Employment-Technical and Vocational Education and Training (E-TVET) Council

Developing Curricula based on Occupational Standards

An Operational Guide

Technical Assistance of the Programme in Support to the Employment and TVET Reforms

ACKNOWLEDGMENTS

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FOREWORD

The rapid changes in the labour market trends do call for appropriate training and skills development through outcome-based training approaches. National Occupational Standards specify the standards of performance that trainees are expected to achieve in their work, and the knowledge and skills they need to effectively perform.

In designing the national occupational and training standards and related assessment systems, stakeholders—including employers, professional associations, labour, and education and training institution representatives—need to be involved. This Guide has given very specific strategies for such a multi-stakeholder involvement in reforming the ETVET Sector in Jordan.

I am proud of the efforts made by the ETVET Council and particularly that of the Centre of Accreditation and Quality Assurance (CAQA) to publish this Operational Guide. As the Guide has stated it is time that the Jordan industry and training providers work jointly to provide outcome- based learning through highest quality learning materials based on labour demands.

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PREFACE

The Centre of Accreditation and Quality Assurance (CAQA) under the E-TVET Council was established to steer the quality standards and to implement the ETVET reform through the qualification framework which includes quality assurance, licensing of E-TVET institutions and accrediting training programmes, conducting competency assessment and tests in line with international quality standards as per the demands of the Jordanian labour market; a goal seen as the most important for both training providers and employers.

CAQA has developed this Guide in line with its primary goal of assuring quality in the ETVET sector through the implementation of Technical and Vocational Education and Training Qualification Framework (TVQF). In order to implement TVQF, it is necessary that industry led and nationally validated occupational standards and outcome-based learning materials are made available to the trainees and trainers.

This Guide focuses on the processes of developing OS based on DACUM and how to develop Training and Learning Materials based on principles of Competency Based Training (CBT).

I urge all the Training Providers to use this as a reference on all matters relating to OS and Curricula based on the Jordanian Technical and Vocational Education and Training Qualification Framework (JTVQF).

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Contents

Contents

Acronyms

BAU	Al- Balqa' Applied University
CAP	Competency Analsyis Profile
CAQA	Centre for Accreditation and Quality assurance
CBET	Competency Based Education and Training
CBT	Competency Based Training
DACUM	Developing a Curriculum
DoS	Department of Statistics
EQA	External Quality Assurance
EQF	European Qualification Framework
E-TVET	Employment-Technical and Vocational Education and Training
EU	European Union
HEAC	Higher Education Accreditation Commission
MoE	Ministry of Education
NCHRD	National Centre for Human Resource Development
NET	National Employment and Training
NOS	National Occupational Standards
NOSS	National Occupational Skills Standards
OS	Occupational Standards
SNA	Sector Needs Analysis
TVET	Technical and Vocational Education and Training
TVQF	Technical and Vocational Qualifications Framework
TVTC	Technical Vocational Training Corporation
VTC	Vocational Training Corporation
TP	Training Provider

1 Introduction

The purpose of this Manual is to provide a clear roadmap on how to develop **competency based** (also called *outcome based)* curricula based on Occipational Standards (OS). The Manual elaborates on the contents of OS and how to systematically devise and review them. It provides guidelines for the process of using the competencies and performance criteria established in the OS to specify the learning outcomes and assessment criteria of the curriculum, and arrange these into modules.

In short it describes the sequence of activities needed to develop Competency Based (also called Learning Outocme Based) and demand-driven E-TVET training programmes.

The Centre of Accreditation and Quality Assurance (CAQA) recommends *DACUM* as its preferred approach to developing OS. Nonethless, CAQA encourages other methods too (such as Job Analysis, CUDBAS and Competnecy Mapping) provided the OS are stated in the given CAQA format.

In the development of this Manual the authors reviewed several international and regional best practice examples for development of OS and related vocational curricula.The countries considered were Canada, Scotland/UK, Australia, Saudi Arabia and Turkey. The authors identified aspects of existing Jordanian practice and international practice that would work in the Jordanian context and proposed a methodology and new format for national OS and for curricula that is user-friendly, high-quality, pragmatic and resource efficient.

OS are excellent tools for making the E-TVET system responsive to the demands of the economy by building communication channels between industry demand and education and training supply. Employers' expectations have to be rendered in a structured and meaningful way and a robust methodology and consultation processes are needed to translate these needs into curricula which meet the needs of all stakeholders.

OS are detailed written descriptions of what an employee is expected to know, understand and do in order to be considered "competent" in the occupation.They are national state-of-the-art statements of competent performance in the workplace. OS content represents valid benchmarks/current best practices and includes detailed specifications against which performance can be measured.

OS are *competency-based*.

Competency refers to the ability to use knowledge, skills and attitudes in order to carry out work activities and achieve expected results. In other words, it involves knowing, doing and behaving, and reflects the harmonious blend of these aspects into successful performance on the job.

The main aim of establishing an OS system is to base the foundations of training, qualifications and recognition of achievement on independent evidence of what people are able to do, instead of focusing on inputs such as what individuals know/ought to know (regardless of relevance);

where or how they were trained, length of service or training curricula etc.

The standard or outcome-based approach to curriculum development is a worldwide trend which reflects a paradigm shift from input to outcome-based provision, from teaching to learning, from content to process-focused/performance-oriented learning experience. In this new paradigm the learner is expected to demonstrate what he/she knows and is able to do against the standards established at national level.

An outcome-based approach looks at what the learners should achieve and focuses on ensuring that they do achieve the expected results. In essence, an emphasis on outcomes implies working towards long-term and clearly

Part One foucsses on the critical component of developing Occupational standards, while in **Part Two**, we discuss in deteail the resulting process of developing outcome based curricula, which use the OS as the starting point.

You will find below some of the key terminologies used in the development of competency based curriculm based on Occupational standards. As you go through the Manual, which is quite elaborate and comprehensive, you will come across these terminologies in different contexts.

Key Terminologies on Competency Based Education and Training

What is Competence Based Education and Trining (CBET)?

DACUM
Duties and Tasks
Knowledge and Skills
Worker Behaviours
Future Trends

OS
Employability competencies
Occupational competencies
Performance Criteria

CURRICULUM
Learning Outcomes
Assessment criteria
Teaching and assessment methods
Resources

defined goals and objectives, and holds the participants of the educational process (learners and trainers) accountable for achieving these.

Adopting an outcome-based approach for curriculum development is an effective way to address potential mismatches between technical and vocational education and training (TVET) provision and the needs of the labour market; between irrelevant/ obsolete training programmes, and employers' and learners' needs and expectations. Outcome-oriented education and training is competence and career focused and defines new learning objectives that are more relevant to employers and more appealing for the learners in terms of efficiency and recognition on the labour market.

This Manaul is divided into two parts to help you understand the process of developing curricula based on Occupational Standards.

An outcome (resulst-based) oriented approach to technical and vocational education and training, based on the competences that employers expect their employees to demonstrate, that is designed to enable the learner to demonstrate his/her ability to complete the specific tasks successfully.

Competence -Based means that "programmes

1. have content directly related to work;
2. focus is on *doing something well* and
3. evaluation is based upon industry work standards." (John Collum)

WHAT IS DACUM?

DACUM is a widely used method of occupational/ job analysis which uses expert workers to analyze occupations/jobs into duties and tasks.

WHAT IS A COMPETENCE?

"Competence is the ability to perform activities within an occupation or function to the standards expected in employment."

"Competency is the ability to perform tasks and duties to the standard expected in employment."

"A set of observable and measurable knowledge, skills, behaviours and attitudes that contribute to enhanced employee performance". (Jordan)

"A cluster of related knowledge, skills, and attitudes that affects a major part of one's job and that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved via training and development."

"Ability to demonstrate a set of skills, knowledge, and understanding, within a set of relevant values and ethics, which have a coherent purpose... related to employment or progression or self-development". (Gunning, Scotland)

WHAT IS AN OCCUPATIONAL STANDARD (OS)?

A statement of industry requirements for the occupation, including competences required in the workplace and performance criteria by which such competencies are judged.

WHAT IS ASSESSMENT?

Assessment is aprocess in which evidence is gathered and evaluated against agreed criteria (competences and learning outcomes) in order to make a judgement of competence for development and/or recognition purposes.

WHAT IS RECOGNITION OF PRIOR LEARNING (RPL)?

A process of assessing and formally recognizing what people have learned on the job and through life experience, regardless of where or how the learning took place.

WHAT IS A QUALIFICATION?

A recognised award registered on the TVQF, which is defined by a TVQF qualification descriptor, and attests to the achievement of a body of knowledge and skills; and signifies a level of competence and ability to perform particular tasks and progress to the next level of learning.

WHAT IS A CURRICULUM?

Statements of the pedagogical approach to be implemented; the knowledge and skills learners are expected to learn; details of the modules or units of the programme; the learning activities; the resources required; the assessments used to evaluate student learning; the entry requirements and exit pathways of the learners.

WHAT IS A LEARNING OUTCOME?

The knowledge, understanding, skills, and abilities that learners will have attained as a result of their involvement in a learning programme or particular set of educational and training experiences.

WHAT IS A CURRICULUM MODULE?

Modularisation involves breaking down teaching and learning into "chunks" or "units" of learning called modules. Each module is stand-alone and represents a coherent package of outcome of learning which enhances employability.

WHAT IS KNOWLEDGE (COGNITIVE DOMAIN)?

- Development of intellectual skills.
- Recall and recognition of specific facts, concepts and procedures.
- Knowledge of scientific, mathematical and engineering concepts.

WHAT ARE SKILLS (PSYCHOMOTOR DOMAIN)?

- Physical movement and coordination.
- Use of motor-skill areas.
- Development of the skills requires practice and is measured in terms of speed, precision, distance, procedures and techniques.

WHAT ARE ATTITUDES / WORKER

BEHAVIOURS (AFFECTIVE DOMAIN)?

• How we deal with things emotionally.

• Feelings, values, appreciation, enthusiasms, motivations and responses to work related requirements and situations.

WHAT ARE TOOLS AND EQUIPMENT?

Apparatus, appliances, devices, implements and machines required to perform work tasks.

WHAT ARE MATERIALS?

Consumable materials required for performing work tasks.

WHAT IS THE TECHNICAL AND VOCATION EDUCATION AND TRAINING QUALIFICATIONS FRAMEWORK (TVQF)?

An instrument for the development, classification and comparison of qualifications; which provides a basis for improving the quality, accessibility, linkages and public or labour market recognition of qualifications within a country and internationally.

The emerging TVQF of Jordan QF has five (5) levels of complexity on which occupational standards and qualifications are registered. Level 1 is the lowest, and Level 5 the highest.

WHAT IS A CREDIT?

Credit values that are based on the workload average learners would normally need in order to achieve expected learning outcomes. A credit value is given to a competency standard or qualification or curriculum module.

WHAT IS ACCREDITATION?

The process by which a quality assurance body evaluates the quality of a specific education and training programme in order to formally recognize it as having met certain pre determined minimal standards. The result of this process is the awarding of a status for a limited time period.

1

DEVELOPING OCCUPATIONAL STANDARDS

2 Occupational Standards: Definitions, Benefits and Major Uses

2.1 Definitions

There is a variety of OS definitions worldwide, but they all carry the fundamental idea that OS reflect the requirements of the workplace.Some of the famous OS definitions are the following:

European Training Foundation: "Standards describe the work activities which are to be carried out within the framework of a specific occupation as well as the related knowledge, skills and social competencies."

UNEVOC: "National Occupational Standards define competencies which apply to job roles or occupations in the form of statements of performance and knowledge, and the evidence required to confirm competence. They cover the key activities undertaken within the occupation in question under all the circumstances the job holder is likely to encounter."

International Labour Organisation: "Competency Standards describe the knowledge, skills and attitudes that a person needs in order to carry out a particular job or activity at the level of performance required. Competencies generally specify minimum standards and the conditions in which they should be applied."

For the case countries referred to in this manual, OS are defined as follows:

Canada

- OS identify a group of tasks associated with a particular occupation and describe the knowledge and skills that a worker must demonstrate to be considered competent in that occupation.

- An inventory of essential skills that impact professional ability to adapt the changing work environment.

- Agreed benchmarks against which people of a particular profession measure their level of performance and competence.

- The competence of an individual requires performing successfully in a particular occupation. Standards are comprised of a set of statements describing the standard acceptable skills and knowledge requirements of professionals. (source: ECO Canada)

Scotland/ UK

- OS describe statements of the standard performance individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding. They express"what an individual needs to do, know and understand in order to carry out a particular job role or function". (source: www.nos.ukces.org.uk)

- "National Occupational Standards set out measurable performance outcomes to which an individual is expected to work in a given occupation.They define the skills, knowledge and understanding required to perform competently in the workplace." (source: Sector Skills Development Agency)

Australia

- "Standards in any quality setting are a key set of measures."(source: www.racgp.org.au)

- "A competency standard is a document that specifies, in a structured format, the purpose of a particular job or role and how people should perform that job or role. Competency standards attempt to capture the various dimensions that, when taken together, account for 'competent' performance."

- "The broad concept of industry competency concerns the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency requires the application of specified skills, knowledge and attitudes relevant to effective participation in an industry, industry sector or enterprise."

Turkey

- "Occupational standards describe the competencies individuals must prove in the workplace – the requirements for employment." (Vocational Qualifications Authority)

Saudi Arabia

- "Occupational standards are descriptions of tasks, duties, skills, knowledge, and the behaviours required for the job." (General Organisation for Technical Educational and Vocational Training)

Jordan

- "Occupational Standards encompass training and employment requirements as well as life skills and skills of intercommunication/interpersonal relationships with which a job holder should be equipped. They include reference measures as benchmarks for determining the extent to which an individual can meet the demands of a particular job."(Center for Accreditation and Quality Assurance)

All these definitions, irrespective of the terminology used, agree with the ***standard being a measuring tool to check the individual's achievement of competencies – knowledge, skills and behaviour - to carry out a particular job in a successful manner.*** Thus OS directly link the workplace or employable skills to the desging of high quality eudatioh and training programmes which are outcome based, measurable and national standards clearly benchmarked against international OS.

2.2 OS benefits and uses

OS are **multi-purpose** and **multi-dimensional** documents. Companies/employers can use standards to attract and retain the best employees while clients can benefit from higher cost savings through reduced risks and mistakes. They can be used to design job descriptions, recruitment procedures and induction programmes for new staff, carry out appraisals and identify training needs related to the introduction of new technologies and equipment.

For **employees**, standards assist in achieving recognition, progression and upward mobility. Practitioners can measure their performance, knowledge and understanding against a nationally agreed checklist, identify where they currently need to develop their knowledge and skills, and decide on what additional training they need to progress in their career.

For **sector bodies**, OS can be used in strategic planning, especially planning to develop resources that are benchmarked to nationally recognised best practices; and as tools for assessing evidence for the management of quality.

Training providers (TPs) can use them to define learning outcomes, review and update existing training programmes and develop new ones in line with the labour market requirements and employer needs; design tailored training packages; assess the relevance and effectiveness of courses; provide clear goals for structured learning;and set up training facilities. In general, using OS contributes to staying competitive on the market and enjoying positive feedback from graduates and employers.

To sum up, OS provide a variety of benefits for individuals, employers and the economy as a whole.

Individuals gain:

- Recognition, progression and increased mobility (work, education and training-related)

- Improved access to training and qualifications

- Fair, valid and reliable assessment (due to objective assessment criteria and open access to assessment)

Employers gain:

- More relevant education and training provision and qualifications

- Improved flexibility and competitive advantage

- A better "guarantee" of capability

- A benchmark for use in customised training

- Valid reference for providing incentives to employees

- Contribution to Human Resources Management and Development processes (e.g. job descriptions, job evaluation, performance appraisal and career progression)

Economy gains:

- Increased ability to compete with other economies

- Increased attractiveness of the labour force to foreign investors

- Potential for economic growth

- Consistency across national training provision

- A better guarantee of available skill sets in the labour force

- Increased labour force planning options

- Clear benchmarks to assure and evaluate quality of training available nationally

- Basis for competency-based qualifications .

OS are **occupational** because they define all the key functions someone should be able to carry out in an occupation – for example, farming, commercial operations or production engineering.

The OS describe occupational functions; and hence we design OS by analysing an area of work, mainly using the input of employers and others who have a close interest in the occupation (industry) – experts at the workplace in that occupation, professional bodies, trade associations, where relevant.

The OS are **Standards** since they descritbe both the functions in the occupations and essential outocmes to be be achieved. They also describe effectively the best practices employed by highly competitive experts in the industry.

They are standards because they are officially reviewed and approved benchmarks to be eachieved nationally or internationally.

3

Jordanian key stakeholders in OS Development

OS fundamentally belong with employers as they describe what an individual needs to know, do and understand in order to perform competently in the workplace.

3.1 Sector Teams and Sector Skills Committees

Sector Teams are established by the E-TVET Council and theyhave a high level strategic role to consider and respond to issues impacting on the development of the (sub)-sector. Sector Teams liaise with industry members, access and interpret labour market information and the results of supply and demand surveys (implemented by NCHRD and DoS) and use such information as input to the development of policies and plans to support the human resource development, productivity and growth of the sub-sector. They make recommendations for the membership of the Sector Skills Committees and appoint their representatives to participate as members of Validation Sub-Committees to validate the outputs of the Sector Skills Committees.

Sector Skills Committees are established by CAQA and have a specific technical role to inform OS development. The members are expert practitioners in the specific occupations of the sub-sector with proven record of good performance and long-term experience in the job.

Validation Sub-committees are a sub-group of the Sector Teams nominated to review in detail, provide recommendations for improvement and validate the products of the Sector Skills Committees.

3.2 Centre of Accreditation and Quality Assurance (CAQA)

CAQA is responsible for guiding the development of OS and for accrediting training programmes for delivery in licensed training centers. CAQA establishes the technical Sector Skills Committees, using recommendations from the Sector Team, and in consultation with their contacts in the industry sub-sector. CAQA supervises the work of the Sector Skills Committees on the development of the standards; determines the format and the process for developing OS; and proposes the format for presenting competency-based curricula for accreditation.

CAQA submits the newly developed and validated OS to the CAQA Steering Committee for endorsement and to the E-TVET Council for official approval.

3.3 Employment-Technical and Vocational Educaiton and Training (E-TVET) Council

The E-TVET Council has the ultimate mandate to approve the OS which have been validated by the Validation Sub-committees of the Sector Teams, endorsed by the Sector Teams and by the CAQA Steering Committee.

4 OS Development Methodology

4.1 Development of Occupational Profiles

4.1.1 Definition of occupational analysis

Occupational analysis is a method for systematised collection of information about an occupation or occupational area. The major target of the occupational analysis is to identify the duties and tasks, knowledge, skills and worker behaviours required for a particular occupation/job. Aside from defining the current occupational specifications, it also aims at identifying the future trends and concerns that are likely to affect the evolution of a certain occupation/job in the labour market in the upcoming 3-5 years.The main techniques of information gathering are desk research, group and individual interviews, focus groups, questionnaires etc.

Occupational analysis is the **first phase** of OS development. The purpose of occupational analysis is to ensure that OS reflect the actual needs of the labour market.

4.1.2 Occupational analysis process and methods

The occupational analysis can be carried out in the following manner:

- a. Sector needs analysis
- b. Occupational profile development and verification
- c. Endorsement of the occupational profile

(a) Sector needs analysis

Sector-based needs analysis focuses on the skills gap and skills shortage, current and future training demand, available training capacities and short/mid-term training supply, quantitative and qualitative aspects of supply and demand of labour force, new technologies and upcoming development trends, strategically important occupations for the sector, emerging and dying occupations etc. Sector Needs Analysis (SNA), also called as *Skill Gap Analysis*, includes identifying lack of skilled human resources as well as further investigation in terms of regional differences (in which regions qualified labour force is/will be needed and in which regions training capacities are available and training is/will be offered?) and gender perspective (are there occupations in the sector suitable for women and are there available training services accessible for them?).

The main participants in sector needs analysis are the large, medium and small-size enterprises that are innovators, but also social partners, employment offices, training providers etc. In Jordan, SNA is done by Sector Teams using the results of supply and demand surveys implemented by NCHRD and DoS.

SNA is an effective tool to evaluate state of play in a sector and identify upcoming technological and organizational changes

so as to anticipate possible sector development scenarios in the near future, and in particular the need for training for specific roles and occupations.

(b) Occupational profile development

Following Sector Needs Analysis, the next stage is occupational profile development, which can be achieved by use of several methodologies such as *Job Analysis, Functional Analysis* or *DACUM*. Their rationale and characteristics are briefly described below. See **Appendix 6** for more detailed information:

4.1.3 Job Analysis

The establishment of "occupational standards" concept started with job analysis. Frederick Taylor (1911), the originator of "scientific management," is usually credited with conducting the first formal job analysis. This approach has been predominant for a long time in many industrialised countries, since it is fit to analyse tasks in a mass production process and in situations where there is little flexibility in the organisation of production processes. The aim of the analysis is to divide and subdivide jobs and tasks into their constituent parts, in order to provide information for training and to develop benchmarks for pay rates. In spite of some fundamental changes in job analysis, the approach is still used nowadays for specific purposes and in certain sectors, including some service and administrative occupations.

4.1.4 Functional Analysis

Functional Analysis starts with the identification of the key purpose/role of an occupation in the major sectors where it is found, articulating the main functions, breaking these down in turn to sub functions until outcomes for each function are determined following a strictly logical sequence. Functional Analysis, as practised in the United Kingdom, uses a consultative process that involves practitioners, managers, and in some cases, the users or "consumers" of standards. The modules are analysed one by one to identify the performance requirements. This method has been used in several countries in Europe and the Middle East and is being experimented within South America.

4.1.5 DACUM

The DACUM approach to occupational analysis is quite different from job analysis. DACUM is an acronym for
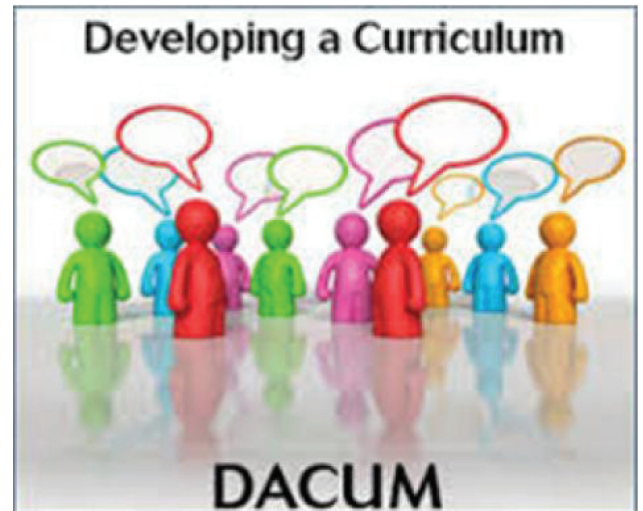
Developing **A CU**rriculu**M**, but it actually involves only the first step in a full curriculum development process. Instead of work process observation, DACUM uses guided group discussion with expert workers.

The DACUM process includes, in addition to occupational specific tasks, identification of work enablers: general knowledge and skills, worker behaviours (personal and interpersonal skills), tools, equipment, supplies and materials used as well as future trends and concerns. The identified tasks translated into competencies become the focus of curriculum development. DACUM is used in many developed and developing countries.

This Manual, as you have already noted, focuses in PART ONE on how to construct DACUM-based OS, and in PART TWO on how to devise learning outcomes and assessment criteria, and cluster them into training modules using OS as input and benchmark.

4.1.5.1 What is DACUM method?

DACUM is a systematic process that enables its users to design vocational curricula that are based on the realities of the workplace. It allows for movement from initial planning and needs assessment through programme design to instructional delivery in a quick and cost effective manner.

The DACUM process has several important advantages over other approaches to curriculum and instructional design. It provides an effective forum for the stakeholders in E-TVET to work closely together from design through delivery. By encouraging participatory approach, it builds a collaborative relationship among business, industry, labour, government and education stakeholders.

The DACUM analysis is usually carried out in a 2-3 day workshop, involving a trained DACUM facilitator and a group of 6-12 expert employees (optimum 8-10) from the occupation/job that is to be analysed. The result of the DACUM analysis workshop is a detailed **Research Chart** describing the duties and tasks performed by the employees involved in the specific occupation.

The DACUM philosophy is based on three principles:

1. **Expert workers** can describe and define their occupation more accurately than anyone else. Persons who are working full-time in their positions are the real experts on the job. Even though supervisors and managers usually know a lot about their subordinates' work, they usually lack the expertise needed for high quality analysis.

2. An effective way to define an occupation is to precisely **describe the duties and tasks** that expert workers perform on a regular basis. A successful employee performs a variety of tasks that either the customer or employer wants performed. Hence, finding out what the job practitioners (top performers) do will provide valid data for training other experts.

3. All tasks, in order to be performed correctly, require certain **knowledge, skills, tools** and **worker behaviours.** While knowledge, skills and behaviour are not tasks, they are enablers which make it possible for the employee to be successful on the job. Because these enablers are so important, considerable attention is given during the workshop to identifying lists of each.

4.1.5.2 When can DACUM be used?

DACUM analysis is particularly suited for two purposes:

(a) Review of existing curricula: A group of expert employees within the occupation in question can be convened to identify the competencies that should be delivered in an existing curriculum, just as they can be convened to identify the competencies for a new curriculum. In this case, once the competencies have been carefully identified by expert employees, the existing curriculum is examined to see if it addresses all required tasks. Modifications of the education or training curriculum are then made, where necessary, to ensure current relevance of the curriculum.

(b) Development of new curricula: Once labour market analysis has been carried out and the need for a new curriculum is established, DACUM can then quickly identify the competencies needed to perform the job for which new training opportunities have to be developed.

Steps in the DACUM Process

1 Conduct Initial 2-Day Workshop

2 Conduct Validation Workshop

3 Conduct Management Review

4 Conduct Task Analysis

5 Curriculum Development

4.1.5.3 What are the benefits of DACUM?

• It is quick, effective and economic/low-cost (all that is needed is a panel of 6-12 employees, a good facilitator and 2-3 days);

• It is performance-based (DACUM looks at what is done in an occupation, not how, why or when);

• It encourages group interaction (a good facilitation gives the expert workers involved the opportunity to have an open-minded exchange of experiences and ideas leading above all to synergy effects when it comes to the development of the product);

- It requires active involvement of the industry/"client" (strong "buy-in" of employers and employees since the "voice of industry" is prioritised) ;

- It provides for broad coverage of the occupation (due to the panel's exchange of ideas and cooperation it is possible to achieve results representative for different companies even though every participant brings the experience from one's company);

- It allows participants to discuss and reach a balanced consensus (a process that creates a strong sense of ownership);

- It generates results that enable training providers to become more responsive to the specific learning needs in an occupation (trainers should realize that they need to teach what is required by the labour market, not what they know best and have been teaching for years);

- It is future oriented (upcoming trends and concerns that are likely to affect the occupation are identified and included in the DACUM Chart).

There are **three DACUM phases** that have to be responsibly followed in order to successfully produce a high quality DACUM product. They are as follows:

- **Preparation for the DACUM workshop**
- **Implementation of the DACUM workshop**
- **Verification of the DACUM workshop results**

4.1.5.4 Preparation for the DACUM workshop (pre-DACUM activities)

In order to implement a DACUM workshop smoothly and in high quality manner, considerable planning and preparation needs to be done. Desk research, development of panel member profiles, workshop logistics are just a few key issues that need to be mentioned.

However, the DACUM process relies on two critical factors for its success. The first and foremost is *selecting the right panel*. A DACUM panel should consist of employees who are considered the very best in the field and currently performing the function, not instructors or supervisors of the job. The second important factor is a *skilled DACUM facilitato*r. CAQA has a pool of 12 DACUM Facilitators who were trained through the E-TVET Reform Project and assessed and certified by Ohio State University.

A **competent facilitator** should guide the panel through the process without prejudice and make sure that the panel comes to consensus on every issue discussed. The

facilitator sets the mood and the pace of the panel and ensures that they know exactly what their tasks are and the expected deliverables for all the parts of a DACUM Chart. As in an orchestra, where the conductor and the musicians are equally important to creating music, both the facilitator and the panel must work together to develop the occupational analysis.

4.1.5.5 DACUM Panel

The **following criteria** have to be taken into account during the panel member selection process:

1. Technical competence

- should be highly skilled in the job and aware of current developments and needs in the field

- minimum of 3-5 years of work experience in the job

2. Full-time employment (results in holistic understanding and experience of the job)

3. Job position/level

- Expert workers must be the one carrying out the job themselves and not the people supervising individuals carrying out the job;

- Presence of supervisors can present problems. In some cases it cannot be avoided to have one supervisor in the group (sometimes this has also the advantage in providing a "reality check") but in this case they must not be supervisors of any of the expert workers on the panel;

- Instructors should not be members of the expert worker panel (DACUM participants must be open-minded and free of bias related to the nature of the job and various elements of associated training).

4. Appropriate gender mix (if occupation allows)

5. Geographic representation (determine the geographical area to be represented)

6. Industry representation

   Appropriate company size representation (large, medium, small):

   -Duties and tasks of an expert worker for a specific job can vary according to the size of the company they are working for. In big companies there is a tendency to divide work and to split responsibilities and duties. These may result in more or less highly specialised persons while in smaller companies the some job

position holder is expected to be an "all-rounder" responsible for a broader spectrum of tasks.

- It is important that the group of expert workers reflect the actual employment situation in the job being analysed. If the respective job is diversified in terms of worker's specification, the expert workers must be selected to reflect those specialisations. The same applies for the type of employer (i.e. private vs. public). Consideration should be given to select a stratified group of experts in order to obtain proportionate representation of different categories of workers in the occupation.

7. Preferred social competencies
   - team player
   - good communicator
   - highly committed
   - freedom from bias

4.1.5.6 DACUM Facilitator

If resources are available it is mostly convenient to have one person (coordinator) to make all the necessary pre-workshop arrangements, including the selection of the participants and arrangements for the verification of the outputs and another person running the workshop (facilitator). But in reality it is often the same person that carries out the pre-workshop and post-workshop activities and acts as facilitator of the DACUM workshop.

A DACUM facilitator should meet the ***following requirements:***

• DACUM Facilitator Certification

• Skillsand experience in occupational analysis procedures

• Ability to display empathy and establish rapport quickly with the participants

• High degree of sensitivity to both verbal and non-verbal communication

• Ability to motivate and encourage participants

• Willingness to assume and "act out" the role of process expert while according participants the role of content experts

• Appreciation of the value of small-group process so that participants are allowed to work out things by themselves

• Excellent listening skills and memory, since the facilitator must be able to "store" the participants' contributions in his or her memory and be able to retrieve them as needed

• Ability to obtain consensus from the participants.

Furthermore, the DACUM facilitator should preferably exhibit the following behaviours (according to the DACUM Facilitator Chart, developed in 2008):

• Professional image and outlook

• Sensitivity for others

• Ability to establish and maintain enthusiasm

• Sense of humour

• Ability to display and maintain a positive image

• Ability to make decisions

• Patience

The facilitator also needs to understand the DACUM process itself. As should now be apparent, facilitating a successful DACUM requires a multitude of skills, many of which cannot be quickly acquired. The qualities described are extremely important to successful performance as a facilitator.

The facilitator must establish and maintain the group's pace, balance the group's participation, clarify vague statements by probing for more details, and insist in selection of the most appropriate action verbs, task statement modifiers, and objects (nouns) in articulating duty and task statements. The facilitator must motivate and lead the group and control the process, yet never impose content judgements or decisions on the participants.

Each DACUM participant should be motivated to participate actively in the process. The facilitator does not have to be familiar with the analysed occupation; in fact, it is usually even better if the facilitator is not a practitioner of that occupation. In this way it is less probable that the facilitator will influence the discussions and include his / her personal judgments in the analysis and synthesis processes.

4.1.5.7 Implementation of the DACUM workshop (DACUM activities)

The workshop generally includes ***7 procedural steps:***

1. Orient the DACUM expert panel

2. Review the occupation (develop organisational chart, conduct initial brainstorming)

3. Identify duties (general areas of responsibility)

4. Identify specific tasks performed under each duty

5. Develop lists: general knowledge and skills required for the job; worker behaviours (desirable attitudes and traits); tools, equipment, supplies, and materials; future trends/concerns

6. Benchmark the DACUM Chart with international/ regional job/occupational profiles (optional)

7. Review/refine task and duty statements

8. Assign codes to task and duty statements (A-1, A-2, B-1 etc.)

Different facilitation techniques are used at different stages of profile development (brainstorming, clustering, comparison, assessment etc.). The main responsibility of the facilitator is to enable an open exchange of knowledge and experience among the expert workers and to take care that the accepted terms and categories of analysis are used precisely and unambiguously. The occupational practitioners are responsible for the content of the Chart,

whereas the facilitators are in charge of the correct application of the method and the formulations to be used to express the content.

Benchmarking the developed DACUM Chart with international occupational profiles is an optional activity. However, CAQA encourages, wherever possible, internationla benchmarking of developed OS to aciheve the highest recognition of teh Jordanian Occupational Standards.

In order to assure the quality of the final product, the duty and **task matrix** and the related lists are compared with one or several international occupational descriptions identified by the facilitator. The job practitioners are given

the possibility to check the completeness of the developed Chart and to get acquainted with the tasks mastered by their peers from abroad.

4.1.5.8 Verification of occupational profile / DACUM workshop results (post-DACUM activities)

An external review / verification of the DACUM Chart by additional occupational representatives from different companies allow a second "reality check" of the workshop results and proof the reliability of the DACUM profile.

The process should confirm that the listed tasks are the actual tasks that the trainees / employees should be able to carry out when they start work in the occupation or when they are promoted within that occupation. Those who conduct the verification process should be asked to take each item into consideration and to determine whether that particular item is really a part of the occupation or not (do employees perform the task or not?). They can also suggest additional tasks which are, in their opinion, left out.

Hence, the objectives of the verification procedure are as follows:

• complete the content of the profile (tasks, equipment etc.);

• verify and confirm the accurate formulation of the identified duties and tasks;

• confirm relevance / validate the identified duties and tasks

• rank tasks according to several key indicators.

The reason why verification is necessary is that the 6 to 12 DACUM participants represent a small number of companies and there might be a risk that the full scope of the occupation was not entirely covered. Hence, if a number of expert employees and supervisors have a look at the Chart, the value and the credibility of the DACUM results will increase. This is particularly important if the results are to be used for the development of national occupational standards and curriculum.

The process includes development of a verification strategy and appropriate instrument(s), selection of verification respondents, collection and analysis of verification data, revision of the DACUM Chart based on verification results and preparation of a verification report, if required by the validation body.

4.2 Development of DACUM-based Occupational Standards

OS are competency-based. A ***competency*** can be defined as a cluster of knowledge, skills and related attitudesthat enable a person to act effectively in a job. Competency descriptions show what level of knowledge and skills mastery is required to successfully perform job tasks, and what behavioural standards must be consistently demonstrated.

Let us revisit the concept of competency briefly.

4.2.1 What is Competency?

What is knowledge (COGNITIVE DOMAIN)?

- Development of intellectual skills
- Recall and recognition of specific facts, concepts and procedures
- Knowledge of scientific, mathematical and engineering concepts

What are skills (PSYCHOMOTOR DOMAIN)?

- Physical movement and coordination
- Use of motor-skill areas
- Development of the skills requires practice and is measured in terms of speed, precision, distance, procedures and techniques

What are attitudes/worker behaviours (AFFECTIVE DOMAIN)?

- How we deal with things emotionally
- Feelings, values, appreciation, enthusiasms, motivations and responses to work related requirements and situations

The ETF Glossary of Labour Market Terms and Standard and Curriculum Development Terms, (ETF 1997) gives three definitions of "competency":

1. Ability to do something well and effectively

2. Ability to meet the requirements of employment

3. Ability to meet the demands of specific work roles

A ***competency in Jordan*** is defined as "a set of observable and measurable knowledge, skills, behaviours and attitudes that contribute to enhanced employee performance."

COMPETENCY

Other relevant definitions are:

"A competency is more than just knowledge and skills. It involves the ability to meet complex demands at work, by drawing on and mobilizing psychosocial resources, including skills and attitudes, in a particular context." (OECD, 2005)

"A cluster of related knowledge, skills, and attitudes that affects a major part of one's job and that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved via training and development."

"Competence is the ability to perform activities within an occupation or function to the standards expected in employment."

"Competency is the ability to perform tasks and duties to the standard expected in employment."

"Ability to demonstrate a set of skills, knowledge, and understanding, within a set of relevant values and ethics, which have a coherent purpose related to employment or progression or self-development". (Gunning, Scotland)

"Occupational competency is defined as the ability to perform tasks common to an occupation at a minimally acceptable level." (Fretwell, USA)

All definitions deal with work. To be competent means to give work results. Therefore, the concept of competency focuses on the performance expected from a worker on the job rather than on the knowledge alone. Being able "to do" is more important than being able "to know." Content is not paramount, it is easy to access and abundant. Real education is about helping learners develop competencies to apply knowledge and to put it into a context that allows them to solve problems and overcome challenges. At the end of the day, knowledge is fleeting, but ***competencies endure.***

OS development on the basis of a DACUM Chart mainly focuses on the identification of competencies and definition of the performance criteria. These two are the backbone of the standard to which additional components may be added as deemed necessary by the stakeholders.

4.2.2 Format of an Occupational Standard

In Jordan, the newly-agreed OS format includes the following components:

- **Cover Page**
  - o occupation title
  - o occupational level
  - o ASCO code
  - o ISCO code
  - o names of the OS development team
  - o endorsement and approval authorities
  - o approval and review dates

- **Occupational Summary**
  - o occupational definition
  - o main knowledge, skills and attitudes required

  - o occupational hazards
  - o work environment
  - o possible jobs
  - o career pathways
  - o future trends and concerns
  - o special legal provisions (if any) etc.

- **Employability Competencies:** These are presented in a table format and their scope of relevance in relation to the occupational levels is indicated.

- **Occupational/Technical Competencies:** These are defined based on the duties and tasks from the DACUM Chart. Occupational competencies are listed in a table format and task references are provided in order to clearly indicate the relation to the DACUM Chart and ensure its full coverage.

- **Performance Criteria:** These are identified for each of the occupational competencies and express quality benchmarks / criteria for success on the job.

- **Equipment, Tools and Materials List** includes the main technical resources – apparatus, appliances, devices, implements and machines, tools and consumables - needed to perform work tasks.

4.2.3 Occupational Standard Development process

The OS development process consists of writing sessions with OS developers that are conducted by 1-2 facilitators experienced in the methodology.The OS developers are a mixed group of expert practitioners (usually including some who participated in the DACUM) and educators who deliver training for the occupation (see below).

The **standard OS writing procedure** used in Jordanis structured as follows:

DAY	TYPE OF SESSION	PURPOSE
1st	**Internal** *(Facilitators only)*	- Introduction to OS-related concepts: occupational summary, employability and occupational competencies (part I) - Brainstorming and draft identification of competencies by clustering work tasks from the DACUM Chart (preparatory work among facilitators)
2nd	**External** *(Facilitators and OS Developers)*	- Working session with OS developers: draft competencies identified on the previous day further developed and validated with industry and training providers' representatives. Plan for the development of the occupational summary.
3rd	**Internal** *(Facilitators only)*	- Introduction to OS-related concepts: performance criteria as quality benchmarks for carrying out competencies successfully (part II) - Brainstorming and draft definition of performance criteria (preparatory work among facilitators)
4th	**External** *(Facilitators and OS Developers)*	- Working session with OS developers: draft criteria identified on the previous day fine-tuned and confirmed with industry and training providers' representatives. Finalization of the competencies, performance criteria, and lists of tools, equipment and materials

The identification of the OS developers is a process as responsible as the selection of the DACUM panel. They should be representatives of top employers and/or employers' associations, private entrepreneurs, leading training providers. The number should be 4 to 6 with equal balance between industry and education experts. The *following criteria* should be used when nominating the OS developers:

- In-depth knowledge of the occupation

- At least 5 years of occupational/training experience

- Informed about the latest occupational trends and technologies

- Well known for sector initiatives and previous development work

- Good writing skills

- Quality-minded

4.2.4 How to devise the OS components: methodology

The occupational summary is a piece of creative writing that the OS developers undertake as homework in between OS writing sessions. It requires least effort and time and may be drafted by one or two of OS developers that volunteer for the task and then share the preliminary outline with the rest of the group for comments and additions. Once the content is agreed by all OS developers, the summary is included in the draft document.

The key components of an Occupational Standards are Competence and Performance Criteria, which we shall discuss in detail below.

4.2.4.1 Competence

Employability /Key / Core competenciesare crucial for lifelong learning and successfully functioning in work and in society. "Key competencies are those which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment." (European Council, 2006)

These should be acquired by:

- young people by the end of their compulsory education and training, equipping them for adult life, particularly for working life, while forming a basis for further learning;

- adults throughout their lives, through a process of developing and updating skills.

All key competencies are considered equally important, because each of them can contribute to a rewarding life in a knowledge society. Many of the competencies overlap and interlock: aspects essential to one domain will support competency in another. Acquiring employability competencies is viewed as an on-going, lifelong learning process. This process occurs in multiple settings relevant for the development of competencies: school, family, peers, youth work, work, political life, religious life, cultural life, etc.

The **European Reference Framework** sets out 8 key competencies:

1 Communication in the mother tongue;

2) Communication in foreign languages;

3) Mathematics and basic competencies in science and technology;

4) Digital competency;

5) Learning to learn;

6) Social and civic competencies;

7) Sense of initiative and entrepreneurship;

8) Cultural awareness and expression.

There are a number of themes that are applied throughout the Reference Framework: critical thinking, creativity, initiative, problem-solving, risk assessment, decision-taking, and constructive management of feelings play a role in all key competencies.

The **Framework of Employability Competencies in Jordan** includes 7 core skills:

1) Communication

2) Teamwork

3) Self-Marketing

4) Problem Solving

5) Entrepreneurship

6) Computer Skills

7) Foreign Languages.

These are further specified as follows:

No.	Employability Competencies	Occupational Levels		
		Craftsman (LEVEL 3)	Skilled LEVEL 2	Semi-skilled LEVEL 1
1.	Communication			
1.1.	Self expression in oral form (listening and speaking skills)			
1.2.	Self expression in written form (reading and writing skills)			
1.3.	Linguistic interaction in a creative way in a range of work, societal and cultural contexts			
2.	Team work			
2.1.	Team building and management			
2.2.	Roles in work teams			
2.3.	Effective team member			
2.4.	Time and resource management			
3.	Self-marketing			
3.1.	CV writing			
3.2.	Cover / Intention letters			
3.3.	Job interviews			
3.4.	Self presentation skills			
4.	Problem solving			
4.1.	Identify and analyze work problems			
4.2.	Consider options and provide solutions			
4.3.	Evaluate results and make decisions			
5.	Entrepreneurship			
5.1.	Self exploration	x	x	x
5.2.	Creativity and innovation	x	x	
5.3.	Plan and manage projects	x		
5.4.	Informed risk-taking	x	x	
5.5.	Networking	x	x	x
6.	Computer / ICT skills			
6.1.	Master basic computer applications			
6.2.	Use internet			
7.	Foreign languages			
7.1.	Basic communication skills			
7.2.	Master basic technical concepts and terminology			

Indication of which (sub)-competencies are relevant for a particular occupational level is helpful for the curriculum developers when designing the training contents and learning activities since it guides them to ensure that specific aspects of the employability competencies are included and developed during the training process.

Occupational Competencies describe knowledge, skills and social behaviour needed for successful performance in a particular occupation. Also referred to as technical job skills, they refer to the talent and expertise a person possesses to perform a certain job or task. Very often these are called "hard skills," as opposed to "soft skills".

Good occupational competencies should:

- Accurately and concisely describe an outcome of learning and/or work activity that needs to be achieved and formally recognised for a specific purpose

- Express a meaningful outcome attributable to an individual and one for which the individual can be recognised

- Be unique, wording must be different from any other competency

- Provide a precise description and not mislead or over-represent the abilities of the person holding credits for the OS.

Occupational competencies could include:

- technical proficiencies: likeinstalling, maintaining, repairing systems (for electrician or plumber)

- multitasking: like answering phones while typing letters or documents (for office manager)
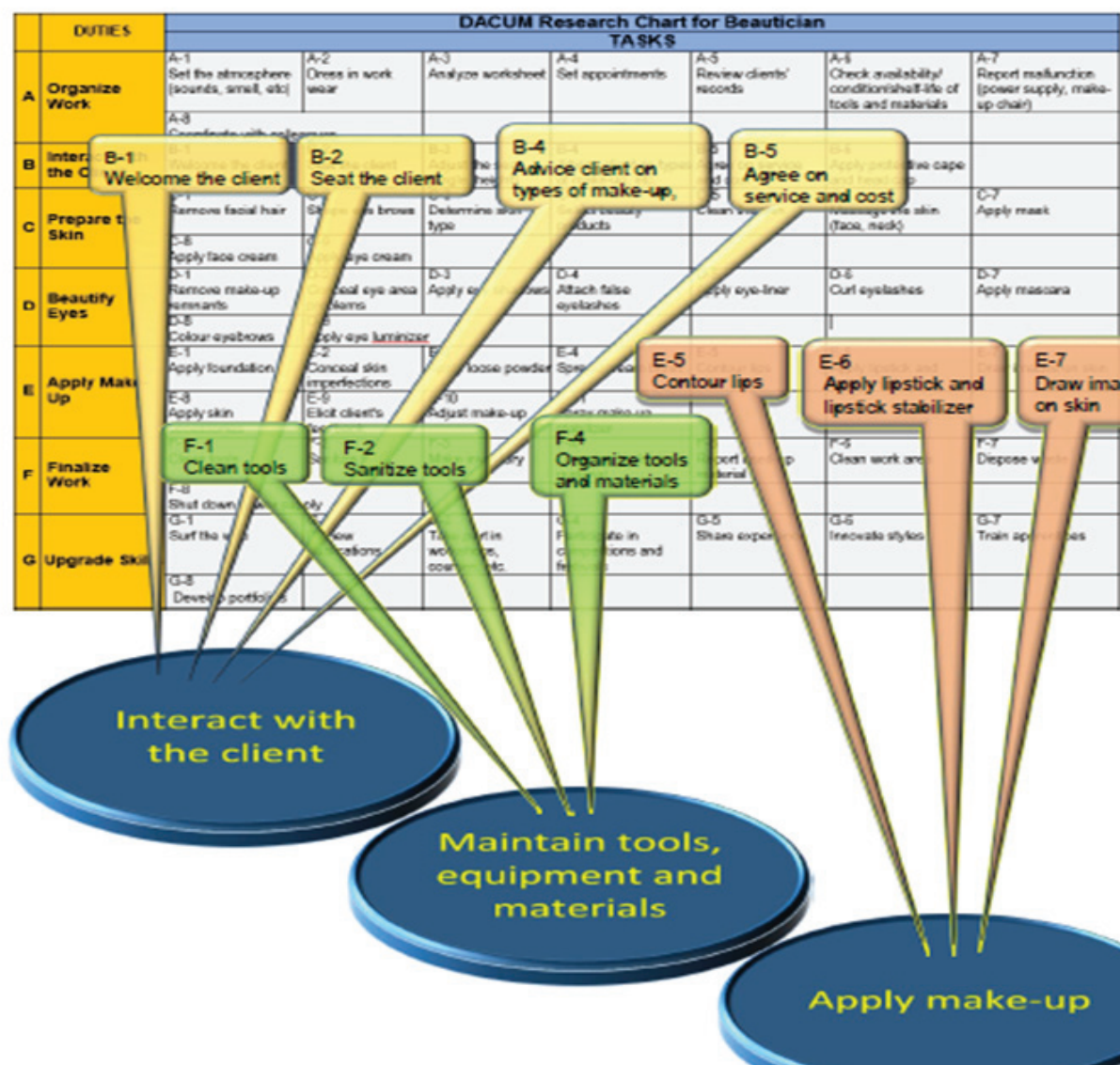
- communication abilities: like talking to large groups or delivering a sales presentation, helping someone make decisions through consultative selling (for salesperson)

- ability to use advanced software (for IT programmer) etc.

Competencies are devised by applying the clustering technique – the process of grouping work tasks with some common characteristics:
(1)into combinations which have meaning and purpose related to needs of an industry,
(2) belong to the same work process, and,
(3) have the same underpinning enablers (knowledge, skills and worker behaviours).

Task clustering or amalgamation is illustrated below:

Sometimes a work task is so complex that it can turn into a stand-alone competency, other times it takes several tasks (from 2 to even 10) to define a robust competency. Occupational competencies are sequenced in (techno) logical order. For each competency, task references are indicated in order to trace all tasks included in Chart. The number of competencies in an OS may vary between 12 and 20.

Some examples of occupational competencies follow:

- "Prepare surfaces for finishing works"
- "Assemble confectionary and pastry products"
- "Sketch furniture designs"
- "Decorate upholstery"
- "Deliver the product" etc.

Performance criteria are evaluative statements, which specify what is to be assessed and the required level of performance. They detail the activities, skills, knowledge and understanding that provide evidence of competent performance of each occupational competency.

Performance criteria are quality benchmarks that an individual should meet in order to prove that his/her job competencies fit the demand of the labour market. They provide the basis for assessing the achievement of the competencies of the standard. The performance criteria are a checklist of measurable criteria that can be applied consistently to all those that want to prove they have achieved the knowledge and skills and demonstrate the behaviour required in the OS.

The identification of performance criteria involves breaking down each competency into more specific sub-outcomes

that assist in explaining the composite of what is involved in achieving the competency. When put together, meeting the performance criteria amount to achieving the competency.

While the list of specific competencies tells the person what is to be known and done, criteria provide the individual with precise performance requirements for each particular competency. They are the observable behaviours and actions which explain how the job should be done, how well the job should be done, plus the results that are expected for satisfactory job performance. They tell the person what a good job looks like. The purpose of performance criteria is to communicate expectations. Good performance typically involves more than technical expertise. Criteria are also expected to describe certain worker behaviours and it is often these behaviours that determine whether performance is acceptable.

Performance criteria answer the following questions:

- What is the practitioner supposed to do? (*actions*)

- How is the practitioner supposed to do it? (*means*)

- How well should the task be performed? (*quality*)

Good performance criteria should:

- represent outcomes of learning and/or work activities that are demonstrable and assessable;

- be in a format similar to the competency

- expand on and be consistent with the competency

- be clear and unambiguous, using language which has meaning for the users of OS

- describe the evidence that must be considered in making an assessment decision. How well this evidence must be demonstrated is also stated. Collectively, performance criteria represent what national stakeholders consider is an informed assessment decision that a competency has been achieved

- be expressions of evidence; they are not written as assessment tasks or instructions to assessors about the way to conduct assessment

- give informative guidance to assessors and candidates as to what evidence is required

- provide sufficient detail for valid and consistent assessment decisions to be made

- collectively indicate the level or quality of performance

required

- be consistent with the competency and should not introduce new aspects of performance not implied by the competency.

The following guidelines should be used when developing performance criteria:

- Determine the most important aspects of the competency/ areas of quality

- Describe the performance expected by the employers

- Identify work actions and procedures that lead to an end result / outcome

- Minimize redundancy and overlap between areas of quality

- Develop clear statements of performance by synthesizing information while taking into consideration the three dimensions: knowledge, skills and attitudes

- Sequence statements in a logical way.

Some examples of performance criteriamight be:

- "Select and apply personal safety gear according to required work";

- "Estimate type and quantity of material based on the work order";

An excerpt from OS for Beautician (developed in Jordan, October 2013) illustrating the relationships between DACUM tasks and duties, occupational competencies and performance criteriais presented below:

Duties & Tasks from DACUM Chart	Competencies and their tasks references	Performance Criteria
Duty A: Organize work Task A-1: Set the atmosphere (sounds, smell etc.) Task A-2: Dress in work uniform Task A-3: Analyze worksheet Task A-4: Set appointments Task A-5: Review clients' records Task A-6: Check availability/ condition/shelf-life of tools and materials Task A-7: Report malfunction (power supply, make-up chair) Task A-8: Coordinate colleagues	1. Prepare the work environment (A-1, F-6)	1.1. Turn on light and ventilation systems; 1.2. Maintain the temperature in the salon at a comfortable level; 1.3. Clean and disinfect work area following health and safety practices; 1.4. Turn on audiovisual media to create a cosy ambience; 1.5. Ensure pleasant fragrance in the salon.
Duty B: Interact with the client Task B-1: Welcome the client Task B-2: Seat the client Task B-3: Adjust the seat (angle, height) Task B-4: Advise client on types of make-up etc. Task B-5: Agree on service and cost Task B-6: Apply protective cape and head cap	2. Apply occupational health, safety and environmental practices at work (A-2, A-7, B-3, B-6, F-7, F-8)	2.1 Wear salon's uniform; 2.2 Report on equipment malfunction according to salon's policies; 2.3 Adjust height and angle of the seat to beautician's convenience; 2.4 Apply protective cape and head cap according to service required; 2.5 Discriminate between healthy beauty products and hazardous, cancerogenic products; 2.6 Collect, sort out and dispose waste in a safe and eco-friendly manner; 2.7 Disconnect electricity, water and gas/ gasoline sources following safety practices; 2.8 Handle safely flammable material inside the salon.

- "Cut work pieces to required size and shape";

- "Test product against quality specifications" etc.

Having developed the OS in the above described manner, it is crucial for the stakeholders to decide on the review date and procedure of the standard: life expectancy of such a document differs from sector to sector. In furniture manufacture, for instance, an OS should need an update every 3-5 years whereas in the ICT sector 6 months would be the average period for standard review exercise.

Regular review of OS should not be underestimated: technologies evolve and occupations experience continuous transformation; leaving a standard without attention for too long would minimise its value, since its main function is to communicate employers' latest needs to curriculum developers.

PART | 2   DEVELOPING OUTCOME-BASED CURRICULUM

5 Outcome-Based Curriculum Development Methodology

The curriculum describes the teaching and learning required to meet the requirements of OS.

OS are the basis for the development of a competency-based curriculum. The learning outcomes and assessment criteria of a competency-based modular curriculum are derived from the competences and performance criteria in the OS. This link between the curriculum and OS makes the curriculum relevant to the needs of employment.

. The **objective of Curriculm Development** is to translate the OS terminology of action and outputs in employment into the language of outcomes in education, which enable training professionals to plan, design and deliver training programmes. Therefore, you will note that the OS are the first basis (foundation) for the development of a competency-based curriculum.

A clarification on what is understood by the term 'Curriculm' would be helpful.

CAQA takes a broad view of the term Curriculum. It is understood, as more than the syllabus (curriculum framework), but refers to all the learning and training opportunities that take place in the learning institutions or work place including:

- Purpose and values of learning
- Learning otucomes

- The content, activities, methods, media or environment
- Learning and teaching strategies used
- Various forms of assessment
- Monitoring and evaluation of the delivery of the training.

If so, we could say that the curriculum deals with

- the **standards setting** (derived from the occupational standards)
- **Learning programmes** development and delivery including formative and summative assessment
- **Quality assurance** of the delivery and assessment processes.

5.1 Key concepts and principles underpinning the curriculum

The curriculum is based on the philosophy and principles of **Competency Based Education and Training** (CBET), also stated as **Competency Based Trianing** (CBT). Over 150 contries in the world toady implement CBT as a tool to reform outcome based learning curricula.

Competence based means that the training programmes designed

i. Have content directly related to work

ii. Foucs is on 'doing something well', and,

iii. Evaluation of the training is based upon industry work standards" (John Collum).

A competency-based modular curriculum MUST be based on the ***following principles*** and ***characteristics:***

- Specific, precisely stated learning outcomes that have been verified as being essential for successful employment and performance in the occupation/job.

- Clarity about what is the evidence that shows when an outcome is achieved, and what progress towards it looks like, i.e. outcomes focused. Focuses on what a learner is able to do at the end of the teaching and learning process.

- Focus on learner's needs. Learner centred training programmes where the Trainer/Instructoris the facilitator and designer of learning opportunities and not presenter of knowledge. Critical thinking, reasoning, reflection and action are developed when the learner is at the centre of the learning process.

- Learning is self-paced; learners must first meet the assessment criteria of one or a set of learning outcomes before progressing to the next set. Trainees are responsible for their own learning.

- Continuous integrated assessment where assessment is part of the learning experience (positive and constructive on-going assessment). Periodic feedback is needed throughout the learning process. Performance is evaluated against pre-set, fixed learning outcomes and assessment criteria (criterion referencing). Evidence of competence is gathered from a variety of methods of assessment that suit the needs of learners. Good international practice involves the use of a combination of continuous and summative assessment.

- Experiential and discovery learning through 'doing'. Learning programmes are designed around real-life situations through learning and assessment tasks/ activities. The learning and assessment tasks/ activities are performed individually and in teams. Educators are charged with the responsibility of creating learning environments which are inviting, challenging and motivating for trainees.

- Encouragement of team work.

- Recognition of qualifications by employers and other stakeholders. Employers and key stakeholders are involved in the development of occupational profiles, OS, the curriculum and assessment instruments.

- Promotion of access and equity. This implies that the criteria against which students will be recruited, trained and assessed will be transparent, common and fair.

- Internal and external quality assurance of training programmes.

- Vertical and horizontal articulation: establishment of pathways between qualifications and facilitation of vertical and horizontal mobility. This is one of the major functions of the TVQF.

5.2 Process for developing key elements of the curriculum

In the following subsection, let us further analyse the OS-based curriculum development process which includes the following stages:

5.2.1 Identifying and sequencingtheLearning Outcomes (LOs)

In a competency based curriculum, the organisers of **learning, teaching** and **assessment** are the the Learning Outcomes (LOs). Each Learning Outcome describes a key area of skill and knowledge that the learner must ahieve.

That is, the LOs define what a trainee is expected to know, understand and do/demonstrate by the end of the training process. They are formulated by associating the elements of employability and occupational competencies into meaningful learning outcomes.

When **formulating LOs** keep in mind that they should:

- represent well-defined "achievements" to be acquired by the end of the training process;
- be feasible for the trainees;
- be specific, measurable and observable;
- be assessable;
- be referenced to thelevel descriptor of the relevant level of the TVQF

Also, it is recommended that:

- LOs should be formulated using an ***action verb*** that gives a concise description of the type of activity

1	Review occupational standards (OS)
2	Analyse the competencies and performance criteria in OS
3	Identify the secquence of learning outcomes (LOs) for each competency
4	Cluster/group related LOs into the Modules and Write the Module Purpose
5	Balance Sizes and determine the Duration/ Credit value and Level of each Module
6	Sequence and allocate Modules to Semesters/Terms
7	Identify and sequence practical learning and Assessment Tasks/Activities
8	Conduct Quality Check and Consistency Check (Review of the ovearll design aginst the OS)

that the learner must be able to do, for example, for knowledge statements one should use the verbs - state, define, recognize, describe; for functional understandingstatements – classify, identify, explain, apply; for problem solving statements – analyze, distinguish, select, estimate, create (according to Bloom's Taxonomy see **Appendix Three**).

- Such verbs as "understand" or "know""appreciate" should be avoided, since they are not measurable enough.

- LOs should be written from the learner's perspective - what should the learner be able to know and do at the end of the module that they did not know or could not do at the beginning.

  This can be expressed in the following statement: "By the end of the training the trainee should be able to…: for instance, plant vineyards, prepare soups and sauces, sew furniture covers" etc.
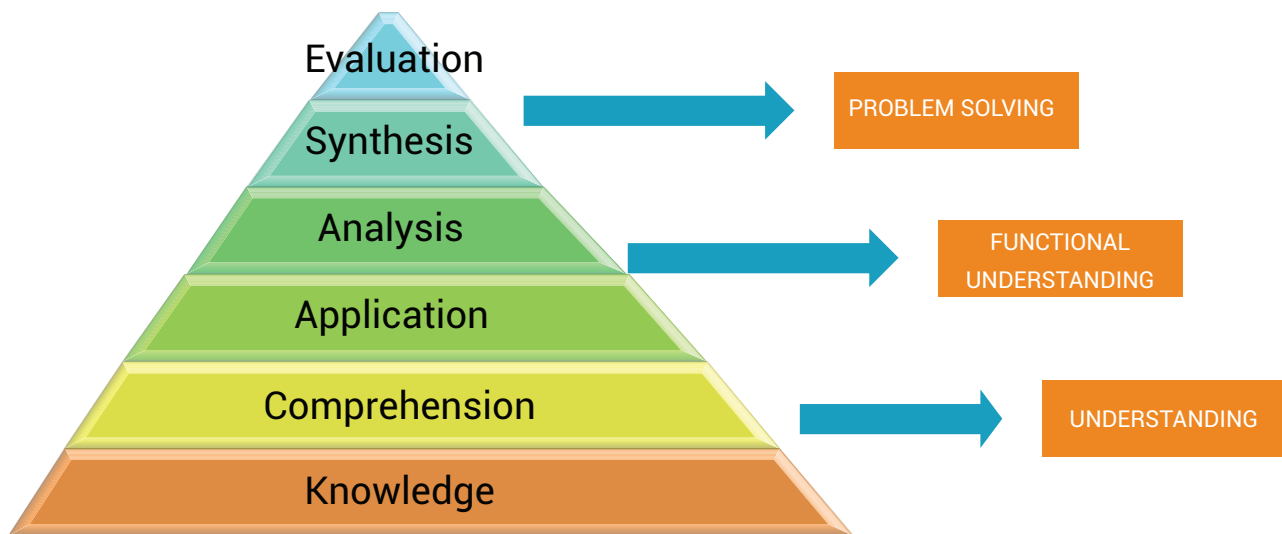
- No more than one single verb should be used when formulating a learning outcome.

- The statements should focus mostly on describing the results of the training process, not on the process itself that is, on what has been learned instead of on what has been taught.

- Each learning outcome should focus on one distinct aspect of learning that is required to meet the requirements of the qualification.

- LOs must focus on what is important; avoid the trivial. A learning outcome should capture in an integrated way the abilities, skills, attitudes and/or values that will demonstrate the achievement of that outcome.

- LOs should be general enough to encompasssignificant 'chunks' of learning, but specific enough to be observable and measurable (i.e. assessable).

A **Module** of the curriculum comprises a number of learning outcomes. The learning outcomes indicate the likely content of the module. There are no general rules on how many learning outcomes should be written for each module, as it depends on the range of knowledge and skills required to perform the work activity. However, as a guide, most modules should contain around 3-6 learning outcomes.

Any less and the module will probably be too general and vague to be of any real value to teachers in terms of planning appropriate teaching and learning strategies and learning activities and assessment tasks, or to learners in guiding their learning. Significantly more and the instructor and learners may lose sight of the big picture.

The diagramme below illustrates the application of Bloom's Taxonomy in TVET.

Outcome-Based Curriculum Development Methodology

A pyramid diagram of Bloom's Taxonomy with levels (bottom to top): Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation. Arrows point to: PROBLEM SOLVING, FUNCTIONAL UNDERSTANDING, UNDERSTANDING.

5.2.2 Writing Learning Outcomes for Knowledge (Cognitive Domain)

As well as learning practical skills, trainees also learn theoretical (underpinning knowledge and understanding) information to use in their job.

The application of knowledge is described through learning outcomes which outline remembering, understanding, application, analysis, evaluation and creation (See Bloom's Taxonomy **Appendix 3**).

When developing knowledge outcomes one must consider the purpose of the knowledge.

> Why should ....be taught?
>
> *Knowing this enables the learner to......*

The following are some examples of learning outcomes in the cognitive domain:

- Explain the menu to clients
- Describe the basic principles of operation of a DC generator

5.2.3 Writing Learning Outcomes for Practical Skills (Psychomotor Domain)

Thinking about questions such as the following, and responding helps develop good outcomes!

Why is it important to teach people how to use a microwave/printer?

We teach people to use a printer so that they are able to.................
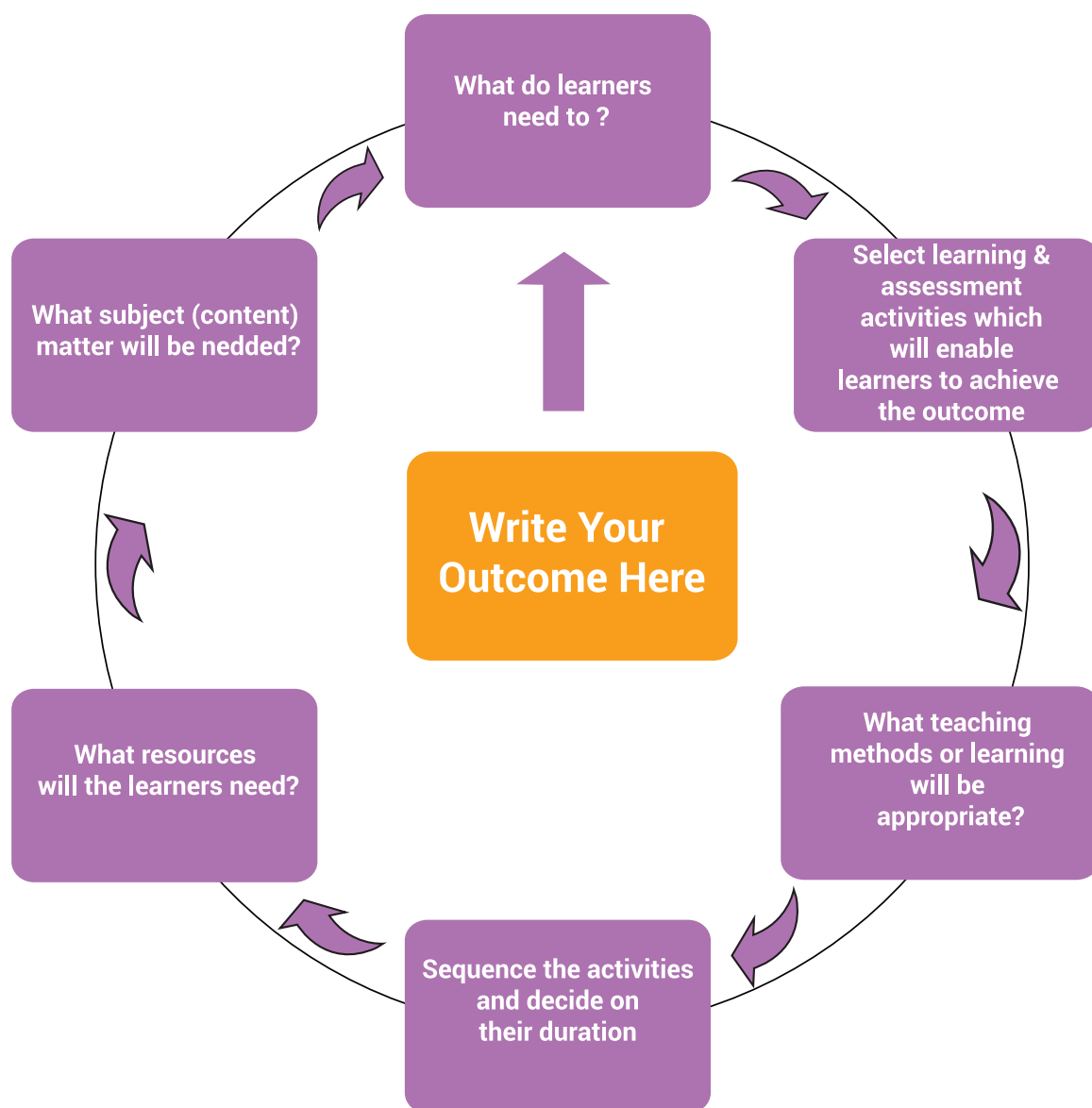
The following are examples learning outcomes for of psychomotor skills:

- Measure voltage, current and resistance in a dc circuit
- Overhaul an engine
- Construct a brick wall
- Make a pattern for a dress
- Bake bread

5.2.4 Writing Learning Outcomes for Attitudes/Behaviour (Affective Domain)

Learning outcomes for the affective domain are state observable behaviours which reflect the required values, attitudes and ethicswhich a competent worker should demonstrate during the performance of work tasks.The following are examples of outcomes in affective domain:

- Observe company safety rules and regulations.
- Be punctual.
- Work in a team.
- Maintain a clean and safe work environment

A circular cycle diagram with a central orange box reading "Write Your Outcome Here" and six purple boxes arranged in a circle, connected by arrows:

- What do learners need to ?
- Select learning & assessment activities which will enable learners to achieve the outcome
- What teaching methods or learning will be appropriate?
- Sequence the activities and decide on their duration
- What resources will the learners need?
- What subject (content) matter will be nedded?

5.3 Criteria and Guidelines for Quality Checking Learning Outcomes

- Are the LOs written starting with a clear and concise action verb followed by an object which sometimes has a qualifier?

- Are the LOs written in simple language, free of errors and free from the possibility of misinterpretation?

- Are the learning outcomes broad enough?

- Are the learning outcomes meaningful and significant and important to the sector?

- Are the learning outcomes worthy of formal recognition?

- Are the learning outcomes attributable to an individual and not a group achievement?

- Are the learning outcomes observable and measurable?

- Are the learning outcomes stated correctly and not ambiguous?

- Do the learning outcomes comprehensively cover the relevant competence and performance criteria in the occupational standard?

- Are the learning outcomes consistent with the module title?

- Are the learning outcomes sequenced?

- For each module do the learning outcomes cover all domains of learning i.e. knowledge, skills and attitudes (integration)?

Outcome-Based Curriculum
Development Methodology

- Are the learning outcomes "learner-centred" i.e. do they represent the behaviour to be demonstrated by the learner?

- Do the learning outcomes represent meaningful outcomes of learning for which a client is willing to pay?

- Do learning outcomes result in meaningful products, decisions and services?

- Are the learning outcomes broad enough not to be assessment criteria?

- Do the learning outcomes exclude words like like "correctly", "correct", "appropriate", "understand", "appreciate"etc.?

5.4 Identifying Assessment Criteria for each Learning Outcome (LO)

The table below provides a useful guide for the identification and writing of Assessment Criteria.

Areas for developing Assessment Criteria	What does the learner have to know or do?	Samples of stems for Assessment Criteria
1. Key terms	Are there any key terms that the learner must know the meaning of?	• State the meaning of ...... • Define the following terms ..... • Explain the following terms .... • Distinguish between the term XXX and YYY. • Identify the common names of ....
2. Features of a product or service	Is there a particular product or service that the learner must know the features of?	• List the characteristics of • List the key features of • Identify the different types, sizes of ... • Identify the ingredients of ... • Identify the parts of .... • Describe the different ratios for ... • Identify the different types of ...
3. Processes / concepts	Is there a key process e.g.: construction process, or concept e.g.: heat transfer in metal, which the learner must understand?	• Explain the ... • Explain the function of ...
	Are there reasons that the learner should understand that explain why a particular concept or why a particular process is used?	• State the reasons for ... • Explain the reason for ... • List the reasons for ... • Outline the reasons for ... • Explain the purpose of .... • Explain the use of
	Are there advantages / disadvantages or strengths / limitations associated with this process?	• State the advantages and disadvantages of.... • State the strengths and limitations of ...

4. Hazards and safety	Are there particular hazards associated with the work function?	• List the key hazards associated with … • Explain the hazards associated with …
	Is there personal protective equipment that the learner must use when performing the work function?	• List the personal protective clothing that is required when ….. • Explain the types and functions of the personal protective equipment used in…
5. Tools and equipment	Are there special tools and equipment that the learner must use to perform the work function?	• List the tools and equipment required to …. • Explain the types and functions of the tools and equipment used in …
6. Procedure	Is there a procedure that the learner must follow in performing a work function?	• Describe the procedure for …
	Does the learner have to show that he / she can perform the procedure?	• Apply the procedure for…. • Demonstrate the …
7. Typical problems	What are the typical problems that a learner may encounter when performing this work function?	• List the problems that may occur when…
	What are the possible remedies for the problems that the learner may confront when performing this work function?	• State the remedies for…

5.5 Clustering related Learning Outcomes into Training Modules

Modularisation involves the breaking down of learning into "chunks" of learning called **Modules**.

Each Module is stand-alone and represents a coherent meaningful package of learning which enhances employability.

5.5.1 What is a Module?

• Unit of learning

• Description of learning and teaching to be conducted

• Content of learning and teaching

• Learning , teaching and assessment strategies

• Resources and inputs required

5.5.2 Advantages of Modularisation of the Curricula

Aadvantages of a modular structure for a curriculum are:

• it facilitates **mobility of learners**, learner exchange programmes, and transfer of credit for 'packages' of learning;

• a modular curriculum facilitates **recognition of prior learning** for discrete groups of learning outcomes amounting to a cluster of competencies required in the work place, and thus it provides entry with credit to people who have on the job training and experience but lack the formal qualifications they need;

• it enables learners to take **'leave of absence'** from their programme and resume without having to substantially repeat material;

Outcome-Based Curriculum Development Methodology

- It enables learners to enrol in *specific selected Modules* required by employers, and they do not need to complete the whole programme if this is not what they need

- it facilitates learner achievement and progress by having a number of *discrete assessable components,* so that if a learner fails in one area s/he only needs to repeat one component, and not a whole semester or year's work

- *New Modules* can be developed on demand in order to satisfy some specific needs. This can be done without affecting the other constituting parts of the curriculum.

Some **criteria and guidelines** for identifying and clustering related LOs into training modules follow:

- **Relationship** in terms of learning, teaching and assessment: LOs which can be "learned", "taught" and "assessed" at the same time. Such LOs generally require the same learning and teaching resources. This is the major and most important criterion for clustering LOs.

- *Process:* This involves clustering LOs according to work process and flow of work e.g. Granulation, Drying, Colouring hair, Making patterns etc.

- *Systems:* LOs are also clustered according to different systems e.g. Safety and Hygiene; Communication, Self management etc.

The curriculum includes **Module descriptors** of each module including:

- Title of the module

- Level of the module

- Credit value of the module

- Co/pre-requisite modules

- Purpose of the module

- Learning Outcomes of the module

- Assessment Criteria for the achievement of each learning outcome

- Teaching and learning methodology to be used in delivery

- Assessment tasks (showing relationship to learning outcomes)

- Resources for the module

- List of recommended readings for the module.

An example of a module descriptor is provided in Appendix 4

5.6 Designing the Curriculum Outline

The criteria for sequencing modules include the following:

- *Logical sequence* of learning and teaching.

- *Complexity:* from the simple to complex.

- *Relationships between modules*: A module hierarchy should be developed showing modules which can be learned and taught together at the same level and indicating pre-requisitesi.e. modules which should be completed before beginning a specific module and co-requisites i.e. modules that can be trained concurrently.

In terms of timing, the size of a module can vary from *30 - 40 hours up to 120 hours* of total learning time.

However, the size of modules should be balanced. One module should not be too big and another one too small. There must be some consistency in relation to size across the whole batch of modules.

The size of a module is determined through the allocation of a credit value to the module based on total learning time. Modules are also assigned to different levels of the TVQF.

Each module has a credit value that reflects the workload of an average learner. The credit value will therefore signify the module's size or the volume of learning that has been undertaken.

Credits reflect the total learning time expected to take candidates to repeatedly meet the learning outcomes and assessment criteria.

In accordance with the TVQF **one credit** represents a notional *20 to 30 learning hours* which include time for orientation, face-to-face training, supervised and self-directed practice, industry-based learning, assessment and field trips. The learning time is "estimated" on the basis of a typical learner and reflects the time of a learner's efforts in learning. It is not a measure of training provider effort. The allocation of time must be fair to learners in terms of the actual effort required.

Credits must be whole numbers and must be consistent across modules with comparable learning outcomes, scope and contexts.

When the modules have been sequenced they are then allocated to semesters according to the complexity of the knowledge and skills described in the LOs.

The implementation and delivery strategy for a competency-based curriculum is based on the implementation of identified **learning and assessment activities** by learners.

5.6.1 Learning and assessment activities:

- develop problem solving skills

- are similar or equivalent to real assignments which someone who has completed a specific module or set of modules will be required to perform in the real world of work based on customer requests and requirements. They are developed based on both the curriculum and OS

- facilitate work process-oriented independent learning;

- result in the production of a product or service, and the planning and marketing thereof as is done in the real world of work

- include the development of employability skills in the context of the work process

- are performance dominated and allow more time for practical repetition and practice

- result in strong learner activation and motivation, experiential learning and discovery learning

- integrate technical craft competence, cognitive (knowledge) competence, affective (attitudes) and business and entrepreneurial competences; these competences are not developed one after the other but simultaneously;

- focus on what should be done during training and how this should be organized; they enhance practice orientation

- are based on real-life problems, typical customer needs, expectations and complaints;

- should, wherever possible, include sketches and drawings

- are carried out by individual trainees or teams of trainees; a team approach is recommended; trainees work in teams following written instructions

- must be complex and challenging and reflect the real complexity which workers face in the world or work

- are written in performance terms starting with an action verb.

For example:

> Build ....
> Construct ....
> Develop ....
> Manufacture ....
> Bake ....

5.7 Quality Checklist for Modular Curriculum

From a structural/functional point of view, curriculum should provide answers to the following questions:

- **Who** are the beneficiaries of education/training, what are their individual and age peculiarities, what are their educational needs, interests and expectations?

- **Why** orWhat for should the trainees undergo this training program – the educational objectives can provide an answer to this question?

- **Which** exactlyare the contents to be taught/learned or, what exactly has to be improved? These questions refer to the educational substance, to the selection and prioritization of the subject matter in a logical order.

- **How** exactly will the training process be carried out, what types of activities will the students be involved in? These are the questions which refer to the teaching/learning strategies as well as with the means and forms of organizing the teaching/learning activities.

- **In what conditions** from the perspective of venue, time and human resources should the training be carried out in order to guarantee the highest efficiency of the process?

- **How to assess** the effects, the results and the progress obtained? How to measure the efficiency of the performed teaching/learning activities? This imposes the need to develop objective assessment methods and perform assessment in full compliance with the expected learning outcomes and the circulated contents.

Content-wise, the quality of a curriculum can be measured by applying the following indicators:

Modules

- Is the module *"meaningful and comprehensive"*?
  - important in the sector
  - worthy of formal recognition
  - will make holder of MODULE "proud" of being recognized
  - attributable to an individual: it is not a group achievement
  - Size of a module: what fits industry needs
- Are the module *titles* written clearly and not ambiguous? Are pre-requisite modules clearly indicated?
- Is there consistency between the **module title** and the **learning outcomes** in that module?
- Is there consistency between the **module title** and the **content** of the module?
- Is the module **coherent**, *stand alone* and be *independent* from other modules?

Learning outcomes

- Do they derive from the *competences* demanded by the employer?
- Are they *sufficient* in number?
- Are they *aligned to the level descriptor* of the relevant level of the TVQF?
- Are they *unique* (or are they repeated in different forms)?
- Are they expressed in a way that allows for *cumulative effect* and further progress?

Assessment criteria

- Are they closely associated with the *learning outcomes*?
- Are they *observable* and *functional,* but not describing the evaluating method/activity?
- Are they *formulated explicitly,* without any ambiguities? Are they objective and lacking interpretable verbs?
- Do they specify the *performances expected* from thetrainee?

Learning activities

- Do they help to *develop* the expected learning outcomes?
- Do they suppose the *direct activity* of the trainee?
- Do they allow for *learning in cooperation*?
- Do they maintain trainee's *motivation* and *interest*?

Assessment activities

- Do they allow for collection and evaluation of the *evidence of achievement* of the specific Learning Outcomes of the module?
- Do they refer to the *norms, procedures* and *quality standards* of the evaluated products or services?
- Do they ensure the assessment of the trainee's performance with *real work tasks*?
- Are they *sufficiently varied* in order to allow for the assessment of all types of competencies?
- Do they provide for a *clear* and *straightforward* evaluationof the performance level of the trainee?

5.8 Applying for programme accreditation

The curriculum is at the heart of a new programme development, but many practical aspects of the launching and delivery of the new programme need to be worked out at the time of the development of the curriculum, before an application for programme accreditation is made. These aspects include the rationale for the programme, the philosophy of the programme, the entry requirements and selection criteria, pathways of the programme, programme regulations, management of workplace based learning and so on.

The best way to ensure that all information relating to the programme is easily accessible to all stakeholders is to package it into one document which becomes the 'encyclopaedia' of the programme, containing all the information that a new staff member or workplace supervisor would need to fully understand the background to the programme, the design of the programme and how it will be delivered.

CAQA has produced a proposed outline of such a comprehensive programme document, which is aligned to the accreditation criteria, and anticipates the information needs of various stakeholders of the programme. The curriculum *per se* is incorporated into this document. The outline is presented in **Appendix 6**.

International and regional best practices in OS Development

In **Scotland**, the structure of National OS (NOS) is standardized throughout the country. Functional Analysis is the base for the development of NOS. NOS are divided into units. Each unit describes a key part of someone's job. Units are split into elements, which contain performance criteria over a range of situations. Each unit specifies the knowledge, understanding, and skills that people need to do their jobs. Units are often introduced with a summary or commentary summarizing what the unit is about, who it is for, how it links to other units and how it fits into the Scottish Vocational Qualifications (SVQ)/National Vocational Qualifications (NVQ) framework.

The **structure of NOS** in the Scottish system is as follows:

• Units: The unit describes a key part of someone's job.

• Elements: Unitsare usually divided into two or more elements that describe the activities the person has to carry out.

• Performance Criteria: Each element contains clear performance evaluative statements that describe what effective workers do and the standards of quality they achieve.

• Range: NOS often specify the range of circumstances or situations that might have an important impact on the activity. These can help individuals prepare for the different contexts or contingencies that they could face.

• Knowledge, understanding and skills: NOS also specify the knowledge, understanding and skills that people need, to do their jobs effectively.

• Evidence requirements for NVQ and SVQ assessment: Each unit in the NOS is usually accompanied by a statement of the evidence that candidates need to submit in order to be assessed as competent.

• Technical data: This is the last part of the NOS and should include development and approval date, version number, indicative review date, validity, status (original or tailored) etc.

Mandatory NOS components:
• Unique reference number
• Title
• Overview/Commentary
• Performance criteria
• Knowledge and understanding
• Technical data

Optional NOS components:
• Elements
• Scope/range
• Behaviours
• Values
• Skills
• Glossary
• Links to other NOS

In **Canada**, the structure of the NOS varies among different industries. The methodology widely used for developing NOS is the DACUM approach. Following are some descriptive examples:

The Mining Industry Human Resources Council adopts the following structure for OS:

Area of Competence: A major function or responsibility of an occupation.

A. Task: A distinct, broad, measurable competency statement that outlines what a practitioner does within an area of competence.

B. Sub-Task: A distinct, measurable, activity that, when combined with other related activities, creates the logical steps to complete a task.

C. Reference: Examples of the types of knowledge and abilities required to complete the sub-task.

D. Contextual Information: Additional information on the task described which includes:

a) Frequency: defines how often the task is performed.

b) Importance: rates the importance of the task to job performance.

The Canadian Council for Aviation and Aerospace (CCAA) adopted the following structure:

A. Block: A general area which reflects a major function or responsibility of a particular occupation.

B. Task

C. Sub-task

D. Knowledge requirements to perform each task

E. Equipment and tools utilized to accomplish tasks and sub-tasks

The Ontario Association of Home Inspector adopted the following structure for the Home Inspectors' NOS:

A. Block/General Area of Competence.

B. Task: A specific, observable unit of work which is complete in itself (having a definite start and end point), which can be broken down into two or more steps (sub-tasks that can be performed in a limited period of time; and that when completed, it results in a product, service or decision; and that a worker is normally paid to do).

C. Occupational Context: Defines the parameters of the task, and provides additional information to amplify the nature of the task, and guidance on performance criteria.

D. Sub-Task: The smallest division, into which it is practical to subdivide any work activity.

E. Supporting Technical Knowledge and Abilities: The elements of skill and knowledge an individual must acquire to adequately perform a given sub-task.

F. Level of Learning (according to Bloom's Taxonomy): The taxonomy recognizes six different levels of processing thought. These levels relate directly to rigor and complexity in thinking and learning, and are provided as guidance to training providers and instructional designers:

Level 1: Knowledge – Ability to recall information

Level 2: Comprehension – Ability to understand information, and grasp its meaning

Level 3: Application – Ability to use ideas in particular situations

Level 4: Analysis – Ability to break down information into parts

Level 5: Synthesis – Ability to put parts of information together to form new knowledge

Level 6: Evaluation – Ability to make judgments about the value of information for a given purpose.

G. Personal and Professional attributes: Describes the generic attributes desirable for the individuals in an occupation. They can be used when defining the type of individual required for recruiting, retention, and advancement in an occupation.

In **Australia,** the National Competency Standards is the term used to describe the NOS, they are very much linked to training provision and constitute an integral part of a training package. A training package is an integrated set of nationally endorsed standards, guidelines, and qualifications for training, assessing and recognizing people's skills, developed by industry to meet the training needs of an industry or group of industries. Australian training packages include both employability and technical units.

Standards are unit-based and have the following structure:

A. **Unit descriptoris** aconcisely worded statement describing key areas of competency expressed in outcome terms.

B. Elements of Competency

   Elements of competency outline what an individual must do to fulfill work roles.They describe the essential outcomes of a Unit of Competency.

C. Performance Criteria

   Performance criteria are evaluative statements describing the level of performance expected for each element of competency. These aid assessors to determine whether the required level of excellence has been reached.

D. Required skills and knowledge to perform the unit.

E. Evidence Guide

   Evidence Guide provides further information on assessment including the contexts in which assessment should take place, which units or elements should be assessed concurrently and what constitutes sufficient evidence of competency as well as methods of assessment, critical aspects of the evidence to be considered, resource implications

F. Range of Variables

   Range of variables outlines the contexts in which performance must occur. These establish boundaries and constraints to be considered during the assessment of performance.

In **Saudi Arabia**, the development of skills standards is the responsibility of the Technical Vocational Training Corporation (TVTC) which is the government leading training provider in Saudi Arabia. Recently, TVTC has initiated a revision and update process of the 250 National Occupational Skills Standards (NOSS) available in the country. The endeavour started with NOSS that represent international best practice for each occupation, and then consulted with Saudi industry practitioners to identify those units that best match the needs of the local labour market. Industry practitioners were further engaged to review the details of each unit standard (performance outcomes, performance criteria, essential knowledge, skills, range and scope) to ensure compliance with Saudi cultural, religious, and legal requirements. The end products, therefore, reflect international standards that have been customized to Saudi Arabia's needs. So far, only 50 NOSS have been brought up to date, the other 200 will follow in 2014.

The new Saudi Skills Standards model on the Australian training packages, United Kingdom and New Zealand NOS. For each occupation, there is a Professional Advisory Group, which consists of people who have been practising the occupation for years and are considered top experts in their field, and who provide the content input. For each sector, there is a Sector Employer Validation Group which examines the NOS in detail, provides comments and recommendations, and gives clearance for approval.

The structure of the NOSS is as follows:

• Occupational Summary provides a brief description of the occupation in terms of main duties, work environment, work-based relations etc.

• Unit Standards described in terms of

   • Performance outcomes are the same as elements of competency and have the purpose to describe the main work activities/results under each unit.

   • Performance criteria are evaluative statements describing the level of performance expected for each performance outcome.

   • Essential Knowledge and Skills: This section states essential knowledge and associated physical and mental skills required for the unit.

   • Scope 1: Range: This sectionstates the tools, equipment, systems, processes and techniques used in the performance of this unit.

   • Scope 2: Conditions: This section states the conditions that the unit covers – requirements from external third parties and organizational requirements such as established internal procedures.

In **Turkey**, the Vocational Qualifications Authority is responsible for the establishment and operation of a Vocational Qualifications System and related NOS. The first step in developing NOS is analysis of sector/occupation needs, also called occupational mapping. The next step is to develop an occupational profile by means of literature research, review of available NOS and international ones, workshops (conducted in line with the DACUM approach), surveys, observation and individual expert opinion, and further elaborate it into a NOS.

The NOS in Turkey include the following components:

- Introduction to the Occupation
  - Definition of the occupation
  - Reference to ISCO
  - Occupational Health, Safety and Environment regulations
  - Other relevant legislation
  - Work environment and conditions
- Occupational Profile
  - Duties, activities and performance criteria
  - Tools, Devices and Equipment used in the job
  - Knowledge and skills
  - Attitude and Behaviors
- Testing, assessment and certification
  - Methods of assessment
  - Context of assessment
  - Institutions in charge

Having considered the case countries examples, the following conclusion is deemed necessary: regardless of adopted format or methodology, the NOS should reflect the up-to-date labour market requirements, be competency-based, include both employability and technical skills, and elaborate on the performance criteria needed to assess efficient practice of an occupation.

Appendix

2

International Best Practices in Outcome-Based Curricula Development

In **Canada** NOS are the building blocks for curricula development. There are two types of standards that have been established in relation to VET besides the NOS:

Training Standards and Curriculum Standards. Training Standards are designed to support consistency and accountability within the on-the-job training process; ensuring that apprentices are developing the skills necessary for success in their trade.

Training Standards are written in concise statements that describe how well an apprentice must perform each skill in order to become competent in the job. A Training Standard consists of several parts including a competency analysis profile (CAP). CAP is a document that identifies the training needs of an occupation and details the skills/skill sets that must be demonstrated. It forms the base of the training curriculum.

CAP is presented in a chart format consisting of the Skill Sets (alias "units of competency") and Skills (alias "elements of competency"). The skills sets are defined as the group of individual skills found in the Training Standards (may also be called Training Unit or General Performance Objective). The Skill refers to the individual skills that make up the skill set.

The Curriculum Standards are designed to support consistency and accountability within the in-school training process; ensuring that apprentices develop the knowledge and skills necessary for success in the trade.

The Curriculum Standards are based on the Training Standards. They start with a Program

Summary listing the skill sets (named, Reportable Subjects) and the number of training hours for the theory and practical parts. This is followed by the general learning outcomes, learning outcomes for each skill, evaluation structure, and the equipment and tool needed for each skill, as listed below:

1. Skill Set Title
2. Duration (theory and practical)
3. Prerequisites
4. Co-requisites
5. Cross reference to Training Standards
6. General learning outcome, outlining what the learner will be able to demonstrate upon completion of the course.
7. Learning outcomes for each skill under the skill sets.
8. Evaluation structure, which shows the percentage distribution of scores on the theoretical part, the practical part, and final assessment; for example:
   - Theory 30%
   - Practical 40%
   - Final assessment 30%
9. Equipment and tools needed to learn each skill.

In **Australia** training curriculum includes national training packages and accredited courses which outline the qualifications, competencies and assessment criteria for specific areas of training. Training Packages consist of the following nationally-endorsed components:

• Competency Standards

- Assessment Guidelines

Competency standards are industry-determined specifications of performance that set out the skills, knowledge and attitudes required to operate effectively in a specific industry or profession. The "Competency Standards" section contains all the units of competency that are included in a certain qualification. Each unit identifies a competency outcome and also includes the required knowledge and skills/enablers that underpin competencies necessary in the workplace.

Assessment Guidelines provide the framework for accurate, reliable and valid assessment using the Training Package. They ensure that assessments are comprehensive, consistent and valid, and provide important quality assurance means in issuing qualifications.

Each Training Package is assigned a qualification level. The level is determined by the combination of units that are required for the qualification to be awarded.

Non-endorsed components of training packages include a range of resources to facilitate the learning and training which are called "support material" and may include:

- Learner guides
- Assessment tools
- Professional development material
- Trainee record book, etc.

Trainers and assessors have the freedom to choose which particular support materials they use to meet the requirements of the training package and the needs of the clients.

Competency-based training (CBT) is an approach to vocational education and training that is widely used in Australia. CBT places emphasis on what a person can do in the workplace as a result of completing a training program.

The following aspects characterize the approach:
- CBT programs are often comprised of modules broken into segments called learning outcomes, which are based on standards set by industry, and assessment is designed to ensure each learner has achieved all the outcomes required by each module.

- For a person to be assessed competent, he/she needs to demonstrate the ability to perform tasks and duties to the standard expected in employment. CBT focuses on the development of the skills, knowledge and attitudes required to achieve the competency

standards.

- One of CBT features is that learner's achievement is measured against the competency standards rather than against the achievement of other learners.

- Under the CBT approach, each learner is assessed to find the gap between the skills he/she needs (as described in the Training Package) and the skills he/she already has. The difference between the two is called the skills gap. A training program is then developed to help the learner acquire the missing skills.

- In many cases, the learner has no current skills and the training program is a full curriculum based course. However, the learning outcomes achieved through the curriculum are derived from the competencies described in the Training Package for the desired qualification.

In **Saudi Arabia** OS are used as a base for developing the training plans and training packages. Plans for the different qualifications are set identifying the courses to be taught, prerequisites, and the number of units. An outline for each course is developed as follows:

1. General description of the course
2. General Objective
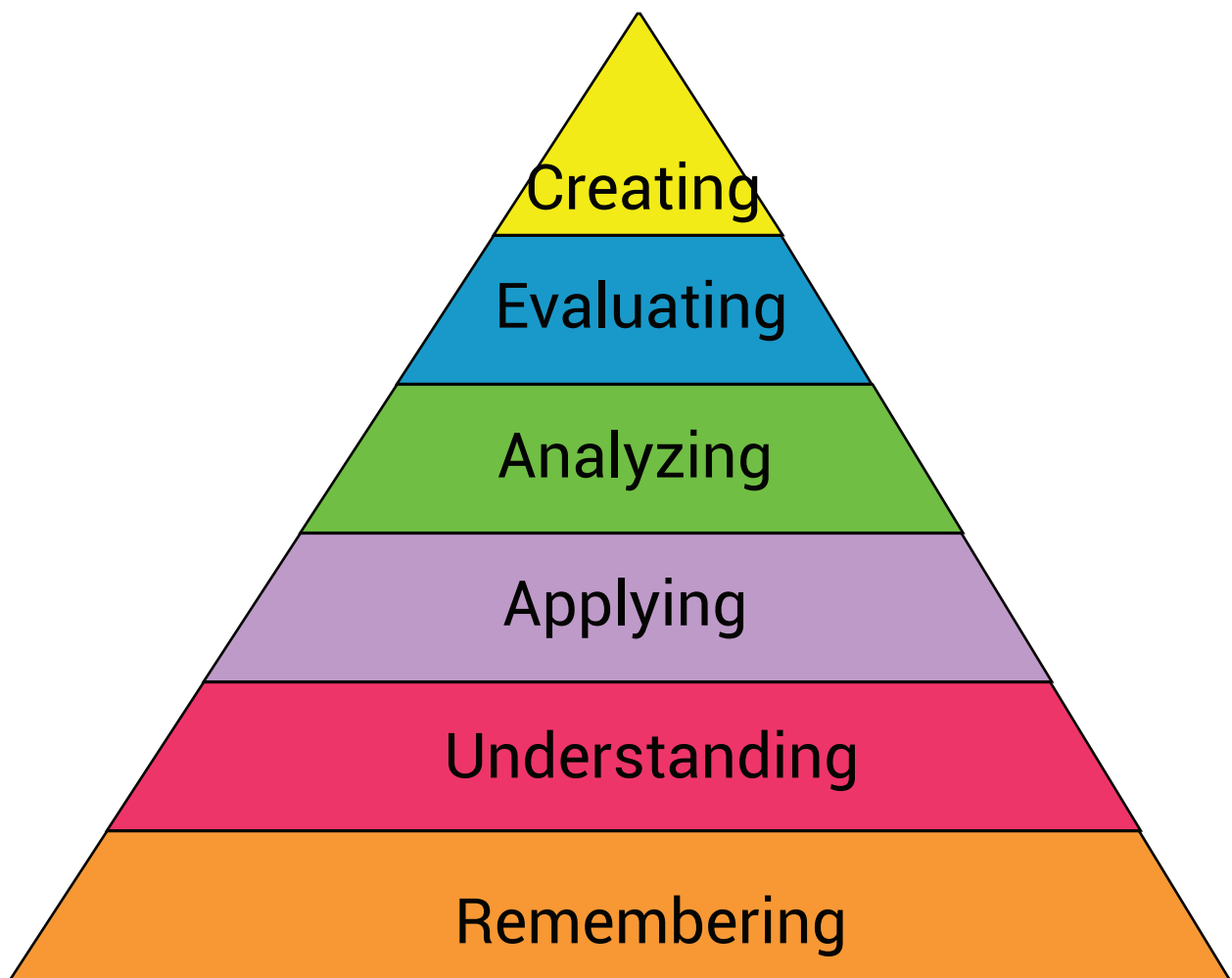3. Topics/Contents and Timing
4. References

Training Packages consist ofunits; the first unit is usually concerned with safety procedures in the work place, which gives general guidance and instructions on safety issues.

Each unit consists of:
1. General objective.
2. Behavioural objectives indicating what the trainee will be able to do upon completing the unit.
3. General instructions for the trainee regarding applying good behavioural practices and conduct such as wearing the work uniform, keeping the training place tidy and clean, applying good manners when dealing with colleagues and instructors, punctuality, etc.
4. Content of the unit.

Generally speaking, the vocational curricula/training packages are heterogeneous to a great extent since the development methodologies are not as regulated as the ones for OS and allow for more flexibility and creativity as long as the workplace requirements are fully integrated.

Bloom's Taxonomy

Creating

Evaluating

Analyzing

Applying

Understanding

Remembering

Bloom's Taxonomy Action Verbs

Level	Definition	Sample verbs					Sample behaviors
KNOWLEDGE	Student recalls or recognizes information, ideas, and principles in the approximate form in which they were learned.	arrange define describe duplicate	identify label list match	memorize name order outline	recognize relate recall repeat	reproduce select state	The student will define the 6 levels of Bloom's taxonomy of the cognitive domain.
COMPREHENSION	Student translates, comprehends, or interprets information based on prior learning.	explain summarize paraphrase describe illustrate classify	convert defend describe discuss distinguish estimate explain	express extend generalized give example(s) identify indicate	infer locate paraphrase predict Recognize	rewrite review select summarize translate	The student will explain the purpose of Bloom's taxonomy of the cognitive domain.
APPLICATION	Student selects, transfers, and uses data and principles to complete a problem or task with a minimum of direction.	use compute solve demonstrate apply construct	apply change choose compute demonstrate discover dramatize	employ illustrate interpret manipulate modify operate	practice predict prepare produce relate schedule	show sketch solve use write	The student will write an instructional objective for each level of Bloom's taxonomy.
ANALYSIS	Student distinguishes, classifies, and relates the assumptions, hypotheses, evidence, or structure of a statement or question	analyze categorize compare contrast separate apply	change discover choose compute demonstrate dramatize	employ illustrate interpret manipulate modify operate	practice predict prepare produce relate schedule	show sketch solve use write	The student will compare and contrast the cognitive and affective domains.
SYNTHESIS	Student originates, integrates, and combines ideas into a product, plan or proposal that is new to him or her.	create design hypothesize invent develop arrange assemble	categorize collect combine comply compose construct create	design develop devise explain formulate generate plan	prepare rearrange reconstruct relate reorganize revise	rewrite set up summarize synthesize tell write	The student will design a classification scheme for writing educational objectives that combines the cognitive, affective, and psychomotor domains.
EVALUATION	Student appraises, assesses, or critiques on a basis of specific standards and criteria.	Judge Recommend Critique Justify Appraise Argue	Assess Attach Choose Compare Conclude Contrast	Defend Describe Discriminate Estimate Evaluate Explain	Judge Justify Interpret Relate Predict	Rate Select Summarize Support Value	The student will judge the effectiveness of writing objectives using Bloom's taxonomy.

Example of a Module Descriptor

Module Code: P101

Module Title: Current Good Manufacturing Practices and Documentation

Purpose: Learners who complete this module will be able to apply the basic concepts and principles of Current Good Manufacturing Practices (cGMP) related to the pharmaceutical manufacturing industry. The learners will have a basic understanding what cGMPs are, why they are important and how they are used.

The learners will be able to interpret, complete, use and store the different documents and records used by a machine operator in the pharmaceutical production process including batch manufacturing records, SOPs, process and production orders.

Compliance with cGMP and the following of a proper documentation system is critical for enhancing the safety, quality, efficiency and effectiveness of the production process and the quality of the products.

Credits: 4

Pre-requisite modules: N/A

Level: 3

Learning Outcomes and Assessment Criteria

Learning Outcomes	Assessment criteria	
LO 1: Interpret the provisions of Current Good Manufacturing Practices (cGMP).	1.1	Explain the meaning and significance of the concept and principles of cGMP in the pharmaceutical production process in relation to Quality Assurance and Quality Control.
	1.1	Define Quality Assurance and Quality Control in relation to cGMP.
	1.1	Interpret relevant cGMP abbreviations.
	1.1	Identify cGMP quality assurance and quality control and basic cGMP requirements in relation to different elements including personnel, premises, equipment, materials and other good practices in production.
	1.1	Describe the cGMP personal sanitation and hygiene program and the prevention of cross-contamination.
	1.6	Apply the provisions of cGMP to all work processes.
LO 2: Manage documents and records.	2.1	Describe the importance of documentation and record keeping in the pharmaceutical manufacturing process.
	2.1	Describe the importance and significance of having SOPs for a proper and systematic documentation and record keeping process and the need to follow organisational hierarchy.
	2.1	Identify the reasons for having a system and SOPs for the coding, security, confidentiality and storage of documents and records.
	2.1	Outline the procedure for issuing, distrubuting and destroying documents and records.
	2.1	Distinguish the different documents and records used by a machine operator in the pharmaceutical manufacturing process as part of cGMP including: labels; documents and records for testing procedures; specifications for bulk and finished materials; master formulae and batch manufacturing records; SOPs and records; log books; SOPs on sampling procedures; In-Process Control (IPC).
	2.1	Interpret the meaning of the different parts of the documents and records.
	2.7	Describe the coding system used for the different documents and records.
	2.8	Fill in the different documents and records in accordance with SOPs including machine and production roomrecords and identification cards/labels, and records of malfunctions of machines.
	2.8	Explain the procedure for correcting documentation errors.
	2.10	Comply with the requirements of all documents and records including process orders, production orders and work forms and records.
LO 3: Apply the requirements of batch manufacturing records.	3.1 Distinguish the different components of batch manufacturing records and their meanings.	
	3.2 Interpret the data in batch manufacturing records.	
	3.2 Fill in batch manufacturing records.	
	3.2 Calculate the actual yield against the expected yield.	

Approach to Teaching and Learning:

1. Face-to-face tuition.
2. Independent reading and research including internet research.
3. Group discussions.
4. Practical exercises.
5. Case studies.

Learners should have access to samples of all documents, forms and records.

Approach to Assessment: This module cuts across all the other modules of this course. Although there will be some assessment of knowledge which will be conducted under this specific module, the learning outcomes and assessment criteria of this module will be applied and assessed under every module.

Assessment tasks:

1. Practical exercises on interpretation, handling and completion of different documents and records: all LOs.

Textbook for the module:

(State here the names of recommended textbooks and reference materials).

Example of a
Module Descriptor

Outline of an application for accreditation

1. Development of the programme	

1.1 Rationale for the programme:	• If this is a revision:
	  • What currently exists?
	  • When was the programme first offered?
	  • What was the original purpose of the programme?
	  • What problems/issues does the revision respond to?
	
	• Who is the target group?
	• How will graduates benefit - specify the likely employment or further study outcomes
	• To what extent is the programme responding to community needs or labour market issues/demands including availability of job opportunities, skills requirements, capacity building etc.? What indicators are available from demand/supply surveys or needs assessment?
	• What is the evidence that the programme is needed now in the country? What are the trends internationally and regionally? Is there anything in the NES or Sector Strategic Plan that support the need for the programme?

1.2 Consultation and support for the development of the programme:	• Who led the development of the programme? • What has been the process of developing the programme? • Which occupational profiles or occupational standards were used to inform the development? • What has been the input of teaching staff, qualified external experts, and industry representatives? • Who has been consulted and how was their feedback incorporated into the design? • What factors were taken into consideration in the development e.g. alternative modes of delivery, use of technology, International context? • What is the evidence of the international comparability of the programme?
1.3 Projected numbers	Show projected numbers for the next 3-5 years: • How many students will be accepted each year • How many graduates will be produced each year?

2. Programme details	
2.1 Programme leading to the qualification	2.1.1 Title of the programme 2.1.2 Vision/mission/philosophy of the programme 2.1.3 Aim(s) and objectives of the programme 2.1.4 Graduate profile of graduates of the programme
2.2 Qualification(s) to be awarded	Final, exit or embedded qualifications: 2.2.1 Title of the qualification(s) to be awarded 2.2.2 Level of the qualification 2.2.3 Credit value of the qualification 2.2.4 Awarding authority 2.2.5 Minimum requirements for the attainment of the qualification 2.2.6 Occupational licence(s) that the graduate will be eligible to apply for
2.3 Entry requirements	2.3.1 Entry criteria (Realistic minimum requirements for entry with no unnecessary barriers to entry) 2.3.2 Selection criteria (Sound and appropriate justification for any selection criteria) 2.3.3 Provision for RPL and credit transfer
2.4 Pathways of the Programme:	Diagram or narrative showing: • Entry pathways into the programme (e.g. with lower level/obsolete qualifications or non-standard entry) • Exit points within the programme • Employment and higher education destinations after completing the programme
2.5 Structure of the Programme:	**2.5.1 Duration of the programme** • Years and semesters of the programme • Number of teaching weeks per year/semester of the programme • Total hours per week of student learning time divided into contact hours, supervised hours and self-directed learning hours **2.5.2 Courses of the programme** • Level and credit value of each course • Sequence of courses • Core, optional and elective courses • Pre-requisites and co-requisites • Total hours of each course divided into contact hours, supervised hours and self-directed learning hours **2.5.3 Balance of theory and practice** • Indicate courses which are mainly theory and which are fieldwork/work based practice

2.6 Delivery methods	• How will the programme and its components be delivered • Justify delivery mode in terms of efficiency and effectiveness • Explain how flexible delivery methods meet the needs of the target group of learners • Describe arrangements for managing learner progress and achievement in the field/ workplace (e.g. MoU, logbook)
2.7 Assessment and re-assessment	2.7.1 Assessment methods used in the programme 2.7.2 Regulations for assessment and re-assessment 2.7.3 Recording of marks/achievements (What is the grading system or competency based system to be used for the programme)
2.8 Other specific regulations of the programme	For example: • Regulations for attendance • Regulations for voluntary exit/deferment • Regulations for dismissal/expulsion from the programme • Regulations for work placement components • Regulations for academic dishonesty • Guidelines for dealing with issues of concern including complaints, appeals against an assessment decision
2.9 Student information	2.9.1 Programme Handbook 2.9.2 Textbooks and other required resources to be purchased by trainees 2.9.3 Any costs or fees over and above basic tuition fees
2.10 Quality assurance processes	2.10.1 Internal and external moderation of assessment • What is the system/cycle for internal moderation of assessment? • What is the system/cycle for external moderation of assessment? 2.10.2 Programme review processes • How frequently will the programme be reviewed? • What will the process be? • Who will be involved? • How will international comparability be assured? 2.10.3 Learners' evaluation of teaching and learning • What is the cycle/system for getting learner feedback on their programme/courses/ teachers? 2.10.4 Quality assurance of results/eligibility to graduate • How does the provider assure itself of the accuracy of results – what is the process for checking for anomalies/quality problems? 2.10.5 Programme Annual reporting • What are the processes for preparing/ receiving/following up annual reports? • What information is included in annual reporting?

3 Resources for the programme	
3.1 Staff of the programme	State the qualifications and experience of the relevant: 3.1.1 Support staff 3.1.2 Technical staff (attach CVs) 3.1.3 Teaching staff (attach CVs)
3.2 Other resources, facilities and accommodation	For each type of resource distinguish between what is currently available and what is needed: 3.2.1 Physical facilities and resources • Classrooms and furniture • Laboratories/workshops and equipment • Clinical areas, if needed • Offices • Computers, teaching aids, learning materials 3.2.2 Library • Books • Journals • Databases 3.2.3 Financial • Adequacy of financial resources available to support the programme • Annual budget for the programme
3.3 Advisory/ consultative group for the programme	3.3.1 Members of the Advisory Group 3.3.2 Terms of Reference of the Advisory Group 3.3.3 Latest minutes of Advisory Group
3.4 Student support services	Outline the services that are available to learners e.g. Student Association, learning skills support, pastoral care, counselling, health, careers advice

Part B Course descriptors of the programme

For each course state:

- Title of the course

- Level of the course

- Credit value of the course

- Co/pre requisite courses

- Purpose of the course

- Learning outcomes of the course

- Performance criteria for the achievement of each learning outcome

- Teaching and learning methodology to be used in delivery

- Assessment tasks (showing relationship to learning outcomes)

- Textbook(s) for the course

- List of recommended readings for the course.

Appendices

Examples of documents to be attached as Appendices if not covered in the body of the application:

- Letters of Support including support from industry, professional bodies

- Market Research Report

- List of Advisory Committee Members; Terms of Reference, Minutes of the Advisory Committee

- Programme Handbook

- Brochure

- Memorandum of Agreement for work based learning

- Curriculum vitae of staff

- List of textbooks, with cost

- Library conspectus report

- List of equipment

- Budget for the programme

- In accordance with the CAQA By-law applicants are also required to submit a full set of the actual training materials to be used in the delivery of the programme.

Other occupational profiling methods

There are several methods of developing occupational standards. Regardless of the different procedures all approaches lead to the same result which is identification of the skills, knowledge and behaviours required to do a job; determination of the importance of each aspect and setting of performance standards for the occupation in the labour market.

CUDBAS is a Japanese approach to developing curricula using occupational analysis. CUDBAS analyses any occupation to the smallest detail. It is similar to DACUM except that in the CUDBAS approach each participant writes his/her contributions to the analysis and gives it to the facilitator so there is objectivity in the discussion of anonymous contributions.

CUDBAS Features

- Work is possible for a short time.
- Procedure is simple and easy.
- A method is based on brainstorming by a small group.
- If authorities make, a result will same as persuasive contents.
- Record remains.
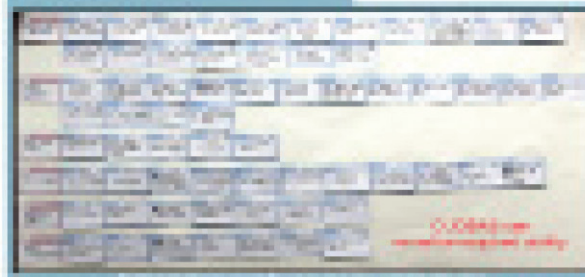- The application range is wide.

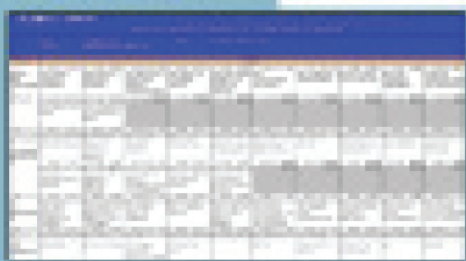**Small Group Activity**
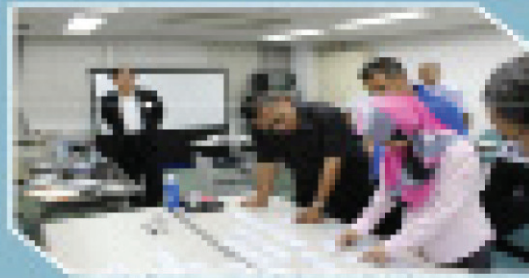
Brainstorming & Card Arrangement

Product 1: CUDBAS Chart

CUDBAS Software

Occupational Analysis is another approach to determining the duties and tasks of an occupation. It includes:

1. The name and code and level of the occupation

2. The duties of the occupation at each level

3. The tasks of each duty, bearing in mind that each duty is a group of related tasks which together form a result which is observable and measurable

4. The skills (knowledge, performance and attitudes) required for each task

5. The importance of each skill

occupations based on:

- The need for training programmes
- The need for assessment tools at each level
- Availability of classification and description

2. Form an Occupational Analysis Committee including providers, employers, unions and syndicates and CAQA

3. Train the committee to conduct the analysis

4. Conduct the analysis

5. Present the analysis to the relevant Sector Team for validation

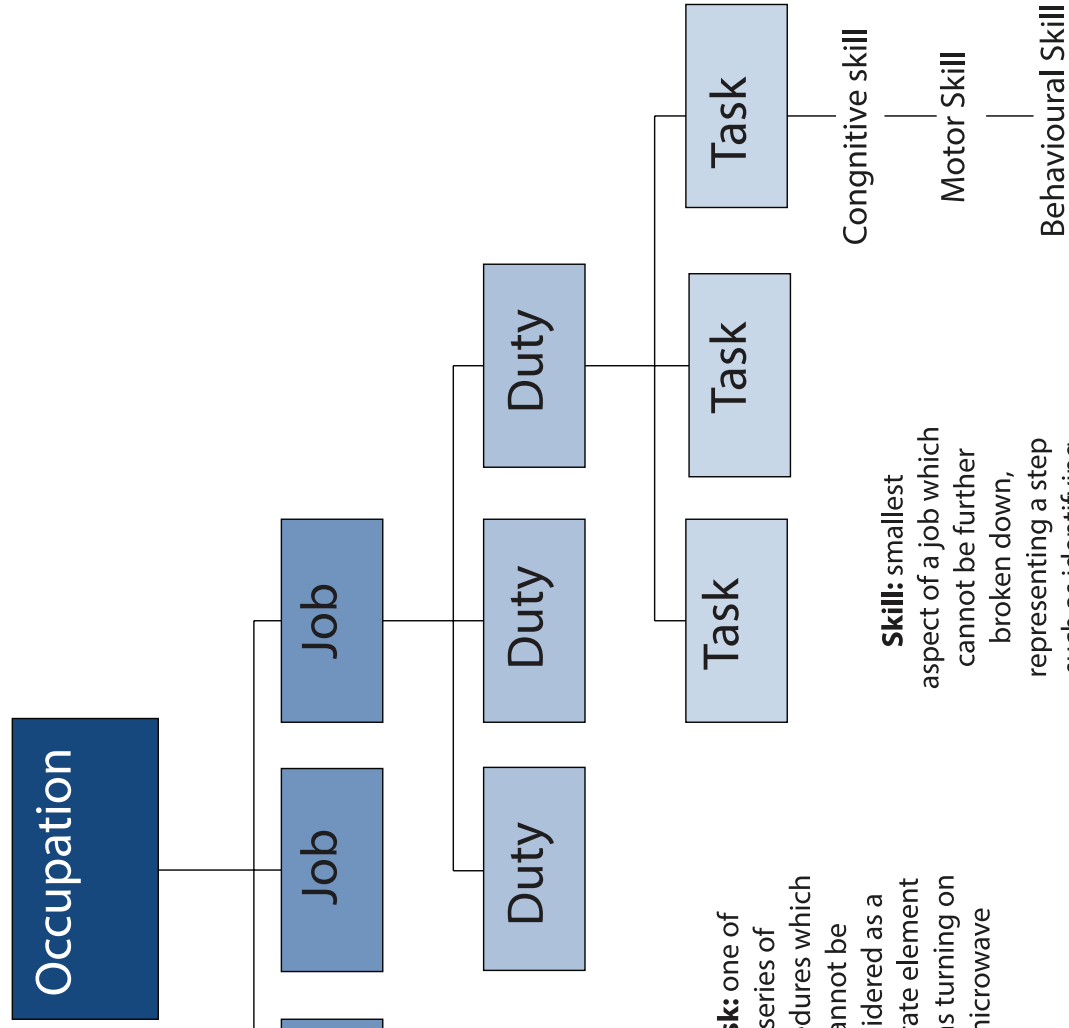6. Present to the CAQA Steering committee and E-TVET Council for approval

Other occupational
profiling methods

Occupation: a
group of jobs of a
similar nature
usually at different
performance levels
e.g. Food
production

Job: a group of
duties assigned to
a worker who gets
paid for performing
them such as
western cuisine
chef

Duty: a complete
discrete work unit
that takes time to
perform such as
preparing
equipment used
for food
preparation

Task: one of
a series of
procedures which
cannot be
considered as a
separate element
such as turning on
a microwave

Skill: smallest
aspect of a job which
cannot be further
broken down,
representing a step
such as identifying
sypes of micowaves

Occupation

Job

Job

Job

Duty

Duty

Duty

Task

Task

Task

Congnitive skill

Motor Skill

Behavioural Skill