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Designing descriptors of learning outcomes for Higher Education qualification

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Abstract

Learning outcomes represent one of the essential building blocks for transparency within higher education systems and qualifications. All aspects of their application were examined in the context of Bologna developments. Learning outcomes have been defined as: statements of what a learner is expected to know, understand and/or be able to do at the end of a period of learning. A key element in contemporary qualifications frameworks is the specification of learning outcomes. The range of outcomes can be categorised and specified in various ways. Traditionally higher education was relatively explicit about the knowledge (outcomes) to be achieved, or at least the knowledge covered by the curriculum. The qualification descriptor represents a description or measurable indicator of learning outcomes and achievements for which the student has been assessed and which the student should be able to demonstrate for the qualification that is awarded. The specifics in the design of descriptors for different levels of qualifications for higher education are explained in detail in this paper.

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1. Introduction

The aim of the Bologna Agreement (1999) and the ongoing subsequent work of the Bologna process are to improve the effectiveness and efficiency of higher education in Europe in the context of a common European Higher Education Area. As part of this process, all higher education level institutions throughout the EU are being asked to write their programs and modules in terms of learning outcomes in preparation for a changeover to the "student-centered" European Credit Transfer System (ECTS).

Learning outcomes are statements of what a student is expected to know, understand and/or be able to demonstrate or have acquired on successful completion of their studies. Learning outcomes represent a move away from traditional models of learning, which emphasize inputs such as content and teaching hours, to a more modern "student-centered" approach, which emphasizes outputs in terms of student competences. Not all learning outcomes are measurable.

Learning outcomes form a critical part of the Bologna education reform. At an international level they contribute to the mobility of students by facilitating the recognition and improving the transparency of qualifications, thereby

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simplifying credit transfer. At a local level they lead to improved curriculum design by strengthening the relationship between teaching, learning and assessment.

2. Framework of qualifications

A Qualifications Framework is an instrument for the development, classification and recognition of skills, knowledge and competencies along a continuum of agreed levels. It is a way of structuring existing and new qualifications, which are defined by learning outcomes, i.e. *clear statements of what the learner is expected to know, understand and/or be able to demonstrate on the successful completion of the approved program of learning.*

The Bologna Process was initiated in 1999. It now involves 46 countries. An important action line in the Process is the restructuring of higher education programs and changes to the qualifications (diplomas) that are made as a result. In 2003, Ministers with responsibility for higher education gathered in Berlin to review progress in the Bologna process. *Ministers encourage the member states to elaborate a framework of comparable and compatible qualifications for their higher education systems, which should seek to describe qualifications in terms of workload, level, learning outcomes, competences and profile. They also undertake to elaborate an overarching Framework of qualifications for the European Higher Education Area. (FQ for EHEA), Berlin Communiqué.*

European Qualifications Framework (EQF) is a European Union initiative to create a translating facility for referencing academic degrees and other learning qualifications among EU member states. The EQF was formally adopted by the European Parliament and the Council on 23 April 2008. The EQF is a common European reference framework which links countries' qualification systems together, acting as a translation device to make qualifications more readable and understandable across different countries and systems in Europe. It has two principal aims: to promote citizens' mobility between countries and to facilitate their lifelong learning.

The EQF for Lifelong Learning (EQF LLL) has eight reference levels.

2.1. Qualifications for higher education

A fundamental question for any framework of qualifications concerns its structure and the number of divisions it contains. The concept of "cycle" has been used in the Bologna Process to refer to the stages in higher education, incorporating qualifications, programs, and phases of learning. Therefore it is proposed that the three principal divisions in the framework to be identified by reference to qualifications corresponding to completion of the cycle:

- First cycle (higher education) qualifications - *Bachelor's degree*;
- Second cycle (higher education) qualifications - *Master's degree*;
- Third cycle (higher education) qualifications - *Doctoral degree*.

2.1.1. Descriptors for higher education

An informal group of higher education specialists from a variety of countries developed a set of descriptors that have come to be referred to as the 'Dublin Descriptors'. The initial descriptors for the first and second cycle were commended to the ministers' meeting in Berlin by the Amsterdam Consensus. Subsequently the group has developed a descriptor for the third cycle. Recently, a descriptor for a short cycle (within or linked to the first cycle), following the pattern of the other three cycles, has also been produced. These descriptors (especially for the first and second cycles) have been found to be useful in various ways by national quality assurance agencies, developers of higher education standards, and designers of higher programs. So far, no significant revisions have been proposed. The Dublin descriptors were built on the following elements: *Knowledge and understanding; Applying knowledge and understanding; Making judgments; Communications skills and Learning skills.*

The Dublin Descriptors offer generic statements of typical expectations of achievements and abilities associated with qualifications that represent the end of each of a Bologna cycle. They are not meant to be prescriptive; they do not represent threshold or minimum requirements and they are not exhaustive; similar or equivalent characteristics may be added or substituted. The descriptors seek to identify the nature of the whole qualification.

3. Methodology of writing descriptors based on learning outcomes

Learning outcomes are statements of what a student is expected to know, understand and/or be able to demonstrate after completion of a process of learning. (ECTS Users' Guide, 2005; Veselinovska, 2011; Alkharusi, 2010; Tavukcu, Gezer, Ozdamli, 2009). Learning outcomes are clear statements of what the student is expected to achieve at the end of the module and how the student is expected to demonstrate that achievement.

Here are some examples of module learning outcomes (Tuncay & Uzunboylu, 2010; Kennedy, D., 2007): Develop criteria for the evaluation of information sources; Determine the accuracy, relevance and comprehensiveness of information sources; Identify inaccurate and misleading information; Assess the quality of the process and products of personal information-seeking; Devise strategies for revising, improving and updating self-generated knowledge.

Well-written learning outcomes include the following characteristics: They specify what the student must be able to do; They are achievable within the time and resource limitations of the module; The specified action is assessable (i.e. observable and measurable).

3.1. Domains of learning

Learning outcomes can specify behavior in one of three domains: cognitive, affective or psychomotor.

Cognitive: involves thought processes, e.g. understanding, analyzing, evaluating.

Affective: involves attitudes, feelings and values, e.g. appreciating, accepting.

Psychomotor: involves physical skills, e.g. performing, assembling, and dismantling

Table 1. Bloom's Taxonomy

Competence	Skills Demonstrated	Verbs
Knowledge	observation and recall of information knowledge of dates, events, places knowledge of major ideas mastery of subject matter	list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
Comprehension	understanding information grasp meaning translate knowledge into new context interpret facts, compare, contrast predict consequences	summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend, etc.
Application	use information use methods, concepts, theories in new situations solve problems using required skills or knowledge	apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover, etc.
Analysis	seeing patterns organization of parts recognition of hidden meanings identification of components	analyse, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer, etc.
Synthesis	use old ideas to create new ones generalize from given facts relate knowledge from several areas predict, draw conclusions	combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite, etc.
Evaluation	compare and discriminate between ideas assess value of theories, presentations verify value of evidence	assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize, etc.

3.1.1. The cognitive domain

Benjamin Bloom (1913–1999) developed a classification of levels of thinking in the cognitive domain. The system, known as Bloom's Taxonomy (Bloom, B., 1956), classifies thinking behaviors during the learning process. As depicted in the table 1, the taxonomy builds on the simple knowledge of facts at the lowest level to evaluation at

the highest level. Module Learning Outcomes In simple terms, this is what it means to be able to operate at each level of the cognitive domain:

Knowledge: you know something.

Comprehension: you understand what you know.

Application: you can take something from one context and use it in another.

Analysis: you can break something down.

Synthesis: you can create something new as a result of analysis.

Evaluation: you can pass judgment on something.

When writing learning outcomes in the cognitive domain, you need to decide which level of thinking behavior you want your students to be able to demonstrate as a result of learning. Once you've decided the level, there is a set of suitable action verbs from which to choose for that level. These verbs are list in the table 1. Also, it is inevitable that some verbs may be associated with more than one level. The classifications are not completely categorical. When writing learning outcomes, it is useful to be tolerant of a certain amount of overlap and ambiguity and to avoid the feeling that you have to exercise unequivocal precision with the drafting of every objective.

3.1.2. *The Affective domain*

The affective domain is concerned with issues relating to the emotional component of learning and ranges from the basic willingness to receive information to the integration of beliefs, values, ideas and attitudes (Kennedy, D. 2007). Here are some examples of learning outcomes in the affective domain: Display a professional commitment to ethical practice; Resolve conflicting issues between personal beliefs and ethical considerations; Relate well to students of all abilities in the classroom.

3.1.3. *The psychomotor domain*

The psychomotor domain mainly emphasizes physical skills involving co-ordination of the brain and muscular activity. The psychomotor domain is commonly used in areas like laboratory science subjects, health sciences, art, music, engineering, drama, physical education and sport sciences. (Harrow, A. (1972)

4. Discussion

Designing the National Framework for Higher Education Qualifications in the Republic of Macedonia is based on the 'Overarching framework for qualifications in the EHEA', compatible with the EQF for LLL (EQF). The National Framework for Higher Education Qualifications that closely define the profile, objectives and initial creation of the curricula of the first, second and third cycle of studies in Republic of Macedonia was established by *Decree for the National Framework for Higher Education Qualifications* ("Official Gazette" No.154 from 30/11/2010) adopted by the Government.

There descriptors of the qualifications for each cycle of studies in Macedonian National Framework reflect the usual skills and accomplishments of the student and are related to the qualifications that indicate completion of specific study cycle. For each level from NQF, HE there are specific descriptors (Table 2).

5. Conclusion

The system of qualification descriptors is the backbone of the National Qualification Framework for Higher Education (NQF, HE). The development of these descriptors is based on the fact that they must be conceived in a simple and clear way. If the descriptors were more complicated, it would be less transparent and therefore very difficult to put into effect and accept. According to Article 5 of the Decree *Qualification descriptor represents a description or measurable indicator of learning outcomes and achievements for which the student has been assessed and which the student should be able to demonstrate for the qualification that is awarded.*

Table 2 Descriptors for a higher education qualification in the Republic of Macedonia (first, second and third cycle of study)

Cycle	Descriptor type	Description
first cycle	knowledge and understanding	Have demonstrated knowledge and understanding founded upon prior education within the main field of study, including knowledge about the range of theoretical, practical, conceptual and critical perspectives in the field.
	applying knowledge and understanding	Can apply their knowledge and understanding in a manner that indicates a professional approach to work or vocation; Have demonstrated competences for identifying, analysing and solving problems; Be able to devise and sustain arguments within their field of study.
	making judgment	Ability to gather, analyse, evaluate, and present information, ideas, concepts from relevant data; Exercise appropriate judgment, taking into account relevant personal, social, scientific or ethical aspects.
	communications skills	Can communicate and discuss information, ideas, problems and solutions on the contexts where criteria for decisions and the scope of the task may be well defined to both specialist and non- specialist audiences.
	learning skills	Take initiative to identify and address learning needs for further knowledge.
second cycle	knowledge and understanding	Have demonstrated knowledge and understanding within the main field of study, implementing methodologies appropriate for solving complex problems, both systematically and creatively.
	applying knowledge and understanding	Ability to critically, independently and creatively solve problems with some originality in new or unfamiliar environments within multidisciplinary context related to their field of study.
	making judgment	Ability to synthesize and integrate knowledge; Ability to deal with complex issues both systematically and creatively, make sound judgments even on the basis of incomplete or restricted information.
	communications skills	Can communicate their conclusions and recommendations with the argumentation of the knowledge and rationale underpinning these, to both specialist and non-specialist audiences clearly and unambiguously.
third cycle	learning skills	Responsibility for further professional development.
	knowledge and understanding	Have demonstrated a systematic understanding of a field of study and mastery of methods and skills of research within that field in accordance with the highest international standards.
	applying knowledge and understanding	Have demonstrated the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity; Have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication.
	making judgment	Ability of critical analysis, evaluation and synthesis of new and complex ideas, having assessment competences; Ability to independently initiate and participate in national and international research networks
	communications skills	Can communicate with their peers, the larger academic community and with society in general about the scope of their expertise.
	learning skills	Promote within professional contexts, technological, social or cultural advancement in a knowledge based society.

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