Geographical Mobility in Vocational Education and Training:
Guidelines for describing units of learning outcomes

Content:

1. Preliminary Note

These guidelines are intended to support stakeholders in vocational education and training in Germany in applying the learning outcomes-oriented ECVET approach. They should facilitate cooperation of partner institutions organising transnational mobility action. The guidelines are based, on the one hand, on the terms defined in the ECVET recommendation and the joint European principles which are to be tested ("technical specifications") as well as on practical experience gained in mobility and innovation transfer projects. The following information and examples are intended as an advice which can contribute towards the development of a joint understanding of learning outcomes orientation in vocational education and training.

2. Development of a "common language"

Before implementing a mobility action, the partner institutions are faced with the challenge of agreeing on a common language and common terminology regarding the contents and objectives of

a mobility project (one could call this "Esperanto for training purposes"). The basis for this agreement can be both the EQF system and the use of ECVET instruments for describing learning outcomes as well as for assessing, documenting and validating units of learning outcomes.

In addition to basic questions regarding the equivalence of training programmes and occupational profiles as well as different national ways of describing and presenting qualifications, a central task is that the partners should agree on the learning outcomes or the management of certain work assignments envisaged. Learning outcomes comprise professional, methodical, personal and social competences to be gained by the mobile learners abroad. The application of ECVET instruments such as partnership agreement (Memorandum of Understanding), learning agreement and personal transcript is intended to contribute towards ensuring that all persons involved – including the learners – develop a common understanding of the intended results. In the sense of quality assurance measures the achievement of these goals, that is to say, the attainment of these vocational competences, shall be made verifiable, for example by successfully completing the work assignments and examinations defined by the partners.

The following definitions and explanations are intended to facilitate communication and understanding between the partners at European level.

3. What are learning outcomes?

Learning outcomes are statements of what a learner knows, understands and is able to do on completion of a learning process. Learning outcomes are defined in terms of *knowledge, skills and competence*[1].

- ***Knowledge*** *means the body of facts, principles, theories and practices that is related to a field of work or study. It is described as theoretical and/or factual knowledge;*
- ***Skills*** *means the ability to apply knowledge and use know-how to complete tasks and solve problems. They are described as cognitive (logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments);*
- ***Competence*** *means the proven ability to use knowledge, skills and personal, social and methodological abilities in work or study situations and in professional and personal development. It is described in terms of responsibility and autonomy.*

4. What are units of learning outcomes?

A unit of learning outcomes (also called “unit” or “module”) is a component of a qualification consisting of a coherent set of knowledge, skills and competence that can be assessed and validated (cf. 10). This presupposes that the units of learning outcomes are structured comprehensively and logically and that they can be examined. Units of learning outcomes can be specific to a single

[1] Recommendation of the European Parliament and of the Council on the Establishment of a European Qualifications Framework for Lifelong Learning, 2008

qualification or common to several qualifications and may also describe so-called additional qualifications which are not part of a formal qualification or curriculum.

5. How are units of learning outcomes determined?

A unit of learning outcomes should be designed in such a way as to provide a(n almost) consistent and structured learning process, with agreed coherent learning outcomes and clear criteria for assessment.

In a learning agreement the partner institutions and the learner agree on corresponding units of learning outcomes. These can be explained more precisely by concrete and assessable work assignments. In this context, the partners must also agree on the scope of a unit of learning outcomes in relation to the duration of the mobility phase, i.e. the "work load" in the sense of the time required to complete the unit of learning outcomes.

Units of learning outcomes can be determined on the basis of complete work assignments, working processes, areas of work, fields of action or fields of competence which are typical of the particular profession. At best, there will be "overlaps" which are part of the respective vocational profile or qualification pathway in all countries, or which can be derived from the existing syllabuses or curricula. However, it is also possible to select and agree on vocational competences and work assignments which enhance or complement the national qualification profile, e.g. in the case of additional qualifications.

The following **criteria** are intended to support the partners determining the units of learning outcomes:

- ✓ Units of learning outcomes should be designed in such a way that they can be completed **as independently as possible** of other units of learning outcomes. In individual cases, this can lead to redundancies when describing several units, i.e. competences may be listed in unit B which are already part of unit A. This does not preclude those parties involved in a mobility partnership from agreeing in advance on the competences/units of learning outcomes which the learner has already achieved.

- ✓ Units of learning outcomes should include **all necessary learning outcomes**, i.e. they should describe the intended professional competences as well as the necessary social and personal competences in this context.

- ✓ Units of learning outcomes should be structured and dimensioned in such a way that the relevant learning outcomes can actually be achieved in the given time, i.e. during the period of mobility. Units of learning outcomes should therefore not be too extensive.

- ✓ In view of the role of a unit of learning outcomes within the framework of transnational mobility, it is, however, often not necessary to structure the entire qualification or the entire training programme in unit of learning outcomes. Unless it is intended to establish a common

European vocational profile, it is sufficient to agree with the partner institutions on one or more concrete unit of learning outcomes which are to be gained in the course of the mobility phase in the respective partner country.

- ✓ Units of learning outcomes should be **assessable**. Orienting units of learning outcomes towards occupational activities and tasks makes it easier to determine assessment criteria.

Once corresponding assignments, working processes or additional qualifications have been identified, the next step is to define which concrete learning outcomes, i.e. knowledge, skills and competence, are needed for their implementation. In order to anchor the unit of learning outcomes in the national training programmes and thus ensure its "suitability" for mobility purposes, the level of the envisaged learning outcomes (in accordance with the EQF system, i.e. the performance of work assignments, for example, "under supervision" or "autonomously and responsibly") is to be taken into consideration and described.

6. What is to be taken into consideration when formulating learning outcomes?

Basically, learning outcomes should be formulated in such a way as to be understandable and thus "manageable" for all those involved.

This means that the partners define the terminology which they use (perhaps in the form of their own glossary) and choose a reference system (e.g. EQF). This procedural step also involves agreement on the part of persons involved, i.e. training personnel and learners, on the application context (e.g. skills level, standard) and objectives of learning mobility.

The partners should consider the following points when formulating learning outcomes:

- ✓ Learning outcomes refer to vocational qualifications (in the sense of assessable vocational competences), not to the individual's specific development of vocational competence. The learning outcomes which are to be described are based on the learning achievements of an average learner. Learning outcomes are described from the perspective of the learner (not from the perspective of the instructor). Learning outcomes do not describe the learning target or the learning path, but the result following the completion of a learning process.

- ✓ General training plans, framework syllabuses, curricula, examination regulations or qualification profiles can form the basis for describing learning outcomes in transnational mobility. However, these can also be generated from work processes.

- ✓ Learning outcomes should be verifiable and assessable. Learning outcomes should be described in as concrete terms as possible so that it can be determined within the framework of an evaluation process whether the learner has achieved the learning outcomes. The learning outcomes should, however, be formulated in such a way as to also enable the learners to judge whether the results have actually been achieved.

- ✓ The nature of the learning process and the learning method itself are not relevant for the description of learning outcomes.

- ✓ The question of whether learning outcomes in the form of knowledge, skills and competences within a unit of learning outcomes are described in detail or in a less complex form depends on the respective context and the objective of learning mobility. As a general principle, there should neither be too many nor too few learning outcomes.

7. How are learning outcomes formulated?

The following basic principles can make it easier to reach an understanding between the mobility partners when describing learning outcomes:

- ✓ **Use of active, clearly understandable verbs**
  Verbs should describe measurable or observable actions, e.g. "explain", "represent", "apply", "analyse", "develop", etc. It may prove useful to develop a taxonomy table. (**Table 1** contains a list of verbs which can be used when formulating learning outcomes. This can be supplemented by job-specific verbs depending on sector and domain.)
  Verbs such as "to be familiar with" should not be used.

- ✓ **Specification and contextualization of the active verb**
  It should be described what the knowledge and ability refer to in concrete terms, or what type of activity is involved. The learning outcomes formulation should consist of a verb and the related object as well as an additional (part of a) sentence describing the context.

- ✓ **Avoiding vague, open formulations**
  Learning outcomes should be described briefly and precisely, complicated sentences should be avoided, learning outcomes should not be formulated in too general or in too concrete terms; clear (simple and unambiguous) terminology should be used as far as possible. Not: He/She knows the *regional* products and is able to prepare *simple* meals.

- ✓ **Orientation towards minimum demands for achieving learning outcomes**
  Learning outcomes should comprehensibly describe the minimum demands for achieving/validating a unit of learning outcomes, i.e. all learning outcomes which are necessary for fulfilling the tasks in the sense of a complete vocational activity should be listed.

- ✓ **Qualifications-/competence level is described comprehensibly**
  Formulations, particularly verbs and adjectives should reflect the level of qualification/competence (EQF or sectoral framework) of a unit of learning outcomes. The learning outcomes description should comprehensibly depict whether the vocational competences can for example be applied under supervision, autonomously or responsibly and competently.

Cf. **Table 2** for examples of how to formulate learning outcomes.

8. Who formulates learning outcomes and defines units of learning outcomes?

On the one hand, learning outcomes can be formulated within the framework of international mobility by an educational institution, i.e. supply-oriented, or, on the other hand, they can be determined, formulated, tested and evaluated by the partner institutions in a joint process. Feedback loops or the establishment of a consulting committee can serve as quality assurance measures.

9. How are learning outcomes described?

Learning outcomes can be described "holistically" within the framework of a coherent description as a continuous text (**Table 3**) or as a matrix, subdivided into individual elements of knowledge, skills and competence (**Table 4**). A detailed description of learning outcomes in the form of a matrix has the advantage that it enables a better comparison with the respective national curricula and is more clearly structured with regard to the subsequent assessment of learning outcomes. It has the disadvantage that it can possibly lead to overlaps and redundancies when describing several units of learning outcomes (particularly when describing personal and social competences). A description in the form of a continuous text has the advantage that the relationships between the individual categories of competences become clear (description of vocational competence: "The whole is more than the sum of its parts"). It is the task of the partners to agree on the type of description.

The title of a unit of learning outcomes should be clear and comprehensible for all persons involved (partner institutions, learners) and it should reflect the content of the unit. Furthermore, the level of the unit of learning outcomes is to be noted separately.

10. How are units of learning outcomes assessed, validated and recognized?

The agreements of the partners in a mobility action are decisive for the *assessment, validation* and *recognition*[2] of learning outcomes against the background of the valid national regulations and practices in the participating states. For this purpose, the partners must agree on criteria for quality assurance in good time.

- ***Assessment of learning outcomes*** *means methods and processes used to establish the extent to which a learner has in fact attained particular knowledge, skills and competence;*
- ***Validation of learning outcomes*** *means the process of confirming that certain assessed learning outcomes achieved by a learner correspond to specific outcomes which may be required for a unit or a qualification;*
- ***Recognition of learning outcomes*** *means the process of attesting officially achieved learning outcomes through the awarding of units or qualifications.*

[2] Recommendation of the European Parliament and Council on the Establishment of a European Credit System for Vocational Education and Training, 2009

The partners are responsible for selecting the procedure for determining and assessing competences. In order to validate and recognize learning outcomes which have been achieved in a different learning context, it is necessary to determine that the learner has actually acquired the competences which have been taught and which are intended. The selection of the method(s) of assessment should be appropriate to the competences to be determined. In the course of the assessment procedure, it is not only possible to assess learning outcomes that are defined in a formal unit of learning outcomes in accordance with the national qualifications system, but also cross-occupational competences which have been acquired during the stay abroad.

11. How are learning outcomes documented?

The **Euro*pass* Mobility** document can be used to document and validate the knowledge, skills and competences acquired during the mobility phase. (cf. **Table 5**)

12. What is the relevance of ECVET points?

ECVET points can be determined for a unit of learning outcomes in accordance with the relative "value" of the unit of learning outcomes measured on the basis of the starting qualification. The value of the unit of learning outcomes for the qualification in the host country is decisive for the transfer of ECVET points. The allocation of points for units of learning outcomes is not necessarily demanded for the transfer and validation of learning outcomes (in Germany).

Links: Using ECVET for Geographical Mobility. Part II of the ECVET User's Guide: http://www.ecvet-projects.eu/Documents/ECVET_Mobility_Web.pdf

Get to know ECVET better – questions and answers. http://ec.europa.eu/education/lifelong-learning-policy/doc/ecvet/faq_en.pdf

Euro*pass* Mobility: www.europass-info.de

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Annex

Table 1: List of verbs based on Bloom's Taxonomy (Bloom 1972)

Bloom distinguishes between six cognitive levels with increasing levels of complexity: Examples of active verbs are listed at each level:

1. Knowledge Being able to recall and pass on information as precisely as possible.
Examples of active verbs at this level:
Arrange, define, describe, duplicate, identify, label, list, match, memorize, name, order, outline, recognize, relate, recall, repeat, reproduce, select, state
2. Comprehension: Being able to interpret information and relate and summarize it in one's own words
Examples of active verbs at this level:
Classify, convert, defend, describe, discuss, distinguish, estimate, explain, express, extend, generalize, give example(s), identify, indicate, infer, locate, paraphrase, predict, recognize, review, rewrite, select, summarize, translate
3. Application: Being able to apply abstractions (rules, methods, etc.) in concrete situations
Examples of active verbs at this level:
Calculate, demonstrate, develop, interpret, judge, modify, organize, predict, select, sketch, transfer
4. Analysing: Being able to break down ideas or problems into simpler parts and compare
Examples of active verbs at this level:
Analyse, appraise, compare, conclude, determine, discriminate, experiment, illustrate, infer, test
5. Evaluating: Being able to compile component ideas into a new whole
Examples of active verbs at this level:
Argue, assess, compare, decide, evaluate, predict, recommend, summarize, validate
6. Creating: Being able to make a qualified judgement
Examples of active verbs at this level:
Argue, arrange, expand, relate, generalize, generate, combine, join

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Further job- and branch-specific verbs are to be added to this list in order to describe **practical skills**, e.g. assemble (components); install and configure (software programmes); prepare and divide into portions (food).

The following is a list of exemplary verbs for formulating learning outcomes at the **psychomotoric domain** (Dave 1970, Simpson, 1972):

1. Imitation: The ability to observe and imitate the behaviour of another person
Examples of active verbs at this level:
Perform under supervision

2 Manipulation: The ability to reproduce actions from instructions and practice
Examples of active verbs at this level:
Perform, participate, assist – according to instructions

3 Precision: Perform a task autonomously
Examples of active verbs at this level:
Implement, handle, complete, perform – autonomously

4 Articulation: The ability to coordinate and modify several actions by combining several skills in order to meet special requirements or solve a problem
Examples of active verbs at this level:
Adapt, develop, design, alter, coordinate

5 Naturalization: The internalizing of processes: skills are combined consistently and can be performed "without thinking"
Examples of active verbs at this level:
Adapt, adjust, transfer

Examples of verbs in the field of **affective domain** (Krathwohl, 2002) are:

1 Receiving: Willingness to note information
Examples of active verbs at this level:
Listen, show, hold in esteem

2 Responding: Voluntary, active participation in learning/working; e.g. participation in group discussions
Examples of active verbs at this level:
Support, participate, practise, cooperate, integrate

3 Valuing: Ability to judge the worth of material against stated criteria
Examples of active verbs at this level:
Question, adapt to, take into consideration

4 Organization of values: Individual processing of (often conflicting) values to form an organized structure, beginning of an internalization of these values
Examples of active verbs at this level:
Differentiate, judge, dispute, organize

5. Characterization by value set: the individual has a stable system of values regarding convictions, opinions and attitudes which steer her/his behaviour predictably and consistently
Examples of active verbs at this level:
Recognize, accept, answer, solve

Table 2: Examples for formulating learning outcomes

Examples:

Knowledge:

He/she is able to

... describe structural characteristics which are responsible for the behaviour and properties of a chemical substance
... differentiate between separation and mix principles and corresponding procedures
... describe the functioning of components, assemblies and systems of a vehicle
... assign the necessary documents for service and maintenance
... explain regulations concerning the handling of hazardous substances

Skills:

He/ she is able to

... receive orders and plan own procedural steps
... analyse data and present it as a basis for decisions
... use information and communication technologies taking into account data protection requirements
... develop a marketing plan and use marketing and PR instruments
... select chemical agents and production procedures and make up formulas

Competence (in the sense of taking over responsibility and autonomy):

He/ she is able to

... calculate production and service costs and analyse profitability
... apply problem solving strategies
... reflect upon his/her own action
... cope with and withstand strain and stressful situations in a way that is not harmful to health
... communicate with appreciation with patients, family members/reference person groups involved in the care process
... express and receive situation-based criticism

Table 3: Example "Mechatronics Technician" (cf. Movet project www.gomovet.eu and VQTS project)

Areas of competence	Steps of competence development			
A	Unit A1*	Unit A2*	Unit A3*	Unit A4*
Installating, configurating, programming and testing hard- and software components for control and regulation of mechatronic systems and facilities	He/she is able to install and configure programs for hardware and software components as well as set up simple software control program (PLC).program (SPS)	He/she can master the selection of hardware and software for mechatronic systems (sensors, actu-ators, interfaces, communication pro-cedures) and can provide and test simple software control programs (SPS) according to production process requirements	He/she can integrate and configure program-, control-, and regulation- mechanisms in mechatronic systems, program simple devices (in co-operation with developers), and simulate the program sequence before start-up.	He/she can develop, test, and configure hardware and software solutions for net-worked mechatronic systems: and can monitor system conditions with suitable measuring and visualisation tools.

* Social and personal competences are described separately in this project.

Table 4: A unit of learning outcomes can be described as follows using the EQF system:

Unit x	Title of the Unit		
	He/ she is able to... (summary description)		
	Knowledge	Skills	Competence
	He/she knows/ is familiar with ...	He/she can/tests ...	He/she is responsible for/supervises...

Example: Project ZOOM "Master Craftsperson in motor vehicle technology" (www.zoom-eqf.eu)

Unit 2	**Service and maintenance**		
	He/she is able to carry out service and maintenance tasks taking into account specifications, evaluate the documents prepared and check the executed tasks.		
	Knowledge	Skills	Competence
	He/she is able to • name service and maintenance specifications • assign the documents required for service and maintenance • describe the function of vehicle components, units and systems • ...	He/she is able to • apply service and maintenance specifications and draw up plans • fill in the documents required for service and maintenance. • disassemble and assemble components, taking into account the manufacturer-specific specifications • ...	He/ she is able to • delegate the service and maintenance tasks taking into account specifications • evaluate measuring and test reports and check the executed tasks by using checklists • ...

Table 5: Example: Documentation of a mobility phase in the training course "Biological Laboratory Assistant" at the vocational college in Hilden (Mettmann)

Unit	Separation of biomolecules (e.g. gel electrophoresis, chromatography)		
Duration of the Unit : 4-6 weeks Learning outcomes correspond to EQF level 5	**Knowledge**	**Skills**	**Competence**
	The learner knows the molecular characteristics of a bio molecule (e.g. protein, sugar, nucleic acid)	The learner understands the functionality of a specific seperation technique (e.g. SDS-PAGE, agarose gel electrophoresis, chromatographic techniques)	The learner is able to apply a specific separation technique autonomously (e.g. SDS-PAGE, agarose gel electrophoresis, chromatographic techniques)

Documentation in the Euro*pass* document (including fictitious entries in the fields 32a-34a):

	Activities/tasks carried out
(29a)	Separation of biomolecules (e.g. gel electrophoresis, chromatography)
	Job-related skills and competences acquired
(30a)	The learner knows: the molecular characteristics of a bio molecule (e.g. protein, sugar, nucleic acid) The learner understands: the functionality of a specific separation technique (e.g. SDS-PAGE, agarose gel electrophoresis, chromatographic techniques) The learner is able: to apply a specific separation technique autonomously (e.g. SDS-PAGE, agarose gel electrophoresis, chromatographic techniques)
	Computer skills and competences acquired
(32a)	The learner is able: to use computers for equipment control and data acquisition to analyse and discuss data corresponding to the aim of the project
	Organisational skills and competences acquired
(33a)	The learner is able: to plan experimental processes and set up apparatus
	Social skills and competences acquired
(34a)	The learner is able: to organize laboratory work in his/her field of work autonomously, to work with scientists to develop and optimise analysis techniques