and a loss of productivity, with individuals employed in positions above their skill level. The ILO also distinguishes between short-term and long-term skills mismatches. A short-term mismatch is considered temporary and

due to an inefficient matching process, whereas a long-term skills mismatch is considered a structural issue, where changes in labour and skill demands are not reflected in training and education systems (ILO, 2017c).

THE STARTING POINT FOR CBT IS ENGAGING WITH EMPLOYERS' AND WORKERS' REPRESENTATIVES, TRAINING PROVIDERS AND OTHER STAKEHOLDERS. A skills needs assessment is an important strategy for starting a collaboration with representatives of employers and workers, as well as training providers and other stakeholders (such as economic development agencies, line ministries and business development services). Such collaborations ensure a wider range of perspectives in the analysis, and help to promote coordination among stakeholders, which increases the impact of interventions.

IDENTIFYING A SKILLS MISMATCH REQUIRES AN IN-DEPTH UNDERSTANDING AND ANALYSIS OF THREE KEY MARKETS: (A) THE MARKET FOR PRODUCTS AND SERVICES; (B) THE LABOUR MARKET; AND (C) THE EDUCATION AND TRAINING MARKET. By analysing these three markets, you can identify what is produced, what jobs are on offer, and what education programmes are available, as well as the unmet demand for products and services, jobs and education. The issue of price is also important, as it impacts on the inclusiveness of the skills development solutions proposed. Chart 1 illustrates the three markets to be analysed when conducting a skills gap analysis, including the supply side of each market, the demand side, and its prices. These include: (1) the market for products and services, where consumers procure goods or services from a businesses for a price; (2) the labour market, where workers secure employment from an employer for a wage; and (3) the education market, where trainees acquire skills from a training provider for a fee, which can be subsidized.

Chart 1. Three markets to be considered in a skills gap analysis



THE ANALYSIS IS BASED ON IDENTIFYING MISMATCHES BETWEEN THE SUPPLY AND DEMAND OF EACH MARKET. Identify the differences between the skills required – by whom, for what job, for which product or service market, in what quantity, and when – and the training available – for which population, at what cost, for what job and for which product or service market. Table 2 presents some of the common findings of a skills mismatch analysis, and lists possible responses to the various issues that may be revealed.

Table 2. Common findings of a skills needs assessment and some corresponding solutions	
Common finding	**Possible solution (not always skills intervention)**
Employers are unable to find workers with a defined set of skills (e.g. to fill a job vacancy or replace outgoing workers, expand activities with new workers or improve productivity).	Provide skills training for the specific occupations and lack of competencies identified.
An unmet consumer demand within a given market requires business management competencies to offer new services/products to the market.	Provide entrepreneurship training for university graduates.
A workforce with the required skillset for a given occupation is available, but wages and work conditions do not meet expectations, limiting the training uptake and leading to high staff turnover.	Provide training on life skills to tackle workforce reservation levels, train managers and HR departments to improve wages and working conditions, and promote the involvement of trade unions for enhanced collective bargaining.
Under-representation of certain populations (youth, women, people with disabilities) in a given occupation because training costs limit their access.	Conduct targeted subsidized training for under-represented populations.
Current workforce in targeted companies do not have the required competencies to adapt to new equipment.	Train the existing workforce for improved productivity and competitiveness.

SOME METHODS WILL ALSO EXAMINE SKILLS ANTICIPATION IN ORDER TO PREPARE FOR THOSE LABOUR MARKET COMPETENCIES THAT WILL BE REQUIRED IN 3–5 YEARS. The main rationale for skills anticipation is to help meet future skill needs by providing policymakers and other actors with relevant information. Approaches to skills anticipation are important for policymaking. Ideally, they are undertaken within a broader foresight approach together with other elements of technological and economic developments, where investments in education/training and changes in the structure and quality of jobs are viewed as part of the process.

TABLE 3 REVIEWS VARIOUS APPROACHES TO ANALYSING SKILLS MISMATCHES (INDIVIDUALLY OR AS PART OF A MIXED APPROACH). They include examples of research questions, possible research methods and their shortcomings. These methods vary in their quality and usefulness for the purpose of a focused market analysis and skills anticipation. In some instances, an analysis will identify elements that are beyond the scope of a training programme (such as wages and working conditions). However, it is important to consider these elements carefully as part of the CBT programme design if they are to improve the employment outcomes of graduates. An analysis may also even conclude that skills are not the main issue to be tackled in order to improve the employment situation.

Table 3. Potential approaches for a skills needs assessment			
Lines of enquiry	**Examples of research questions**	**Sources/methods**	**Possible shortcomings**
Macroeconomic	What are the growing sectors in the country? What are the policy priorities and incentives for growth? Which of these sectors are job-rich? Which occupations are increasing? What competencies are required for these occupations? Is the education and skills development system already focused on these occupations/ competencies in a sufficient manner?	Macroeconomic data, policy reviews, labour force surveys, sector studies, employers' establishment surveys, qualitative methods (semi-structured interviews, focus groups)	Availability and accessibility of public data
Policy triggers for employment	What is the vision of the government for supporting employment creation? What are the incentives provided for targeted sectors, occupations and populations?	Policy reviews	Not all countries have a coherent vision of employment policy
Replacement demand	What are the sectors/occupations with the highest number of outgoing workers for the next period (60 years+)?	Labour force surveys	Labour force survey not always available
Wage progression	Since increases in wages are an indicator of increased demand, what are the wage trends by occupation and educational background?	Labour force surveys	Labour force survey not always available
Inclusiveness	Who are the most vulnerable workers in the labour market (unemployed, low-income)? Where are they, where do they work, and what support do they require?	Labour force surveys, vulnerability assessments	Labour force survey not always available

Lines of enquiry	Examples of research questions	Sources/methods	Possible shortcomings
Export-related competencies	Which sectors are developing sectors as a result of exports? Which occupations are expanding because of increased exports? What are the main competencies required for these occupations? Are these occupations/ competencies targeted by education and skills development systems in a sufficient manner?	Export statistics, employers' establishment surveys, qualitative methods (semi-structured interviews, focus groups)	Availability of export data and willingness of employers to participate
Value chain analysis	What are the various stages of value chains? How much value is added for each stage? How can this level of value be increased with skills intervention? What are the specific competencies to focus on?	Value chain analysis	Time consuming
Area-based analysis	What unmet consumption needs exist in the targeted areas? What kind of businesses can be created and/or expanded to meet these needs? Which competencies are required for these businesses?	Consumer surveys and business surveys	Time consuming
Usefulness/ relevance of education	What is the employment and unemployment rate of graduates by field and level of education? How has this rate changed in recent years? How useful was the training programme in securing and retaining a job? How satisfied were employers with the training?	Tracer studies Employers' establishment surveys	Time consuming, employers may be reluctant to engage
Administrative data	What are the current job vacancies and how much time is required to fill these positions?	Public employment services (National Employment Office) data	Limited in scope

AS TABLE 3 ILLUSTRATES, THE CHOICE OF ANALYSIS TO BE UNDERTAKEN IS CONTEXTUAL, SINCE THERE ARE MANY DATA SOURCES, WITH ADVANTAGES AND DISADVANTAGES TO EACH. Understanding the range of data sources and analytical approaches available enables a training programme developer to select the best approaches and sources of information that match their design. Users should use a number of approaches to conduct their analysis, as well as the best sources and tools available. The choice of methods should be based on their relevance to the specific context, and their feasibility. The specific mix of methods can be structured in a sequential manner (e.g. stepping through categories in a quantitative survey or in a focus group discussion), or based on background research, where projections are validated through focus group discussions with relevant stakeholders. Table 4 lists in greater detail some of the sources that can be used for undertaking a skills analysis/anticipation, including a description of each source's potential shortcomings.

Table 4. Various methods for undertaking a skills needs assessment

Method/source	Data requirements	Technical expertise	Shortcomings
Qualitative methods (focus group, expert workshops, expert opinions, Delphi methods, etc.)	No specific data requirements	Qualitative methods in preparing interviews, focus groups, etc., and in synthesising findings	May be subjective May be inconsistent May be too anecdotal
Quantitative forecasting	Consistent and frequent labour market data (occupations, sectors, etc.) and population variables (labour market participation, age, gender, etc.)	Modelling expertise Statistical software use and analysis	Requires a lot of data over a long period of time. Costly Not always quantifiable
Graduate surveys/ tracer studies	Initial data collection with graduates Contact information for subsequent follow up (tracer studies) Data can be enhanced with administrative data (from educational, training and work institutions)	Survey design and execution Outcome analysis Ensuring representation of findings	Only analysing early work years of graduates Usually limited to graduates of particular formal institutions Not standardized or comparable Difficult to maintain contact with graduates over long period of time

Method/source	Data requirements	Technical expertise	Shortcomings
Employer-employee skills survey	Enterprises to partake	Survey design and execution Outcome analysis Ensuring representation of findings	Low response rates Findings might be subjective Need large sample for findings to be meaningful Employers (especially small businesses) may have limited capacity to assess current/future needs
Foresights and scenario development	Input data can be used (not compulsory), such as quantitative forecasts, labour market information, sectoral studies, etc.	Moderators for foresight sessions/workshops Qualitative data compilation Stakeholder engagement	May be subjective May be non-systematic May be inconsistent
Sector studies	Sector-based data (surveys, studies, etc.)	Knowledge and expertise in sector-based labour markets and occupations Data analysis Survey design and execution (if applicable)	May not be representative Results provide no information on other sectors, even if they have linkages – offering no insight on possible integration
Vacancy surveys	Primary data collection Administrative data from Public Employment Services (PES) or employer surveys	Survey design and execution Outcome analysis Ensuring representation of findings	Not representative of all labour demands Quality of data depends of the outreach of the PES Vacancies may be filled while data analysis is being undertaken

Source: ILO (2017c).

MOST COUNTRIES IN THE ARAB REGION DO NOT HAVE SYSTEMS IN PLACE TO ASSESS SKILLS ANTICIPATION AND MISMATCHES. The aim of such systems is to institutionalize regular analyses in order to gain a better understanding of the kind of skills in current and future demand, and for education and training to be aligned with labour demands.

Step 2: Training needs analysis

ONCE THE MARKET'S NEEDS ARE IDENTIFIED FOR A SKILLS DEVELOPMENT INTERVENTION, THIS SHOULD BE FOLLOWED BY A TRAINING NEEDS ANALYSIS FOR THE TARGETED POPULATION. A training needs analysis answers the following questions:

- What are the aspirations of the targeted women and men, and what are the education and skills pathways to reach their objectives?
- What are their technical and vocational skills gaps that need to be addressed for gainful employment?
- What is the willingness of potential trainees to join the programme, and under what conditions?
- What are the accessibility constraints and steps that should be taken for the training to equally benefit women, people with disabilities, and disadvantaged groups.

The reconciliation of the demand side – the jobs on offer, the skills training available – with the aspirations and capacity of the targeted groups to join and benefit from this training is best achieved through a process of counselling, which should allow for the identification of cost-effective ways to secure the successful participation of the targeted groups.

Additional readings

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2. Identifying competencies

THE NEXT ACTION FOR IMPLEMENTING CBT INVOLVES IDENTIFYING OCCUPATIONAL PROFILES AND STANDARDS. This chapter describes the three-step process of identifying the competencies and competency standards that will later be used by learners and training providers. To identify occupational competencies and standards, these steps follow on from those introduced in the previous chapter:

Intended readers: curricula developers, instructors, assessors, TVET centre managers, private-sector representatives

Step 3: Identifying competencies using occupational analysis → **Step 4:** Verifying the occupational profile → **Step 5:** Developing competency standards

Step 3: Identifying competencies using occupational analysis

OCCUPATIONAL ANALYSIS IS THE PROCESS OF IDENTIFYING THE MAJOR AREAS OF RESPONSIBILITIES AND COMPETENCIES THAT A WORKER NEEDS TO POSSESS FOR A SPECIFIC OCCUPATION. Occupational analysis helps to structure the dialogue with the private sector and/or employers with respect to their skill requirements. When asked informally to describe the skills required of staff, employers often identify a specific education background, or a generic field of skills. Such a general description is not sufficient for curricula designers to develop or amend a skills training programme. Therefore, there is a need to approach employers, workers and partners through a structured process of competency profiling, or occupational analysis, in order to define the specific competencies required.

WHEN CONDUCTING AN OCCUPATIONAL ANALYSIS, ONE NEEDS TO IDENTIFY THE DUTIES OF THE GIVEN OCCUPATION, THEN IDENTIFY THE TASKS RELATED TO THOSE DUTIES. In an occupational analysis, it is essential to determine the main areas of responsibilities, called "duties".[3] Duties are the stand-alone parts of work that one is required to perform within a given job. After determining the occupational duties, the tasks for each duty should be identified. The task should be observable, assignable (delegable to other workers) and performed within a limited time period. Tasks should be clear and concise, and use specific action verbs. Table 5 provides an example of the corresponding duties and tasks of an auto mechanic.

3 Or general areas of competencies (GAC).

Table 5. Some duties and tasks for the occupation of "auto mechanic"		
Code	**Duty**	**Tasks**
A	**Complete documentation requirements**	**A-1** Document work time **A-2** Prepare work order (e.g. vehicle vitals) **A-3** Verify customer's complaint **A-4** Diagnose customer's concern **A-5** Prepare work estimate
B	**Perform preventative maintenance**	**B-1** Verify vehicle-specific maintenance schedule **B-2** Conduct vehicle walk-around inspection (e.g. tyre pressure, tread, body damage) **B-3** Conduct under-hood inspection (e.g. hoses, belts, wiring, air, cleaner, filters, fluid leaks) **B-10** Service transfer case fluid system **B-11** Service brake fluid system **B-12** Service transmission fluid system **B-13** Service power steering fluid system **B-14** Service coolant fluid system
C	**Maintain brake systems**	**C-1** Road test to verify brake function(s) **C-2** Perform brake inspection and diagnostics (hands-on and visual) **C-3** Verify brake specifications **C-4** Rebuild/replace master cylinder **C-5** Service boosters **C-13** Service proportioning valves **C-14** Service metering values **C-15** Service pressure differential valve **C-16** Service brake warning system (tail lights) **C-17** Service brake warning system (dash indicator)
D	**Maintain engine**	**D-1** Diagnose engine problems (e.g. leaks, cracks, compression, unusual noises) **D-2** Service engine gaskets (e.g. head manifold) **D-3** Service engine seals (rear main) **D-4** Service engine cooling system (e.g. water pump, radiator, coolant flush)
E	**Maintain fuel systems**	**E-1** Diagnose fuel system problems **E-2** Test fuel quality **E-3** Road test to determine fuel system problem(s) **E-4** Inspect for fuel system leaks (e.g. evaporation, liquid, air leaks) **E-11** Service water separators/filter systems **E-12** Service fuel-level sensors

Source: Center on Education and Training for Employment (2004).

THERE ARE MANY METHODS FOR IDENTIFYING COMPETENCY REQUIREMENTS. Table 6 outlines a number of methods that can be used to identify the competencies required for CBT.

Table 6. Methods of assessing the competencies required for a training programme

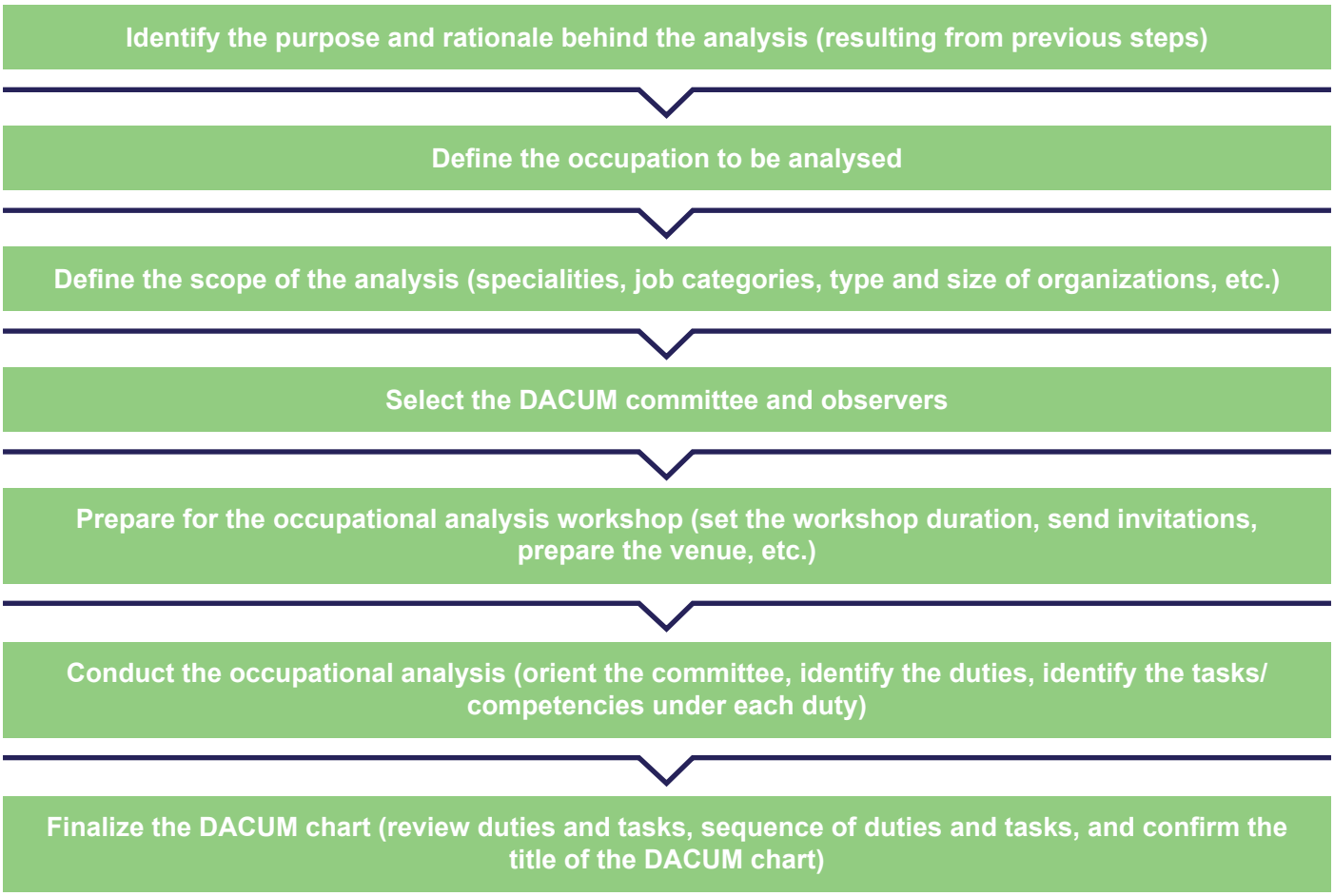
Technique	Description
Direct observation	The performance of the worker is monitored and recorded by an occupational analysis expert. The expert also learns about business processes, the work environment and working conditions.
Survey/questionnaire of target groups	A survey or questionnaire is administered to practitioners and supervisors.
CUDBAS **(curriculum development based on vocational ability structure)**	CUDBAS uses a competency checklist as a basis for training programmes. It is useful for anticipating future skill needs and effective in aiding the design and implementation of market-relevant training programmes. The main products of CUDBAS include a duty/ability chart, a short-term training schedule, an ability map, and an education plan.
DACUM **(developing a curriculum)**	DACUM uses a focus group comprised of experts to conduct a thorough analysis of an occupation. It is one of the highest quality and lowest cost analytical procedures, as it combines group interaction, brainstorming, group synergy and consensus.
Work and business process analysis	Work and business process analysis is a methodological concept that identifies competencies. It is a project-oriented method for simulating real work situations.
Delphi technique	Information is gathered as a way to reach a consensus among experts on an occupational/job profile through several rounds of validation of qualitative findings. It is a common research technique – not specific to the identification of competencies.
Individual expert consultation/interview	The occupational analysis expert engages in a conversation with expert practitioners and supervisors to gain a thorough understanding of the job/occupation and its associated competencies.
Nominal group technique	A technique that enhances brainstorming with a voting process used to rank the most useful ideas for further brainstorming or prioritizing.

DEVELOPING A CURRICULUM (DACUM) IS THE RECOMMENDED METHOD FOR THIS MANUAL AND THE MOST COMMON STRUCTURED OCCUPATIONAL ANALYSIS USED FOR CBT IN THE REGION. DACUM is a quick, and cost-effective method of occupational analysis, and uses focus groups to facilitate a storyboarding process in order to conduct a thorough analysis of a given occupation. This includes the necessary knowledge, skills and gaps. The DACUM method is typically led by a certified DACUM facilitator, and comprises a two-day "brainstorming" session with qualified workers (around 8–12 expert practitioners

4 The DACUM process is popular worldwide and has been in use for over 40 years. It was originally developed in Canada, but has since been further developed and refined over the years by Robert E. Norton from the Ohio State University in the United States. For further information on the DACUM training centre see: https://dacum.osu.edu/.

who have direct on-the-job experience). DACUM facilitators are trained and certified by two international institutes.[5] During the two-day workshop, experts on the given job work with the facilitator to list all of the major duties of the job, and the tasks of each duty (see appendix step 3.2 for more). An occupational analysis typically results in the identification of around six to 12 duties comprised of around 50–150 tasks that define what a successful worker in a particular job (or cluster of related jobs) must be able to do.[6] This analysis can also include identifying the related knowledge, general skills, tools, equipment, and work attitudes or behaviours required. When the occupational profile is complete, the information can be used to write job descriptions, determine the skill and compensation levels for the position, develop a curriculum and create training materials. Chart 2 outlines the DACUM steps of analysis, while Chart 3 illustrates an example of an occupational profile in the form of a DACUM chart.

Chart 2. DACUM analysis key steps



5 The two international training centres that train and certify facilitators in DACUM are the DACUM International Training Centre at Ohio State University's Centre on Education and Training for Employment (CETE), and the Canadian Vocational Association (CVA).

6 As per the CVA, the GAC (duties) may range from seven to 15 with at least one general (transversal) competency. Tasks range from five to 30 per GAC.

Chart 3. Part of an occupational profile for auto repair (DACUM chart)

A	**Complete Documentation Requirements**	**A-1** Document work time	**A-2** Prepare work order (e.g., vehicle vitals)	**A-3** Verify customer complaint	**A-4** Diagnose customer concern	**A-5** Prepare work estimate
B	**Perform Preventative Maintenance**	**B-1** Verify vehicle specific maintenance schedule	**B-2** Conduct vehicle walk around inspection (e.g., tire pressure, tread, body damage)		**B-3** Conduct under hood inspection (e.g., hoses, belts, wiring, air cleaner, filters, fluid leaks)	
		B-10 Service transfer case fluid system	**B-11** Service brake fluid system	**B-12** Service transmission fluid system	**B-13** Service power steering fluid system	**B-14** Service coolant fluid system
C	**Maintain Brake Systems**	**C-1** Road test to verify brake function(s)	**C-2** Perform brake inspection & diagnosis (hands-on & visual)	**C-3** Verify brake specifica- tions	**C-4** Rebuild/ replace master cylinder	**C-5** Service boosters
		C-13 Service proportioning valves	**C-14** Service metering values	**C-15** Service pressure differential valve	**C-16** Service brake warning system (tail lights)	**C-17** Service brake warning system (dash indicator)
D	**Maintain Engine**	**D-1** Diagnose engine problems (e.g., leaks, cracks, compression, unusual noises)	**D-2** Service engine gaskets (e.g., head, manifold)	**D-3** Service engine seals (rear main)	**D-4** Service engine cooling system (e.g., water pump, radiator, coolant flush)	
E	**Maintain Fuel Systems**	**E-1** Diagnose fuel system problems	**E-2** Test fuel quality	**E-3** Road test to determine fuel system problem(s)	**E-4** Inspect for fuel system leaks (e.g., evaporation, liquid, air leaks)	
		E-11 Service water separa- tors/filter systems	**E-12** Service fuel level sensors			
F	**Perform Ignition Systems Service**	**F-1** Diagnose ignition system problems (e.g., scan tool, scope)	**F-2** Verify ignition system function/ operation	**F-3** Service battery	**F-4** Service ignition signaling systems	
		F-11 Service ignition coil(s)	**F-12** Service spark plugs & wires	**F-13** Service distributor rotor systems	**F-14** Service emission control systems	**F-15** Perform ignition road test
G	**Maintain Electrical/ Electronic Systems**	**G-1** Diagnose affected electrical/ electronic system malfunction(s)	**G-2** Service alternator/ generator charging system		**G-3** Service exterior lighting (e.g., headlight, dimming, turn signal indicators)	
		G-10 Service cooling fan systems	**G-11** Service horn systems	**G-12** Service SIR systems (e.g., air bags, seat belts)	**G-13** Service cruise control systems	**G-14** Service entertainment systems

Source: Center on Education and Training for Employment (2004).

Appendix links: Step 3

3.1. DACUM tasks, duties and jobs under a given occupation
3.2. DACUM examples of duties and tasks for different jobs and occupations
3.3. Format of a DACUM Research Chart

Step 4: Verifying the occupational profile

ONCE DEVELOPED, THE OCCUPATIONAL PROFILE CAN BE VALIDATED WITH A LARGER NUMBER OF OTHER EXPERT WORKERS WHO RATE THE IMPORTANCE OF EACH COMPETENCY ON A 1–5 SCALE IN THE AREAS OF FREQUENCY, CRITICALITY, AND DIFFICULTY/COMPLEXITY. They also take into consideration whether the requirements apply for entry-level recruits. The final ranking is calculated based on equal weightings for each response or by assigning different weights, depending on the objective and scope of the analysis (see table 7). The rating is used to develop the final list of tasks/competencies.

Table 7. Part of an auto mechanic's competency verification results

Duty/general area of competence (GAC): Engine repair					
Task or competency	**Frequency (%)**	**Criticality (1 2 3 4 5)**	**Difficulty (1 2 3 4 5)**	**Prerequisite for entry level (yes/no)**	**Ranking (%)**
Repair cylinder head	97.6	4.6	2.1	No	96.1
Repair cylinder block and parts	89.0	4.5	2.4	No	93.6
Repair cooling system	92.7	4.5	1.7	Yes	69.3
Repair lubrication system	95.1	4.6	1.9	Yes	81.5

Appendix link: Step 4

4.1 Example of competency verification results table

Step 5: Developing competency standards

COMPETENCY STANDARDS HELP ENSURE THAT SKILLS ATTAINMENT IS CONDUCTED AT THE ENTERPRISE LEVEL. They define an ideal competent performance against which to compare the actual performance of a worker. Competency standards provide a clear reference with which to identify areas of competency that need improvement in order for the worker to reach the standard. By developing competency standards after the occupational profile, it will allow you to identify key knowledge areas, performance indicators and criteria, performance conditions and requirements (transversal/generic skills, tools and equipment, occupational safety and health (OSH), assessment issues, etc.) that should be addressed through developing the curriculum and identifying the required teaching and learning resources (step 6 and beyond).

ONCE THE OCCUPATIONAL PROFILE HAS BEEN DEVELOPED, COMPETENCY STANDARDS CAN BE DEVELOPED BY USING THE NATIONALLY AGREED-UPON TEMPLATE. If there is no national template, it is possible to use similar competency and occupational standards already developed in other countries or by international organizations.[7] For example, the ILO's Regional Model Competency Standards (RMCS) describe competency standards for a wide range of occupations. These standards can be used by Arab countries in the process of creating or reviewing their national standards that underpin TVET.

These competency standards can be contextualised to fit the environment of a given country, and validated through a local process. When developing a local validation approach, the ILO (2016) advocates taking the following into consideration:

- the size and geographic distribution of the industry, so that representative enterprises can be involved;
- the diversity of the industry (i.e. technology used and products produced);
- the worker's profile, in order to ensure that all competencies are included;
- validation costs;
- the time available for validation.

Competency standards should be reviewed and adjusted according to local needs by a panel of experts, including industry/sector representatives, employers, TVET/CBT trainers and centre managers, government officials and international skills experts, etc. The final draft of the standards should be shared with a wide audience as part of the validation process.

ALTERNATIVELY, COMPETENCY STANDARDS CAN BE DEVELOPED FROM SCRATCH.[8] This typically involves the five-step process as outlined in Chart 4. The first step involves selecting the relevant industry or sector, and then appointing a group of experts for a focus group. The functional areas of competence are then determined, and competency standards are written.

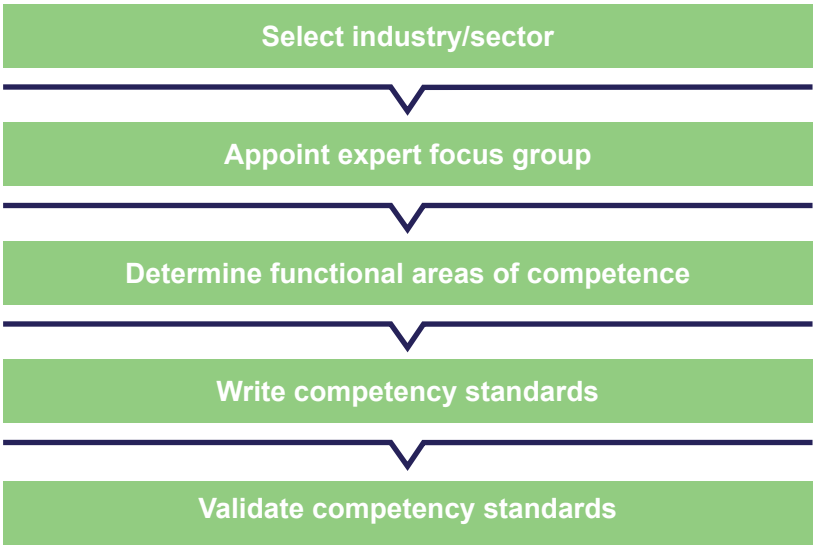
Finally, occupational standards become industry standards when they are validated by industry, or national standards when they are validated by a government (see appendix step 5.1 for examples of competency units as part of competency standards). Since the development of competency standards is a time-consuming

7 See appendix (step 5.1) for links to current competency standards.

8 Each duty of the occupational profile can form the basis of a unit of competence in the competency standard, and each task can form the basis of a single element of competence.

and, at times, a costly exercise, TVET providers can, alternatively, access previously validated competency profiles for certain skills and occupations, as mentioned above.[9]

Chart 4. Steps to developing competency standards



Source: ILO (2016).

Appendix link: Step 5

5.1 Examples of competency units as part of competency standards

Additional readings

- ILO. 2016. Updated Guidelines for Development of Regional Model Competency Standards. Geneva: International Labour Office. https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_496514.pdf.
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9 Such profiles can be found online by searching the occupation and the associated skills. For example, the competency profiles of the Technical and Vocational Training Corporation of the Kingdom of Saudi Arabia are available at: http://tvtc.gov.sa/Arabic/Departments/Departments/cdd1/job/Pages/default.aspx. Other agencies maintain profile charts similar to the DACUM profiles available at: http://www.dacum.org/resources.pdf and http://www.dacumohiostate.com/.

3. Developing competency-based training programmes

THIS CHAPTER DESCRIBES A THREE-STEP PROCESS OF DEVELOPING A COMPETENCY-BASED TRAINING PROGRAMME FOR LOWER- TO MID-LEVEL SKILLED OCCUPATIONS. Following the identification and verification of competencies to be facilitated, the next step is the actual development of the training programme. The steps to develop a CBT programme involve the following:

Intended readers: curricula developers, instructors, quality assurance managers, private-sector representatives

Step 6: Defining the curriculum → **Step 7:** Developing learning tools → **Step 8:** Designing CBT for workplace-based learning

Step 6: Defining the curriculum

A COMPETENCY-BASED TRAINING CURRICULUM SERVES AS THE BLUEPRINT FOR CBT. The curriculum should be based on the verified occupational profile or industry/nationally approved competency standards for the given occupation. The curriculum serves as an essential guide for trainers, holding them accountable for the skills to be learned, as well as a means for measuring student performance. Table 8 outlines elements to consider when defining the framework for the curriculum.

Table 8. Elements to consider when defining a curriculum framework (training programme profile)

Considerations	Examples
1. Programme rationale and objectives	Purpose and aims of CBT, including skills and competencies
2. Programme eligibility and prerequisites	Age, previous qualifications, entry test, etc.
3. Trainer requirements	Qualifications, experience, etc.
4. Training methodology	On-the-job training and/or off-the-job/school-based training
5. Training module design	Training modules, learning outcomes, performance criteria
6. Training programme structure and sequence	Training modules, duration, module sequence, etc.
7. Graduation requirements	Completion of a number of modules, etc.
8. Accreditation requirements (if any)	National/international credits/points
9. Proficiency level (skill level)	Skill level 2

ADVISORY COMMITTEES ARE USUALLY ESTABLISHED AT THE TRAINING PROGRAMME LEVEL. An advisory committee is mainly composed of expert practitioners and other stakeholders (instructors participate as observers). The main role of these committees is to assist the TVET provider in ensuring the quality and relevance of the training programmes, in addition to providing resources and training equipment, participating in the recruitment of instructors, and employing the graduates. The members also support the TVET providers in identifying or approving programme profiles/curriculum frameworks, and participate in the task analysis process.

DEVELOPING A COMPETENCY-BASED TRAINING PROGRAMME REQUIRES THAT EACH COMPETENCY/TASK IN THE TRAINING PROGRAMME IS BROKEN DOWN INTO FURTHER LEVELS OF ANALYSIS. The TVET managers implement this process of task analysis, preferably through a two-day workshop with six to 14 expert practitioners (particularly when national competency standards do not exist). Through this process, each task is broken down into subtasks or key steps (usually 2–5 steps per task), and the performance indicators and criteria (both process and product criteria, as shown in Chapter 4) are defined for each step (at least two indicators per step). Any related knowledge that underpins the task is also defined for each task, together with two to three general or transversal skills.

A KEY ELEMENT OF THE CURRICULUM IS THE LEARNING OUTCOME. A learning outcome describes what the trainee is expected to know, understand and be able to do upon the completion of learning. In other words, a learning outcome reflects what the training was designed to achieve, consistent with the agreed competency profile. Such outcomes must be oriented to demonstrable performance (i.e. described in such a way that it can be measured or assessed). For example, at the end of the module/training on “lubrication system diagnosis and repair” the trainee will be able to: (a) perform an oil pressure test; (b) inspect the oil pump; (c) change the oil and filter; and (d) repair defective parts in the lubrication system.

ONE OF THE MAJOR STEPS IN DEVELOPING CBT PROGRAMMES IS PUTTING THE PROCESS INTO MANAGEABLE UNITS. THESE UNITS ARE USUALLY REFERRED TO AS LEARNING GUIDES OR MODULES. Referring to the detailed task analysis, the objective of each learning module is derived from a task or a cluster of tasks. The module’s learning outcomes are derived from the sub-tasks/key steps. Knowledge (cognitive outcomes) can be added where necessary. However, in a context of promoting problem-based and project-based training programmes and assessments, higher skilled occupations with more complex levels of performance will require more complex linkages between competencies/tasks and learning outcomes.

THE LEARNING MODULES ALSO ALLOW FOR AN ADEQUATE SEQUENCING OF THE TRAINING. The duration of the theoretical and practical training, and the total programme duration are also estimated in the training module. Training modules are then sequenced, with the first competencies relating to OSH since trainees need to know how to protect themselves when practising skills. Theory sessions are structured in relation to practical sessions in order to promote problem-based and project-based learning. Table 9 provides a template example of a learning module design. The modules are then validated with employers, future resource requirements are identified and approved, and curricular changes are approved by a programme advisory committee. Table 10 provides an example of a training course structure.

Table 9. Template of an auto mechanics module design	
Title	**Example**
Occupation/job	Light vehicle mechanics
Training course	Auto mechanics
Training module	M-02: Cylinder head repair
Code in competency profile	B1, B2, B4, B5, etc.
Training provider	TVET college, school, training centre, etc.
Module description	This module covers the competencies required for: • checking a cylinder head and its parts; • replacing cylinder head parts; • adjusting engine cylinder head.
Skill/proficiency level	Skill level 2
Training duration	13 hours of practical training and two hours of theory
Prerequisites	• Perform basic works (M-99) • OSH (M-100)
Learning outcome	To be able to successfully reassemble a cylinder head to the required standard
Performance assessment criteria	Tightening a cylinder head bolt using a torque wrench
Underpinning knowledge	• To master engine classifications (including ignition, fuel type, number of cylinders, cylinder arrangement and valve position) • To master the basics of cylinder head operation • Knowledge of cylinder head parts and the function of each part
Occupational Safety and Health (OSH)	• Wear personal protection equipment (clothing, safety glasses, etc.) • Comply with instructions on working with the engine (developed by the instructor/trainer) • Ensure that no oil or fluids on the work floor cause slippage • Avoid touching hot parts or sharp edges • Ensure that the workplace is clean and safe at all times
Tools and equipment	• Tool box • Engine with overhead camshaft • Engine with under-head camshaft • Cylinder head holder • Torque wrench(es) • Filler gauges • Cleaning materials • Reference books and manuals

Practical supported skills	Able to read service and maintenance manuals, and demonstrate the steps of dismantling and reassembling the cylinder head
Assessment	Skills tests, formative assessment forms

Table 10. Parts of an auto repair course structure

Training module code & sequence	Training module title	Learning outcomes	Total training period		
			Duration	**Practice**	**Related areas of content and knowledge**
M-01	Cooling and lubrication system repairs	Replace drive belts and pulleys Inspect and replace thermostat Replace water pump Inspect and test radiator Perform oil pressure test			
M-02	Cylinder head repairs	Remove and inspect cylinder head for crack Check gasket surface areas for warpage and leakages Check the condition of cylinder head passages			
M-03	Engine block part repairs	Inspect engine block for cracks, passage conditions, etc. Inspect and measure cylinder wall for damage and wear Deglaze and clean cylinder wall			

Appendix links: Step 6

6.1 Example of course structure template
6.2 Template of module design

Step 7: Developing learning tools (learner guides, job sheets and lesson plans)

ONCE THE TRAINING MODULES ARE DESIGNED, THE NEXT STEP IS TO TRANSLATE THE CURRICULUM INTO LEARNER GUIDES THAT WILL FORM THE BASIS OF TRAINING DELIVERY.[10] A learner guide is essentially a learning package that directs trainees through all learning activities for a given competency, divided into modules. Learner guides should promote critical thinking, problem solving, and fault finding in learning activities, and use clear, concise, short sentences and unified text formatting. Key terminology should be provided in both Arabic and English. In addition, illustrations, sketches and technical drawings (with specifications for performance) should be used whenever they are helpful to reduce text and to focus the attention of the reader on particular details. A guide usually contains the following for each training module:

- the training module title;
- introduction and table of contents;
- occupation/job title and competency elements/learning outcomes;
- description of the module;
- prerequisite competencies;
- theoretical knowledge training and assessment sheets;
- practical exercises as part of the job sheets;
- required references and resources (tools, equipment, facilities, consumables, textbooks, videos, etc.);
- skills/performance tests and self-assessment forms[11];
- additional learning activities to support learning processes (i.e. visiting workplaces, games, role plays, references, assignments, projects, homework, etc.);
- glossary of new key terms;
- white space for the trainee's notes.

JOB SHEETS ARE GUIDES FOR THE PRACTICAL PARTS OF TRAINING SESSIONS. They are designed to be used in training where trainees learn by doing. Job sheets typically document the key tasks performed, and contain instructions to assist the trainee to complete a certain task. They allow some flexibility, with space provided on each sheet for listing additional tools and materials, as well as spaces for special instructions to be used as each instructor sees fit. Chart 5 is an example of a job sheet.

LESSON PLANS ARE ESSENTIAL FOR TRAINERS AS THEY BRIDGE THE MODULE TEMPLATE TO THE ACTUAL DELIVERY OF CBT. A lesson plan is a written document compiled by the instructor before a lesson and outlines the key features of the lesson to be given. This includes the allocated time for the lesson, its objectives, learning outcomes, sequence of teaching and student activities, teaching method and aids, resources and assessment strategy. Chart 6 is an example of a simple lesson plan.

10 Training materials typically include textbooks, job sheets or practical exercise booklets for trainees, and assessment guides for instructors.

11 See chapter 4

Chart 5. Job sheet example

Job sheet

Trainee: …… Date started: ……

Instructor: …… Date completed: ……

Work sequence # : ……

Training module:……

Competence/training module: ……

Tools, equipment, etc.: ……

……

……

Special instructions: ……

……

……

References: ……

……

……

Procedure

#	Steps	Drawing	Assessment	
			Achieved	Not achieved yet

Supporting questions for assessment (oral or written)

1. What ……..
2. How …….
3. If …….

Notes

……

……

……

……

……

Chart 6. **Example of a lesson plan**

Lesson plan

Instructor: ……..…… Lesson date: ……..……

Training module:…….....

Relation to prior knowledge: ……..

Lesson objectives: •

•

•

Learning outcomes (learner skills to be gained): •

•

•

Assessment/verification methods of achieved objectives: …….....……

Teaching method (s): •

•

Teaching aids: •

•

•

Tools/equipment: •

•

•

Type of student work (individual, group, mix, etc.): …….....……

	Instructor activities	Student activities	Time	Skills
Lesson intro				
Main lesson				
Final lesson				

Readings/supporting resources: •

•

•

Comments:……...……

Step 8: Designing CBT for workplace-based learning

WBL IS LEARNING THAT OCCURS WITHIN AN ACTUAL WORKPLACE AND UNDER STANDARD CONDITIONS OF WORK. By engaging in on-the-job training, learners are able to effectively acquire skills that are unique to a particular job. Typically, on-the-job training includes hands-on practice and imitation as well as verbal and written instruction, demonstration and observation. On-the-job training involves the passing of skills and knowledge from an experienced worker (either a supervisor, master craftworker or an experienced employee) to a novice or trainee.

AN APPRENTICESHIP IS A STRUCTURED FORM OF WBL THAT REQUIRES A SPECIFIC DESIGN PROCESS. One of the oldest and most enduring models of on-the-job training is that of apprenticeship. An apprenticeship is a learning system whereby the learner or apprentice acquires skills for a specific trade or craft by working alongside experienced workers in an actual enterprise. A formal apprenticeship is also complemented by school-based instruction. The apprentice, together with the craftworker who directly supervises the apprentice, the employer and the training provider all enter into a training agreement that is normally regulated by formal laws and Acts. Typically, training costs are shared between the apprentice, employer and the Government. Based on the competencies and learning outcomes identified for a given occupation, the employer of the craftworker, with the support of the TVET training instructor, develops training modules for the learner. These consist of practical on-the-job training and theory knowledge, as well as assessments to measure the achievement of each learning outcome. In addition, the employer or craftworker, with support from TVET experts, should also identify work processes that feed into a pool of potential learning situations.

APPRENTICESHIPS AND OTHER WBL REQUIRE SPECIFIC STRATEGIES. Collins et al. (1991) describe six stages that a trainer – or craftworker – might use to assist their apprentices in mastering a task: modelling, coaching, scaffolding and fading, articulation, reflection, and exploration.

Table 11. Example of workplace learning strategies – auto mechanic wheel alignment procedure

Learning strategy	Description	Example in the workplace
Modelling	An expert performs a task so that the trainee can observe and build a conceptual model of the processes that are required to accomplish it.	The craftworker explains to the trainee the steps required for entering a vehicle's information into the wheel alignment computer. The craftworker explains to the trainee how to fill in the form of wheel alignment test results.
Coaching	The trainee is observed while they carry out a task. The coach offers hints, feedback, reminders, and issues new tasks aimed at bringing their performance closer to expert performance.	In front of the craftworker, the trainee enters the vehicle information into the computer for wheel alignment and benefits from the craftworker's feedback.

Learning strategy	Description	Example in the workplace
Scaffolding	The expert provides support or "scaffolding" to help structure the task in such a way as to enable the trainee to carry out the task. It can take either the form of suggestions or physical support, and can involve the expert in executing parts of the task that the student cannot yet manage. A prerequisite to such scaffolding is the accurate assessment of the student's current skill level and the availability of an intermediate step at the appropriate level of difficulty in carrying out the target activity.	The trainee conducts the wheel alignment test for a car using the wheel alignment device while being observed by the craftworker, who focuses on the main qualifiers for the performance and makes the required correction(s).
Fading	Fading is part of scaffolding and involves the gradual removal of supports until students can perform on their own.	The trainee receives a real vehicle, conducts the alignment test and fills in the required test result form.
Reflection	The trainee reflects on their performance and compares their own problem-solving processes with those of an expert, or another trainee.	The trainee conducts a wheel alignment test and fills in the test result form. The craftworker reviews the form and makes the required corrections.
Articulation or exploration	This involves any method of getting the trainee to articulate their knowledge, reasoning, or problem-solving processes so that they learn how to frame questions and problems that are interesting and solvable.	The craftworker asks the trainee about the actions required when a calibration error occurs in the wheel alignment device.

Additional readings

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- National Volunteer Skills Centre. 2003. A Guide to Writing Competency-Based Training Materials. Melbourne: National Volunteer Skills Centre, Commonwealth of Australia.

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- Collins, A. ,Brown, J. , and Holum, a. 1991. Cognitive apprenticeship: making thinking visible, Reprinted with permission from the winter 1991 issue of the AMERICAN EDUCATOR, the quarterly journal of the American federation of teachers.
  http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.124.8616&rep=rep1&type=pdf

- Training Centre by IDEC
  https://www.trainingcentre.gr/

4. Delivering, assessing and certifying learners in CBT programmes

THIS CHAPTER COVERS THE DELIVERY OF A CBT PROGRAMME, INCLUDING HOW TO MANAGE THE ADMINISTRATIVE ASPECTS, IMPLEMENT EFFECTIVE TRAINING TECHNIQUES, MANAGE THE LEARNING PROCESS, DESIGN AND CONDUCT STUDENT ASSESSMENTS, AND CERTIFY CBT GRADUATES. Some parts of this chapter (i.e. learning strategies, classroom management) are not entirely specific to CBT, but are recommended for any general training. The following steps are included in this chapter:

Intended readers: instructors, assessors, assessment designers, curricula developers, private-sector representatives, quality assurance managers, TVET centre managers

Step 9: Managing the administrative aspects of CBT

THE ADMINISTRATIVE ASPECTS OF ANY COURSE MUST ALWAYS BE CONSIDERED. Typically, such aspects include gaining relevant approvals for a new course, recruiting and training staff and trainers, selecting appropriate training venues, and admitting new students to undertake the course. Table 12 provides a basic pre-course checklist of what needs to be approved and finalized before beginning a CBT course.

Table 12. CBT pre-course checklist

Pre-course checklist	Yes/no
Programme title, course and timeframe approved by the training provider or advisory committee	
Detailed estimated cost of the course prepared and approved	
Selection and preparation of training sites/venues finalized	
Training logistics are organized (training venue(s) equipment, tools, facilities, consumables, supplies, resources, materials, etc.)	
Training of trainers/instructors completed	
Staff and trainer schedules and timetables prepared and finalized	
Applications and selection of students/trainees completed according to criteria that reflect both entry requirements and inclusivity objectives	

MANAGING AN INCLUSIVE APPLICATION AND RECRUITMENT PROCESS FOR STUDENT ADMISSION BENEFITS ALL TRAINEES. An "inclusive" learning environment, where the needs of vulnerable/under-represented trainees are taken into consideration: (a) allows for a process of consultation to be promoted to the benefit of all trainees; and (b) provides exposure to an inclusive cohort, thereby contributing to the civic skills of all trainees. Thus, proactive measures need to be put in place in order to ensure that women, persons with disabilities, and other vulnerable/under-represented populations can overcome entry barriers to TVET programmes. These measures should be defined following consultation with the groups concerned; it is also advisable to institutionalize this consultation process to secure continuous feedback throughout the training programme in order to ensure that vulnerable trainees benefit equally. Selection criteria for trainees should be inclusive such that they take into account: (a) the entry level requirements of the training; (b) the programme objectives; and (c) the target population and specific quotas for sub-targets. Programme designers should also be aware of other aspects of the programme that can act as hidden selection biases and impact on the inclusiveness of the programme, such as cost, transport, timing and programme duration, as well as the accessibility of the training facilities (see table 13). Practical solutions should be identified and instigated.

Ensuring appropriate venue and training needs for people with a disability in a timely manner brings predictability, control, and independence for trainees, so that they may concentrate on enjoying the learning process with their peers. When accommodations are insufficient, people with a disability might focus on practical issues that prevent them from benefitting from the training session. For example, "Will Mustafa be there to carry my books? Will I have time to take my medication and still get to my next class? Will there be a seat left in the front of class? Will there be water on the floor that might cause me to slip?"

Table 13. Considerations for preparing an inclusive training programme

Possible issues	Example
Programme costs	Does the target population have the financial capacity to cover direct costs, as well as opportunity costs,1 related to the programme?
Transport	Is safe and reliable transportation available for the target population to reach the training location?
Timing and duration	Does the proposed timing and duration fit well with other professional and familial obligations the participants may have?
Accessibility	Are the training venue, training content, languages, workshop areas, and training staff attitudes appropriate for all participants to join and benefit from the programme on an equal footing?

Note 1: These are costs incurred by simply participating, such as lost income due to absence from a job.

ONCE THE SELECTION CRITERIA IS FINALIZED, THE APPLICATION NEEDS TO BE DESIGNED AND WIDELY DISSEMINATED. Once the selection criteria have been designed, the next step is to design the application form. The application form, along with information on CBT, should be widely disseminated through outreach campaigns (e.g. media and social media, public and private media outlets, government centres,

post offices, municipalities, schools, mosques, and churches). Special care should be taken to ensure that vulnerable populations have access to these campaigns. It may mean reaching out through women's groups, or using sign language, for example.

ALL APPLICATIONS SHOULD BE CAREFULLY REVIEWED. Potential students need to be assessed against entry level requirements by examining their previous grades, degrees, and certificates, talking to referees, and examining their work history. Through this process, the instructor needs to exercise judgement in order to identify candidates who exhibit the potential to successfully complete the training programme.

SELECTION TESTS NEED TO BE CONDUCTED. These tests are designed to assess the competency and commitment of the candidate, taking into account the social targeting of the programme, together with any alterations required to accommodate their needs – in terms of access, language, support structure, etc. Tests may need to be adapted, for example, by offering text in Braille or reading test questions aloud to a candidate with a visual impairment. Written tests can also be performed through a computer or by dictation. Interviewers need to explore with candidates the type and degree of accommodation they will require during instruction and testing.

REASONABLE ACCOMMODATION NEEDS TO BE MADE FOR PERSONS WITH DISABILITIES TO ENSURE THAT THEY PARTICIPATE IN AND BENEFIT FROM THE TRAINING PROGRAMME ON AN EQUAL BASIS WITH OTHERS. Such accommodation should be based on an analysis of the person's needs in relation to: (a) the programme or classroom environment and how it may pose barriers to their participation; (b) the presentation methods of course material or instruction that could prevent the trainee from learning; and (c) evaluation methods that may not allow for adequate assessment of what the trainee knows or can do. These accommodations should be decided on and tested before commencing the training session, and integrated with the training routine. Most kinds of accommodation will be inexpensive and simple to arrange. It is also important to test the accommodation before the course begins in order to avoid possible problems. Table 14 provides a simple checklist for considering the kinds of accommodation that may need to be made.

Table 14. Considerations for training accommodation

Considerations	Yes/no
Can a trainee get around the classroom or workshop easily?	
Can the trainee use the equipment and tools in the classroom or workshop easily and safely?	
Can the trainee acquire information from the course material or workshop demonstration in the form in which it is currently presented?	
Can the trainee participate with other trainees in group activities?	
Can the trainee practise in the classroom or workshop as other trainees do?	
Can the trainee demonstrate acquisition of knowledge as other trainees can (i.e. perform as others do)?	
What type of support or other adjustments does the trainee need for testing or performance evaluation?	

PEOPLE WITH DISABILITIES ARE OFTEN THE BEST EXPERTS IN DEFINING WHAT IS A REASONABLE ACCOMMODATION FOR THEIR NEEDS. Trainees with specific disabilities, such as a hearing, visual, or mobility impairment, are in the best position to explain to TVET instructors how to accommodate their needs. However, they may be afraid or unprepared to tell the TVET centre what accommodations they require. If an invitation is extended to them to view the TVET building, visit the classrooms and workshops, and learn how courses will be presented and what is expected of trainees, they will then have a better idea of what will be required of them and may be more comfortable about sharing their needs. Organizations for people with a disability can also provide expertise on accommodating their needs and making the programme more inclusive for them.

Step 10: Implementing effective learning strategies for CBT

THIS STEP INCLUDES DIFFERENT STRATEGIES AND APPROACHES TO LEARNING. Delivering instruction requires interaction between the learner and the instructor so that the learner acquires or uses the skills, knowledge and attitudes that are required to function effectively on the job. The success of the interaction will depend on the instructor's skill to:

- make use of adult learning techniques;
- accommodate the learning styles of trainees;
- structure content delivery;
- match instructional content with active learning strategies;
- develop and use effective learning resources.

EFFECTIVE COMPETENCY-BASED TRAINING PROGRAMMES NEED TO INTEGRATE ADULT LEARNING PRINCIPLES AND MODALITIES INTO THEIR LESSONS. According to Knowles (1984), there are four key principles to adult learning:

(1) It is important for adult students to be involved in the planning and evaluation of their lessons.
(2) Experiences (including mistakes) are the basis for learning activities.
(3) Adults tend to be interested more in learning subjects that have immediate relevance and the potential to impact on their job or personal life.
(4) Adult learning is problem-orientated, rather than driven by content.

Table 15 highlights the implications of adult learning for CBT.

Table 15. Adult learning – implications for CBT sessions	
Description	**Example in the workplace**
Adults, including youth, are self-directed and want to take responsibility for their own learning decisions, actions and consequences.	CBT should ensure that each session is learner-centred, where the learner takes responsibility for skill acquisition.
Adults want to apply their own experiences to the learning process through practice, reflection and analysis.	The instructor should realize that the adult learner will "filter" new information through their personal experiences to determine if it makes sense. The instructor should be prepared to be questioned.
Adults prefer to be active participants in the learning process.	The instructor will engage the adult learner through active learning strategies, rather than having the learner sit passively in class.
Adults are motivated by tasks related to their own unique roles.	The adult learner will ask, "What does this have to do with me?" The instructor should ensure that learning applies to the adult's personal situation and role.
Adults are problem-focused rather than subject-oriented.	The instructor will ideally present problems, situations and scenarios for the adult learner to solve.
Adults value two-way communication and effective feedback.	As the instructor comments on the learner's progress, opportunities should be provided for the adult learner to ask questions and comment.
Adults value practical, structured course design and delivery.	Learning outcomes and objectives should be made clear to the adult learner from the outset.
Adults value clear, measurable, task-oriented objectives.	Instructor should ensure that learning tasks are clear, with measurable outcomes.

LEARNING STYLES: THERE ARE A NUMBER OF DIFFERENT WAYS THAT INDIVIDUALS PREFER TO LEARN – SOME BY WATCHING, SOME BY LISTENING, AND SOME BY DOING. This implies that, for CBT to be effective, it must integrate the various learning modalities and styles of trainees, since one size does not fit all. It is a challenge for the instructor to respond to this variety of learning styles, some of which are different from their own, and requires preparation. Sessions should include elements that appeal to all types of learners, including learners with disabilities.

THE INSTRUCTOR SHOULD INCORPORATE "TELL", "SHOW", AND "DO" STEPS IN EVERY LEARNING LESSON FOR LEARNERS TO HAVE AN OPPORTUNITY TO PROCESS INFORMATION ACCORDING TO THEIR PREFERRED LEARNING MODALITIES. Educationists [12] have shown that people use three

12 According to the VAK (Visual, Auditory, and Kinesthetic) Model; sometimes known as VAKT (Visual, Auditory, Kinesthetic, and Tactile) model, learners use these three/four modalities to receive and learn new information. VAK learning styles form a model of learning designed by Walter Burke Barbe and later developed by Neil Fleming.

different senses or modalities to process information: auditory, visual and tactile (See appendix step 11.1 for Korr modality ratings). Auditory learners have a preference for learning through hearing (i.e. verbally, through the use of audio tapes, CDs and other auditory media). Visual learners have a preference for the use of visual aids, models, pictures and other visual media. Tactile learners have a preference for "hands-on" activities in which the learner can practice and physically experience something. Research [13] shows that people have a preference for one modality over another, but frequently use all three learning modalities individually and together as part of the learning process. Therefore, in order to accommodate these three learning modalities (auditory, visual, and tactile), an effective instructor will ensure that training offers a mix of modalities that best suit the ways that individuals process information, and encourage students to adopt a variety of approaches towards skill acquisition.

Table 16. Examples of learning modalities

Learning steps for the instructor	Learning modalities for the learner	Method	Example
Describe the skill	Auditory	Tell	Describe OSH prevention methods needed in a welding operation.
Demonstrate the skill	Visual	Show	Demonstrate the use of protective gear.
Allow learners to participate	Tactile	Do	Trainees try on protective gear and masks before they start welding exercises.

A range of distinct learning styles were identified by Felder and Soloman (1993), who described eight kinds of learners: (1) active; (2) reflective; (3) sensing; (4) intuitive; (5) visual; (6) verbal; (7) sequential; and (8) global. Table 17 illustrates these various learning styles and advises trainers to consider certain issues when designing and planning training sessions.

Table 17. Considerations for different learning styles in CBT sessions

Learning style	Characteristics	Considerations for planning CBT sessions
Active	Active and reflective learners prefer to process information via application, active involvement and learning.	Provide opportunity for real-time engagement.
Reflective	Reflective learners prefer to have time to process new information and draw their own conclusions, and prefer to study alone or with one other person at most.	For reflective styles, provide an opportunity for reflection and analysing outcomes.
Sensing	Sensing learners seek information based on facts. They are methodical, and prefer to learn via clear and structured lessons. They are careful and often slow.	Provide an opportunity to "touch," "taste", "smell" and "try" elements in the learning plan.

13 http://www.ibe.unesco.org/en/glossary-curriculum-terminology/l/learning-styles

Intuitive	Intuitive learners seek information based on their own experiences and imagination. They enjoy abstract concepts and thrive on complications. They prefer a variety of teaching methods rather repetition.	Recognize that some learners are satisfied with their "feelings" about the subject matter and do not rely on proving it for themselves.
Visual	Visual learners retain more information from visual presentations than from written or spoken presentations.	Visual learners require pictures, diagrams, and demonstrations.
Verbal	Verbal learners retain information best by hearing it.	It is sufficient for verbal learners to hear the presentation in order to retain the information.
Sequential	Sequential learners enjoy solving problems or learning new concepts by moving in linear steps. They tend to be successful in school because most teaching is done in sequential order.	Break down the presentation of the skill to be acquired into a sequence of steps.
Global	Global learners make non-sequential leaps and absorb information randomly until they finally get it or are able to fit the pieces together. They are able to solve problems that go beyond the ability of sequential learners. They often have difficulty explaining how they solved a problem or understood a concept.	Present the big picture first, and then its components/elements.

ACTIVE LEARNING INVOLVES STUDENTS ENGAGING WITH MATERIALS AND COLLABORATING WITH ONE ANOTHER. Grunert (1997) found that students learn more when they participate in the lesson and actively learn through practice, application or discussion. Active learning also provides an opportunity for students to informally receive feedback on how well they have grasped a new concept or information. Not all students may willingly engage in active learning activities, since this style conflicts with traditional teaching methods where students are provided with information, memorize it, and then are tested on it. Active learning strategies should be incorporated into every component of the course in order to maximize learning and student engagement. Some examples of active learning activities are given in table 18, which shows that an effective training session is comprised of a patchwork of approaches, including various learning styles.

Table 18. Examples of active learning strategies

Active learning Strategies	Characteristics	Considerations for planning CBT sessions
Sorting	Physically placing learners into specific groupings to build community, encourage involvement, and physically demonstrate differences between student characteristics	Post *YES* and *NO* signs at different locations and have learners stand near a sign, based on an auto mechanics question you ask. Place learners in the four quadrants of the Learning Styles Model to physically illustrate the different styles of learning in the auto mechanics course.
Structured controversy	Grouping learners to express opinions on an issue to develop critical thinking and oral communication	Place signs with the words *AGREE* and *DISAGREE* around the room and have learners place themselves depending on their opinion about a certain auto mechanics problem. Members of each group are encouraged to present their arguments.

Categorizing grid	Having learners place items into categories to develop analytic skills, improve memory of material and develop a conceptual framework for learning	Place the five stages of learning on a grid and then provide learners with a list of auto mechanics activities. Have the learners categorize each activity in one or more of the learning stages.
Reach a conclusion	Drawing inferences to encourage critical thinking and relationships between theory and practice	Ask learners to consider the probable results or consequences of a specific learning theory in auto mechanics. Ask learners to consider the causes of student failures relating to their auto mechanic course.
Demonstration	Developing practical understanding of theories, generate interest and develop critical thinking skills	Have learners demonstrate the tell, show, do concept by teaching a simple auto mechanic task to another student.
Pause procedure	Stopping during lessons and giving learners a task to aid memory and allowing them to process the material	When discussing action verbs, stop and have learners write specific auto mechanic examples and read them to the class.
Perspective approach	Identifying a number of perspectives on an issue and having learners speak about the issue from an individual or group perspective	Competency-based instruction has come under criticism over the past few years. Have learners discuss the issue from the perspective of society, learners and the economy.
Think, pair, share	Having learners work individually and in pairs to encourage critical thinking skills	Ask learners to individually write down some creative learning activities for the auto mechanics class. Then place them in pairs to combine their ideas and report back to the class. Pairs can also be combined into groups of four for further discussion.
Humour	Using stories to promote learning through laughter	Share relevant anecdotes from the instructor's own experience, and emphasize the humour.
Generate questions	Offering learners the opportunity to write possible exam questions to improve recall, develop study skills and generate a pool of questions	After providing learners with factual material on a learning theory, ask them to write an exam question relevant to auto mechanics.
Journaling	Learners maintaining a journal to promote higher-level thinking, record personal responses and improve writing skills	Encourage learners to maintain a journal during their auto mechanics course. At various points in the training, have them write personal insights or responses to the materials presented.
Games	Using games to support a concept, motivate learners or provide some structured recreational time	Various games can be used to illustrate the use of tell, show and do in auto mechanics. For example, tell students how to change oil, show them, then ask them to do it.

TRAINING SESSIONS ALSO NEED TO TAKE INTO ACCOUNT THE FIVE STEPS OF ADULT LEARNING: (1) attention, which makes us receptive to (2) information, which we, in turn, (3) process, to draw (4) conclusions, which we (5) test for application and understanding. In a training session, each orchestrated step is necessary for learning to occur.

THEREFORE, FOR CBT A FOUR-COMPONENT INSTRUCTIONAL MODEL IS RECOMMENDED – FOCUS, PRESENTATION, PRACTICE, AND APPLICATION. The key to the application of this model is that it encourages the instructor to engage learners early in the learning, to deliver elements/objectives of the learning, and have the student perform a task as the instructor assesses their performance before full application. The instructor should adjust their function over the course of the four components and avoid a "lecturing" role/attitude.

THE INSTRUCTOR SHOULD SELECT THE APPROPRIATE AND MOST COST-EFFECTIVE TRAINING AIDS FOR EACH LEARNING STRATEGY AND THE BEST CORRESPONDING TOOLS. Learning strategies and training aids should facilitate the implementation of learning activities, self-learning and active learning, and support both off-the-job and on-the-job training. Care should be taken not to overuse any training aids or tools (see table 19 below for examples of training tools).

Table 19. Tools for instruction and regular assessment of competencies

	Knowledge	Skills	Attitude
Tools for instructing	▶ Video ▶ Guest speaker ▶ Student assignments ▶ Internet ▶ Demonstrations ▶ Hand-outs ▶ Research ▶ Lecture ▶ Group presentations	▶ Demonstration ▶ Student practice ▶ Student-to-student peer-based exercise	▶ Assign learners to groups, look for teamwork, commitment, leadership, self-confidence ▶ Create a schedule of assignments ▶ Create a problem
Tools for Assessing	▶ Quizzes/paper and pencil tests ▶ Verbal discussions ▶ Create groups and have them find the solution ▶ Student presentations	▶ Checking the "product" against specifications	▶ Paper and pencil tests ▶ Oral exams ▶ Observation ▶ Performance tests ▶ Standardized tests ▶ Rating scales

Step 11: Managing the learning process (classroom management)

INSTRUCTORS SHOULD TAKE THE OPPORTUNITY ON THE FIRST DAY IN CLASS TO AGREE WITH LEARNERS ON THE LEARNING OBJECTIVES AND THE CHARACTERISTICS OF THE LEARNING ENVIRONMENT. Interestingly, when adults are allowed to play a part in establishing their learning climate, they participate much more fully and assume more responsibility for achieving outcomes. First impressions and events on the first day have a major impact upon learners' perceptions of what the classroom environment and the relationship with the instructor and other learners will be like. Learners want to know what is expected of them in order to successfully complete the class. The instructor needs to clearly spell out the behaviour that is expected from trainees from day one.

It is important to be transparent with respect to the limitations of the instructor and notify students how sanctions will be applied. Make clear what will or will not be tolerated. This includes following safety protocols, such as wearing protective equipment. Such expectations should be constantly reinforced by giving positive feedback to students when they display correct behaviours, and praising students to generate positive emotions and a sense of encouragement. As an instructor, it is equally important to model good behaviour and stick to the rules (i.e. use safety equipment as required, be respectful, and exercise good listening and communication skills).

INTERPERSONAL COMMUNICATION IS THE FUNDAMENTAL BASIS OF RELATIONSHIPS AND LEARNING. Instructors are constantly communicating, both verbally and non-verbally. Interpersonal communication is a key factor in developing student motivation, self-esteem and trust. It is also important for building productive relationships inside and outside the classroom. Effective listening is commonly described as an essential communication skill. It requires the instructor to empathize with the trainee in order to understand their points of view. Table 20 lists some important techniques for effective listening.

Table 20. Key techniques for active listening

Technique	Definition	Example
Acknowledging	Letting the person who is talking to you know that you are paying attention without interfering with the individual's train of thoughts.	Replying to the speaker in the following ways: ▶ a brief declarative statement ("I understand"); ▶ a noncommittal statement ("I hear you"); ▶ an encouragement to continue speaking ("I got it").
Attending	Nonverbal communication that encourages the speaker to continue.	Assuming a posture or facial expression such as head nodding, leaning forward in a chair, an open stance and eye contact with the speaker.

Door opening	Statements that promote greater understanding by inviting the speaker to elaborate on a point. They also show the speaker that the listener is interested in what the speaker has to say.	A door-opener can include statements such as, “Could you tell me more about that?” or, “I’m not sure I understand you correctly”.
Questioning	When the listener needs more information to ensure that they have received the full message from the speaker.	Asking the speaker to elaborate on specific issues.
Probing	When the listener makes a reply that describes the issue under discussion by the speaker and poses a question that prompts the speaker to elaborate on that particular issue.	The listener may ask, “What about …?” or, “Isn’t it also true that …?”

THERE ARE ALSO FOUR KEY QUESTION TYPES THAT ARE COMMONLY USED IN THE CLASSROOM.

These include: (1) closed questions; (2) open questions; (3) convergent questions; and (4) divergent questions. A definition and example of each of these is provided in table 21 below.

Table 21. Four key question types

Question type	Definition	Examples
Closed questions	The response can be one word, often “yes” or “no”, or a very brief phrase.	If you saw another student cheating on an exam, would you report them to the instructor? If you saw another student cheating on an exam, would you report them to the instructor or look the other way?
Open questions	These questions leave the form of the answer up to the person answering; they encourage more thinking and elicit a greater amount of information.	If you saw another student cheating on an exam, how would you respond?
Convergent questions	These questions are intended to lead to a single “correct” answer, and often expect the student to refer to conventional wisdom or an information source.	According to the student handbook, what should you do if you see another student cheating on an exam?
Divergent questions	These questions are intended to elicit a number of possible answers, many of which may be acceptable.	What can we do to stop learners from cheating on exams?

THE LEAST METHOD IS A MODERATE APPROACH TO CLASSROOM MANAGEMENT FOR DEALING WITH STUDENTS' DISRUPTIVE BEHAVIOUR. Inevitably, situations that require intervention from the instructor will arise. Instructors significantly differ in both their level of tolerance for classroom disruptions and how they handle them. In any case, it is important to remember not to overreact to disruptive behaviour. Table 22 describes the various strategies that can be used to address disruptive classroom behaviour using the LEAST approach.

Table 22. The LEAST approach to classroom management

	Stands for	Explanation
L	Leave things alone	This action involves maintaining a regular routine, ignoring the behaviour and refraining from overt action that disrupts the class. This is the best alternative when: ▶ the behaviour is most likely to go away; ▶ no one is being harmed; ▶ there is no danger of a ripple effect with other participants.
E	End the action indirectly	This action involves non-verbal communication with the participant(s) to stop a disruptive behaviour without interrupting the learning. If the behaviour can be stopped at this level, it prevents further confrontation. Some proven non-verbal actions include: ▶ making eye contact with the disruptive participant(s); ▶ shortening the distance between the instructor and the disruptive participant(s); ▶ briefly stopping to allow the disruptive participant(s) to end the behaviour.
A	Attend more fully	This action involves direct communication with the participant(s) to determine the most appropriate response. The following approaches are recommended: ▶ Meet with the participant(s) in private if possible. ▶ Use questioning to gain input from the participant(s). ▶ Avoid being judgmental by targeting the behaviour, not the individual. ▶ Respond to the input constructively.
S	Spell out direction	Verbally spell out the changes in behaviour required: ▶ State the behaviour you wish to see and the reason for it. ▶ If the behaviour does not improve, specify the required behaviour and the consequences for not complying.
T	Track student behaviour	Keep notes on problematic behaviour, including the date and description of the behaviour. This allows for the accurate recording of incidents, especially if there is a need to speak to the participant(s) or justify further disciplinary actions to a supervisor.

Source: Northern Alberta Institute of Technology (2009).

GIVING AND RECEIVING REGULAR FEEDBACK IS AN IMPORTANT ELEMENT IN THE INSTRUCTIONAL PROCESS AND IS KEY TO EVERYONE'S SUCCESS. Feedback should not be limited to formal assessment or to moments following performance assessment. Ongoing feedback at all stages of the learning process allows the student to develop skills and knowledge, and establish a connection with instructors. In time, feedback allows the learner to gain self-assurance and autonomy, which will reduce the need for direct instruction. Constructive feedback encourages the learner to experiment as part of the learning process, and acquire a higher level of autonomy and creative skills, which are considered highly relevant to the world of work.

TIMELY, CONSTRUCTIVE AND BALANCED FEEDBACK PROVIDES SUGGESTIONS FOR LEARNERS TO ADJUST AND ENHANCE THEIR PERFORMANCE. Feedback plays a major role in reinforcing positive actions and results. To maximize the impact of feedback, it should be provided while the details are fresh in learners' minds and the person or group is still close to the situation. Giving effective feedback is also not about handing out criticism; the primary goal of effective feedback is, in fact, performance improvement. Feedback that focuses only on what a person needs to do better and fails to acknowledge what has been done well can damage self-esteem. Likewise, instructors who only comment on strong performance are equally ineffective. They are missing opportunities to help their trainees become even more successful.

SPECIFIC FEEDBACK PROVIDES A DISTINCT PICTURE OF PRESENT PERFORMANCE AND CLEAR GUIDANCE ON ACTIONS TO REPEAT OR ALTERNATIVE ACTIONS THAT WILL INCREASE THE LIKELIHOOD OF SUCCESS IN THE FUTURE. Learners need to know the following:

- What they did, or did not, accomplish – in precise, measurable terms. Comparing specific data to targets indicates whether people are on the right track or if they need to make adjustments.
- How they achieved or did not achieve results. What actions did they take? What programme/company values did they support? What methods were effective?
- Why their actions were effective or not. What were the results? How did people respond? What were the outcomes?

IN ADDITION TO PROVIDING FEEDBACK TO LEARNERS, AN INSTRUCTOR IS LIKELY TO RECEIVE FEEDBACK ABOUT THEIR OWN PERFORMANCE. Even without asking for it, it may come in the form of a complaint or criticism addressed directly to the instructor, or to senior staff in the institution. It is important to remember that every instructor receives complaints and criticisms in the course of their training programme. How an instructor handles this feedback will significantly affect the interaction with learners and the ability to provide quality instruction. Table 23 lays out a three-step approach that is recommended for handling complaints: (1) identify; (2) translate; and (3) respond.

Table 23. A three-step approach to handling complaints		
Step	**Stands for**	**Explanation**
Identify	In almost every case, a complaint or criticism is a request to change the way an instructor is doing something. The first task of the instructor is to identify the change that is being requested. This is not always straightforward because the request is often couched in emotional language.	For example, “You treat us like children” could mean many different things.
Translate	A complaint usually contains a hidden request. It is important to turn the complaint into a request the instructor can act upon. To do this, the instructor may have to ask some questions for clarification.	Instructor: What do I do that makes you think I treat you like children? Student: You make fun of people who ask questions you think they should know the answer to. Instructor: Then, you want me to handle student questions more objectively? Student: Yes.
Respond	Once the complaint has been translated, respond to the student(s), and identify the action that will be taken.	In the above example, you may respond to the student by saying, “I will try to handle student questions more objectively in the future.”

Appendix links: Step 11

11.1 Example of Korr modality ratings
11.2 Example shows the varying roles of the instructor across the four components of the instructional model

Step 12: Understanding and designing assessments

ASSESSMENTS ARE THE BASIS OF QUALIFYING INDIVIDUALS FOR A GIVEN OCCUPATION/TASK. Assessments are conducted by collecting information or measuring certain variables to establish a trainee's level of competency (i.e. their knowledge, skills, and attitudes) for a given occupation. Skills tests are one type of assessment and should consist of a theory or knowledge assessment, and a practice assessment to determine the learner's practical skills and attitudes. As a result of the competency-based assessment, the individual is declared either competent or not, as opposed to having scored a certain percentage on a grading scale.

ASSESSMENTS PROVIDE EVIDENCE OF THE COMPETENCY LEVEL OF THE LEARNER. Data collected about the learner's performance during the assessment process is compared with predetermined standards to provide evidence of their competency. Assessment results can be further analysed in order to make a final decision on the competency level of the learner, or recommend any changes to the training programme.

THIRD PARTY TESTING AND CERTIFICATION GUARANTEES FAIRNESS AND TRANSPARENCY, BUT IS EXPENSIVE AND TIME-CONSUMING. Under this system, an independent accreditation agency will:

(1) set the competency requirements for the training providers and/or assessment centres, and/or assessors;
(2) provide accreditation for training providers and/or assessment centres, and/or assessors;
(3) set up and administer the assessment, or control and supervise its administration by assessors;
(4) issue the final certificates for graduates.

A COST–BENEFIT ANALYSIS SHOULD BE THE BASIS FOR DECIDING ON THE LEVEL OF OVERSIGHT REQUIRED FOR THE ASSESSMENT AND CERTIFICATION SYSTEM. With third party certification, the overall quality assurance is under the complete control of the accreditation agency. While this model works well in advanced economies, it involves a considerable amount of bureaucracy, and its cost can often be prohibitive. At the same time, skills development authorities may be rightfully concerned about assessments and certification being designed and administered by training institutions themselves, so a decision needs to be made on the level of independent oversight required, and should be based on a cost–benefit analysis.

NO ASSESSMENT METHOD IS INTRINSICALLY BETTER THAN ANOTHER, SINCE THE ASSESSMENT CHOICE DEPENDS ON ITS RELEVANCE TO THE PARTICULAR COMPETENCIES TO BE ASSESSED. Table 24 outlines six main assessment strategies that are frequently used to measure an individual's competence. These include: (1) formal and informal assessments; (2) summative and formative assessments; (3) direct assessments; (4) indirect assessments; and (5) supplementary assessments.

Table 24. Common assessment strategies	
Assessment type	**Definition**
Formal/ informal assessments	Formal assessments use pre-defined frameworks to assess the individual's competence. For example, school and university exams are formal assessments. An informal assessment is often conducted through the trainer–learner interaction, with the trainer recording their observations of the trainee's performance.
Summative/ formative assessments	A summative assessment is conducted at the end of the learning period (final or post-testing). A formative assessment is implemented as training proceeds (continuous).
Direct assessment	Direct assessment strategies include direct observation, questions and presentations. Direct observation involves the observation of the trainee's performance in a defined work environment, at the workplace, or under circumstances that simulate a real work environment. Observation may focus on process, or on both process and outcome. Questions can be asked as part of an interview or during observation (support questions). Presentations can also provide examples of skills, products or services.
Indirect assessments	Indirect assessment can include an assessment of the end product, written assessments, or an evaluation of the candidate's previous work.
Supplementary assessments	Supplementary assessments can be based on a portfolio of previous skills and work performance, as well as reports and testimonials from employers, supervisors and colleagues.

The following principles should also be considered when deciding on the most relevant method of assessment:

- **Validity.** The ability of the assessment method or tool to measure what it was originally designed to measure.
- **Reliability.** A measure of how consistently an assessment method or tool yields the same results for the same performance over time.
- **Objectivity.** The degree to which the same results are obtained by different assessors.
- **Authenticity.** The degree to which an assessment is applied to work solely produced or conducted by the trainee.
- **Accessibility.** The circumstances of the assessment are equally accessible for all trainees, and reasonable adjustments are made for vulnerable groups (i.e. people with disabilities), without affecting the reliability of the assessment.
- **Effectiveness.** Avoiding redundancy and unnecessary long assessment periods.
- **Cost efficiency.** Adopting assessment procedures that are cost-effective relative to the quality of evidence or obtained.
- **Currency.** The degree to which the knowledge, skills and attitudes assessed are relevant to the current labour market.
- **Sufficiency.** The quantity of evidence available is sufficient enough to make an accurate assessment the competency of the trainee.

ASSESSMENT PROCEDURES, CIRCUMSTANCES, TOOLS, AND MATERIALS MUST BE ADAPTED TO ENSURE THAT THEY MEET THE NEEDS OF STUDENTS WITH DISABILITIES. Accommodations should to be discussed directly with those authorities responsible for persons with disabilities. The changes required should be similar to those that companies must introduce for recruiting persons with disabilities in order to ensure that the work environment meets the specific needs of the worker. For example, physical access to the testing centre for wheelchairs, the oral and written language used, the pace of the tests, the height of the tables, and the preparation time given to students must take into account the needs of people with disabilities. It is not a question of "preferential treatment" but of reasonable accommodation to ensure that the tests are inclusive.

ADDITIONAL EFFORTS CAN BE MADE TO IMPROVE THE INCLUSIVENESS OF THE ASSESSMENT PROCESS. Skills training should be an opportunity to promote a less segmented and more inclusive labour market, with all learners competing together. However, in some areas, women may find it easier to be tested separately by female assessors, and testing may also be undertaken by mobile training units or any method of distance assessment for learners in remote areas. Alternatively, transport costs may be covered. Priority should be given to a greater outreach of the assessments, and requests in some specific contexts for separate assessments should be taken into account. The assessment language can be adapted, in line with practices in the world of work. Care should also be taken so that questions and assessment subjects do not contain anything that candidates with specific social or cultural backgrounds could find shocking or offensive. The assessment design should also be adapted to illiterate persons by using graphs, dictation and videos, instead of written questions.

RECOGNITION OF PRIOR LEARNING CAN BE AN IMPORTANT STEP IN THE FORMALIZATION OF EMPLOYMENT. Recognition of prior learning (RPL), or prior learning assessment and recognition (PLAR), is the process of identifying, assessing and recognizing knowledge, skills, or attitudes that have been acquired through any type of activity, including formal or informal work experience, unrecognized training, independent study, volunteer activities, and hobbies. RPL/PLAR may be applied towards academic credit, towards the requirement of a training programme, or for occupational certification. It does not matter how the individual acquired the competency – the challenge is simply to determine whether they have it. So, RPL or PLAR is, in fact, a competency-based testing process disconnected from a training programme to allow those who already have these competencies to be acknowledged through the process. It can improve the learner's self-confidence and facilitate the transition of workers to the formal economy.

ASSESSMENT DESIGNS SHOULD BE BASED ON THE IDENTIFIED LEARNING OUTCOMES FOR A SPECIFIED OCCUPATION. Assessments should be based on what the trainee is expected to know, understand and be able to do on completion of training, and how well they should be expected to achieve those outcomes. Learning outcomes not only serve the purpose of directing the content and design of a training module; they form the basis of assessment. All learning outcomes identified in the design stage of a curriculum should be assessed, including attitudes, behaviours, values and ethics.

AN ASSESSMENT SPECIFICATION TABLE, ALSO KNOWN AS A "BLUEPRINT FOR ASSESSMENTS" IS A TABLE THAT INSTRUCTORS CAN CONSTRUCT TO ASSIST THEM IN ALIGNING LEARNER OBJECTIVES, INSTRUCTION AND ASSESSMENT. An assessment specification table helps in identifying relevant test questions, particularly for the theoretical test. The table also helps to specify the weights and marking distribution of the test questions and performance elements. The table is a two-way chart that defines each topic covered in an assessment, as well as the number of points associated with each specific topic (see appendix step 12.1 for an example of a specification table). The assessment specification table also shows the learning outcomes and their cognitive complexity level, which can be classified into the following:

(1) **Lower level.** Isolated pieces of information (the recalling and understanding of facts).
(2) **Intermediate level.** Interlinked pieces of information (application of rules/concepts – a minimum of two concepts is involved).
(3) **Higher level.** Linked information of special relevance/high order and critical thinking (higher levels of analysis, synthesis, evaluation, and creativity).

THEORY OR KNOWLEDGE ASSESSMENTS AIM TO MEASURE AN INDIVIDUAL'S CAPABILITIES AT VARIOUS LEVELS OF COGNITIVE COMPETENCY RELATED TO UNDERSTANDING PRINCIPLES, FACTS, CONCEPTS AND THEORIES. This is measured in accordance to the level of complexity in the assessment specification table. Assessment items should be specific, accurate and clear. Table 25 below shows the various types of theory knowledge assessment items (examples of these types are in appendix step 12.3).

Table 25. Comparisons of theoretical knowledge assessment items

Theoretical knowledge assessment items	Complexity level	Characteristics	Directions for designers
Long essay	All levels	In most cases long essays assess more than one learning outcome. Long essays are not recommended because of their length and complexity of the expected response.	Give clear directions about answer length and context. Set clear standards for answers. Give sufficient time for answering. Give weight for communication skills.
Essay completion	Lower level	Uses simple paragraphs Often used for vocabulary and word meaning tests	Tests only one idea Tests concepts and terms Requires leaving a space at the end of the paragraph for student to respond Answer options are limited

Short essays	Intermediate and/or higher levels	The answer requires, at most, three paragraphs or 250 words. These are mostly used to test the relationship between two concepts.	Set clear instructions for answering. The answer should include one or two specific ideas.
True/false	Lower Level	Students have a 50 per cent chance of correctly guessing each answer. These are quick for the instructor to mark. Effective in formative assessments.	It is preferable to write the paragraph in the affirmative. Only one idea is tested. The answer is susceptible only to true or false with no third possibility. Refrain from using words that denote generalizations (e.g. always, rarely) or indefinite expressions (e.g. mostly, in most cases). Correct statements should constitute 50 per cent of the total number of phrases.
Matching	Higher level	Matching assessments address relations between concepts and principles, and the opportunity for guessing is limited.	Include additional choices. Clarify list/column direction. Ensure that items in the two columns are homogenous and arranged logically. Use 3–6 options. Use illustrations.
Multiple choice	Intermediate or higher levels	Multiple choice is effective in formative assessments because it allows room for discussion.	Options for answers should be of the same length. Specify only one correct answer. Provide reasonable/realistic choices for answers. Label options with letters. Paragraph stem should include a problem and alternatives for possible solutions. Alternatives should be short and avoid redundancy and excessive words not related to the problem. Give no signs through linguistic cues that suggest the correct answer. Do not use negation at the beginning of the question; if used, it should be underlined.

Work sequences	Higher and/or intermediate levels	Work sequences require sorting a list of work steps in which the sequential order is mixed up. It covers exercises that cannot be covered in practice tests. It could cover work and safety rules.	Use the most related and relevant work steps. Use 6–10 steps. Use definite and clear items. Use illustrations.
Cause–effect	Intermediate or higher levels	Cause–effect assessments measure individual abilities in logical thinking and functional understanding. It uses 3–5 statements (mixed up from their logical order) that describe either causes or effects (of defects). Statements are connected logically, but not in sequence.	Use precise statements using nouns and verbs/adjectives. There must be no cause that leads to two effects. Ensure there are no missing steps causing a large gap. The second statement is not simply a more specific example of the first statement. Use illustrations.

IN ADDITION TO ASSESSING THEORY KNOWLEDGE, IT IS ESSENTIAL TO ASSESS EACH STUDENT'S PRACTICAL PERFORMANCE THROUGHOUT THEIR TRAINING. There are several methods used for assessing a trainee's practice performance and their ability to demonstrate competence and the skills they have acquired for a given exercise or task. Table 26 compares the most common methods used to assess practice performance.

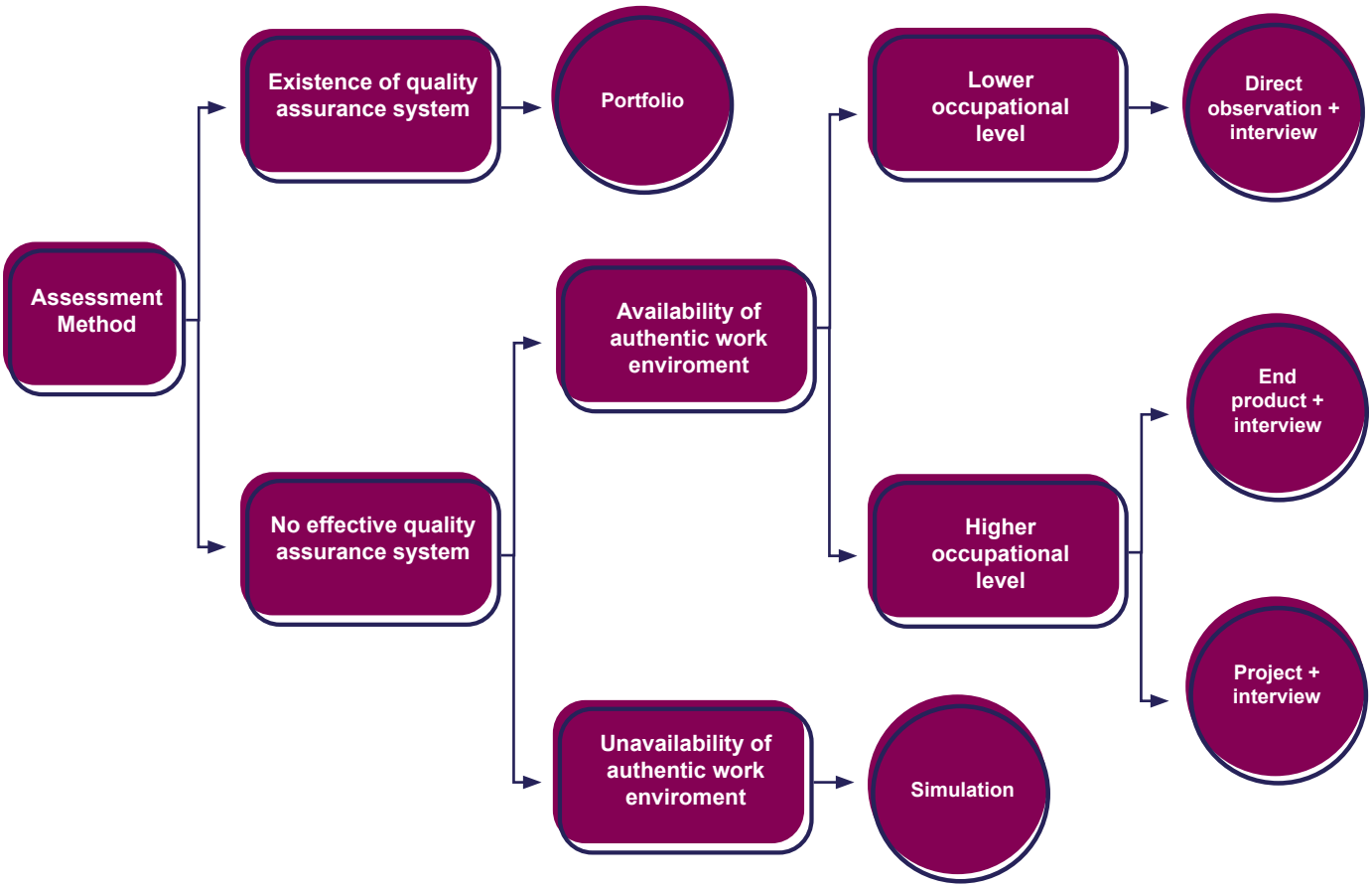
Table 26. Comparisons between the most common practical assessment methods

Practice performance assessment method	Description	Strengths	Weaknesses
Process-based	A process assessment answers whether tasks were conducted: ▶ appropriately; ▶ safely; ▶ in the correct sequence; ▶ within the given time limit. An example of a process assessment is the observation of students disassembling and reassembling engine parts.	Process assessments accurately define fields of skills and competencies. They are thorough and can indicate where a performance error has occurred.	Process assessments require a lot of time to design and implement.

Product-based	A product assessment is more objective than the process method, since it has pre-set standards for design and accuracy, and answers the following questions: ▶ Does the end product meet design specifications? ▶ Does the end product have an elegant or correct appearance? ▶ Does the end product fulfil safety standards? An example of a product assessment is examining the outcome of an engine repair.	Product assessments are easy to design and implement. They are more reliable because standard tests may be applied to the product/outcome.	If an error leads to a poor outcome or product, it is not possible to specify exactly where it occurred.
Project-based	Project assessments are often used for assessing advanced competencies that involve autonomy and critical thinking. Trainees can be assessed either on individual projects or collectively on group projects. In both cases the aim is to measure the ability to achieve planned objectives with limited resources, within a specified period of time.	Project assessments are more comprehensive than other methods. They are useful in bringing together a wide range of skills, knowledge, and assessing them collectively.	It is difficult to thoroughly assess an individual in a collective project. Some tasks may be implemented without direct observation from the instructor.
Simulation	Simulation assessments evaluate competencies as part of real work scenarios. This is done in an environment that resembles a real workplace as much as possible. Assessment scenarios may include tackling various problems the future worker is likely to face. Methods of simulation assessment vary from simple role play to comprehensive re-creation, such as using a flight simulator.	Simulation assessments allow the instructor to conduct the assessment in an environment similar to real work environment. They tend to cost less than other methods, especially when other forms of assessment require an expensive environment or equipment.	It is challenging to create a simulated environment that resembles a real work environment.

Interview and question-based	Oral testing is usually used as a supporting strategy for assessing performance and validating written tests. It is useful for assessing situations, skills and knowledge in which no other test is valid except through verbal means. Interviews allow for judging how the candidate thinks and interacts under pressure, and for assessing other soft skills, including self-confidence, analytical skills, articulating a case, logical thought processes, and interactive capabilities. An oral test is typically a planned interaction between the student and assessor(s) with a pre-defined list of questions that range in complexity to assess the student's competence.	Useful for assessing situations, skills and knowledge, as well as a student's ability to think logically and analytically and interact appropriately.	Not a very comprehensive method of assessment due to the small number of questions an assessor is able to ask. The assessment depends on the assessor's self-estimation and may lack objectivity. A student's fear of the situation may influence their performance, through shyness, nervousness, etc.
Performance portfolio	A performance portfolio can be used by assessors to evaluate a student's performance, as well as by recruiters to evaluate potential job candidates. A candidate's portfolio is a collection of their work that exhibits their performance, competencies, and achievements, and usually includes the candidate's and instructor's reflections. It may include the contents and examples of recent training programmes, training and assessment records, duties and tasks assigned in past and present jobs, class assessments, exam papers, examples of products (technical drawings, photographs, etc.), and certificates.	Performance portfolio assessments are an effective alternative to assess skills and for tracking a student's progress.	There is a need to set observation standards and mechanisms to ensure that the assessment is of sufficient quality.

Chart 7. Tree diagram on assessment methods



THE CHOICE OF WHICH ASSESSMENT METHOD IS BEST FOR ASSESSING CBT STUDENTS IS DRIVEN BY THE NATURE OF THE KNOWLEDGE, SKILLS AND ATTRIBUTES TO BE ASSESSED AND WHAT EVIDENCE WILL BE REQUIRED TO DEMONSTRATE COMPETENCY. Assessment in lower-level skilled occupations could rely more on direct observation while higher-level skilled occupations could use product- or project-based assessment methods. A lack of available authentic work situations could lead to simulation methods being used. Performance portfolio assessments could be used to supplement other assessment methods. Also, portfolio-based assessment could be used as an alternative to skills assessment. In the latter case, observational standards and mechanisms should be in place to ensure the quality of the assessment. Chart 7 summarises the decision path for selecting the best method of assessment for CBT students.

FORMATIVE ASSESSMENTS ARE AN ONGOING ASSESSMENT METHOD CONDUCTED BY THE INSTRUCTOR DURING OR THROUGHOUT A TRAINING PERIOD. The purpose of formative assessments is to measure what the trainee has learned, and to identify shortcomings for future improvements. A formative assessment is conducted using assessment tools that allow an instructor to collect evidence and document the performance of the trainees during and after the assessment takes place. Assessments are done alongside the training, and must be built into the lesson plans. Assessment tools need to be developed in consultation with industry and tested on a sample of candidates. One assessment method or more can be used as a basis for the actions and activities required from the trainee. Assessment tools may take the shape of checklists, rating scales, rubrics or any other qualitative or quantitative tool.

CHECKLISTS USUALLY OFFER A YES/NO FORMAT IN RELATION TO LEARNER DEMONSTRATION FOR SPECIFIC CRITERIA. Checklists include a list of actions or activities that an instructor is required to assess and are usually answered by one of two choices, such as "qualified or unqualified", "competent or not yet competent", "achieved or not yet achieved". Table 27 provides an example of a checklist.

Table 27. Checklist example

#	Performance element	Assessment	
		Achieved	Not yet achieved
1	Diagnose engine problems		
2	Service engine gaskets		
3	Service engine seals		
4	Service engine cooling system		

RATING SCALES INCLUDE A LIST OF ACTIONS TO BE ASSESSED, BUT PROVIDE FOR A NUMERICAL RATING TO BE GIVEN FOR EACH ACTION (E.G. ON A SCALE OF 1–5 OR 1–10). They allow an instructor to indicate the degree to which the skills displayed by the learner have been achieved and are progressing.

Table 28. Rating scale example

#	Performance element	Assessment	
		Rating 1 2 3 4 5	Mark (%)
1	Diagnose engine problems		
2	Service engine gaskets		
3	Service engine seals		
4	Service engine cooling system		

A RUBRIC FOR ASSESSMENT IS AN ASSESSMENT TOOL THAT USUALLY TAKES THE FORM OF A MATRIX OR GRID TO GRADE A STUDENT'S WORK OR SKILL AGAINST A CERTAIN SET OF CRITERIA. A rubric clearly indicates the expected performance standards for a certain task or skill, and should be aligned with learning outcomes, and is comprised of three main components: (1) clear criteria which state the objectives the student must meet in a given task or skill; (2) a performance range from highest to lowest (rating, mark, or grade); and (3) a detailed description of each performance level, from highest to lowest.

Table 29. Rubrics assessment example					
	Level 5	**Level 4**	**Level 3**	**Level 2**	**Level 1**
Perform oil pressure test, and determine required action	Trainee able to test oil pressure satisfactorily and determine correct required action in broad range of situations that require critical thinking and problem solving	Trainee can perform oil pressure test satisfactorily without assistance or supervision	Trainee can perform all steps of testing oil pressure satisfactorily but requires periodic assistance and/ or supervision	Trainee can perform some steps of testing oil pressure satisfactorily, but requires assistance and/ or supervision to perform the entire task	Trainee not able to perform oil pressure test or determine required action
Perform oil and filter change	Trainee can perform oil and filter change satisfactorily and is able to lead others in performing it	Trainee can perform oil and filter change a number of times, in most normal situations, at speed and quality that compares to a worker with two years of real work experience	Trainee can perform oil and filter change a number of times, in most normal situations, without assistance or supervision	Trainee can perform oil and filter change a number of times, in many normal situations, with support or supervision required from time to time	Trainee can perform some steps of oil and filter change satisfactorily, but requires assistance and/ or supervision to perform the entire task
Application of safety practices	Trainee followed all safety rules and procedures	Trainee followed safety rules and procedures, but may have forgotten one	Trainee attempted to follow safety rules and procedures, but forgot several	Trainee forgot to follow most safety rules and procedures	Trainee made no attempt to follow safety rules and procedures
Attitude	Trainee displays excellent attitude towards instructor, peers and work	Trainee displays a good attitude towards instructor, peers and work	Trainee displays a fair attitude towards instructor, peers and work	Trainee displays a poor attitude towards instructor, peers and work	Trainee displays an unacceptable attitude towards instructor, peers and work

AN INSTRUCTOR SHOULD USE FORMATIVE ASSESSMENT SHEETS TO ASSESS TRAINEE PERFORMANCE DURING THE IMPLEMENTATION OF PRACTICAL EXERCISES, ACCORDING TO THE JOB SHEETS. An instructor can use any qualitative or quantitative tools (like the above-mentioned) to serve as a formative assessment sheet. However, there is a need to convert the job sheets used for training into an objective measuring tool for practice performance assessment. Without qualifiers that precisely define the conditions for either “competent” or “not competent yet”, this tool should not be considered objective. Terms like “properly” or “adequately” leave room for interpretation. Good qualifiers for objectively verifiable assessment criteria can be found in table 30. Further examples are also shown in appendix step 12.2.

Table 30. Good qualifiers for assessment		
Assessment type	**Qualifier**	**Explanation**
Performance- and process-related assessment criteria	Measurable tolerances	Length, temperature, voltage assessment, squareness, level, evenness
	Use of special tools and technological processes	For sequences where tools are specified
	Observation/ignorance of rules	Work and safety rules can serve as a measuring tool for mastery of performance
	Essential verifiable details	Aspects of the process that cannot be bypassed
Performance- and process-related assessment criteria	Functional assessments or compliance with set procedures	Functional assessments as set by manufacturers, either specifications taken from manuals or more commonly as visible colours, surface patterns, contour deformations, smells, noise etc.
	Symptoms for defects	Symptoms need interpretation so that systematic troubleshooting can start. The ability to troubleshoot represents the highest level of performance quality in many occupations.

MENTORING AND CONDUCTING ASSESSMENTS FOR LEARNERS PARTICIPATING IN ON-THE-JOB TRAINING IS AT THE CORE OF WBL. It requires intensive coaching and follow-up by instructors from the training institution through effective tracking tools, and a monitoring process. Instructors are responsible for following-up with apprentices through weekly field visits to workplaces. Skills acquisition is tracked through score cards and logbooks, which are filled out by the apprentice as a self-assessment and then validated by the master craftworker, as well as the mentor. The development of these score cards is based on the learning outcomes identified in the curricular framework. The instructor also plays the role of mediator with apprentices, master craftworker and, in some cases, even parents in order to limit programme drop-out.

IN THE CONTEXT OF APPRENTICESHIP, AN INSTRUCTOR'S PRIMARY TASKS INCLUDE THE FOLLOWING:

- conducting weekly visits to the apprentice's worksite;
- following-up, guiding, and mentoring apprentices and craftworkers;
- completing monthly reports on training progress and challenges faced by the apprentice;
- communicating and resolving any issues or conflicts between the apprentice and employer, craftworkers, skilled workers, customers or other persons;
- assessing an apprentice's performance and up-skilling (to be conducted jointly with the craftworker);

- providing career guidance and counselling for apprentices;
- complete the necessary tracking forms/tools; [14]
- an apprentice's daily record includes:

  - a performance record;
  - a self-assessment record;
  - a weekly worksite visit record;
  - a mentor's monthly report.

WHEN DEVELOPING SUMMATIVE ASSESSMENTS, IT IS NECESSARY TO IDENTIFY WHICH COMPETENCIES OR UNITS OF COMPETENCE IN THE COMPETENCY PROFILE WILL BE ASSESSED. These competencies should be known to trainees before setting the assessment. After choosing the assessment method(s), it is useful to prepare an assessment evidence matrix to ensure that the evidence collected covers all competencies to be assessed. It is also necessary to confirm the validity and sufficiency of assessment evidence. In addition, it helps to identify suitable assessment methods to be used in the assessment, and cluster similar skills and learning outcomes in groups of work sequences for which assessments can be conducted together. Strong involvement of qualified practitioners from the private sector are needed to identify the skills that may be clustered and assessed together with the appropriate assessment methods. An evidence matrix consists of at least the competencies and assessment methods. It is also possible to add the actions, activities or work sequences required to be conducted for every assessment method. Table 31 is an example of a detailed evidence matrix.

Table 31. Evidence matrix example

Competency unit/ competency elements	Work-sequences required for the applicant to carry out for every assessment method[1]		
	Direct observation (process assessment)	Supported oral questions	End-product assessment
Competency unit (duty) Diagnose and repair of fuel system **Element of competency** Diagnose fuel system failures, define causes and repair	The applicant is required to conduct one or more of the following work sequences: ▶ tuning engine by using the analyser.	The applicant is asked to list the most common reasons for failure of the engine to start in cold conditions.	The applicant is given a car engine that needs tuning and injectors that require cleaning. The applicant is assessed on the basis of: ▶ stabilizing the engine operation after cleaning and tuning by using the exhaust analyser.

14 Examples of tracking tools are provided in appendix steps 12.5 to 12.9.

Dissemble fuel tank from vehicle, identify failure and reassemble it. Check fuel pipes and carry out the necessary repairs.	Disassemble fuel tank and check dents and leaking and reassemble.	---	
Check pressure and empty fuel pump. Remove fuel pump (mechanical or electrical) from engine and reinstall.	Check electrical or mechanical fuel pump by using special apparatus.	---	
Remove fuel injectors from engine and reinstall. Dissemble fuel injectors into parts and reassemble. Conduct maintenance for fuel injectors. Dissemble air and fuel filters, clean and reinstall.	Dissemble fuel injectors and carry out necessary maintenance and then reassemble it.	The applicant is asked to recite the main circuits inside the fuel injectors.	

Note 1: Other assessment methods can also be added to the matrix (simulation, project, etc.) where appropriate.

A THEORY/KNOWLEDGE SUMMATIVE ASSESSMENT IS DEVELOPED USING THE ABOVE-MENTIONED ASSESSMENT ITEMS. In particular, theoretical knowledge assessments use matching, cause–effect, work sequences, and multiple choice items. All these assessment items cover multiple levels of cognitive complexity with an emphasis on the higher critical thinking skills of problem solving, trouble shooting, faulty components and processes, defect-cause links, symptoms and remedies. In addition, workplace core skills and life skills should be assessed in both practice and theory knowledge as part of summative assessments.

FOR A PRACTICE TEST, SUMMATIVE ASSESSMENT SHEETS ARE TO BE DEVELOPED (see appendix step 12.11 for examples). Whatever the assessment method chosen, assessment sheets should contain at least the following elements:

- **Generic information on:** (1) the occupation related to the assessment such as occupation name, code, competency or skill level, etc.; (2) the candidate's contact information, including name, telephone number, etc.; (3) the assessment location, date and period; and (4) the assessor's name(s).
- **Instructions** to assessors for setting the assessment environment and gathering and interpreting evidence. Instructions should also be provided to candidates to prepare for the assessment(s), and be informed on the content and method of analysis. Directions for candidates should be clear, time-specific, and show how answers are to be presented. Assessment questions and paragraphs should be arranged in a logical manner and include a model of correct answers.
- **Performance elements/steps,** which include the skills to be assessed, the assessment methods, the main actions, products and or services the candidate is required to conduct or produce (in line with the assessment specifications table and evidence matrix), and an assessment judgment for each of the performance elements (competent/not competent). Performance steps are characterized by:

    - specific descriptions that are clearly understandable;
    - descriptions of a motor activity, rather than a non-observable mental activity;
    - the absence of safety hints, tool references and work rules, which are left out from the performance description (unnecessary help), but are instead used for qualifiers;
    - objectively verifiable criteria that lead to a clear-cut "fulfilled/not fulfilled" judgement (without pseudo qualifiers like "proper");
    - labelled sketches, which are used to show explanatory details whenever the wording of the performance description is not sufficiently clear;
    - technical drawings (with specifications for performance), which are attached as an appendix to clarify the complexity of the performance or product.

- **Performance criteria** that describe the level of performance required for the candidate to demonstrate achievement. Performance criteria should avoid pseudo qualifiers by using specific qualifiers (e.g. an acceptable numerical discrepancy in performance accuracy – these can be related to speed and to safety standards applied, the appearance of the end product etc.).
- **Oral supportive questions** to the candidate at a certain step of the assessment (to evaluate their knowledge of elements related to the assessment). These cannot be used alone, but in conjunction with other assessment methods, particularly direct observation. Oral supportive questions mostly relate to:

    - justifying and analysing the performance step (e.g. "Why did you install the washers before operating the machine?" or "Why should the engine reach normal operating temperature before tuning up?");
    - naming parts and components (i.e. naming the components of a cooling circuit as presented).

- **Resources** required for candidates to carry out assessment activities.
- **Scenarios (to be added for simulation).** The assessor should outline for the applicant the required procedure(s) to be followed when carrying out a series of actions, activities and operations (e.g. “working in a team, the applicants are to demonstrate the safe procedure for cleaning up a small hazardous leakage”).
- **Oral or interview questions (to be added for interview method)** are raised to assess the candidate’s knowledge of the technical basis related to the duties and tasks of the assessment. They differ from oral supportive questions by the fact they are not related to a demonstrated action. The interview method can be used alone or in conjunction with other methods (e.g. direct observation, product- or project-based, or portfolio) to ensure the sufficiency of evidence. Oral interview questions mostly relate to:

  - clarification questions (e.g. when using the portfolio assessment method);
  - procedures and processes (e.g. “What are the main steps in ...?”);
  - underpinning knowledge (e.g. “How much should ...?” “Why?”);
  - further probing questions (e.g. “Give an example of an action that could occur in offset printing that you think would not show that the appropriate duty of printing has been taken”);
  - contingency questions (e.g. “What would you do if you saw that action occurring?”).

- **Expected contents of the portfolio (to be added for portfolio assessment method),** which are to be included with details on the type of evidence required for the candidate to be considered competent.

IT IS IMPORTANT TO NOTE THAT BEFORE THE FINAL ADOPTION OF ANY ASSESSMENT METHOD, A DRAFT TEST SHOULD BE PILOTED ON A TARGET GROUP SAMPLE. This sample should consist of graduates of vocational training programmes or workers. Pre-test results must be analysed for the purpose of defining areas of strength and weaknesses, and to amend the draft test in order to improve its validity before adoption.

Table 32. Example of a practice test form

Practice test form No. 1

Learning outcome: Diagnose steering system

Assessment method: Direct observation and product Test duration: 2 hours

Main resources: Wheel alignment device, tool box

Assessment element (performance step)	Assessment (competent or not yet competent)		Assessment criteria
	Process	Result/product	
Diagnose steering column			Noise, looseness, and binding problems, including tilt mechanisms, are checked.
Diagnose power non-rack & pinion steering gear binding			Uneven turning effort, looseness, hard steering, and fluid leakages are inspected.
Dismantle steering wheel			Dismantling and assembly are done without causing damage to any parts. Assembly is done in reverse steps as dismantling.
Check caster			The vehicle is in a straight position on the test area. The vehicle is secured with the steering wheel in the middle position. Caster tolerance is +/- 1 mm from the service manual specifications.

Assessor's name & signature : …… **Date:**……

Appendix links: Step 12

12.1 Specification table
12.2 Examples of good qualifiers
12.3 Examples of theoretical test items
12.4 Examples of practice test form
12.5 Example of apprentice daily records:
12.6 Example of apprentice performance sheet
12.7 Example of Apprentice self-performance sheet
12.8 Example of weekly worksite visit sheet
12.9 Example of a mentor monthly report
12.10 Additional information on apprenticeship
12.11 Examples of practice test and summative assessment sheet

Step 13: Conducting final assessments and certifying learners

SEVERAL PREPARATIVE STEPS NEED TO BE TAKEN BEFORE ACTUALLY CARRYING OUT A COMPETENCY-BASED FINAL ASSESSMENT(S), INCLUDING THE FOLLOWING:

- **Select assessors.** The national institution in charge of overseeing assessments and certification should identify pool of assessors for each assessment. The role of the assessor is to:

  - check the official ID (identification document) of the candidates;
  - supervise assessments of knowledge of theory, and mark them;
  - implement practical assessments with relevant specialists;
  - document the assessment results on the candidate's application.

Assessors should have certain technical and pedagogical skills, including no less than five consecutive years of recent experience in the relevant field. They should demonstrate core work skills (Arabic language proficiency, computer skills, etc.). They should be physically capable and ready to implement the assessment. They should also have completed a training course on conducting skills assessments.

- **Select the assessment venue.** Assessment locations will be selected based on a range of criteria, including accessibility of toilets, rest areas, car parking, and so on, and a secure room where the assessors will be safe to make an independent decision without pressure. Assessment locations should also provide a safe and comfortable environment for candidates (such as well-lit, quiet and cool rooms), sufficient space and adequate furniture, and suitable teaching aids (whiteboards, etc.). Qualified administrative support should be available for the theoretical assessments. For practical assessments, technical facilities specified in the documents should be made available, and accredited by the national standard-setting institution. Special care should be taken to meet occupational safety and health standards.

- **Design a skills assessment implementation plan.** A simple skills assessment implementation plan based on the assessment tools should be written in collaboration with the assessment designers, and then shared with the students beforehand. A skills assessment implementation plan should include:

  - the general assessment rules and specific instructions for students (e.g. how the candidate should prepare for the assessment, the product they are expected to produce, readings they should complete beforehand, how their portfolio should be put together and what information to include);
  - the duties and tasks included in the assessment (i.e. what will be assessed);
  - the time, place, and circumstances of the assessment (when, where, and the context of the assessment);
  - the methods of assessment and the tools that will be used (i.e. how the assessment will be implemented, and the fact that an assessor will be observing the process);
  - the decision-making criteria for assessing which candidates are competent;
  - the list of assessors and members of the supervision committee;
  - confirmation that all required materials and tools will be available;
  - confirmation that candidates with disabilities will be accommodated (in terms of accessibility, assessment language, aids, etc.) and the procedure that candidates with disabilities should follow to request specific accommodations;
  - the procedures for assessment retakes and appeals.

IN ADDITION, WHEN PREPARING FOR A SKILLS ASSESSMENT, ASSESSORS NEED TO ENSURE THAT:

- candidates have been notified of the assessment, and that the skills assessment implementation plan was shared with them in advance;
- the information stated in the assessment document is accurate;
- assessment tools have been pre-tested on a sample of candidates, and that the assessment procedures have been tested with technically relevant people (TVET providers or industry representatives);
- the equipment and tools required for the assessment are available beforehand and that the environment reflects the conditions of a real workplace (particularly for simulation assessments);
- candidates with disabilities have been identified and “reasonable accommodations” have been included in the assessment design and implementation;
- the appropriate administrative staff have been assigned to oversee the assessment;
- candidates have filled out the assessment application forms.

Appendix step 13.1 provides a template for an assessment implementation plan, with an example of an actual assessment plan.

THE ASSESSMENT SHOULD BE CONDUCTED ACCORDING TO THE ASSESSMENT IMPLEMENTATION PLAN AND THE COMPLETED ASSESSMENT SHEETS SHOULD BE COLLECTED AND MARKED IN ACCORDANCE WITH THE AGREED TOOLS. If the assessment has been prepared well, the implementation of the assessment should not have any major challenges. The performance of the candidates can be videotaped for learning purposes, with the consent of the student(s). Candidates should also be reminded prior to undertaking the assessment about the appeals process, and eligibility requirements for assessment retakes. Once completed, the assessments are then marked in accordance with agreed standards, and the results reported accordingly. The results need to be kept confidential for a defined period of time, after which a committee should be formed by the national institution supervising the assessments for their destruction.

RETAKES AND APPEALS SHOULD BE MANAGED AS PART OF A SET PROCESS. In a competency-based approach to assessments, trainees who fail an assessment or who are not able to attend for valid reasons should be given the opportunity to retake the assessment within a reasonable period of time (i.e. between 6 months and one year), possibly with their financial contribution. Students should also be given the right to appeal assessment results, subject to valid reasons. Appeals should be investigated by an independent committee that decides whether the reason is valid and whether the student should be assigned a different grade, or a retake is ordered.

ASSESSMENT REVIEW IS AN IMPORTANT STEP IN THE PROCESS. Feedback from candidates and assessors should be collected and analysed carefully by the institution supervising the assessment to identify possible flaws. These flaws need to be taken into account when revising the design of the assessment(s). To identify the revisions required, an assessment review form should be completed by students who undertook the assessment once completed. Table 33 is an example of an assessment review for students.

Table 33. Example of an assessment review form		
Assessment review form		
Please complete this form after completing your theoretical and practical assessments. Your feedback will be taken into consideration to improve future assessments for this course.		
Feedback on theory knowledge assessment		
1. Assessment questions were clear and could be easily understood	Yes	No
2. Assessment questions covered the theoretical information related to the occupation	Yes	No
3. There were questions that had nothing to do with the occupation	Yes	No
If you answered yes, please specify ……		
4. Some questions had more than one correct answer	Yes	No
If you answered yes, please specify ……		
5. The time allotted to the assessment was sufficient	Yes	No
6. Assessment halls were suitable in terms of seating, ventilation and lighting	Yes	No
I**f you answered no, please specify** ……		
Feedback on practical assessment		
1. Assessment questions were clear in terms of language and phrasing	Yes	No
2. The assessment reflected the technical capability of the person performing the job	Yes	No
3. The place where the assessment was held was suitable in terms of the:		
▶ facilities	Yes	No
▶ equipment	Yes	No
▶ tools	Yes	No
4. The supervisor (assessor) was cooperative in clarifying the required duties for the assessment	Yes	No
5. The time allotted for the assessment was sufficient	Yes	No
Thank you for your cooperation		

ON THE SATISFACTORY COMPLETION OF TRAINING AND ASSESSMENT, A CERTIFICATE IS AWARDED. Certification should facilitate the transition of graduates to decent jobs, and be organized according to national rules and regulations. It is common for the TVET institution to take on the function of certification. The certificate should state the exact qualification that the graduate has attained, and may also list the competencies they have mastered. This helps to inform potential employers of the competencies of the graduate. Award ceremonies with the private sector are a useful way to strengthen trust in the validity of certificates.

PERFORMANCE PORTFOLIOS PRESENT ADDITIONAL EVIDENCE OF A GRADUATE'S COMPETENCE BEYOND FORMAL CREDENTIALS. A candidate's portfolio is a collection of their performance, competencies, achievements, and usually includes the reflections of the candidate and the instructor. It includes evidence of the various projects and activities undertaken by the individual during their programme, and demonstrates their generic skills and competence. It may include the contents and examples of recent training programmes, training and assessment records, duties and tasks assigned in past and present jobs, class assessments, exam papers, examples of products (technical drawings, photographs, etc.), and certificates. Performance portfolios can be used by assessors during CBT to evaluate a student's performance, and also by recruiters to determine potential job candidates.

OCCUPATIONAL LICENSES RESTRICT ACCESS TO THE LABOUR MARKET TO CERTIFIED WORKERS. Certificates sometimes also function as occupational licenses, which are legally required to practise a specific occupation or perform certain restricted work tasks. A registry of these licenses should be available for employers to access in order to verify that job applicants are correctly licensed. International best practices consider that: (a) licenses should be limited to occupations where there is a demonstrable public need to limit access to certain jobs to those who have the required competencies; and (b) professional associations can play a useful role in managing the system of occupational licenses.

THE ASSESSMENT CENTRE SHOULD INCLUDE QUALITY ASSURANCE PROCESSES. These should guarantee that internal verification mechanisms are in place to ensure that assessments are carried out according to established procedures and guidelines, and that results are impartial, transparent and objective.

Appendix links: Step 13

13.1 Template for an assessment plan
13.2 Example of test review form

Additional readings

- Department of Training and Workforce Development. 2016. Assessment in the VET Sector. Perth: Government of Western Australia. https://www.dtwd.wa.gov.au/sites/default/files/uploads/Assessment%20in%20the%20VET%20Sector%20-%202016%20-%20Final.pdf.

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- Usman, Y. H. 2015. “Differences Between Pedagogical and Andragogical Methods of Teaching and the Preference of Andragogy for the Teaching of Adults”. International Journal of African and Asian Studies, 6: 58–62. https://pdfs.semanticscholar.org/dc22/9b0e99085f504cecf30ae2aa59463614deff.pdf.

5. Keeping CBT programmes relevant

SINCE THE WORLD OF WORK IS NOT STATIC, THERE MUST BE AN ONGOING EFFORT TO ALIGN ALL TRAINING PROGRAMMES WITH THE CHANGING NEEDS OF THE LABOUR MARKET. Training programmes do not stay relevant for very long and, therefore, need to be periodically validated for their market relevance and inclusiveness.

Intended readers: curricula developers, private-sector representatives, TVET centre managers

Step 14: Monitoring and evaluating CBT → **Step 15:** Conducting a validation study → **Step 16:** Undertaking graduate tracer studies and employer satisfaction surveys

This chapter aims to cover the information required to effectively monitor a CBT programme, and outlines two key methodologies to ensure that a CBT programme remains relevant. In order to address the two primary questions regarding (1) the extent to which a CBT programme meets the current and future needs of the labour market, and (2) whether the content is still valid, steps 14 to 16 address the issue of maintaining relevance.

Step 14: Monitoring and evaluating CBT

MONITORING AND EVALUATION ARE INTEGRAL TO CBT. Key performance indicators that measure critical aspects of a programme's operations and results must be established at the outset as part of a programme's design. They should be specific, measurable, attributable, realistic and time-bound (SMART) (see appendix step 14.1 for an example of SMART CBT indicators). Monitoring is based on existing data, which is collected for administration purposes (such as trainee registration data, attendance records, assessment results). This is supplemented, as required, with data collected through surveys or inspections. Table 34 outlines some of the statistical information collected through different monitoring methods.

Table 34. Information obtained from various monitoring methods		
Indicators	**Disaggregation**	**Collection methods**
Student enrolments, hours of curriculum delivered, the number of courses, teaching and support staff, drop-out rates, course completions, graduations, with reference to performance measures, such as quality, timeliness and cost	Gender, age, course type, course number, number of students, number of teachers, RPL status, people with disabilities, etc.	Regular course reviews Enrolment and graduation records Staff observation and appraisal Departmental self-assessments and action plans for improvement
Finances	Expenditures by source of funding (purchases, salaries, materials, equipment, tools, utilities, rent, etc.), revenues/student fees, cash flows, reserves, deficits or surpluses by source of funding	Institutional expenditure records, budgets, and financial reports External inspections, audits and reporting
Capital assets	Capital value, net equity, depreciation, expansion, disposal, etc.	Receipts Official evaluations Value assessments
The achievement of specifically targeted government objectives (e.g. a rise in the participation of women in trade and technical training programmes)	N/A	Pre- and post-evaluation reports Graduate tracer studies Employer satisfaction surveys Official statistics, censuses, labour force surveys, etc.

Source: Gasskov (2006).

IT IS EQUALLY IMPORTANT TO MONITOR THE APPRENTICESHIP SCHEMES THAT STUDENTS ARE INVOLVED IN AS PART OF THE CBT. This includes various areas of assessments for both students and employers, and is typically conducted via a questionnaire with supplementary qualitative interviews. The assessment should cover the following areas:

- profile of apprentices/students;
- relevance of training;
- quality and content of training received;
- amount of training received;
- appropriateness of skills and knowledge for current and desired work;
- level of employer support;
- quality of feedback;

- overall satisfaction with the apprenticeship;
- apprenticeship outcomes (employment, promotion, pay raise, etc.).

In addition, employer satisfaction surveys are also commonly conducted post-apprenticeship in order to measure the quality and level of apprentices that employers receive under the scheme (see step 16 for more).

Appendix link: Step 14

14.1 Example of SMART CBT indicator

Step 15: Conducting a programme validation study

A PROGRAMME VALIDATION STUDY CAN BE DEFINED AS A METHOD OR PROCESS FOR REVIEWING, VALIDATING, AND UPDATING A PROGRAMME'S CURRICULUM. This is achieved by surveying the industry in which graduates of the programme will be working. As part of a CBT programme, one should be continually monitoring events in the marketplace to determine if the CBT is producing graduates with appropriate entry-level competencies. If a gap develops between programme outcomes and employment market needs, the institution can decide to proceed with a curriculum validation study for the programme in question.

THERE ARE SPECIFIC STEPS TO IMPLEMENT SUCH A STUDY. THE OVERALL PROCESS CAN BE UP TO 1 YEAR LONG, AND SHOULD BE IMPLEMENTED AT LEAST EVERY 5 YEARS.

(1) The need for a curriculum validation study is first identified and approved by the appropriate authorities (dean, principal, advisory committee, programme leader, etc.). A project facilitator is assigned to the study and develops a project work plan in conjunction with the head of the programme. All of the programme leaders and instructors are oriented to the process and prepare a list of important competencies a trainee should demonstrate when they graduate from the programme.

(2) These competencies are then reviewed and edited by all instructors at a staff validation meeting. The outcome of this meeting is a preliminary graduate competency profile, which is to be presented to employers at an employer validation workshop.

(3) The programme leader and instructors then select around 20 representatives from various companies and organizations that hire programme graduates. At the employer validation workshop, they review and rate the importance of each competency and revise competencies and add new ones to the list, as needed. The outcome of this employer workshop is a validated and ranked list of competencies expected from the programme's graduates.

(4) A competency profile verification survey can also be conducted on other experts in business and industry to confirm the findings. Programme staff then use this new list of competencies to re-design course content and overall course structure in accordance with the feedback and advice received from employers, and the institution's resource capacity.

Step 16: Undertaking graduate tracer studies and employer satisfaction surveys

THE REAL TEST OF THE RELEVANCE OF AN EDUCATION AND TRAINING PROGRAMME IS THE EXTENT TO WHICH GRADUATES HAVE ACCESSED DECENT JOBS. Graduate tracer studies and employer satisfaction surveys measure the perceptions of both graduates and employers on their satisfaction with the training programme and the employability of graduates. The information gathered through the studies and surveys serve as a basis for improving, scaling up, downsizing or even closing CBT programmes altogether. Results might also suggest that no changes to the programme are required.

THE AIM OF GRADUATE TRACER STUDIES IS TO CHECK THE LEVEL OF GRADUATE SATISFACTION ON AN ONGOING BASIS. A tracer study is a standardized (written or verbal) survey of graduates from an educational or training institution that is conducted after a specific period of time following graduation, or at the end of training. Although tracer studies address a wide range of topics, most tracer studies should answer the following questions:

- What happens to graduates after they leave the educational/training institution?
- Were graduates able to secure paid or self-employment within a reasonable period of time?
- Were they satisfied with the training and was it relevant to their current job?
- Are graduates using the skills and knowledge they acquired at the educational/training institution? If no, why not?

EMPLOYER SATISFACTION SURVEYS TRACK SATISFACTION LEVELS OF EMPLOYERS WITH THE SKILLS AND WORK PERFORMANCE OF GRADUATES. Employer satisfaction surveys should answer the following primary questions:

- To what extent are employers satisfied with graduates' skills, knowledge and attitudes, and how employable are graduates?
- What are the past, current and anticipated hiring practices?,
- What are the main core skills and technical competencies required?

THE MAIN KEY DESIGN ELEMENTS FOR A TRACER STUDY OR EMPLOYER SATISFACTION SURVEY INCLUDE:

- the target population, the availability of contact information and the willingness of the target population to answer the questionnaire;
- the sampling method;
- the time elapsed since graduation at the time the study is conducted (from 6 months to two years);
- data collection methods (structured/semi-structured interview, written questionnaire, online questionnaire, alumni event, etc.);
- how to account for regional differences in the demand for jobs (i.e. graduates are less likely to be employed in remote areas where job creation is low, for instance);
- a standardized (closed questions) questionnaire with drop-down menus of pre-defined answers on the basis of, for example, focus group discussions;

- survey management, either outsourced or implemented directly.

Table 35 outlines the main tasks to perform when conducting either a graduate tracer study or an employer satisfaction survey.

Table 35. Primary tasks for a graduate tracer study or an employer satisfaction survey

Task	Description
Development of the study concept and tools	▶ Identify study objectives ▶ Design the study (select the cohort, study strategies) ▶ Collect addresses ▶ Update addresses ▶ Develop questions and answers ▶ Arrange the questionnaire ▶ Pre-test ▶ Print the questionnaire and support materials
Data collection	▶ Train the study team ▶ Distribute and collect the questionnaires ▶ Reminder actions (raise the rate of participation)
Data analysis and report writing	▶ Identify the rating system for open-ended questions ▶ Enter and control the quality of the data ▶ Analyse the data ▶ Develop the study report ▶ Hold workshops with graduates and employers ▶ Conduct other actions to improve the educational/training programme

Appendix link: Step 16

16.1 Primary tasks for graduate tracer study or an employer satisfaction survey

Additional readings

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- Schomburg, H. 2016. *Carrying Out Tracer Studies: Guide to Anticipating and Matching Skills and Jobs, Vol 6.* European Training Foundation and European Centre for the Development of Vocational Training/ International Labour Office. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_534331.pdf.

Conclusion and next steps

In the global drive to shift to outcome-based training, much work has been done to identify competencies relevant to the labour market. However, less attention has been given to the use of such competencies in the design, implementation, assessment and certification of TVET courses. This manual is a first step in assisting TVET practitioners and course developers in the Arab states to move in this direction.

The introduction of market-relevant competency-based training is now the policy solution of choice to tackling employment issues in the MENA region. It should not, however, be taken as a replacement for much-needed reforms on the demand-side aspects of employment policies. As covered in this manual, CBT only provides an opportunity to equip learners with sufficient skills and knowledge to join the labour market and progress through it. CBT does not directly impact on the lack of labour demand, which often remains the main challenge. In addition, the move towards CBT will not be easy to achieve in the Arab region. However, it can be introduced in an incremental manner, depending on the strengths of national systems. In addition to the 16 steps highlighted in this manual, it is recommended that three particular areas should be reformed in order to support a shift to competency-based training:

(1) strengthen governance through the institutionalized involvement of employers' and workers' representatives in the design, accountability, assessment and accreditation of training;
(2) enhance the programming and administration of training providers through the implementation of rules and regulations, while ensuring the right infrastructure and facilities are available for CBT;
(3) improve human resource development and performance management, instruction and training through the training of trainers, and strengthen programme design, implementation and evaluation.

Opponents of CBT point to several weaknesses, which they present as inherent to the approach:

(1) training is fragmented (few connections between tasks lead to superficial learning and insufficient understanding of the occupation as a whole);
(2) only minimum standards of performance are required to be met (the codification of performance may result in simplification of the skills described);
(3) standards of competence reflect only the requirements of large enterprises, while small businesses are underrepresented.

Taking these comments into consideration, it is important to ensure that:

(1) the connections between the tasks are made explicit, in order to avoid reducing an occupation to a mere series of discrete observable tasks or steps;
(2) life skills, employability skills, and behaviours are adequately and holistically weaved together in course content;

(3) related learning outcomes are consolidated in real work processes, instead of addressing each discrete learning outcome as a stand-alone objective.

(4) learners are related to as subjects, rather than objects, of the learning process, through active problem solving and critical questioning, and making use of a variety of skills, rather than limited repetitive tasks;

(5) small and medium-sized companies are adequately represented on committees that decide on competency profiles and standards.

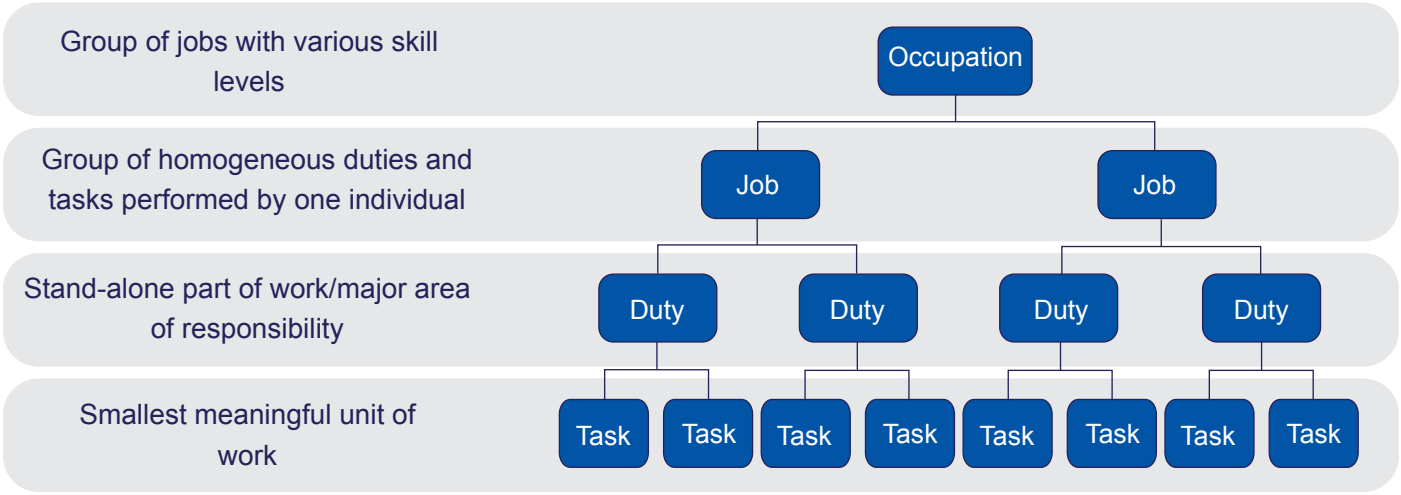
Finally, through familiarizing themselves with this manual, it is hoped that TVET developers and instructors will have grasped the basics of implementing CBT in their institutions, while recognizing the advantages of moving towards a CBT, or more outcome-based, approach to learning. The International Labour Organization would be interested to receive feedback on the outcomes and lessons learned by TVET institutions in the region on the application of CBT processes in their learning programmes, and anticipate that such feedback will help improve future iterations of this manual.

Appendix

The appendix is organized according to the series of steps outlined in the manual, commencing with step 3. However, not all steps are represented in the appendix.

Step 3: Identifying competencies using an occupational analysis

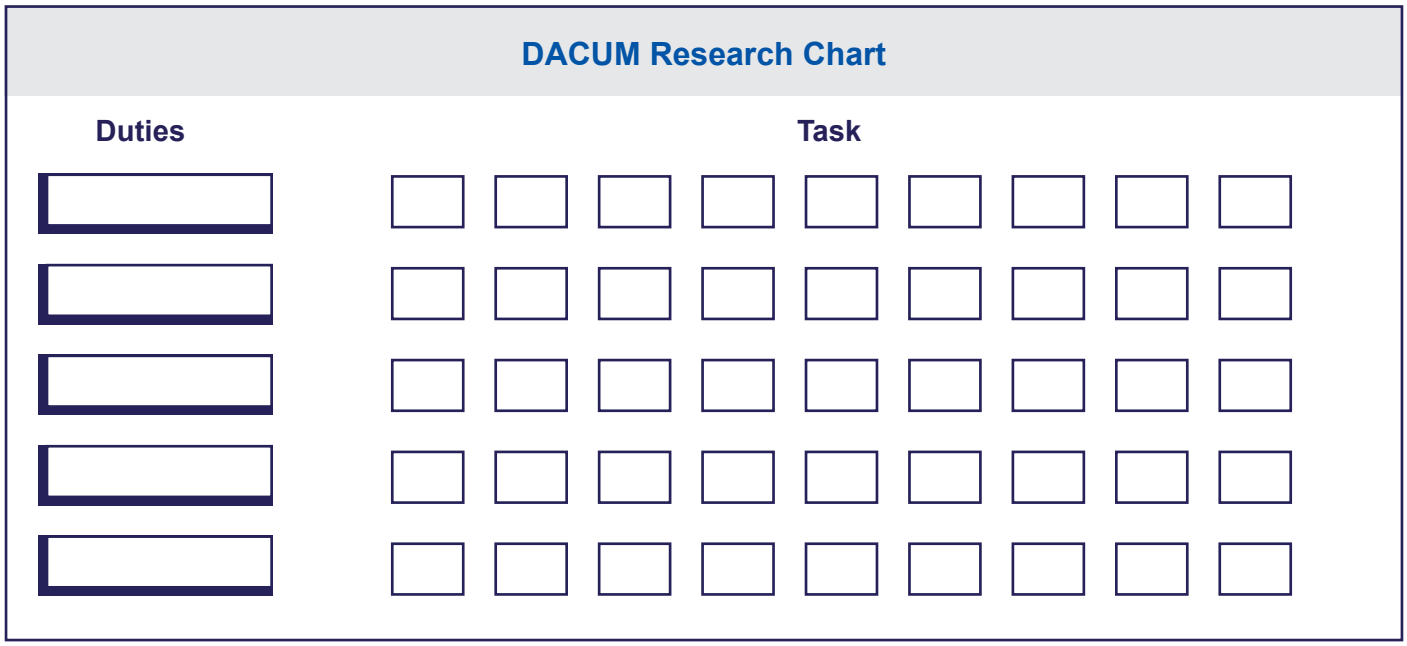
3.1 DACUM tasks, duties and jobs under a given occupation



3.2 DACUM examples of duties and tasks for different jobs and occupations

Occupation	Job	Duty	Task
Light vehicle mechanics	Steering system mechanic	Front wheel angles adjustment	Measure front wheel angles
Cooking	Oriental food cook	Salad preparation	Prepare raw materials
Hairdressing	Women's hairdresser	Hair colouring	Prepare dye

3.3 Format of a DACUM research chart



Step 4: Developing a competency profile

4.1 Example of a competency verification results table

Duty/competence unit:					
Task or competency	Frequency (%)	Importance (1 2 3 4 5)	Difficulty (1 2 3 4 5)	Prerequisite for entry level (yes/no)	Ranking (%)
Average					

Step 5: Setting competency standards

5.1 Example of main elements of a competency unit as part of a competency standard

Term	Definition	Example
Title of competency unit	This refers to the GAC, which is expressed in outcome terms. It defines the area of competency, and is a well-framed unit of work.	Repair engine cylinder head
Unit descriptors	A unit descriptor outlines what is done in the workplace. It expands on the information in the title, clarifies the scope and content of the unit and helps to differentiate between similar titles.	This unit covers the competencies required for dismantling, repairing, assembling, and adjusting an engine cylinder head.
Competency elements	Elements are the building blocks of a unit of competency. They describe in outcome terms the functions that the candidate should be able to perform. They describe certain actions or outcomes that are demonstrable and assessable.	• Remove the cylinder head and its related parts. • Diagnose the cylinder head. • Repair the valve mechanism. • Repair the overhead cam. • Assemble the cylinder head parts. • Adjust the cylinder head. • Test the cylinder head.
Performance criteria	Performance criteria specify what is to be assessed, and the required level of performance. Four common performance criteria are quantity, quality, efficiency and durability.	• Component parts are cleaned in preparation for inspection. • Cylinder head is pressure and/or crack tested. • Cylinder head and components are dismantled and checked without causing damage to any part. • Job card is processed. • Work performed is documented. • A final inspection is made to ensure that surfaces are protected. • Cylinder head is cleaned for use or storage.

Range of variables	The circumstances or context in which the work is to be performed, and the range of situations under which skills should be assessed. This term also specifies activities, skills, knowledge and related evidence, and refers to the unit of competency as a whole, allowing for specific knowledge and enterprise requirements.	This unit of competency applies to engine cylinder heads. Engine cylinder heads may be of various configurations, and components include inserts, valves, valve guides and rocker gear. Work requires individuals to demonstrate discretion, judgment and problem-solving ability. The competency is fully observed when the candidate is able to respond to unusual situations and complete a range of cylinder head repairs to manufacturers' and suppliers' specifications. Tasks include: • interpreting measurements and specifications; • communicating effectively with others involved in or affected by the work; • selecting methods and techniques appropriate to the circumstances. The competence in this unit may be assessed in conjunction with the engine block repair unit.
Performance condition	Performance conditions include the tools, equipment, materials, resources, OSH, work environment, quality requirements, rules and regulations, standard operating procedures, and assessment context and conditions.	Tools and equipment such as torque wrenches, power tooling and compressors. Materials include gasket sealing materials, lubricants, spare parts, cleaning materials, etc. OSH includes safe operating procedures, such as treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting. Environmental requirements include waste management, noise, dust and clean up management.
Underpinning knowledge and skills	Supporting practical skills, knowledge and core workplace skills	• Assembly or repair procedures • Types and layout of service/repair manuals (hard copy and electronic) • Equipment safety requirements • Tensioning procedures • Company policies • Manual handling techniques • Engine operating principles • Interpretation and application of technical information • Teamwork • Problem solving

Note: For detailed components of competency units, competency unit forms and competency standards, see https://training.gov.au/.

Step 6: Defining the curriculum

6.1 Example of course structure template

Training module code	Competency	Learning outcomes	Time (training hours)		
			Theoretical	Practical	Total

6.2 Template of module design

Occupation/job	
Training course	
Training module	
Code in competency profile	
Training provider	
Module description	
Skill level	
Training duration	
Prerequisite	
Learning outcomes (elements of competency)	
Performance assessment criteria	
Underpinning knowledge	
Occupational safety and health (OSH)	
Tools and equipment	
Practical skills	
Assessment	

Step 11: Implementing effective learning for CBT

11.1. Examples of Korr modality rating

Read each of the following statements carefully and compare it to the way you prefer to work. If the statement is not at all like you, give it a value of "0". If the statement describes you very well, give it a value of "3". If the statement describes you partly, give it the appropriate value between "0" and "3".	
Statements	**Value**
1. If I want to understand and remember something, I prefer to do it or make it myself.	
2. I notice the details of people's appearance and I notice if they change something.	
3. I like to write things down, even if I don't read my notes later.	
4. I spell best if I say the letters to myself or sound the word out.	
5. I can usually remember faces better than names.	
6. I like to hold something in my hand (keys, coins, etc.), especially when I'm listening, talking or reading.	
7. I can follow oral instructions better than written ones.	
8. If someone is pleased with me, I like to get a pat or hug, or something specific to make me feel successful.	
9. I would rather read something to myself than have someone read it to me.	
10. If I can listen to something a few times, or repeat it to myself, I can remember it better than if I write it down.	
11. I enjoy descriptions in writing, and make pictures in my mind as I read.	
12. When I'm listening to a talk or lecture, I like to write down ideas or draw or doodle on my paper.	
13. I often do not see signs, notices, etc. and have to be careful not to miss the details when I'm reading instructions.	
14. I get distracted if there are too many outside things to look at when I'm trying to concentrate.	
15. I can understand something well if I can watch someone do it or study a picture or diagram of it. I don't need to do it myself.	
16. I prefer reading stories that are fast-moving and have lots of action.	
17. If I am upset about something, I don't say much, but it shows on my face.	
18. I would make better marks if I could take oral exams instead of written ones.	
19. I don't like taking notes. I'd rather discuss the assignment and then just do it.	

20. I start to fidget if I have to sit still for very long. I have to move my foot, knee, finger, etc. if I can't get up and move around.	
21. If I get angry, I let others know how I feel. I don't just keep it to myself.	
22. I'm good with maps, charts and graphs.	
23. When I get really frustrated, I have to do something physical to release the tension.	
24. Details and descriptions are often frustrating or boring to me.	
25. I concentrate best if I move around, eat, chew gum, etc. while I work.	
26. I like to have a written copy of an assignment so that I can read it myself and understand what is expected.	
27. When someone is explaining something, I need to stop the speaker and ask questions along the way to make sure I understand.	
28. If I really want to understand and remember what I read, I have to read it slowly and say the words to myself, instead of writing it down.	
29. I find it difficult to sit still if I am having a serious talk with someone. I need to do something while we talk.	
30. If I really want to remember something, I make a clear mental picture of it in my mind.	

Source: Northern Alberta Institute of Technology (2009).

Tallying Korr modality preferences

Beside the number of each statement, write the value you gave that statement. Total each column to find your preference for each modality.

	VISUAL	AUDITORY	TACTILE
	2. _____	4. _____	1._____
	5. _____	7. _____	3._____
	9. _____	10. _____	6._____
	11. _____	13._____	8._____
	14. _____	18._____	12._____
	15. _____	19._____	16._____
	17. _____	21. _____	20._____
	22. _____	24. _____	23._____
	26. _____	27. _____	25._____
	30. _____	28. _____	29._____
TOTALS	_____	_____	_____

If the totals are within 4 points of each other you have a MIXED MODALITY, which means you process information effectively in more than one mode.

11.2. Example of the varying roles of the instructor across the four components of the instructional model.

Learning outcome statement: By successfully completing this learning, you will be able to operate oxy fuel equipment.				
Component	**Instructor role**	**Emphasis**	**Objective**	**Example** (operating oxy-fuel equipment)
Focus	Motivator	Student engagement	Get learner's attention.	Tell a story about problems that have occurred in cutting metal with an oxy–fuel system, which were poorly handled and had dire consequences. Have learners share their experiences.
			Tie new objectives to previous learning.	Cutting is an important skill that builds on the previous lesson on preparation for welding.
			Assess gaps in readiness.	Ask about learners' experiences with oxy-based cutting.
			Motivate the learner to participate.	This skill is an integral part of the welding process; successful completion is considered significant.
			Communicate the objective of the learning.	The outcome of today's learning is that you will be able to operate oxy-welding equipment for cutting.
			Encourage the learner to take ownership of the content.	The learner will be the prime beneficiary of this skill.
			Instructor and learner participate together.	Both the instructor and learner have participated until this point.
Presentation	Information-giver	Delivering the content sequentially (i.e. one objective at a time)	Present the steps in logical order.	The steps involved in the cutting process are followed.
			Incorporate "tell", "show" and "do" steps throughout the lesson.	Describe the cutting process. Show the learners, by way of illustration, the cutting process, one step at a time.

Learning outcome statement: By successfully completing this learning, you will be able to operate oxy fuel equipment.				
Component	**Instructor role**	**Emphasis**	**Objective**	**Example** (operating oxy-fuel equipment)
			Use appropriate active learning strategies.	Have the learners show and discuss their "product" at each step.
			Significant involvement of the instructor.	The instructor presents materials and coordinates all elements.
Practice	Coach	Student involvement, with coaching from the instructor as required	Allow the student to try each step as many times as required.	The instructor allows the student to practice each step.
			Instructor and peers provide coaching.	Each step is evaluated/ commented on by the instructor and peers.
			The student demonstrates their ability to reach the objective.	By practicing each step, the learner can demonstrate their ability.
Application	Evaluator	Student involvement, with the instructor acting as an evaluator after the activity is completed.	Assess progress on accomplishing all the objectives.	Have the learners use the oxy-fuel cutting process on their own.
			Provide feedback or assessment.	Select learners who will present their product and have the class discuss the positive elements and what is required for improvement.
			Determine further training needs.	Based on the assessment, determine if the learner requires more training.
			Involve the learner with the instructor in the evaluation process.	Have learners comment on the overall assessment process.

Note: See: http://www.skills.edu.gov.on.ca/OSP2Web/TCU/DisplayNocDetails.xhtml?nocid=7237a.

Step 12: Understanding and designing assessments

12.1 Example of a specification table

Sector:	Printing and binding								
Occupation:	Printing								
Job title:	Plate offset printing								
Skill level:	Skilled								
No.	Competency	Learning outcome	Complexity level						
			Cognitive						
			Evaluation	Synthesis	Analysis	Application	Comprehension	Knowledge	Skills	Attitude
1.	Prepare the plate offset printing machine	**1.1** Recognize the offset printing machine, parts and operation.								
		1.2 Recognize the disassembly, assembly and adjustment of the plate offset printing machine.								
		1.3 Recognize the instructions for adjusting and calibrating the plate offset machine.								
		1.4 Recognize the tools and materials necessary to prepare and operate the machine.								
		1.5 Wear special work clothes.								
		1.6 Perform disassemble and assemble of the printing machine.								

		1.7 Perform the adjusting and calibration of the machine according to the instructions.								
		1.8 Feed the machine with the operating material (ink).								
		1.9 Operate the plate offset printing machine								
2.	Carry out plate offset printing	**2.1** Recognize the procedures and steps to execute printing.								
		2.2 Recognize the operating troubles and factors affecting the performance.								
		2.3 Recognize, diagnosis and repair the failures.								
		2.5 Test print experimental jobs and compare to printing order.								
		2.6 Perform the necessary adjustment and repair.								
		2.7 Observe the results of printing for colour stability and printing order.								
		2.8 Resolve problems and failure.								
		2.9 Print the required quantity according to the requirements.								

3.	Service plate offset printing machine	**3.1** Recognize tools, equipment and materials necessary for service.								
		3.2 Recognize the lubrication of printer parts.								
		3.4 Clean the machine.								
		3.5 Lubricate various parts of the machine.								

12.2 Examples of good qualifiers in different occupations

Performance step	Assessment criteria with good qualifier
Fix wash basin	Level position within a tolerance of +/- 1 mm.
Prepare dye for hair colouring	Hydrogen peroxide concentration is diluted to 35%–40%.
Shape finger nails	Smoothness of nail tips can be felt.
Wave hair	Thickness of hair tuft is equal to the diameter of “perm” (permanent) roller.
Adjust angles of vehicle’s front wheel	Adjust camber to +/-1 degree from standard values as per the service manual.
Cut in wall edges	The candidate should cut vertical edges of 2 m wall corner or of a frame (door or window) in less than 20 minutes with strokes that are about 30 cm long covering completely the surface of the wall (10 cm from the edge), without drips on the floor or touching the protection of the frame less than 5 mm from the edge.
Cut in baseboard edges	The candidate should cut horizontal edges of 2 m baseboard or of a frame (door or window) in less than 20 minutes with strokes that are about 30 cm long covering completely the surface of the wall (10 cm from the edge), without drips on the floor and touching the protection of the baseboard or frame less than 5 mm from the edge.

12.3 Examples of theoretical knowledge test items

The following assessment items show examples on the most innovative theory knowledge assessment items: cause–effect, work sequences, matching, short answer, and multiple choice. These types of theory knowledge test items could be included in the learner guide to assess the trainee's' knowledge of theory. It comes after the information sheet (the knowledge theory background), and in the performance test conducted by the instructor at the end of each module or chunk of content.

Cause–effect

- **Find the cause–effect sequence and enter the letters into the sheet.**

(A) = flood-like situation, **(B)** = incessant rains **(C)** = vegetable prices in the local market increase.

Response: ( )
( )
( )

The key would be: B A C (incessant rains have created a flood-like situation, which may increase vegetable prices in the local market, assuming all other conditions remain unchanged).

Work sequence

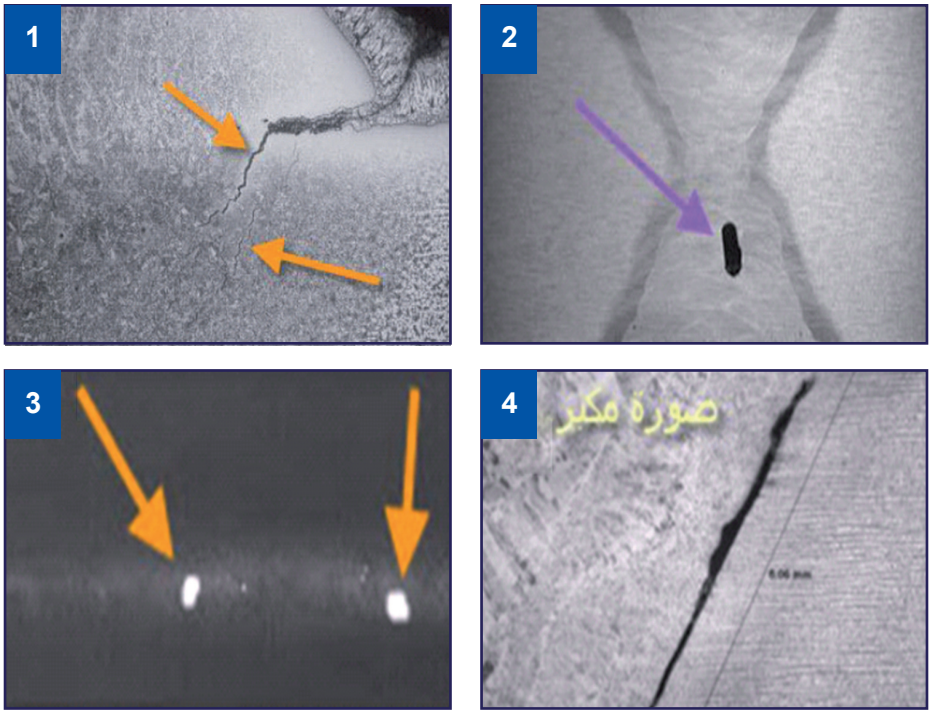
Match numbers 1 to 10 to the descriptions of the work steps for "colouring hair".

( ) Flush hair to remove dye
( ) Wear gloves
( ) Inspect scalp for any injuries or ulcers
( ) Inspect colouring from time to time
( ) Conduct allergy test
( ) Select dye colour
( ) Mix dye with hydrogen peroxide
( ) Put dye to hair tufts
( ) Dilute hydrogen peroxide

Key: 9, 1, 2, 8, 3, 4, 6, 7, 5

Matching

- Which type of welding can be matched with the pictures (representing typical faults/defects, or the cause of this defect, or in which welding type this defect occurs)?



( ) This defect occurs in shielded metal arc welding
( ) Welding cracks
( ) This defect occurs as a result of excessive temperature variations
( ) Gap between welding line and iron metal
( ) This defect occurs in TIG welding (tungsten inert gas)
( ) Slag inclusion
( ) This defect occurs as a result of breaking part of electrode
( ) To avoid this defect, suitable arc length should be kept

Redrafting short answers

- Name five causes of evacuation of water storage tank in houses.

The key for this short essay item offers several solutions. This item could be improved to measure higher cognitive levels by other alternatives (to be included in assessment guide):

a) Revised short essay item:

- List causes for evacuation of water storage tank.

I. Due to defective components in the water system

_____

_____

II. Due to faults made by a plumber

_____

_____

b) Using cause-effect item

The original key provides statements which can be arranged as a cause-effect item.

- Rearrange the following statements of cause–effect into a sequence in order from the cause to the effects. Enter the items A–D into the brackets:

  A = Defect in the spring of the non-return valve
  B = Evacuation of the water storage tank
  C = Back flow of water from the tank to supply line
  D = Connecting the tank with the clean water pipes without a non-return valve

Two ultimate causes ( )
( )
( )
Ultimate effect ( )

Key: A, D, C, B??

Multiple choice items

- The original hair colour for a client was dark blond (0/6). She asked a hairdresser to dye her hair to become a dark grey blond (1/6), but the hair appeared more orange after colouring. The action that must be taken by the hairdresser to achieve the customer's request is to re-dye the hair as:

  A. Dark blond grey + 1 ml of a blue mixing colour
  B. Dark blond grey + 1 ml of a golden mixing colour
  C. Dark blond grey + 1 ml of a violet mixing colour
  D. Dark blond grey + 1 ml of a red mixing colour

Key answer: A

12.4 Examples of practice test form

Each objectively verified formative assessment sheet includes the learning outcomes to be assessed, assessment criteria, assessment judgment (achieved or not yet), and areas for improvements (source: unpublished GIZ ProVET project, Lebanon).

Learning outcomes	Assessment criteria	Assessment (achieved or not)	Areas for improvements
Prepare paints	Is the stirring tool inserted/removed with drill unplugged?		
	Is the drill switched on/off with the stirring tool properly immersed?		
	Is the stirring tool up and downward while stirring?		
	Is the stirring continuous for at least 5 minutes?		
	Is the right consistency achieved by adding water to water-based paint?		
Cut in edges with a brush	Is the brush straight (vertically) in the paint?		
	Is the brush covered with paint up to two-thirds of it?		
	Is there any excess of paint on the brush after loading?		
	Did any paint drip outside of the paint bucket?		
	Is the first paint stoke on the wall done 5 cm away from the edge?		
	…		

Note: If not achieved, the trainee should repeat the task until they successfully demonstrate all learning outcomes required.

12.5 Example of apprentice daily record

Apprentice daily record

Apprentice name: ..... **Date:** .....

Work achieved

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.....

Trainee's signature: .....
Mentor's signature: .....

12.6 Example of an apprentice performance record

Apprentice performance record

Apprentice name: ..... **Date:** .....

Training module : .....

Learning outcomes	Assessment
1-1 Diagnoses fuel system; determines the reasons for malfunctions and then carries out repairs	o Under training
	o Works under supervision
	o Works alone
2-1 Removes fuel tank; identifies defects and reinstalls it	o Under training
	o Works under supervision
	o Works alone
3-1 Inspects fuel pipelines and carries out repairs as required	o Under training
	o Works under supervision
	o Works alone
4-1 Conducts pressure and vacuum tests for fuel pump	o Under training
	o Works under supervision
	o Works alone
5-1 Removes and reinstalls mechanical and electrical fuel pumps	o Under training
	o Works under supervision
	o Works alone
6-1 Removes, cleans and reinstalls air and fuel filters	o Under training
	o Works under supervision
	o Works alone

Mentor's comments

.....

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.....

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Overall assessment for the training modules/set of learning outcomes

1. achieved
2. not achieved yet

Mentor's name ---------- Signature ----------

Craftworker's name ---------- Signature ----------

Trainee Signature: .....

12.7 Apprentice's self-assessment record

Apprentice self-assessment record

Apprentice name: ..... **Date:** .....

Module title : .....

Learning outcomes	Assessment
1-1 Diagnoses fuel system; determines the reasons for malfunctions and then carries out repairs	o Under training
	o Works under supervision
	o Works alone
2-1 Removes fuel tank; identifies defects and reinstalls it	o Under training
	o Works under supervision
	o Works alone
3-1 Inspects fuel pipelines and carries out repairs as required	o Under training
	o Works under supervision
	o Works alone
4-1 Conducts pressure and vacuum tests for fuel pump	o Under training
	o Works under supervision
	o Works alone
5-1 Removes and reinstalls mechanical and electrical fuel pumps	o Under training
	o Works under supervision
	o Works alone
6-1 Removes, cleans and reinstalls air and fuel filters	o Under training
	o Works under supervision
	o Works alone

Mentor's comments

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.....

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Overall assessment for the training modules/set of learning outcomes

1. achieved
2. not achieved yet

Mentor's name ---------- Signature ----------

Craftworker's name ---------- Signature ----------

Trainee Signature: .....

12.8 Weekly worksite visit record

Enterprise name	Visit No.	Date and time of visit	
Name of apprentice	**Attended**	**Absent**	**Comments**
1			
2			
3			
4			
5			
6			
7			

1. Apprentice				
Indicator	**No**	**Yes**	**Improvement rate (if any)**	**Action comments**
1.1 Apprentice's commitment and attendance improved				
1.2 Apprentice's following of safety and health measures improved				
1.3 Skills that apprentice acquired increased				
1.4 Apprentice's relations with employer/ craftworker improved				
1.5 Apprentice's relations with colleagues improved				
1.6 Apprentice's dealing with customers improved				
1.7 Apprentice's awareness and knowledge on rights at work improved				
1.8 Apprentice's awareness on future career improved				
1.9 Apprentice attained a job at the enterprise				

2. Craftworker				
Indicator	**No**	**Yes**	**Improvement rate (if any)**	**Action comments**
2.1 Craftworker's following of safety and health measures improved				
2.2 Craftworker's tracking of apprentice's skills improved				
2.3 Craftworker's relations with apprentice improved				
2.4 Craftworker's relations with skilled workers in the enterprise improved				
2.5 Craftworker's interaction with customers improved				
2.6 Craftworker's abilities in organizing the worksite and managing work improved				

3. Worksite				
Indicator	**No**	**Yes**	**Improvement rate (if any)**	**Action comments**
3.1 Safety and health in workplace improved				
3.2 Worksite organization and work management improved				
3.3 Relations in the enterprise improved				
3.4 Enterprise income and number of customers increased				
3.5 Work conditions improved				
3.6 Rate of accidents in workplace decreased				

Mentor comments
.....
.....
.....
.....

Mentor's name _____ **Signature** _____

12.9 Example of a mentor's monthly report

Mentor's monthly report

Mentor's name: …… **Date:** ……

Overview:

No. of visits: ……

No. of apprentices:……

No. of enterprises/worksites: ……

Main activities: ……

Evaluation

Evaluation domain	Evaluation elements
Attendance	Ratio of attendance days Reasons for absence
OSH compliance	Improvement in OSH compliance Reasons for incompliance
Up-skilling	Progress on performance Evaluation of the role of the craftworker
Work relations	Relations between apprentices and managers, craftworkers, customers, etc. Nature of conflicts
Workplace/work management	Improvements in workplace and work management Reasons for non-improvement
Career guidance	Career awareness Knowledge on rights at work
Employment	Ratio of apprentices employed in the same or other workplaces Reasons for not getting a job yet
Enterprise income and customers	Improvements in income and number of customers Reasons for improvements (e.g. apprentices, OSH, work management, customer relations, etc.)

Recommendations: ……

……

……

……

Mentor's signature: ……

12.10 Additional information on apprenticeships

The integration of apprenticeships into the programme design is an efficient way to develop the skills needed in the labour market. CBT requires facilities and equipment that closely match those used in companies, so that the learner gains relevant skills that will improve their employability. Given this significant cost barrier, apprenticeships are a cost-effective way of providing skills training that is valued by employers. The following is an overview of formal apprenticeship systems and a description of various models and issues related to them.

Apprenticeships require the involvement of both instructors and master craftworkers.[15] Most of the training is done while working for an employer alongside an experienced (master) craftworker, who helps an apprentice learn their trade or profession. Theoretical education is also involved, by attending a local technical college, vocational school, or university. The master craftworker coaches the apprentice through a wide range of activities: choosing tasks, providing hints, coaching, assessing the activities of apprentices and diagnosing the kinds of problems they are having, challenging them and offering encouragement, giving feedback, structuring the ways to do things, and working on particular weaknesses. At the same time the instructor provides complementary learning, and ensures that the apprenticeship programme is implemented as expected.

Apprenticeships are especially efficient at providing know-how. The apprentice will become proficient in accomplishing a certain task without necessarily being able to describe the various operations this task entails. They will learn from the master craftworker through observation, imitation, and practice. The key to acquiring such tacit knowledge relies on extensive personal contact, regular interaction, trust, and practice, rather than simple repetition of declarative knowledge, or facts. In addition, tacit knowledge leads to a subconscious "automatization" that frees the capacity of trainees' minds for other, more complex, tasks.

However, the learner also needs institution-based education that complements their apprenticeship. Often, learners do not often have the opportunity to learn the reasons behind a machine function or dysfunction as part of their apprenticeship. In CBT, it is very important that the development of skills is supported by sufficient background knowledge and understanding so that the learner can troubleshoot problems when they arise. By knowing what is going on "inside the box/equipment", the learner is able to solve a problem when conditions change from the norm. That is, the learner knows "why" the machine is performing the way it should (or should not). Employers often indicate this as a core competency. However it is often missing from on-the-job training, where supervisors tell the new recruit "what" to do, but seldom "why" it needs to be done, preventing them from gaining the capacity to take appropriate action when conditions change from the norm.

One of the important benefits added by "dual training" (with on-the-job and training centre-based sessions) is that time is spent providing the necessary background information on the skill, so that the learner can understand how to adapt processes as required. The training centre can also provide opportunities for "trial

15 The term master craftworker should not be taken as limiting the scope of apprenticeships to the industrial sector, as service providers may also make great use of apprentices.

and error" experiences, which cannot take place on the job, where the focus is more often on production. The added value of the instructor's contribution will be, for instance, to present certain scenarios/problems for learners to solve, thereby allowing for a demonstration of their knowledge and skills.

In North America and many parts of Europe, a "dual system" combines on-the-job training with vocational education into a single course through a technical/vocational centre. The length of the programme and contractual arrangements can vary. In some cases, the apprentice spends part of the week in school, learning background knowledge for the trade, and the other part of the week working in the company. In other situations, the apprentice spends the majority of the year (around 9 or 10 months) on the job, learning the trade, and two or three months in the training centre. In some countries, the same amount of time is spent in practical training and theory, with either (a) 2.5 days in a company and 2.5 days at school, (b) 1 week in a company and 1 week at school, or (c) 6 months in a company and 6 months at school.

Apprentices are workers. Either the labour code applies to them in full, or there are special provisions related to the work they accomplish. They have access to social protection, and their wages can be calculated as a share of the minimum wage (i.e. depending of their age and years of experience).

A skills task book is required to track the apprentice's competencies. The purpose of the apprenticeship component of CBT is that the apprentice gains the agreed-upon competencies in a real world environment. Sometimes, however, when the employer is not involved in the full continuum of the CBT implementation, they are unsure of the role of the apprentice and may only see them as cheap labour, or as a burden. In cases like this, the apprentice may be assigned to sweep the floor or make tea and coffee. This represents a lost opportunity for the apprentice, the employer and the training centre. One way to address this situation is through a skills tracking book that outlines the competencies that the apprentice should gain on the job. This book is prepared by the training centre or accreditation agency, and informs the employer about the competencies the apprentice is expected to acquire. The skills tracking book may allow for: (a) the apprentice to conduct a self-assessment; (b) the master craftworker to validate it; and (c) the instructor to supervise the process and complement training as and when needed.

Other aspects of apprenticeship agreements, which may form part of the contract between the training institution, employer, and apprentice, should address the following:

- Content and process of a training and tracking system
- Working conditions and working hours
- Assessment and certification
- Quality assurance -of the apprentice's products or servies -
- Eligibility of the apprentice to later set up a new business in the same field / be hired by another business
- Duration of the apprenticeship to allow for cost recovery
- Breach of contract
- Liability in case of damage to equipment
- Social protection for apprentices

12.11 Examples of a practice test and a summative assessment sheet

Practice test:
Information page

Occupation: ……..…… **Skill level:** ……..……
Job name and code: ……..……
Test applicant's name: ……..…… **Telephone No. :** ……..……
Test location: ……..…… **Test duration:**
Name of assessors……..……
Date of test: ……..

General instructions:

- **To assessors** (for setting the testing environment, gathering and interpreting evidence, etc.)

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- **To candidate** (to prepare for the test, and be informed on the contents and testing methodology, test regulations, etc.)

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Practice test form #1

Competency unit: Hair waving
Work sequence: Waving hair using perm rollers
Assessment method: Direct observation & product **Test duration :** 30 minutes
Main resources: Shampoo, hair dryers, hairbrushes, scissors, combs, hair clippers, hair perming rollers, ribbon, hair elastics, barrettes, and hairpins

Assessment element/ performance step	Assessment (competent or not competent yet)		Assessment criteria
	Process	Result/ product	
Select perm rollers			Client consulted on the shape of waving
Clean hair			By water and shampoo
Divide hair			To 6 or 9 parts
Install rollers			Thickness of hair tuft is equal to the diameter of the “perm” (permanent) roller Tuft width less than roller length by half centimeter from each side Tuft combed at obtuse angle to the scalp Ends of the hair tuft are in the centre of the perm roller and not flexed on the roller Places the perm roller on the base of the hair tuft and towards the growth of the hair tuft without affecting the other tufts Fixes the roller with the elastic fascia, where the mortar is flat on the surface of the fascia at the hair roots
Distribute waving liquid			Uses the special protector to avoid spilling liquid on the client›s clothes Discussion question: How do you determine waiting time?

Assessor›s name & signature : ……..…… **Date**……..……

Step 13: Conducting final assessments and certifying learners

13.1 Template for an assessment implementation plan

Assessment implementation plan

Assessment task: Produce a workplace OSH induction kit

Assessment method: Group project

Assessor(s):

Date of assessment:

Units of competency/elements to be assessed

1. **Organize workplace information.** Gather information on OSH requirements/practices for the kit from appropriate sources. Determine the suitability of information for induction kit purpose.
2. **Design and produce text documents.** Design user-friendly kit documentation, suitable for the intended audience. Produce final proofed and reviewed documentation.
3. **Collaborate in the creative process.** Work collaboratively with others in the design and production of the kit.

Brief description of task

Trainees work in teams of three to create an induction kit for workers beginning in the industry about the OSH practices followed in a workplace. Documents from the workplace, or work placement, together with research, are to be used to develop the kit. Assessment will be based on the content and layout of the finished product and also the teamwork demonstrated during the development of the product.

Resources required

Access to: workstation; application software; printer; organization's style guide; bank of images (e.g. for kit illustration); and documents containing OSH information, which may be copied and pasted.

Instructions for trainees

Trainees receive detailed specifications of the content to be included in the induction kit and the style to be used.

13.2 Example of an assessment review form

Test review form		
Please complete this form after completing your theoretical and practical tests. Your feedback will be taken into consideration to improve future assessments for this course.		
Feedback on theory knowledge test		
1. Test questions were clear and could be easily understood	Yes	No
2. Test questions covered the theoretical information related to the occupation	Yes	No
3. There were questions that had nothing to do with the occupation	Yes	No
If you answered yes, please specify ……		
4. Some questions had more than one correct answer	Yes	No
If you answered yes, please specify ……		
5. The time allotted to the test was sufficient	Yes	No
6. Test halls were suitable in terms of seating, ventilation and lighting	Yes	No
I**f you answered no, please specify** ……		
Feedback on practical test		
1. Test questions were clear in terms of language and phrasing	Yes	No
2. The test reflected the technical capability of the person performing the job	Yes	No
3. The place of test implementation was suitable in terms of the availability of:		
▶ Facilities	Yes	No
▶ Equipment	Yes	No
▶ Tools	Yes	No
4. The test supervisor (assessor) was cooperative in clarifying the required duties for the test	Yes	No
5. The time allotted to the test was sufficient	Yes	No
Thank you for your cooperation		

Step 14: Monitoring and evaluating CBT

14.1 Examples of SMART CBT indicators

Indicator and description	Data collection method
Public perception. This indicator measures the public knowledge, attitudes, and perception towards technical vocational education and training in terms of relevance and quality.	Survey/questionnaire
Net placement rate at 3 months. This indicator measures the percentage of TVET graduates who were employed within 3 months of graduation and were retained in employment for at least 12 months, **and who would not have been employed without this programme.** Data should be disaggregated by provider, programme type (regular or short), programme, gender, age group and governorate.	Document review + tracer studies
Employer satisfaction. This indicator measures the degree of employer's satisfaction with the skills and competencies of TVET graduates, disaggregated by provider, age group, gender, governorate and sector/programme.	Questionnaire/survey
Enrolment in regular TVET programmes: This indicator measures the number of students/trainees enrolled and attended at least one session in regular technical/vocational programmes offered by government and non-government providers, disaggregated by provider, gender, age group, disability and governorate.	Document review
Graduation of regular TVET programmes. This indicator measures the number of graduates expressed as a percentage of the number of students enrolled in regular technical/vocational programmes offered by government and non-government providers, disaggregated by provider, gender, disability, age group and governorate.	Document review
Drop-out rate of regular TVET programmes. This indicator measures the number of dropouts from regular technical/vocational programmes offered by government and non-government providers as a percentage of the number of students enrolled in the same kind of programmes, disaggregated by provider, gender, disability, age group and governorate.	Document review
Number of accredited programmes. This indicator measures the total number of programmes accredited, disaggregated by sector, occupational level, training provider and governorate.	Documents of national accreditation body
Investment in new infrastructure. This indicator measures the total amount of money invested in new infrastructure, disaggregated by provider, governorate, sector, source of fund, and donor.	Document review

Public expenditure on TVET. This indicator measures the share of total government expenditure on government TVET providers, disaggregated by provider, expenditure type (current or capital), gender, age group, sector and governorate.	Obtained from national statistics, measured annually
Student cost. This indicator measures the average cost (per full-time equivalent student) of a regular TVET programme operated by government and non-government providers, disaggregated by provider, sector, programme and governorate.	Document review

Step 16: Undertaking graduate tracer studies and employer satisfaction surveys

16.1 Primary tasks for a graduate tracer study or an employer satisfaction survey

Task	Description
Development of the study concept and tools	▶ Identify study objectives ▶ Design the study (select the cohort, study strategies) ▶ Collect addresses ▶ Update addresses ▶ Develop questions and answers ▶ Arrange the questionnaire ▶ Pre-test ▶ Print the questionnaire and support materials
Data collection	▶ Train the study team ▶ Distribute and collect the questionnaires ▶ Reminder actions (raise the rate of participation)
Data analysis and report writing	▶ Identify the rating system for open-ended questions ▶ Enter and control the quality of the data ▶ Analyse the data ▶ Develop the study report ▶ Hold workshops with graduates and employers ▶ Conduct other actions to improve the educational/training programme

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