

*"Applying the G20 Training Strategy – A Partnership of the ILO
and the Russian Federation (Phase II)"
Project*

APPROACHES TO DEVELOPING COMPETENCY-BASED VET PROGRAMS
Stock-taking technical report

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July 15, 2019

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Glossary

Term	Source	Working Definition
Competency	Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP)	1) Ability to use knowledge, skills and personal, social and/or methodological abilities in work or study situations and in professional and personal development” 2) Ability to apply learning outcomes adequately in a defined context (education, work, personal or professional development)
Qualification	Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP)	The concept covers different aspects: • Formal qualification: the formal outcome (certificate, diploma or title) of an assessment process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards and/or possesses the necessary competence to do a job in a specific area of work. a qualification confers official recognition of the value of learning outcomes in the labor market and in education and training. a qualification can be a legal entitlement to practice a trade (OECD); • Job requirements: knowledge, aptitudes and skills required to perform specific tasks attached to a particular work position (ILO).
Qualification’s framework	Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP)	Instrument for development and classification of qualifications (at national or sectoral levels) according to a set of criteria (using descriptors) applicable to specified levels of learning outcomes. or Instrument for classification of qualifications according to a set of criteria for specified levels of learning achieved, which aims to integrate and coordinate qualifications subsystems and improve transparency, access, progression and quality of qualifications in relation to the labor market and civil society. Comment: a qualification framework can be used to: • establish national standards of knowledge, skills and competences; • promote quality of education; • provide a system of coordination and/or integration of qualifications and enable comparison of qualifications by relating qualifications to one another; promote access to learning, transfer of learning outcomes and progression in learning.
Type of qualifications	Linking credit systems and qualifications frameworks.	A broader group of qualifications that may have certain common characteristics but may be different

	An international comparative analysis. - Luxembourg: Publications Office of the European Union, 2010	in terms of levels, volume or programs leading to them
Standard of competency	Definition of the report's authors	Specially structured description of qualifications in terms of the learning outcomes developed by the experts focus groups and using for assessment and learning purposes Competency standards are used by professionals and governments to define the qualifications required for the labor market. Usually, standard of competency consists of units including title, performance criteria, critical skills and essential knowledge statements for learners, teachers and curricula developers; the evidence guide for assessors
Learning	Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP)	Process by which an individual assimilates information, ideas and values and thus acquires knowledge, know-how, skills and/or competences. Learning occurs through personal reflection, reconstruction and social interaction. It may take place in formal, non-formal or informal settings
Learning outcomes	Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP)	Set of knowledge, skills and/or competences an individual has acquired and/or is able to demonstrate after completion of a learning process, either formal, non-formal or informal or Statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and workplace performance
Curriculum/programme	Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP) Definition of the report's authors	Inventory of activities related to the design, organization and planning of an education or training action, including definition of learning objectives, content, methods (including assessment) and material, as well as arrangements for training teachers and trainers. <i>Comment:</i> the term <i>curriculum</i> refers to the design, organization and planning of learning activities while the term <i>programme</i> refers to the implementation of these activities. <i>Competency-based curriculum/programme</i> The curriculum/program developed on the base of standard of competency leading to the full development of the planned objectives - learning outcomes, (qualification or it's part) – due to the special developed content and chosen methods (including assessment) and training of teachers and trainers.

Module	Definition of the report's authors	Part of the program or an independent program developed on the basis of a competency standard unit
Assessment of learning outcomes	Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP)	Process of appraising knowledge, know-how, skills and/or of learning outcomes competences of an individual against predefined criteria (learning expectations, measurement of learning outcomes). Assessment is typically followed by certification.
Credit	ECVET Terminology, European Parliament and European Council, 2009	A set of individual learning outcomes which have been assessed and which can be accumulated towards a qualification or transferred to other learning programmes or qualifications
Qualification assessment criteria	Definition of the report's authors	The signs on which the assessment of the learning outcomes is based; formalized description of the estimated key parameters of the process (algorithm) or the result of an activity

Introduction

The stock-taking technical report was prepared in the framework of the project "Applying the G20 Training Strategy – A Partnership of the ILO and the Russian Federation (Phase II)". The report provides an overview of international practices in the development and application of vocational training programs based on the principles of competence, including an analysis of the main approaches in this field practiced in the countries of Asia and Europe, Australia and the USA.

The structure and the content of the report allows its use for holding a seminar in the countries of the G-20 project participants for curriculum developers and as a methodological basis for the implementation of pilot projects in the participating countries to develop VET programs based on the principles of competency.

I. COMPETENCY-BASED APPROACH TO VET

1.1. *Meaning of competencies*

Competency-based approach to VET develops and spreads all over the world since the end of 20th – beginning of 21st centuries. One of the main reasons – social-economic changes (growth of knowledge in the age of information society, effects of globalization on economic systems and associated labor markets, technological changes throughout the world; diversity of qualifications and convergence of occupations, professions; the threat of economic crisis and unemployment and at last demographic developments) leading to the changes on understanding concept "qualification". The definition of qualification - document (certificate, diploma, etc.) recognizing that a person has achieved and demonstrated learning to a certain standard (*EQF recommendation, 2008*) – required to specify what standard means in new economic conditions. It was (and is) necessary to make qualification's descriptions transparent and comparable for different countries. Another reason - bridging the gap between labor and education spheres, ensuring the implementation of the LLL principle.

Competency-based approach became the solution for modernization both qualification's and VET systems in absolute majority countries in the world. It is based on ideas of active learning and emphasize the dynamic role of social relationships and the situations in which learning takes place. Several new terms and concepts were born on the base of competency-based approach.

First among them are competence (competency) and learning outcomes. According to the different researches and publications two approaches are opposed. They connected with the understanding of the VET results as outputs and outcomes. "Output can be defined as the results of learning¹ in an educational context, whereas the outcome of learning is the capacity of an individual to implement what he or she has learned in a 'real life' professional context"².

¹ For Russian-speaking readers it's important to emphasize the meaning of the words "to learn", "learning". Translating into Russian we often understand translation in meaning "teach" and/or "study". But there is another one: "self-learning", "self-development". This is very important for understanding competency-based approach methodology. "Learning is the process by which an individual assimilates information, ideas and values and thus acquires knowledge, know-how, skills and/or competences. Learning occurs through personal reflection, reconstruction and social interaction. It may take place in formal, non-formal or informal settings" (Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP).

² The dynamics of qualifications: defining and renewing occupational and educational standards. Cedefop. Luxembourg: Office for Official Publications of the European Communities, 2009 – VI, 75 pp.

Description of competences (and understanding them) in terms of the learning outcomes is the first approach. It includes two trends (or routes, paths) – British and American. Both of them are connected with the labor sphere and, we can say, were born inside it.

The UK approach called “functional”. The UK system of national vocational qualifications are based on national occupational standards (firstly called standards of competency, by the way). This approach is focused on the outcomes; competences describe functions and roles, requirements of the workplace needed in an occupation. According to the functions competences integrated into units. Such competency-based standard defines knowledge (what learner will know and understand) and skills and behaviors (what he or she will be able to do). This approach has been adopted in many countries, for example, in Cyprus, Malta, Australia.

USA approach called “behaviorist” can be considered as close to the UK approach. But it emphasizes the role of person’s behavior on the workplace leading to the effectiveness of work. Competencies reflects the capabilities of a person. They describe what he or she can do (but, may be, not really do), regardless of the situation and conditions. Such vision, from European point of view, makes difficult assessment procedures in terms of the qualification. This approach is more commonly used in the United States and some American continent countries.

Fundamentally different second approach has been developed in Germany. It considers competences in terms of the learning outputs. Germany has no occupational standards. The approach is based on the concept of action competence (Handlungskompetenz) as subject-centered including implicit knowledge and skills. The role of the learner in the context of a profession (Beruf) and in society is important for this approach. “Handlungskompetenz” includes four dimensions: occupational competence (Fachkompetenz), personal competence (Personalkompetenz – attributes of a person), methodological competence (Methodenkompetenz) and social competence (Sozialkompetenz). Educational standard (called “Regulation on profession”) has two parts. First, school-based, includes outputs as learning objectives; second part, work-based, includes the main activities, tasks and knowledge areas identified in the Berufsbild (professional profile). A checklist is used to ensure that skills and knowledge acquired in the workplace are also treated in class. Other countries with a VET system resembling the German system are adopting similar approaches, for example, Denmark, Switzerland and Austria³.

Obviously, the reason for the different approaches is different historical and socio-economic background of the countries, their different goals ascribed to VET in general and to qualifications in particular. But despite these differences, standards targeting learning outcomes or learning outputs now are considering as competency-based standards. The comparison of such standards (or equivalent documents) in different countries shows that along with differences there are similarities. And common understanding of the concept “competency” is possible.

The definitions for this concept are “ability to use knowledge, skills and personal, social and/or methodological abilities in work or study situations and in professional and personal development” or “ability to apply learning outcomes adequately in a defined context (education, work, personal or professional development)”⁴. Competence is not limited to cognitive elements (involving the use of theory, concepts or tacit knowledge); it also encompasses functional aspects (including technical skills)

³ We can state that such approach is closer for the Russian VET system despite the fact that occupational and educational standards are being developed and applied in Russia. We will explain this situation further.

⁴ Terminology of European education and training policy. Second edition. A selection of 130 key terms. (2014) Luxembourg: Publications office of the European union; European Centre for the Development of Vocational Training (CEDEFOP).

as well as interpersonal attributes (e.g. social or organizational skills) and ethical values⁵. We will stick with this understanding in this report.

1.2. Requirements to knowledge, skills and workplace performance in standards of competency and competency-based qualifications

Requirements to knowledge, skills and workplace performance are connected with qualification's level. Since the beginning of the 21-st century different international organizations and associations, different countries began to develop qualifications frameworks as tools for matching and streamlining qualifications. Qualifications framework is an instrument for developing and classifying qualifications (e.g. at national or sectoral level) according to a set of descriptors applicable to specified levels of learning outcomes (LO).

The competency (or standard's unit) consists of a set of knowledge, skills and workplace performance. Speaking about the requirements to knowledge, skills and workplace performance we are based on the ILO point of view that competency standards are primarily developed as assessment tools. They define the skills, knowledge, and attributes people need to perform a work role⁶. Learning outcomes are central to such standards.

LO can be defined as statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and workplace performance. This absolutely new term was chosen because it brings absolutely new sense, leads to the new paradigm of education, including VET. It shifts focus from providers to users of education and training. By explaining what a learner is expected to know, understand or be able to do at the end of a learning process, individuals will be better able to see what is offered in a particular course and how this links with other courses and programs. It is also an effort to increase transparency and strengthen accountability of qualifications – for the benefit of individual learners and employers. In a situation where lifetime jobs have become exceptions and where moving between work and learning has become a significant factor in most people's lives, learning outcomes may help to reduce barriers and build bridges⁷.

EU Member States has developed their national qualifications' frameworks in reference to European Qualifications Framework (EQF)⁸.

For the ASEAN Member States the ASEAN Qualifications Reference Framework (AQRF) has been developed⁹.

The core of the EQF is its eight reference levels defined in terms of learning outcomes, i.e. knowledge, skills and autonomy-responsibility. Learning outcomes express what individuals know, understand and are able to do at the end of a learning process.

⁵ Ibid.

⁶ Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016.

⁷ Aviana Bulgarelli, Cedefop Director //The shift to learning outcomes. Policies and practices in Europe. (2009) Cedefop Reference series; 72. Luxembourg: Office for Official Publications of the European Communities.

Another sources: Coles M., Andersen T., Luomi-Messerer K., Ulicna D. Using learning outcomes – discussion note. - Prepared by GHK Consulting as part of the Framework Contract DG EAC 19/06, August, 2010;

Kurpal S. R. Labour-Market Flexibility and Individual Careers. A Comparative Study. - Technical and Vocational Education and Training Series, 13. – UNESCO-UNEVOC. – 2011.

⁸ See: <http://www.cedefop.europa.eu/en/events-and-projects/projects/european-qualifications-framework-efq>

⁹ Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016.

The AQRF¹⁰ level descriptors include two domains:

- Knowledge and Skills
- Application and Responsibility

The Knowledge and Skills domain includes the various kinds of knowledge such as facts and theories as well as the skills used, such as practical and cognitive skills.

The Application and Responsibility domain defines the context in which the knowledge and skills are used in practice as well as the level of independence including the capacity to make decisions and the responsibility for oneself and others.

The level descriptors assume that the learning outcomes are cumulative by level. In other words, one level assumes that the knowledge, skills and conditions at one level include those at the lower levels. In addition, the domains must be read together to give a true indication of level.

Compare descriptions of the 3-5 levels in EQF and AQRF which in different countries may referring to the qualification types of qualified workers and technicians (see Tab. 1 and Tab. 2).

Table 1. Descriptors defining 3-5 levels in EQF

	Knowledge	Skills	Responsibility and autonomy
	In the context of EQF, knowledge is described as theoretical and/or factual.	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).	In the context of the EQF responsibility and autonomy is described as the ability of the learner to apply knowledge and skills autonomously and with responsibility
Level 3 The learning outcomes relevant to Level 3 are	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Take responsibility for completion of tasks in work or study; adapt own behavior to circumstances in solving problems
Level 4 The learning outcomes relevant to Level 4 are	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and

¹⁰ See: <https://asean.org/asean-economic-community/sectoral-bodies-under-the-purview-of-aem/services/asean-qualifications-reference-framework/>

			improvement of work or study activities
Level 5 The learning outcomes relevant to Level 5 are	Comprehensive, specialized, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others

Table 2. Descriptors defining 3-5 levels in AQRF

Knowledge and Skills	Application and Responsibility
Demonstration of knowledge and skills that:	The contexts in which knowledge and skills are demonstrated:
Level 3 • includes general principles and some conceptual aspects • involve selecting and applying basic methods, tools, materials and information	• are stable with some aspects subject to change • involve general guidance and require judgment and planning to resolve some issues independently
Level 4 • is technical and theoretical with general coverage of a field • involve adapting processes	• are generally predictable but subject to change • involve broad guidance requiring some self-direction and coordination to resolve unfamiliar issues
Level 5 • is detailed technical and theoretical knowledge of a general field • involve analytical thinking	• are often subject to change • involve independent evaluation of activities to resolve complex and sometimes abstract issues

The outcomes or competency standards of a qualification are benchmarked. This is because they are the key critical skills that learners must demonstrate to gain award of the qualification. The competency standards remain the fixed reference point¹¹.

The description may be different depending on approach. Standards may be very detailed and binding in a regulated system like the UK, or they might be rather unspecific to allow different forms of implementation, as in the German dual system where work-based training is provided in companies which may be very different¹² (compare Tab. 3 and Tab. 4¹³).

¹¹ Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016.

¹² The dynamics of qualifications: defining and renewing occupational and educational standards. - Cedefop panorama series. Luxembourg: Office for Official Publications of the European Communities, 2009.

¹³ Examples are given by the publication: The dynamics of qualifications: defining and renewing occupational and educational standards. - Cedefop panorama series. Luxembourg: Office for Official Publications of the European Communities, 2009. – P. 32-33.

Table 3. Example of the professional profile of the vocational qualification in logistics (Germany)

Position in the professional profile	Skills and knowledge, which have to be conveyed involving autonomous planning, executing and controlling capacities of the student
Sending goods and transport	Compare performance of transport modes (road, rail, air, water). Assess adequacy of transport modes for specific goods, taking into account norms and regulations. Make use of the possibility of combining different modes of transport. Choose a transport route following economic and geographic criteria. Assess capacities in combined transport modes. Describe the organization of transport as one core element of logistics, and explain the difference with own-name operation. Choose service providers, especially freight carrier. Make arrangements for transportation means and technical equipment with regard to charging and discharging schedules. Describe area of application of handling technologies and equipment

Source: Ausbildungsordnung Kaufmann/Kauffrau für Spedition- und Logistikdienstleistungen (2003).

Table 4. Example of standards, vocational qualification “Logistics operations management” (Scotland, UK)

Unit LOM6 Utilise transport modes in logistics operations	
You will be able to: 1) Review the nature of the supplies being handled in the logistics operations 2) Identify the main transport modes and transportation routes used to deliver the supplies to their destination 3) Identify any factors that affect the transportation of the supplies 4) Select the most suitable transport modes to enable supplies to reach their destination according to the organisation’s requirements 5) Coordinate logistics resources to work effectively with the selected transport modes 6) Ensure the data that is required to use the transport modes is processed correctly	You will know and understand: Transport modes a) advantages and disadvantages of different transport modes b) types of vehicles used in different transport modes c) major routes, transport hubs, and destinations d) geography of routes and destinations Legislation and regulations e) legislation and regulations relating to health, safety, and logistics operations

7) Report work activities and record them in the appropriate information systems according to organisational procedures 8) Comply with all relevant work and safety legislation, regulations, standards, and organisational procedures	f) sources of information on legislation and regulations g) regulatory bodies and their compliance requirements Organisational procedures h) roles, responsibilities, and management systems i) working practices, operating procedures, guidelines, and codes of practice j) information systems and communication methods used by the organisation
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Source: National occupational standards (NOS) directory. See: www.ukstandards.org

Competencies have the abstract nature. Knowledge, skills and workplace performance are the descriptions, specifications of the competency. It's important to keep balance in their number and degree of detailing in description. A set of knowledge, skills and workplace performance should describe the key positions important in professional activity. They should allow judgements to be made by assessors against the quality of performance in the workplace. And on the other hand, knowledge, skills and workplace performance referring to the competency (standard's unit) becomes critical assessment points during learning process by module or the program (curricula). They influence to the learning conditions which should be performed by learning providers in terms of the practical part. But they can't capture the holistic education and training needs of learners. In this sense, curricula's outputs are based on the standards of competency but always wider than standard.

In conclusion, let mention the main requirements to knowledge, skills and workplace performance in standards of competency and competency-based qualifications:

- they must fully disclose the content of the competency to which they relate;
- they must correlate among themselves (for example: for be able to identify the main transport modes and transportation routes used to deliver the supplies to their destination – should know and understand a) advantages and disadvantages of different transport modes; b) types of vehicles used in different transport modes ; c) major routes, transport hubs, and destinations; d) geography of routes and destinations);
- they must be diagnostic in relation to qualification (or its' part) taking into account qualifications' level;
- in the framework of the set knowledge, skills, workplace performance referring one competency the number of each group separately (knowledge, skills, workplace performance) should not exceed 10.

1.3. *Packaging and unpacking standards of competency and qualifications for the purpose of VET*

Packaging standards of competency and qualifications is the process making by the rules. Algorithm recommended by ILO includes five stages¹⁴.

1) Selection industry or sector (s)

Standards of competency describe not each (single) occupation but the whole industry or the main sectors of industry. Common knowledge, skills and workplace performance **sets** (core, generic competencies) should be identified. Specific technical competencies could be added if necessary (important for the industry). But this description should be relevant to the requirements of the whole industry.

2) Forming an expert focus group

Such focus group (advisable) includes representatives from typical enterprises across the industry; employer bodies and associations; workers' organizations and employee representatives (trade unions, may be); professional associations; representatives of VET system (teachers, trainers); regulatory or licensing bodies, where relevant, etc.

The focus group in whole should

- a) represent the breadth of the industry;
- b) have current knowledge of the skills required to perform the roles within the industry;
- c) be able to consult with industry when seeking feedback and validation;
- d) have time to commit to the lengthy development process; and
- e) advisable have experience in such work.

3) Determination functional areas of competence

This is very difficult task solving by different techniques. For example, technique called the "day in the life of" and recommended by ILO as "Competency International Limited's training needs analysis process .. shared to promote a systematic approach to competency design"¹⁵.

Technique supposes answering questions to specify vocational (professional) activity requirements step by step.

Step 1: What roles exist within this sector?

Step 2: What tasks do these people do every day, every week, every month, every year?

Step 3: What knowledge, skills, and attributes do these people need to do these tasks?

Step 4: How can these be grouped into functional areas of competence?¹⁶

Identifying roles depends on the classifications of industry sectors and their occupations existing in the country and are corresponded with qualifications' levels and types. For example, in the automotive electrical and electronics industry, there may only be one role, that of automotive technician. Here, this one role becomes the focus of determining the functional areas of competency. In some countries in the domestic worker industry, there are a number of roles including cleaner, cook, gardener, etc.

¹⁴ See: Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016.

¹⁵ Ibid., P. 10.

¹⁶ Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016. – P. 10-11.

Focus group should answer what roles are typically for the selected industry and what tasks are typical for each role (performed on a daily, weekly, monthly, and yearly).

It's possible to use such form for this work:

Table 5. Example of roles and tasks performed on a daily, weekly, monthly, and yearly (domestic worker sector)

Role	Tasks			
	daily	weekly	monthly	yearly
Cleaner	Dispose of household waste. Clean floors, surfaces, furniture, appliances, upholstery, windows. Use cleaning agents. Wear protective clothing. Store cleaning agents and equipment. Wash and iron clothes. Operate cleaning equipment.	Do inventory of cleaning supplies. Inform employer of any issues.	Produce accounts.	
Cook	Clean food preparation areas. Prepare food in a hygienic way. Identify hazards. Cook food: baking, blanching, boiling, frying, etc. Serve food.	Clean all food preparation areas. Dispose of food waste. Order supplies. Plan menu.	Clean all food preparation equipment. Produce accounts.	Do stock take of food staples

Next step - identify what knowledge, skills, and attitudes people need to perform these tasks to the required level. You need answer the questions:

What do you need to know to do this task?

What skills do you need to have to do this task?

What attributes do you need to do this task?

And it's possible to use this form:

Table 5. Knowledge, skills, and attributes that underpin all tasks (domestic worker sector)

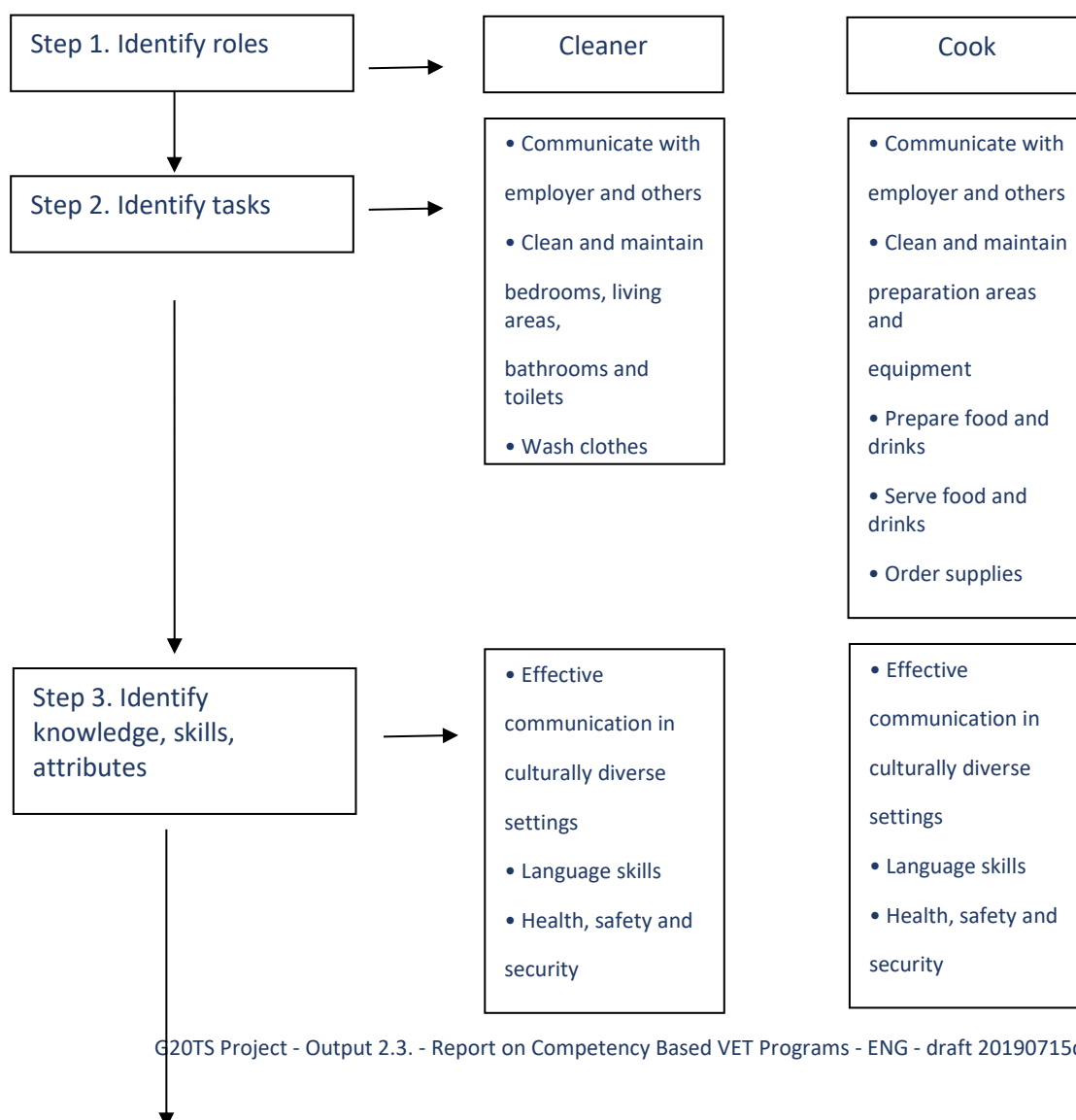
Role	Tasks	Knowledge	Skills	Attributes
Cleaner	Dispose of household waste.	Health and safety. Cleaning agents, disposal of waste.	Managing different cleaning tasks with different cleaning agents.	Effective communication in culturally diverse situations.
	Clean floors, surfaces, furniture, appliances, upholstery, windows. Use cleaning agents. Wear protective clothing. Store cleaning agents and equipment. Wash and iron clothes. Operate cleaning equipment.	Operating cleaning and ironing equipment. Waste recycling.	Managing waste disposal. Laundering and ironing. Effective communication. Calculating supply requirements. Language skills. Managing workload.	Honesty.
Cook	Clean food preparation	Health and safety.	Planning and making food:	Effective communication in

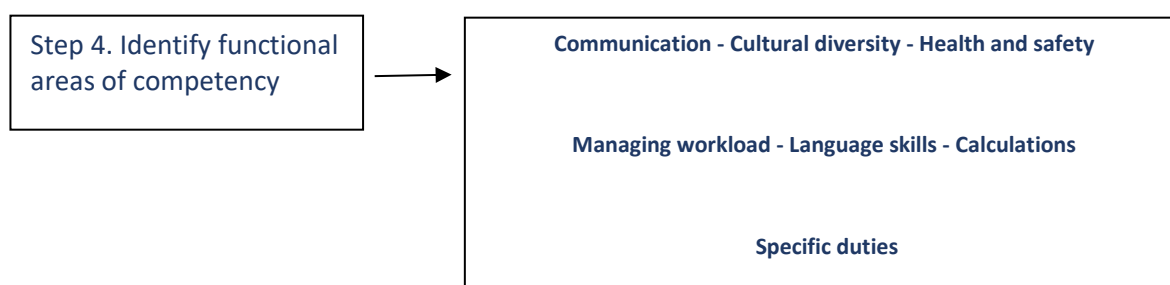
	areas. Prepare food in a hygienic way. Identify hazards. Cook food: baking, blanching, boiling, frying, grilling, roasting. Serve food.	Food preparation and handling. Calculating ingredients. Hazard identification. Dietary requirements. Preparation and cooking techniques. Serving techniques.	baking, blanching, boiling, frying, grilling, roasting. Serving food. Using and maintaining equipment. Language skills. Managing workload.	culturally diverse situations. Honesty.
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Source: Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016

On the base of knowledge, skills and attributes sets it is necessary to determine the common themes – functional areas of competency (see Figure 1).

Figure 1. Process for determining functional areas (domestic workers)





Source: Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016

The competency standards are then developed for each area:

Table 6. Functional areas (domestic workers)

Functional area	Code	Unit title (competency standard)
A Core competencies	DS-A1	Communicate effectively in a domestic work environment.
	DS-A2	Work in a socially and culturally diverse workplace.
	DS-A3	Maintain health, safety, and security in a domestic work environment.
	DS-A4	Plan, organize, and manage own work.
	DS-A5	Undertake calculations relevant to domestic work.
	DS-A6	Use a language other than the local language to communicate in a domestic work setting.
B Domestic cleaning and basic housekeeping	DS-B1	Apply basic cleaning principles to perform cleaning tasks.
	DS-B2	Clean and maintain bedrooms and living area.
	DS-B3	Clean and maintain bathrooms and toilet facilities.
	DS-B4	Wash clothes, linen, and fabrics.
	DS-B5	Iron and store laundered items.
	DS-B6	Clean and operate basic household equipment.
C Cooking and food handling	DS-C1	Clean and maintain food preparation, storage, and service areas.
	DS-C2	Follow basic food safety practices.
	DS-C3	Organize and prepare basic food in a domestic setting.
	DS-C4	Serve food and beverages

Source: Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016

Examples for Electrical fitter mechanic see in Appendix 1.

As usual, competency standards consist of several components¹⁷:

- The Unit title expresses the main outcome that someone who is credited with the standard has demonstrated they know and/or can do.
- The Description describes the purpose of the standard. Often the description is a collation of the competency standards elements.
- The Elements tell the learner what they should be able to do. Elements are outcome statements that describe the more detailed outcomes that learners' knowledge and skills are assessed against. Together the elements comprise the outcome expressed in the title. In order to be credited with the standard, a learner must achieve all of the outcomes described in the element statements.
- Performance criteria tell the learner how they can show that they are competent. The criteria specify the critical evidence required to meet the outcome. Together the evidence requirements provide the standards against which the outcomes are assessed.
- The Evidence guide consists of guidance notes for assessors to help them determine when competency has been achieved. The notes may contain information about the conditions and context of assessment, suitable methods and resource implications.
- Critical skills and Essential knowledge statements are brief. They outline what the person needs to actually do to perform their work (critical skills). They must also include what the person needs to know to be able to perform in an informed and effective manner (essential knowledge).

In countries with competency-based standards, the packaging/unpackaging process is relevant to curriculum development but can also be connected with the concept of "credit"¹⁸. The description of the learning outcomes related to a specific unit or module which may be given credit correspond to a certain level of National Qualifications Framework (NQF). Thus, each unit or module which may be given credit can be assigned a certain qualification level. In addition to the descriptors in the NQF, as a rule, for each qualification level, a number range of credits required to attain a qualification at this level is given.

Packaging means reaching the understanding of the qualification structure concerning credits. Different qualifications can consist of the different set of competences (credit units) packaged in different combinations. The difference can be in the level and significance for the qualification. Whilst the result of packaging is a decision about necessary volume and "credit content" of qualification and possible VET pathways leading to it, packaging decisions should also be guided by judgements about how the particular combination of units or modules meet a labour market need.

In theory, qualifications can be achieved "step by step", as each part of the qualification can be considered as a separate element. In this case, learning process can have different exit points and VET programs leading to the whole qualification or to its part can be different in nominal duration (or credit) according to the particular level on the qualifications framework.

Learning outcomes are used as one of the effective ways of transition from programs and educational systems tied to a time frame, to programs and educational systems based on individual educational pathways that are more relevant to the principle of lifelong learning.

¹⁷ ILO Guidelines accumulated different practices of developing competency standards existing in different countries. You may see similar approach of Singapore in **Appendix 2**.

¹⁸ See more: Linking credit systems and qualifications frameworks. An international comparative analysis. - Luxembourg: Publications Office of the European Union, 2010.

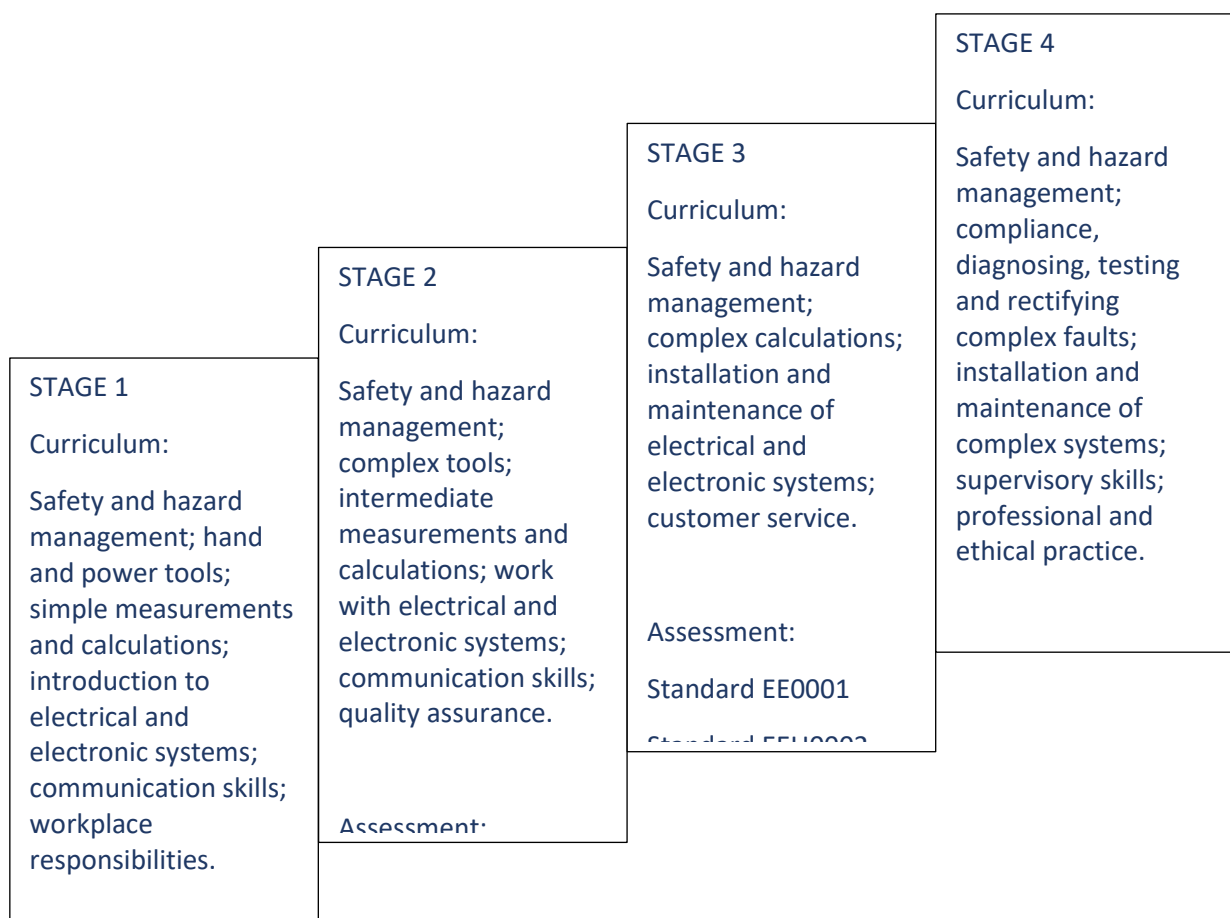
For example, the National Certificate in Electrical Fitter Mechanic, Level 48 (Fiji Higher Education Commission) is made up of the following 13 competency standards (table 7). The curriculum and subsequent training programme is delivered over four stages. Each stage is not necessarily linked to a competency standard, but the stages, when taken together, meet the competency requirements (figure 2).

Table 7. Competency standards: National Certificate in Electrical Fitter Mechanics, Level 4, Fiji Qualifications Authority

Identifier	Title
EE0001	Use tools and equipment in electrical fitter mechanic operations.
EE0002	Carry out calculations and measurements for use in electrical fitter mechanic operations.
EE0003	Install, test, and commission low-voltage electrical components, motors, appliances, and fittings.
EE0004	Maintain and service low-voltage electrical components, motors, appliances, and fittings.
EE0005	Diagnose and rectify faults in low-voltage electrical components, motors, appliances, and fittings.
CG0031	Shut down and isolate machines and equipment.
CG0007	Communicate effectively in the workplace.
CG0001	Apply customer service skills.
CG0013	Apply safe working practices in a workplace.
CG0021 v2	Practice accountability in the workplace.
CG0037	Access and apply technical information.
CG0038	Act professionally and ethically as a tradesperson.
CG0002 v2	Apply quality assurance processes in the workplace.
CG0009 v2	Develop supervisory skills in accordance with workplace requirements.

Source: Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016

Figure 2. Curriculum: National Certificate in Electrical Fitter Mechanic, Level 4, Fiji Qualifications Authority



Source: Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016

Unpackaging standards of competency and qualifications for the purpose of VET has the specific rules, too. They will be considered in the part II of this report. This work requires special analysis. As we have stressed, the standards of competency are presented as tools of assessment with learning outcomes and assessment criteria. Unpackaging them for the purpose of VET should be supported by learning topics including practical and theoretical parts.

The learners will be expected to be taught and develop the knowledge and skills required to achieve the learning outcomes.

Critical skills and essential knowledge grouped together, constitute the most significant competences which are the critical points of the curricula, but they do not capture the holistic education and training needs of the learners¹⁹. Curricula development should only occur after a thorough training needs analysis process. Any curriculum design must go beyond competency standards and take into account general educational and general professional part of the learning outcomes (see paragraph 2.6).

Unpackaging takes into account:

¹⁹ Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016

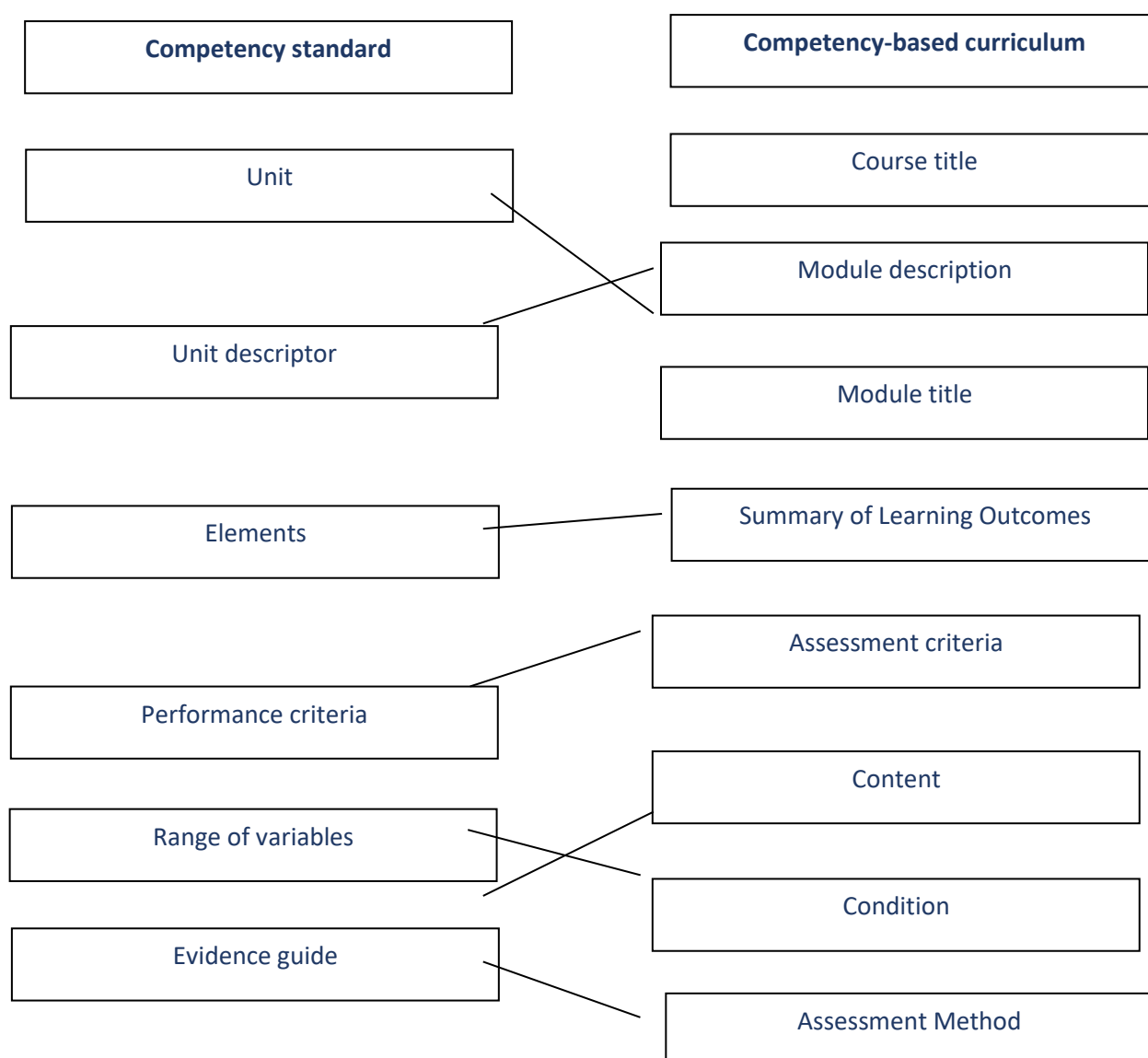
- 1) Specifications of the competency standards.
- 2) Background and requirements of the learners or trainees.

The process of development involves representatives from industry, curriculum developers and teachers or trainers experienced in the subject matter/industry sector.

It is necessary to identify the relationship between the components of competency standard and competency-based curriculum. In different countries they may have specific in the structure and elements. For example, Technical Education and Skills Development Authority of Philippines describes such relationship as it is on Figure 3.

Figure 3. Relationship between the components of Competency

Standard and Competency -based curriculum



In many countries different professional associations, societies, expert bodies, guilds, institutes etc. take the responsibility for developing model curriculum or recommendations, teaching guides to help VET providers in developing of competency-based programs.

Some examples. American Society of Health-System Pharmacists has developed Model Curriculum for Pharmacy Technician Education and Training. In the overview to the Forth edition it is written that “The Model Curriculum reflects changes to the ASHP Accreditation Standard for Pharmacy Technician Education and Training Programs that was approved by the ASHP Board of Directors in April 2013. The new set of goals took into consideration the most recent task analysis by the Pharmacy Technician Certification Board and other current trends. The new Standard is intended to be responsive to changes in the pharmacy profession and the evolving role of pharmacy technicians”²⁰.

Model Curriculum includes objectives and instructional objectives for each of the goals (competencies), as well as examples of learning activities for each portion of the program, including the didactic, simulated (lab), and experiential program components²¹ (see Tab. 8).

²⁰ Ibid., P. 3.

²¹ Model Curriculum for Pharmacy Technician Education and Training Programs. Forth Edition. - American Society of Health-System Pharmacists, 2015.

Table 8. Fragment of the Model Curriculum for Pharmacy Technician Education and Training (USA)

Personal/Interpersonal Knowledge and Skills

Goal 1: Demonstrate ethical conduct in all job-related activities. Teaching Strategy Examples* *Suggestions only. Other options possible at discretion of program*

Objective	Instructional Objectives (IOs)	Didactic	Simulated (Lab)	Experiential
1.1 Act ethically in all job-related activities.	• (Remembering) Define the term "ethics." • (Understanding) Explain the difference between ethics and laws. • (Understanding) Explain situations that might present ethical questions for technicians.	<i>Instructor: Cover material described in objectives ("ethics" definition, etc.).</i> <i>Sample student activity:</i> Describe sample ethical situations and ask students to describe and justify ethical responses. <i>Example:</i> <i>Susan works at a small private pharmacy with the owner. An older patient comes in to purchase a small tube of cream which would last them several months. The owner wants you to sell the customer a larger tube (that they won't use and the same cream will expire in two days.) The larger cream is on sale but still more expensive. The owner wants to get rid of the inventory before the expiration date and instructs you to sell the customer the larger tube of cream. What would be ethical to do and what are your options? How do you think you would handle this situation?</i>	<i>Sample activities:</i> Combine ethically challenging situations with other lab activities that require students to apply ethical judgment and decisions.	Students: Demonstrate ethical responses when called for. Preceptors: Ask students describe ethical challenges they encountered and how they responded to them.

Foundational Professional Knowledge and Skills

Goal 12: Perform mathematical calculations essential to the duties of pharmacy technicians in a variety of contemporary settings. Teaching Strategy

Examples**Suggestions only. Other options possible at discretion of program*

Objective	Instructional Objectives (IOs)	Didactic	Simulated (Lab)	Experiential
12.1 (Applying) Perform mathematical calculations frequently needed in pharmacy technicians' work.	• (Understanding) Explain the use of Roman and Arabic numerals, fractions, decimals and apothecary symbols • (Applying): Demonstrate how to convert weights and measures, and direct ration and proportion. • (Applying) Demonstrate how to reduce and enlarge formulas • (Applying) Demonstrate how to solve problems involving specific gravity, percent strength, weight-in-volume, weight-in-weight and volume-in-volume • (Applying) Demonstrate how to perform ratio strength	<i>Instructor: Cover material described in objectives (types of calculations, when used, how to perform, practice)</i> <i>Sample student activities:</i> Perform each type of calculation in relevant assignments and assessments.	<i>Sample activity:</i> Perform each type of calculation in situations that simulate tasks that occur as a part of typical pharmacy technician jobs. <i>Examples:</i> <i>Ask students to calculate the total amount of a suspension if the patient must take 10 ml every 8 hours for 7 days, followed by 10 ml every 12 hours for 5 days, followed by 5 ml every 12 hours for 2 days.</i> <i>Ask students to calculate the total number of tablets</i>	Perform calculations as needed during duties at the experiential site.

Described approach is closer to UK one, but all parts and elements of competency standards we can find in the German regulations on professions. The Regulation defines the requirements for the evaluation procedures and their general content, presents the basic curriculum for enterprises and for vocational schools and general principles of training. But this description is wider and more detailed. The regulation can be considered as competency standard and model curriculum in one.

Table 9. Example of the checklist for the profession “Industrial mechanic” (fragment)²²

Training cycles For enterprise		Duration (months)	Training modules For vocational school		Duration (hours)
Cycle 1	Production and bonding	6-8	Module 1	Production of structural elements with the help of available tools	80
			Module 2	Production of structural elements using machines	80
Cycle 2	Maintenance and inspection	1-3	Module 4	Maintenance of technical systems	80
Cycle 3	Setup and Redesign	2-4	Module 3	Making simple structural units from individual structural elements	80

In addition, the regulations include knowledge, skills, workplace performance for each cycle and module, as well as recommendations for their assessment. Development of these documents and recommendations for using them is the responsibility of the Federal Institute for Vocational Education and Training of Germany. Institute involves into this work experts from enterprises and VET, sectoral chambers of commerce, trade unions, etc.

1.4. Training to the requirements of competency-based qualifications

²² Source: Industrial mechanic. Recommendations of the German Federal Institute for Vocational Education and Training (BIBB). – Bonn: BIBB, 2016. Link to the Russian version: <https://firo.ranepa.ru/mezhdunarodnoe-sotrudnichestvo/rossijsko-germanskaya-rabochaya-gruppa-po-professionalnomu-obrazovaniyu#promyshlennyj-mekhanik> (Date of access: 19.05.2019)

Competency-based approach is based on the principles of interdisciplinarity and synchronization of theoretical and practical training.

Competency-based learning requires a new definition of the teacher's or trainer's (instructor's, tutor's) role. Learner's dependence from the teacher must be at least partially replaced or supplemented by self-organization. A teacher has to organize the learning situation. However, he is still responsible for the educational/training process, but part of the situational responsibility is transferred to learners.

The teacher must understand that he does not "produce" knowledge and does not "load" it into the heads of learners²³. His role in the educational process is changed. Teacher:

- supports the process of self-learning and development by learners their competencies;
- develops the learning process and contributes to its success with the use of training questions and tasks;
- advises students during planning and performing practice-oriented tasks;
- indicates possible actions and asks questions about likely alternatives;
- makes information sources accessible, systematically prepares them, updates;
- indicates assessment criteria and advises during the reflection of the individual learner's results discussion²⁴;
- uses explicit instructional methods to maximize transmission of knowledge, and model application of knowledge to relevant work-based problems, methodically building understanding and skills;
- supports classroom learning with visits to the workplace, guest speakers from industry, master classes and engaging online learning content;
- includes regular formative assessments to check candidates' knowledge and understanding of key content throughout;
- differentiates learning through challenge to give less skilled candidates the time to develop their knowledge and understanding and the most skilled candidates opportunities to go deeper and broader into the subject content²⁵.

The teacher always follows the principle of minimum assistance: to help as little as possible, to provide support only in the required amount. Learners acquire more active position. The main characteristics of their learning activities are motivation; meaningfulness; autonomy and responsibility (in accordance with the planned learning outcomes and qualifications' level).

Focus on outcomes assessment approach (competency-based standards) provides more time for teaching staff to use effective learning tools and techniques that allow learners to experiment and innovate with the knowledge, skills and understanding they have gained. Teachers should allow learners to work with and learn from others, developing their communication and collaboration skills. Metacognitive activities which encourage students to learn about their

²³ Methods of vocational training: training manual for VET teachers and trainers/ Ed. Blinov V. - Moscow: Yurait Publishing House, 2017.

²⁴ Ibid.

²⁵ Technical Qualifications. Teaching, learning and assessment. Version 2.0. - City & Guilds Group Business (UK), September 2017. – P. 13.

learning and think about their thinking, will be useful in helping them to reflect on their learning processes. Technology-enhanced learning can help to both support and challenge students and extend learning outside of the classroom. Supported problem-based learning can be useful in encouraging learners to draw on their knowledge and skills to solve work-related problems and questions²⁶.

The project activity of learners (project method) is a pedagogical technology, which specific is in two levels of goals: a practical goal (making useful product) and a pedagogical goal (developing the competencies of project participants). To achieve a practical goal, learners are required to have certain knowledge, skills and competencies that they master in the process of project implementation.

Every educational project has its own life cycle, consisting of a certain sequence of stages. In addition, each stage has its own practical result or "output"²⁷.

II. DEVELOPMENT OF COMPETENCY-BASED CURRICULUM

2.1. *Meaning of the VET curriculum: criteria of quality*

Term "curriculum" means design, organization and planning of educational (training) process, including definition of learning objectives, content, methods (including assessment) and arrangements for training teachers and trainers. Term "programme", as a rule, is used for the implementation of educational process after designing.

Each curriculum may be called project (lat. "*projectus*"- "*thrown forward*") because curriculum's development is purposeful activity leading to the achievement of effective solutions for designing of a particular system.

"Design" is a concept characteristic of the technical sphere (construction, IT, etc). Regarding VET, it means activities aimed at building a thoughtful educational process, a system leading to a given result - the qualification, professional and personal development of a graduate (learning outcomes).

Curriculum's criteria of quality includes internal and external parts.

Internal part

A well designed curriculum:

- is holistic and coherent;
- is inclusive / accessible / student centred;
- fosters a deep approach to learning, encouraging independence in learning;
- has links to research / scholarship
- based on feedback, evaluation and review.

²⁶ Technical Qualifications. Teaching, learning and assessment. Version 2.0. - City & Guilds Group Business (UK), September 2017. – P. 15.

²⁷ See more: Sergeev I. How to organize project activities of students. M.: ARKTI (Source: <http://eduidea.ru/communities/14/publics/1666> ; retrieved 3.07.2019); Methods of vocational training: training manual for VET teachers and trainers/ Ed. Blinov V. - Moscow: Yurait Publishing House, 2017.

External part

A well designed curriculum takes account of:

- its market / its intake / its output;
- its learning environment/resources/staffing;
- national and international requirements.

2.2. Principles and methods of the regular curriculum development. Meaning of the competency-based curriculum

Competency-based curriculum is based on the standards of competency if they are developed and implemented in the country. And this is a time-consuming task, but less difficult than developing a curriculum in the absence of such standards. But the principles and methods are the same.

Competency-based approach makes focus on external part of the curriculum's quality criteria, on the one hand, and on another – is centred on the end-assessment of the learning outcomes, qualification. Such requirements are the purpose to make fresh look at the internal part of curriculum's quality criteria to combine the holistic goals of education, it's general mission and learning outcomes.

Main principles of the competency-based curriculum development are:

- goal setting, which is based on preparing the student for a particular professional/vocational activity in accordance with the requirements of the economy/labor market or a particular customer-employer;
- social partnership, understood as the involvement in the designing curriculum and teaching activities representatives of the economic sphere - direct customers, consumers and beneficiaries of the results;
- primacy in the learning process of practical tasks, focused on the development of learning outcomes;
- integration of practice and theory;
- module structure of curriculum;
- feedback analysis and evaluation; learning/training providers self-evaluation and every year correction of the curriculum.

Methods of the competency-based curriculum development²⁸:

- 1) SWOT-analysis
 - for defining the possibility for training, understanding what resources need and how (where) to get them;
 - for self-evaluation and making decision for making changes in existing curriculum;
- 2) questioning and interviewing;
 - for evaluation and review (feedback information from all stakeholders (graduates, employers, training staff etc);
- 3) focus group method;

²⁸ Curriculum may be developed for the first time or may be upgraded.

Both (2 and 3) methods are used for specifying requirements to the learning outcomes in the case of absence of the standards of competency. Focus group should include representatives from educational and labor sphere (see paragraph 1.3. of this report). The focus group is also used to develop elements of curriculum (modules, disciplines) and to ensure the interaction of teaching / learning personnel.

- 4) approval or accreditation by external experts not involved into the development of curriculum.

2.3 Applying competency principles to the curriculum development. Algorithm of the competency-based curriculum development.

Applying competency principles to the curriculum development is expressed in the set of rules, steps of its' development, which stages are similar in different countries using standards of competency (see Tab. 10).

Table 10. Approaches to the competency-based curriculum development

Australia	UK	ASEAN countries ²⁹
Three sequential phases: organisation, development and application³⁰ <u>The organization phase includes:</u> Selecting people who will develop the curriculum, their experience and expertise, and how they will influence the curriculum; Identifying the competency standards, or job roles, functions and skills, that will be addressed by the curriculum; <u>The development phase includes:</u> Determining what should be included in the curriculum and producing the curriculum documents and materials and follows a cyclical sequence: <i>situational analysis > purpose > learning outcomes > assessment criteria > conditions > assessment method > content > delivery</i>	Identify and read all of the relevant documentation for delivering the qualification; Involve the wider teaching team, including employers; Take a holistic overview to the whole qualification and identify learning outcomes; Identify key content and concepts which need to be taught first, leading to more advanced content; Consider learning resources and the role of 'flipped approaches' to content coverage and extending learning outside of the classroom; Plan in opportunities for relevant visits and experiences which bring learning to life and reinforce the real world of work; Ensure sufficient time for regular evaluation of learning	Stages of the curriculum development process³²: Assess the need and demand for the course; Selection of competencies and generic skills to be covered in the course; Plan and Develop the Course Structure; Approve Course Structure; Develop detailed curriculum for subjects and modules; Approve or accredit the full course structure and content

²⁹ Additionally see Appendix 3.

³⁰ Porter, B. Developing Competency Based Curriculum Modules. A Guidebook for TAFE Teachers and Curriculum Writers. – Rural & Mining Industry Training Division NSW TAFE Commission, 1993. – P. 3-4.

³² Competency Based Curriculum Development in ASEAN. A Draft Discussion Paper. Prepared for discussion at ASEAN in-country workshops in Cambodia, Lao PDR, Myanmar, Vietnam, Thailand and Indonesia: September – November, 2007.

<i>methods > learning strategies > learning resources + assessment strategies > situational analysis</i> <u>The application phase includes:</u> Implementing the curriculum, monitoring the curriculum implementation and providing; Feedback to those responsible for the curriculum	process ³¹	
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Summary of the table 10 content let us prepare the development of a competency-based curriculum algorithm:

First stage:

Defining working (focus) group(s) for the development of the curriculum and each of its' elements including representatives of the employers.

Second stage:

Definition of the objectives/results of the curriculum (learning outcomes including critical skills and essential knowledge + key competencies important both for the educational level and qualifications' level)

For this purpose:

- Defining competency standard(s) which is (are) relevant to the curriculum.
- Compare the content of the competency standard with educational one (if exists).
- In the case of absence of the competency standards - identifying learning outcomes (job roles, functions and skills etc.), that will be addressed by the curriculum (see paragraph 1.3. of the report).

Third stage:

Development of assessment criteria for the learning outcomes.

Forth stage:

Development of the curriculums' structure and content (including each subject/discipline, module).

Fifth stage:

Development of the curriculums' conditions ensure delivering of the content including material and technical, methodical, personnel.

Sixth stage:

Expertise and evaluation (approval, accreditation) of the curriculum.

Let us see in more detail the stages of the algorithm.

³¹ Technical Qualifications. Teaching, learning and assessment. Version 2.0. - City & Guilds Group Business (UK), September 2017.

2.4. *Requirements to the curriculum's results. Unpacking units of standard and qualification requirements for understanding of the requirements to VET curriculum. Combining competency requirements with national educational standards*

The curriculum's results (learning objectives) should include requirements to learning outcomes as to special in terms of qualification, professional activity as to key competencies.

Learning objectives should be diagnostic. The objectives expressed as expected learning outcomes that a teacher or other expert can identify or evaluate (diagnose).

It is considered that the objective is diagnostic if the following rules are observed:

- 1) given description of the learning outcome can be accurately identified among any others;
- 2) there is a way, a tool, a criteria for an unambiguous assessment of this result;
- 3) there is a rating scale based on the measurement results.

The most important rule of diagnostic objective setting is to use the most clear language to describe the learning objectives, that is understandable to both the teacher and the student.

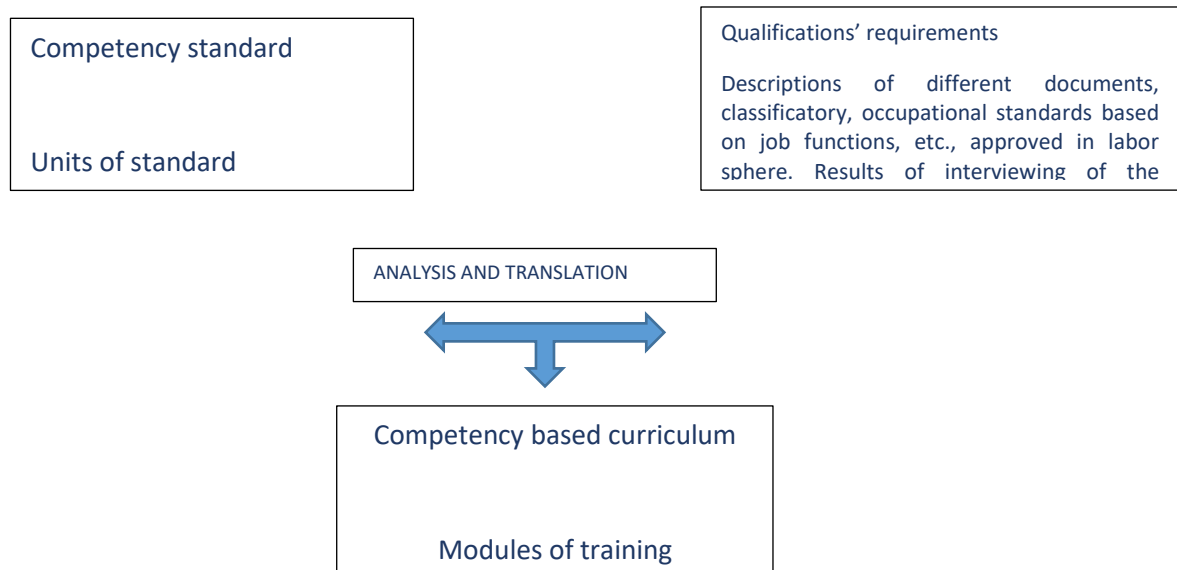
Table 11. Examples of correct and incorrect objectives

Rule	Correct	Incorrect
1. The accuracy of the description	assemble the MB-4A device in full compliance with instruction-2017 by the due date/time <i>(the description includes action, its' subject, rules for the action (instruction) and time requirements)</i>	assemble complex devices
2. Tool or criteria	assemble the MB-4A device in full compliance with instruction-2017 by the due date/time <i>(tool in this case is instruction and criteria will be chosen from it)</i>	assemble the MB-4A device
3. Measure	assemble the MB-4A device in full compliance with instruction-2017 by the due date/time	assemble the MB-4A device in full compliance with instruction-2017

	(the description includes requirements to time)	
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Unpacking units of standard and qualification requirements for understanding of the requirements to VET curriculum needs analysis work (see Figure 4).

Figure 4. Unpacking units of standard and qualification requirements for understanding of the requirements to VET curriculum



Source: prepared by authors.

During analysis and translation of the qualification requirements it's necessary to answer the questions:

1. What is purpose and title of the curriculum?
2. What is the level of qualification the curriculum leads to (according to national qualifications framework or similar approved in the country document)?
3. Is there a competency standard?
4. Is there an educational standard?
5. What are another documents which can be useful?

Discussion in focus group (and/or interviewing/questioning of leading experts, if necessary) should help to make conclusion what units and their elements (of standard of competency) correspond to the curriculum. Any curriculum design must go beyond competency standards. The standards only capture the key critical assessment requirements within the

curriculum; they do not capture the holistic education and training needs of learners³³. Focus group should identify the relationship between the components of competency standard and competency-based curriculum (see Appendix 3).

In the case of absence of the competency standard the task become more difficult: it's necessary to make analysis as was described in paragraph 1.3. for packaging of standard of competency.

In some countries there are no competency standards but there are occupational and educational ones. In such situation will be useful to make analysis as was described in paragraph 1.3. for packaging of standard of competency and in addition it's necessary to make comparable analysis of existing standards. Necessary to understand the possibilities for corresponding between their elements. The table 12 is helpful for the comparable analysis:

Table 12. Comparable analysis of occupational and educational standard

Elements of occupational standard	Elements of educational standard	Conclusion for the curriculum
Functional areas and job functions (job roles, actions, positions at working place)	Competencies, requirements to practical learning (tasks of practice)	Chosen competencies and requirements for workplace performance
Knowledge, skills	Knowledge, skills	Chosen knowledge, skills

Source: prepared by authors

Anyway, at the end of the work at this stage the curriculum's results should be formulated as:

- key and specific competencies;
- workplace performance;
- skills;
- knowledge.

It is desirable that they are grouped by units of learning (modules). Table 12 may be useful.

At this stage it's difficult to do, but it is possible to return after forth stage of curriculum development (see paragraph 2.6.).

Table 13. The results of curriculum

Unit of learning (module) title			
competencies	workplace performance	skills	knowledge

³³ Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016.

1.1. ...			
1.2. ...			
1.n. ...			

Very important to follow the rules:

- the rule of autonomy and certification: each unit of learning (module) leads to the qualification or its' part with corresponding official document (certificate);
- the rule of decomposition: competences are determined by its decomposition (knowledge, skills, work performance);
- the rule of formulation: the title of module, the description of workplace performance are given through a verbal noun; competencies - through an indefinite verb form;
- all results of the curriculum should be diagnostic.

2.5. *Importance of understanding of the qualification assessment criteria to the curriculum's results. Main principles of the criteria development*

The third stage of curriculums' development (after definition of the results/objectives) is the development of assessment criteria for the learning outcomes. Designing results at the same time implies an exact understanding how these results will be assessed. Such interconnection in the design process allows reasonably select the learning content, choose tasks, their hierarchy (gradual complication), choose the training methods.

Diagnostic objectives (results) allow to develop clear system of assessment criteria. The main question is what evidence is that learner is able to do, understand and can apply everything he or she learnt. Criteria answers the question what an evidence of the quality for the process or the result of an activity is. So there are two types of assessment: task assessment and evidence assessment.

Task assessment is when an assessor provides learners with a specific task to demonstrate their knowledge and skills in relation to the outcomes of the competency standard. Task assessments usually take place in a provider or training environment.

Evidence assessment is when an assessor provides learners with an evidence guide that tells them what evidence they need to present from their everyday work practice to meet the criteria of the competency standards. Evidence assessments usually take place in the workplace³⁴.

Following questions can help in criteria development:

What criteria must learners satisfy to show that they have achieved the learning outcomes?

³⁴ Updated guidelines for development of Regional Model Competency Standards / International Labour Organization. - Bangkok: ILO, 2016.

How will teachers be able to tell that the learners have achieved the learning outcomes?

How will learners be able to tell that they have achieved the learning outcomes?

Main principles of the criteria development.

The assessment criteria of the competence are complex (they are not limited to the sum of knowledge and skills assessment).

The criteria should not repeat the wording of the competence.

The criteria characteristics are diagnostic, accuracy and measurability.

Table 14 may be useful for criteria development.

Table 14. Assessment criteria development

Assessment subjects: competencies	Assessment objects (product or process or product and process simultaneously)	Assessment criteria

2.6. Structuring curriculum by areas of knowledge and skills

This stage is necessary for the determination of the curriculum elements and further packaging of its documents (programs of modules including practice at the working place, disciplines). This work can be organized on the base of the table 15. Content for the columns 1, 2, 5 of the table 15 is in the table 12 and content for the columns 3, 4, 6 is necessary to develop.

Table 15. Structuring curriculum by areas of knowledge and skills

1	2	3	4	5	6
Competency	Skills and work performance	Labs work, seminars (themes)	Tasks during practice	Knowledge	Theory (themes)

Based on the analysis made within the table 15 it's possible to do structuring curriculum by areas of knowledge and skills. The whole working group involved into the curricula design develops the content of the table making comparable analysis of all set of skills and knowledge. Such work should give the possibility for the conclusion about all necessary elements of the program.

As it was already mentioned, curriculum design must go beyond competency standards and take into account general educational and general professional part of the learning outcomes. And this stage is necessary for determination of the program's elements. Among them should be elements (disciplines or general modules) covering general professional skills and knowledge common to a number of modules devoted to special vocational requirements (critical points).

2.7. Competency-based curriculum in the modular format

Modular format meets the principles of interdisciplinarity and synchronization of theory and practice. It allows to master qualification in parts, increasing it and alternating training with work. The modular format allows to combine modules in a different order and develop different programs by content, duration, complexity.

Structuring curriculum by areas of knowledge and skills let define the units of learning (modules) corresponding with units of competency in competency-based standards. It should not be assumed that one unit of competency will lead to one module. In some cases it may be appropriate to develop modules, which are applicable to several units of competency, e.g. a module concerning occupational health and safety. Such modules may relate to underpinning knowledge and skills relevant to one or more units.

The working group (team of the module) should clearly understand how the theoretical and practical material of the module is connected, the sequence in which the topics are studied, practical exercises and laboratory work are carried out, and practices are conducted. It is important to determine the place and time of their performance, the content of work (tasks at the working place and tasks preparing for their implementation).

It is often a good idea to review course structures from other organizations offering the same or similar course/s to identify options for grouping the competency elements. Typically after group discussions and the review of similar courses there will be three or four possible structures with slightly different combinations of the competency elements into modules.

Module title has some influence on how the module is perceived in the training sector. It should convey a clear message of what the module entails, names providing a better indication of what the module is about would be more useful. An action verb with "ing" is appropriate.

Each module's program includes list of learning outcomes; defines nominal hours per module; specifies assessment criteria; describes content and learning conditions. All principles and rules described in terms of the whole curriculum are suitable for module program development.

2.8. Using competency-based units and qualifications for allocation of teacher-guided learning, self-learning and practice training hours to the knowledge and skills requirements of qualifications

Syllabus including volume (hours) and duration of training begin to count as a draft from the very beginning of the curriculum development. But you can finish this work at the last stage only after development of all curriculum parts, including modules' programs.

Module's content is better to pack using table 15. Such design makes the connection between theory and practice, the distribution of responsibility areas between teachers and trainers transparent and clearly demonstrates the continuity of their activities in the learning process.

In the future, when organizing learning, such table can be supplemented with specific time periods, dates by months and years. On the basis of the table is easy to build a calendar training schedule and a schedule for moving students during practice.

Another important point. When calculating hours by module, you should be guided by the requirements for the level and complexity of mastering its results. This depends on the knowledge and skills requirements of qualifications.

Table 16. Content of learning by module _____ (title)

Module title	Theory (themes including seminars and labs work)	Hours	Practice (themes and tasks)	Weeks/months/hours
Total:	****		****	

III. COMPETENCY -BASED TEACHING AND ASSESSMENT OF STUDENT PERFORMANCE

3.1. Requirements to qualifications of teachers and assessors to deliver competency-based VET

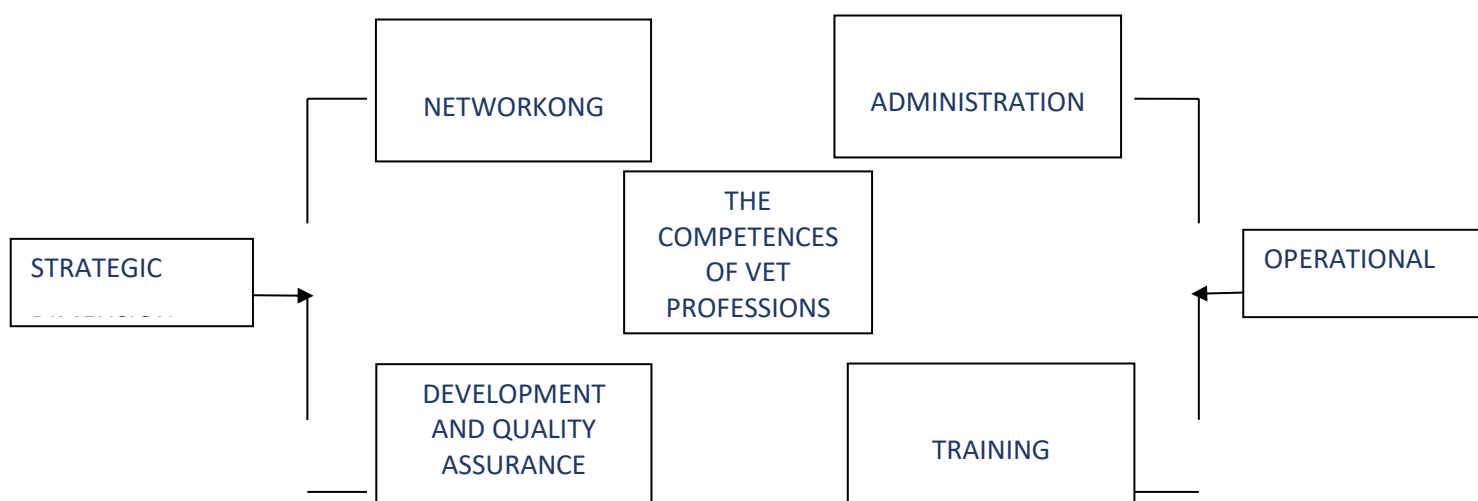
Committed and competent teacher, trainers and assessors are crucial to ensuring the quality and labour market relevance of competency-based learning, both in VET schools and in companies. Teachers and trainers are responsible for strengthening the links between education and work, establishing new curricula, providing more, and high-quality, apprenticeships and other forms of competency-based learning.

Being a teacher is very challenging. A good teacher needs to possess a wide and deep knowledge and understanding of the professional field, of human growth and development and how to steer this growth by means of education and training. Further, the teachers need to have adopted the ethical responsibility of the profession. Finally, a teacher operates in a multi-dimensional context and must understand the dialogue and interlinkage between education, labour market and society to be able to promote the learners progress.

Four areas presented in figure 5 constitute the core competences of VET professionals in all training contexts where VET professionals are involved (including training and assessment). The weight and importance of the different areas vary from national and occupational context to another. Also the boundaries of the activity areas overlap and require adaptation in different contexts

The most remarkable changes in the activities of VET professionals regarding competency-based learning include internal and external networking and adopting new approaches to learning. Consequently, teachers, trainers, assessors and leaders need to work in teams and networks. This requires the experts to possess cooperation skills. Teachers, trainers and leaders will also have to possess the skills to mentor, guide and teach.

Figure 5. Activity Areas of VET professionals



Source: Volmari, K. Helakorpi, S. Frimodt, R. Competence framework for VET professions: Handbook for practitioners / Finnish National Board of Education and editors. Vammalan Kirjapaino Oy Sastamala 2009.

The main responsibility of VET teachers and trainers in the context of competency-based learning is to train the students for a profession. Thus, they are required, in addition to mastering learning-related matters, to be able to foresee future competence requirements. A prerequisite for this is a strong knowledge of the development in the labor market and the ability to analyse these. The training is nowadays often done in collaboration both within the organization and the world of work.

Consequently it is not enough anymore that the teachers and trainers can teach. The competences include for example the skill to analyse phenomena within work, the society as well as development trends and integrate these into their training tasks. In future, teachers are also likely to operate more and more in different networks and utilize information networks in their work. For example tutoring and guiding the students can take place in a virtual environment.

Teachers and trainers have to perform administrative tasks like participation in student recruitment and marketing, recording progress of students, engaging in teamwork and cooperation with all staff, guiding new colleagues, writing project applications, planning and follow-up of, project finances that require skills and knowledge. Modern teachers in order to successfully administrate competency-based learning process should know the basics of HRM, ICT skills, have team-work and communication skills, be familiar with induction procedures, have project management knowledge and skills, have budgeting knowledge and skills, have team-work and communication skills.

Competency-based approach to learning has affected the training activities as well as diversification of learning environments and fast changes in education structures and priorities and the labor market. Training activity can be decomposed to following groups of activities:

- Planning comprises such activities as designing courses/programmes (in cooperation with colleagues and enterprises), analysing and taking into account learning needs of students and labor market, linking training to political and societal priorities, planning learning events and processes: structure, content and materials, setting up individual learning plans, organizing learning in workplace in cooperation with enterprises. In order to carry out successfully activities a teacher should know the curricula: objectives and defined learning outcomes, know tools or sources for learning needs analysis and understand their effect on training, know national and international educational policy, possess language skills, recognize developments in the labor market and recognize their relevance to the training, know learning theories and teaching strategies, be able to adapt learning content to students' capabilities, have team-work and negotiation skills.
- Facilitation of learning comprises such activities as managing and delivering learning process and event, linking training to practice, facilitating learning, supporting, motivating and guiding students, dealing with disruptions, creating and using resources, and materials, cooperating with homes, supporting and guiding students in transitions to work-based training and labor market. In order to carry out successfully activities a teacher should know learning and teaching theories, have skills to present information clearly and effectively, have skills to deliver learning in a varied and flexible way, have a command of learning environments, e.g. virtual ones, know developments in professional field, know about learning difficulties and psychology, have skills to detect and identify learning difficulties and motivate students, know guidance and counseling theories and techniques, be aware of equality and equity issues, special education needs and inclusion, multiculturalism, know classroom management theories and practices, have skill to create safe learning environment and manage student relationships, have interpersonal skills, know the world of work developments in own field.
- Assessment and evaluation comprises such activities as administering diagnostic skills tests, assessing learning achievements of students (in cooperation with colleagues and in-company trainers), monitoring in-company trainers, giving feedback to support the students' learning and professional development of trainers. In order to carry out successfully activities a teacher should know assessment theories, techniques and tools, have a global understanding of training and relation to work-based training, have interpersonal skills.

Teaching methods applied in competence-based approach are broad, descriptive terms that relate to the types of learning activities. The various learning strategies can be grouped into several suggested teaching methods that are used to allocate staff resources to teaching because some teaching methods require smaller learner/teacher ratios than other teaching methods. The main teaching methods used in vocational education programs are modified lecture, integrated theory/practical, computer based training, small group tuition, self-directed learning, industrial visits, internship and apprenticeship, field work, vocational experience, individual learning centers, etc. As it was mentioned in the paragraph 1.4. supported problem-based learning and the project activity of learners are useful. Among tasks can be real working tasks received from the enterprises, for example.

The activity area of development and quality assurance comprises development of the teachers' own professionalism as well as the development of their institutions. Responsibility for one's own continuing professional development (CPD) has been recognized as part of a teacher's

work for a long time. Thus teachers are expected to continuously keep up to date on new methods and technology.

VET educators are recognized as dual professionals because they have industry expertise and knowledge as well as professional teacher/educator skills. The challenge for VET educators, and the training providers employing them, especially when we are talking about competency-based approach is to maintain currency and proficiency in both industry and professional domains. A workforce development plan should provide a record of each educator's qualifications, professional and vocational currency, and their development plan. It should be maintained at the training provider level. A workforce development strategy and capability framework (if in place) can result in improvements in educator engagement and in developing their practice expertise. Ideally, improvements in teacher quality and practice would be reflected in evidence of improved student retention, completion and satisfaction, as recorded in relevant data, surveys and other instruments for gauging satisfaction.

A more recent area of activity for teachers and assessors regarding competency-based learning is the demand to take responsibility and be involved in the overall development of one's own institution and its quality assurance. Quality assurance can for example be about regularly reviewing teaching and training materials to ensure that they meet with students' or clients' needs. Today teachers are typically also expected to participate in audits and external evaluations carried out in their institutions.

Taking responsibility of one's own and the institutions professional development requires the ability to analyse feedback or evaluation results and use this as a basis for professional reflection. The teachers further need to detect the direction of improvement and take corrective actions. Thus the main competences connected to quality assurance for VET teachers are: the ability to produce accurate records, the ability to contribute to the annual quality cycle and the ability to reflect on and evaluate professional performance.

Training activity can be decomposed to following groups of activities:

- Development of oneself comprises such activities as following developments in own field, e.g. selecting and reading professional literature, planning own long-term professional development (PD), finding CPD opportunities, participating in CPD, recording and sustaining CPD activities. In order to carry out successfully activities a teacher and assessor should be aware of the importance of own PD for own work, be able to reflect on own practice and recognize skills needs (vocational, pedagogical, didactical, personal), be able to integrate their new learning or research into teaching, be able to transfer development in the field into training.
- Developing institution comprises such activities as involvement in departmental and institutional development, developing new organization, methods and materials within teams and projects, developing learning in workplace in cooperation with enterprises. In order to carry out successfully activities a teacher and assessor should know theories on learning organizations, be aware of the importance of an institutional approach to development, government policies and initiatives, employer priorities and practices, know international objectives, priorities and tools, have skills for project work: management and team-work skills, interpersonal and intercultural awareness, communication skills.
- Quality assurance (QA) comprises such activities as contributing to the QA of the institution, participating in design of QA tools, collecting feedback and data, contributing to applying QA results for development of institution, planning improvements, self-assessment. In order to carry out successfully activities a teacher and assessor should know QA theory, principles, systems and tools, know purpose and utilization of outcomes of QA cycle, have skills to plan

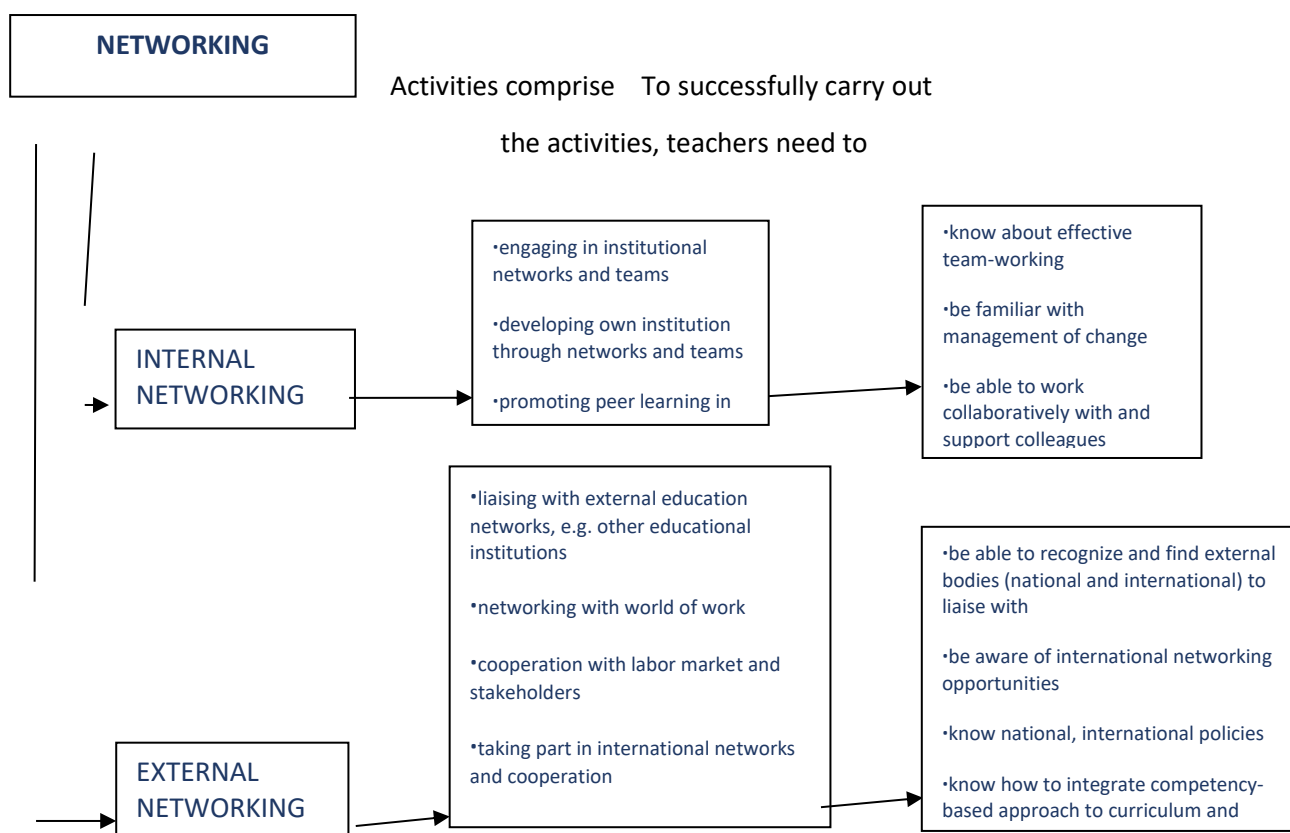
the QA procedures, be able to record and analyse feedback, have skills to utilize feedback and QA results to improve the operations and activities of institution.

Networking can be regarded as the most recent addition to the activities of VET teachers and assessors due to competence-based approach. To be able to survive amidst all the demands and changes, organizations need to adopt more collaborative approaches in their operations. In order to keep up to date with new technologies, new working practices and future trends in professions, teachers need to be aware of what is going on in the labor market and the enterprises. Internal collaboration is a prerequisite for institutions to become learning organizations. As a result, developing ways to share knowledge and expertise have become central issues. Also organizational changes have led to the introduction of new working practices, such as flexibility, modularization and interdisciplinary teaching, that challenge the traditional roles of VET teachers. The role of the VET teacher is no longer to work autonomously but rather to cooperate with other teachers to plan, coordinate and carry out teaching together.

The networking activities of teachers can be classified as internal and external networking.

The internal networking is related to the conceptions of learning organizations and shared expertise. The external networking in turn relates to liaising with professional networks, the world of work and internationalization (see figure 6).

Figure 6. Networking activities and required skills and knowledge of teachers and assessors



Source: Volmari, K. Helakorpi, S. Frimodt, R. Competence framework for VET professions: Handbook for practitioners / Finnish National Board of Education and editors. Vammalan Kirjapaino Oy Sastamala 2009.

3.2. *Applying the competency-based qualification requirements to assessment of students' performance by module, package of modules and a whole qualification*

A qualification is defined as the formal outcome of an assessment and validation process which is obtained when a competent body determines that a student has achieved learning outcomes to given standards assessment: methods and processes used to establish the extent to which a learner has attained particular knowledge, skills and competencies. A qualification requires that assessment has been carried out in a reliable way, that standards are validly applied and that those involved in the different stages are appointed in a balanced and credible way. All these steps are necessary to ensure that learners have attained the level of knowledge, skills and competence expected and required of them, regardless of when, where and how these learning outcomes were acquired.

When developing and assessing competencies the following assumptions should be taken into account:

- Competency is both individual and collective (collaborative learning and expertise);
- Competency is accumulated both in formal education and in informal contexts (experiential learning);
- Competency is not only about knowing but about controlling and mastering one's work. Social interaction also becomes more pronounced (team learning);
- Competency means flexibility, tolerating uncertainty and a positive attitude to change;
- Competency requires continuous assessment and development. The assessment is both self-assessment and external assessment;
- Competency is context-dependent (triological learning). Thus its assessment is linked to the prevailing valuations and the operating environment.

The results of educational programs characterize the graduate's education and his readiness to solve professional problems. Accordingly, the assessment procedures should allow to establish both the educational level and the formation of competencies that ensure successful professional activity.

It is important to conduct an integrated, complex assessment of competencies, rather than individual skills and knowledge as their components. And take into account the necessity of core/generic skills and knowledge. This is very serious challenge for the modern teachers. To meet the challenge we should use all possible assessment forms and tools taking into account the questions: Why? What? When/Where? and How?

Ongoing and formative assessment is a crucial part of the competence-based learning. Formative assessment provides essential feedback for teaching staff on how well students are making progress in their studies (modules), how they may need to adapt their lesson plans and where key areas of the qualification content would benefit from being re-visited and reinforced. Formative feedback also provides feedback for students on what they must do to improve. Formative assessment and specific 'feed-forward' targets all help to ensure that students are well prepared to take the external assessments.

Table 17 shows the efficiency and effectiveness of assessment forms during the educational process.

Table 17 Assessment Forms showing both Efficiency and Effectiveness Issues

Assessment Form	Efficiency	Effectiveness
Strategic curriculum review	Avoids over-assessment and repletion; encourages synoptic assessment	Ensures mixture of methods; emphasizes student experience; focus on quality of feedback; encourages deep learning
Use of IT	Speeds up marking although takes time to set up; good for repeat comments and large classes	Timely feedback and good quality can be assured
Peer assessment	Reduces lecturer's work; students learn from each other	Deepens understanding by engaging students in marking criteria and outcomes; fosters confidence; encourages dialogue
Self-assessment	Reduces lecturer's work	Deepens self-reflection; leads to lifelong learning; fosters independence
Oral feedback	Good use of class time, no need to write, more informal	Timely feedback, personalized but students need to find it meaningful
In-class assessment	Good use of class time	Timely feedback, good use of class time, eases pressure on summative assessment
Group assessment	Less marking but takes time to address group problems	Develops transferable skills and peer learning

Source: Marilyn Higgins, Fiona Grant & Pauline Thompson (2010) Formative Assessment: Balancing Educational Effectiveness and Resource Efficiency, Journal for Education in the Built Environment

It is important that assessment is efficient and a good use of lecturers' time, especially given large numbers of students. A number of researchers have put forward ideas to promote efficiency - e-assessment including using IT to give tests with instant computer feedback can help, especially with large classes; students learn while the questions are fresh in their minds. Group assessment can mean less marking, more is achieved and different skills are developed. In groups, formative assessment could be peer assessment with one group giving feedback on another group's product or processes. Teamwork is an increasingly important transferable skill for employers: there are problems of free riders but there are ways to overcome this and assign marks fairly. Peer and self-assessment can cut down work for lecturers while actively engaging students in assessing work and devising assessment criteria. Results from over twenty studies of peer assessment found that they were generally reliable in a variety of contexts, although it has to be acknowledged that some students do not like marking their peers. Self and peer assessment is especially appropriate in the context of learning about oneself and others, about appraisal and life-long learning, employment, career progression and continuing professional development

To increase both effectiveness and efficiency there is a need to engage students in the whole assessment process by explaining why assessment is undertaken in specific ways. This will help students to understand the purpose of assessment and feedback, how it relates to the subject area and the relevance of the assessment to their skills and knowledge development. The engagement of students in the assessment process from inception through to marking is important throughout a course, starting in the first semester, and this is not happening enough. One of the results is that student take-up of formative assessment opportunities is often not as high as it should be.

Issues to do with formative assessment and feedback are inseparable and the quality of feedback to students is variable. Feedback should be clearly understandable and include positive reinforcement, constructive criticism and pointers about how to improve. Teachers need to remember that feedback can engender strong emotions that can both motivate and demotivate. Feedback about how to do better is more important than the mark, since it is the aim of improvement that lies at the heart of formative assessment.

In the table 18 assessment results based on revised Bloom's taxonomy are presented.

Table 18 Revised Bloom's taxonomy

Level of Taxonomy	Definition		Process Verbs		Assessments
Creating	Generating new ideas, products, or ways of viewing things	Act Combine Compose Create Design Develop	Generate Improve Invent Imagine Predict Prepare Revise Show, Write	Poem Blueprint Cartoon Collage Film Formula Invention New game	Newspaper Painting Plan Play Song Story Video
Evaluating	Justifying a decision or course of action	Assess Choose Conclude Criticize Debate Defend	Determine Evaluate Justify Prioritize Rate Support, Value	Conclusion Debate Editorial Investigation Judgment Opinion	Recommendation Report
Analyzing	Breaking information into parts to explore understandings and relationships	Classify Compare Contrast Discover Distinguish Experiment	Group Interpret Order Organize Question Research Survey	Chart Checklist Database Illustration Investigation	List Plan Report Summary
Applying	Using information in another familiar situation	Adapt Change Demonstrate Draw	List Make Produce Solve Teach	Demonstration Diagram Journal Lesson	Performance Poster Presentation Report Simulation

		Illustrate	Use	Map Model	
Understand- ing	Explaining ideas or concepts	Ask Calculate Convert Describe Discuss	Report Research Review Summariz e	Definition Dramatization Example	Quiz Recitation Story Problems Summary
Remember- ing	Recalling information	Choose Cite, Define Describe Group, Know List	Match Memorize Repeat Select Underline	Definition Fact Label List Quiz	Test Worksheet

Source: Curriculum design guide / Liverpool John Moores University, September 2018.

Different activities and tools can be used in competency-based learning process to check students competency, from online quizzes and the use of mobile apps, to unseen written questions including multiple-choice and short answer responses. Mock assignments help students to carry out independent research and solve a range of applied problems. When completed, to a formative assessment dead line a teacher should use tutor, self and peer-assessment feedback to identify strengths and areas for further development. A teacher or assessor should be supported by a planning officer from the local council, who gives up some of his time to listen to student presentations and findings as part of their practice assignment. Teacher gathers evidence and marks the assignments using the marking grid and standardizes his marking with colleagues, preparing for the formal synoptic assessment marking. This helps the marking team prepare for suitable evidence collection and develop their own understanding of what standard is required to achieve high marks and to cover all the relevant assessment objectives. This can support them in feeding back to students, and students are encouraged to use the verbal and written feedback to set themselves challenging targets and clear actions in preparation for the formal end assessment.

Learning outcomes can and should be assessed at the intermediate stages of the educational programs. One of the tools - learner's portfolio. This is the tool of cumulative assessment of the individual educational achievements of a learner in a certain period of his studies.

The portfolio includes:

- educational and significant products created in the educational process, design and research, creative, professional activities (in necessary cases in the form of photographic and video products), as well as some of the most significant working materials created or used in the preparation of products (for example, plans scripts, drawings, sketches, etc.);
- sheets of self-assessment, filled in a certain form on the basis of the preparation of a product;

- external feedback on the activities of the student and the quality of the completed product received from teachers, mentors, product customers, independent experts, etc.

During final assessment procedures an estimate for the practice can be counted, an estimate for the separate module according to the cumulative principle.

Several practical assessment tools can be used in competence-based learning:

Knowledge checks. Regular checks of knowledge recall can be very helpful to ensure students are making good progress. For example, this could be through online quizzes in the virtual learning environment, or weekly tests of key content at the start of learning sessions.

Mock assignments. Mock or practice assignments can help students to draw on and apply their developing understanding and skills from across the breadth of their learning in an integrated way, helping to meet the demands of the synoptic assignment.

Self-assessment. Learning logs and journals can be useful for encouraging students to reflect on their performance and to evaluate their progress. This can be useful in helping students to demonstrate their perseverance and understand the impact of their actions.

Peer assessment. Encouraging students to review and critique each other's learning can be helpful in developing an awareness of the expected standard and what they need to know.

Work-related scenarios. Working with employers, teaching staff can create challenging and engaging scenarios that require students to demonstrate their knowledge and skills in industry-related contexts.

Team challenges. Working in small teams, students could be set challenging, time-bound projects which encourage them to use trial and error, experimentation and creativity to solve problems. This supports the development of the high levels of performance through application of knowledge and skills necessary for achieving highest scores.

The most promising assessment method that meets modern requirements for vocational education is often called the 'problem or project based learning' which involves the case/situation analysis. It is equally in demand both in foreign and in Russian practice. The process of assessment using the 'problem or project based learning' method is an imitation of a real event, combining a generally adequate reflection of reality, small material and time costs and variability of training.

The essence of this method is that the control material is given to students in the form of problems (cases), suggesting that knowledge and skills are acquired as a result of active and creative work: independent goal setting, collecting necessary information, analyzing it from different points of view, putting forward a hypothesis, conclusions, conclusions, self-control of the process of obtaining knowledge and its results.

The 'problem or project based learning' method is well-known as an educational technology. It provides a comprehensive, meaningful approach to the results of activities, the connection between theory and practice, an interdisciplinary, systemic vision of professional tasks. Creating a project can perform both training and control functions. Choosing project protection as a method for assessing, it should be remembered that the content of the project should be related to the current content of the profession, with the targeted order of employers, rely on experience in practice, focus on priority areas of research.

Competence-based learning relies upon practical tasks and practical assessment. Practical assessment methods are:

- Simulated Work Exercises when learners complete an exercise that closely resembles a workplace function. For example - select appropriate ingredients from the range available and make a loaf of bread;
- Structured Practical Exercises where learners carry out practical tasks based on workshop, laboratory, classroom or field activities. Exercises tend to be parts of workplace tasks. Learners may proceed through several 'stations' and undertake a variety of practical tasks.
- Fault Finding Exercises when learners are presented with a piece of equipment a series of test results, a set of accounts, or something similar, and asked to identify an error or problem. For example: *Given an electrical circuit that is not working, identify the fault and correct it.*
- On Job Assessment Method - direct observation of the learner performing a practical task, technical skill, or interpersonal skill, in a real or simulated setting. For example a nursing student taking a patient's blood pressure

Students need pointers to effective time management and to the positive effect of practice and further study on learning and assessment. Programme teams should provide guidance on the amount of study time a student is likely to need for out of class activities and for each piece of assessment.

What is important is how students can be encouraged to spend time studying outside classes. The number of class contact hours is not an indication of quality.

Programme teams could consider synoptic assessment whereby students are encouraged to make links across modules so that learning from two, or more, modules could be assessed by the same piece of work e.g. theory and practice modules, patchwork text assessment across modules, capstone modules. Each module would have to have at least one piece of assessment.

Sampling of learner performance plays an important part in assessment in competency based education. No matter which assessment methods are used, the full range of knowledge, skills and attitudes stipulated in the curriculum module can never be fully assessed. Not only do cost and time prohibit it, but it is important to see that vocational education and training is devoted to more than just testing. While learner performance is the basic criterion for assessment, it is essential that this performance be assessed in a holistic way, rather than as a series of tests undertaken in isolation from each other.

CONCLUSIONS

Using of learning outcomes in curriculum development makes VET systems in different countries more learner-centred. This is changing approaches to the teachers role and learning process organization.

The external points of reference for VET become clearer. Despite the presence or absence of competency-based standards, teams of stakeholders should be able to identify appropriate sets of learning outcomes.

For teachers and for the management of learning activity, learning outcomes are appropriate weighting alongside aims and objectives, curriculum content, pedagogy, assessment and quality assurance.

Many European countries, Australia and USA develop competency-based standards about last 20-30 years. ASEAN countries make real success on this way. CIS countries including Russia are at the beginning of the way. Many instruments for national qualifications system has been developed last 10 years in the Russian Federation. There is understanding of competency-based approach special features in VET and labor spheres. Mutual cooperation of the countries involved into ILO project, joint expert working teams existing in the framework of it allows choose joint approaches and solutions for occupational standards and qualifications and skills assessment instruments development.

Abbreviations

VET – vocational education and training

LLL – Lifelong learning

EQF – European Qualification's Framework

AQRF - ASEAN Qualifications Reference Framework

NQF – National Qualification's Framework

CEDEFOP – European Center for the Development of Vocational Training

ETF – European Training Foundation

ILO – International Labor Organization

Appendix 1. Examples of process for determining functional areas Electrical fitter mechanic

Figure 7. Process for determining functional areas (Electrical fitter mechanic)

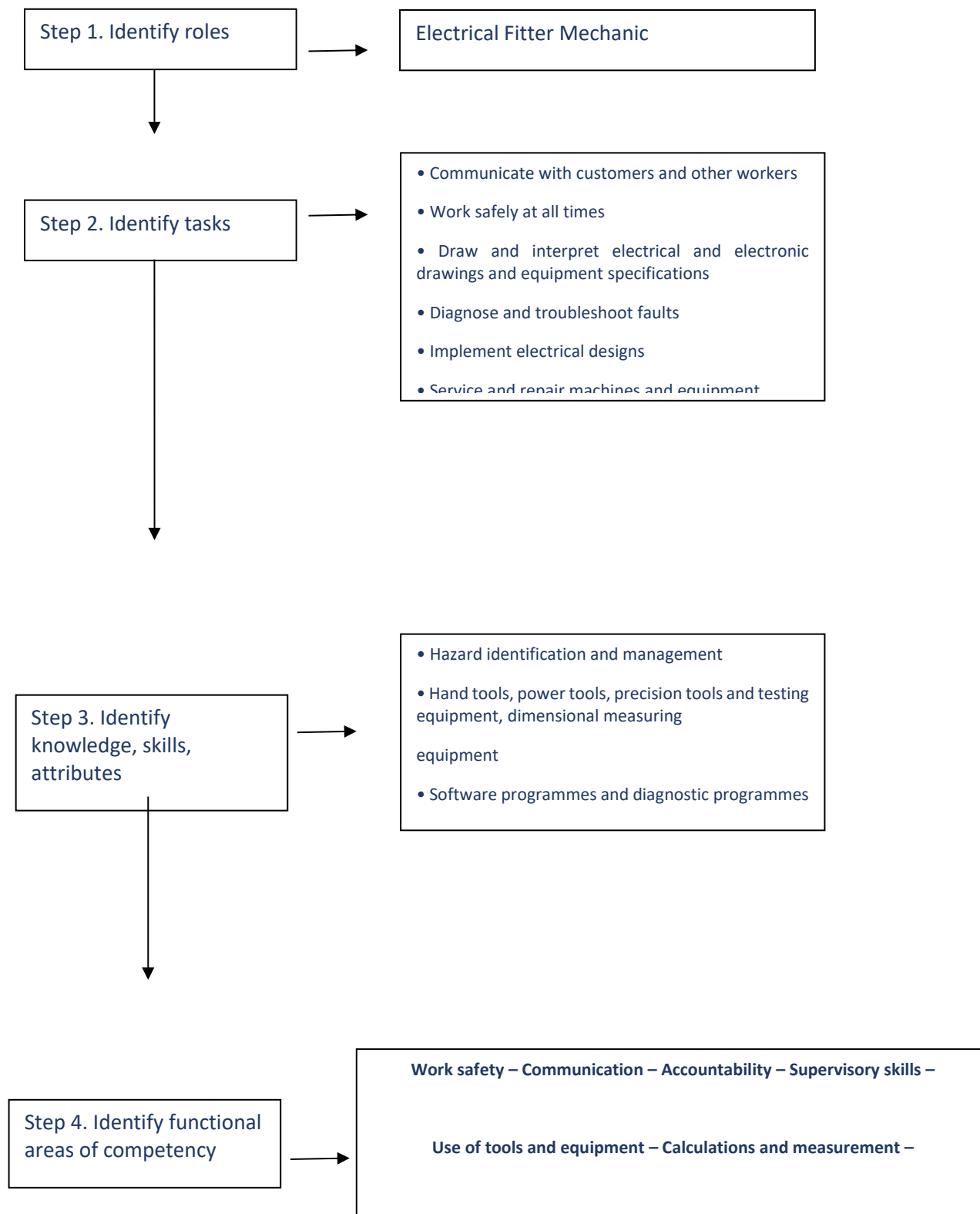


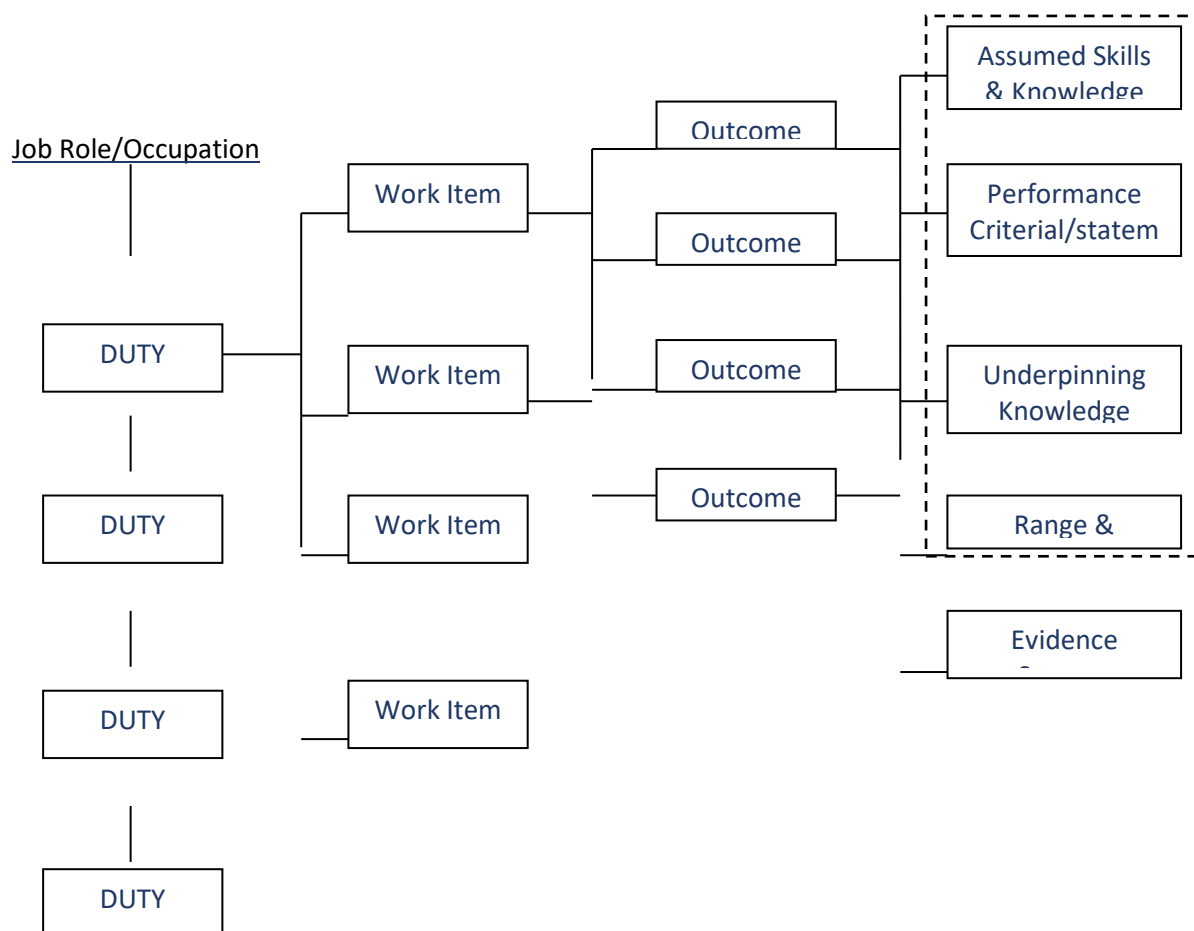
Table 19. Functional areas (Electrical fitter mechanic)

Functional area	Code	Unit title (competency standard)
A Generic competencies	EFM-A1	Apply customer service skills.
	EFM-A	2 Apply quality assurance processes.
	EFM-A3	Communicate effectively in the workplace
	EFM-A4	Apply safe working practices.
	EFM-A5	Practice accountability in the workplace.
	EFM-A6	Research and apply technical information.
	EFM-A7	Develop supervisory skills.
B Electrical fitter mechanic competencies	EFM-B1	Use tools and equipment in electrical fitter mechanic operations.
	EFM-B2	Carry out calculations and measurements for use in electrical fitter mechanic operations.
	EFM-B3	Install, test, and commission low-voltage electrical components, motors, appliances, and fittings.
	EFM-B4	Maintain and service low-voltage electrical components, motors, appliances, and fittings.
	EFM-B5	Diagnose and rectify faults in low-voltage electrical components, motors, appliances, and fittings.

Appendix 2. Approach to competency standards development of Singapore

A Workforce Skills Qualifications (WSQ) competency standard states performance standards that are validated and endorsed by industry to be the minimum performance standards for the industry. A WSQ competency standard documents expected work performance outcomes, expected level of performance, knowledge that supports the delivery of work performance outcomes and work contexts under which the work performance outcomes are to be delivered. The contents of a WSQ competency standard are derived from task analysis:

Figure 8. Process of analysis for competency standard development



Source: Interpretation of WSQ competency standards for training and assessment.- Singapore Workforce Skills Qualifications, 2016.

Appendix 3. Summary of Curriculum Development Process

(Source: Competency Based Curriculum Development in ASEAN. A Draft Discussion Paper. Prepared for discussion at ASEAN in-country workshops in Cambodia, Lao PDR, Myanmar, Vietnam, Thailand and Indonesia: September – November, 2007)

Assess Need and Demand

- Seek advice from Industry regarding the need for a course
- Identify the likely demand for training from students surveying of previous and future students
- Conduct surveys and interviews.
- review employment trends and future predictions

Select Competencies and Generic skills to be included in the Course

- Review available sets of competencies
- Discuss Generic Skills with industry representatives

Plan the Course

- Decide whether the course will be offered by one or many Institutions (including decision to conduct high level parts in a limited number of institutions)
- Review the availability of qualified teachers
- Review the availability of equipment and simulated workplace spaces
- Decide on the level of the award (Certificate I II III IV, Diploma I II) based on qualifications criteria
- Decide on course Structure (FT PT Block Release) and mode of delivery (Distance, Classroom, Workplace etc)
- Decide on target audience
- Decide on the format for presenting the course and subject curriculum (course numbering, layout etc)
- Prepare initial estimates of cost of delivery (consumable materials)
- Decide whether the course will have electives, optional modules and or compulsory elements.

Develop the Course Curriculum

- Conduct group meetings with industry representatives, curriculum specialists and a facilitator to identify possible groupings of competencies and generic skills
- De-construct occupational competencies and generic skills into their various elements and re-construct them as subjects.
- Decide on the best method of grouping all of competency elements and generic skills as subjects.
- Specify pre-requisites/ and entry requirements and minimum time
- Estimate the cost of delivery (consumable materials and capital equipment required)
- Approve the overall course structure (including subjects, electives, delivery modes, level of award pre-requisites and target audience).

Develop Subject Curriculum

- Develop detailed descriptions of each of the subjects approved
- Specify equipment needed by students and teachers,
- recommend teaching, learning and assessment strategies
- List recommended teaching, learning and assessment resource

Specify Record keeping requirements

Approve and Distribute complete Curriculum

Future Activities

- Teachers to develop personal lesson plans based on the curriculum document;
- Develop teaching, learning and assessment resources based on needs identified in the curriculum development process;
- Plan and implement professional development for teachers
- Purchase equipment needed to conduct the course

Develop a performance monitoring system and regularly review the course.

Useful Links

In Russian:

Methods of vocational training: training manual for VET teachers and trainers/ Ed. Blinov V. - Moscow: Yurait Publishing House, 2017.

<https://urait.ru/catalog/408854>

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Guidelines for the development of VET programs taking into account the requirements of vocational standards. – Moscow: Pero Publishing House, 2014

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