FOCUS 1
Tools for university quality

AQU CATALUNYA

DEGREE PROGRAMME PROFILES

Learning objectives, graduation profile and learning outcomes

Generalitat de Catalunya

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DEGREE PROGRAMME PROFILES:

Learning objectives, graduation profile and learning outcomes

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C. d'Enric Granados, 33
08007 Barcelona

Editorial team: Josep Manel Torres
Collaborator: Sebastián Rodríguez Espinar

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ACRONYMS

AQU Catalunya: Catalan University Quality Assurance Agency

ECTS: European Credit Transfer System

EHEA: European Higher Education Area

EQF: European Qualifications Framework

LO: learning outcome(s)

MCQES: Catalan Higher Education Qualifications Framework

MECES: Spanish Higher Education Qualifications Framework

MOOC: Massive Open Online Course

QF-EHEA: Qualifications Framework in the European Higher Education Area

RD: royal decree

RUCT: Register of Universities, Higher Education Centres and Degree Programmes

SCL: student-centred learning

SUC: Catalan university system

INTRODUCTION

Across the world, there is a growing interest in holding higher education institutions accountable for the learning outcomes of their student body: definition of expected results and their achievement. This demand has become even more necessary in recent years with the emergence of new, often transnational higher education providers and new educational structures (dual training, MOOCs, micro-credentials, etc.) and, most critically, the COVID-19 pandemic, which has made hybrid and online education a permanent part of the landscape. Learning outcomes have been one of the key elements of the so-called Bologna Process, appearing repeatedly in documents related to the European Higher Education Area (EHEA) and in various ministerial communiqués.

Catalonia is no stranger to this growing demand. In 2019, the Catalan University Quality Assurance Agency (AQU Catalunya) published the Catalan Higher Education Qualifications Framework, developed by an international group of experts in higher education systems, qualifications and learning outcomes. It has also promoted the development of benchmarks in a number of subject areas.

In Spain, the Ministry of Universities took up the suggestion of the quality assurance agencies to move forward in defining the learning outcomes that graduates of university degree programmes are expected to achieve. The inclusion of learning outcomes in Royal Decree 822/2021, of 28 September, establishing the organisation of university education and the procedure for quality assurance, marked a turning point after which both the Catalan Qualifications Framework and the benchmarks would play an important role.

The aim of FOCUS 1. TOOLS FOR UNIVERSITY QUALITY is to guide universities in defining the learning profile of their degree programmes, i.e. the learning objectives, graduation profile, and overall learning outcomes of the programmes themselves and the modules that make up their curricula.

Why learning outcomes?

For those who design and deliver higher education programmes and their modules/courses, an outcomes-based approach has a number of benefits. For example, it brings clarity, precision and transparency to curriculum design, teaching practice and assessment.

The shift towards learning outcomes opens up programme design to better curriculum alignment and accountability in the teaching-learning process. Well-designed learning outcomes bring clarity to student performance expectations and increase student satisfaction.

Learning outcomes are the essential building blocks for organising curricula into coherent structures, with aligned objectives, learning outcomes, teaching strategies, content and assessment methods, in order to improve both curriculum coherence and student learning (curriculum alignment).

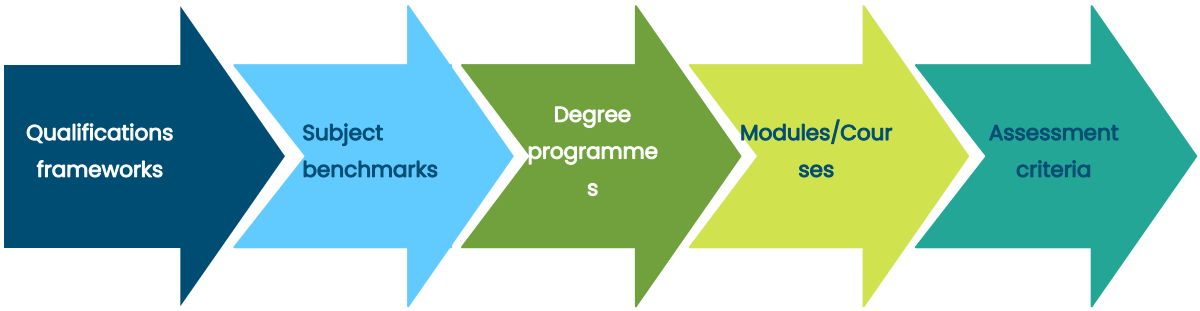
Uses of learning outcomes

Learning outcomes can serve different purposes and be used in many ways, for example in:

- **National qualifications frameworks:** learning outcomes are used to provide a general description of qualifications (degree programmes) at the different levels of a national education system. They do not, therefore, specify outcomes in particular subject areas, but make broader statements about the learning outcomes expected of students on completion of a qualification at a particular level of education, including cross-functional skills. National descriptors serve as a reference for the development of qualifications profiles for specific degree programmes.
- **Subject benchmarks:** learning outcomes are used to clearly indicate the general academic characteristics of degree programmes in a discipline or subject area. They describe what gives a subject area its coherence and identity, and define what can be expected of students at the end of any degree programme in that area of knowledge. They serve as external reference points for designing curricula for degree programmes in that area.
- **Degree programmes:** learning outcomes are used to describe and express qualifications that are specific to a degree programme, validated in Catalonia by AQU Catalunya. They comply with the requirements of the relevant qualifications framework. Within degree programmes, learning outcomes are used to describe knowledge, skills and competences in the respective subject area. They usually include general soft, transferable skills and competencies.
- **Modules/Courses:** learning outcomes are used as statements of what students are expected to know, understand and/or be able to do if they pass. They are directly linked to a teaching and assessment strategy that enables students to achieve the intended learning outcomes and teachers to verify that they have done so.
- **Assessment and marking criteria:** in modules/courses, learning outcomes are a way of specifying the criteria that determine students' levels of achievement and relative performance. Assessment criteria are what students are expected to be able to demonstrate. They serve as thresholds that distinguish between

passing and failing the module/course. Learning outcomes can also refer to the quality of achievement and therefore be used for scoring during assessment.

Depending on their use, learning outcomes range from the most general to the most specific descriptions, as illustrated below:



QUALIFICATIONS FRAMEWORK AND SUBJECT BENCHMARK

Qualifications framework

A qualifications framework is an instrument for classifying qualifications according to a set of criteria for specified levels of learning. Its purpose is to integrate and coordinate national qualifications subsystems and to improve the transparency, accessibility, progression and quality of qualifications in relation to the labour market and society.[1]

In our context, therefore, a qualification is any degree, diploma or other certificate issued by a competent authority attesting to the successful completion of a recognised study programme.

National qualifications frameworks typically cover all degree programmes in their education systems and organise qualifications within a system, i.e. indicating how students can move between different levels of education. This is the case for both the European Qualifications Framework (EQF)[2] and national qualifications frameworks. Sometimes, however, they cover only higher education qualifications, as in the Qualifications Framework in the European Higher Education Area (QF-EHEA),[3] the Spanish

[1] Council of the European Union, 'Council Recommendation of 20 December 2012 on the validation of non-formal and informal learning', Pub. L. No. 2012/C 398/01, § Information and Notices, C 398 *Official Journal of the European Union* 5 (2012).

[2] Council of the European Union, 'Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning (Text with EEA relevance)', Pub. L. No. 2008/C 111/01, § I Resolutions, recommendations and opinions, C 111/01 OJ 1 (2008).

[3] Bologna Working Group on Qualifications Frameworks, *A Framework for Qualifications of the European Higher Education Area: Bologna Working Group on Qualifications Frameworks*. (Copenhagen: Ministry of Science, Technology and Innovation, 2005).

Higher Education Qualifications Framework (MECES)[4] and the Catalan Higher Education Qualifications Framework (MCQES).[5]

In drawing up the proposed MCQES, AQU Catalunya adopted the EQF's classification of learning outcomes for the range of qualifications offered in the region. In the EQF, educational levels are established on the basis of descriptors expressed as learning outcomes and grouped into knowledge, skills and competences, which are defined as follows:

- **Knowledge:** the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices related to a field of work or study. In the EQF, knowledge is described as theoretical or factual.
- **Skill:** the ability to apply knowledge and use know-how to complete tasks and solve problems. In the EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).
- **Competence:** the proven ability to use knowledge and skills (including personal, social and/or methodological skills) in work or study situations and in professional and personal development.

Accordingly, when degree programmes are asked to describe their learning profile in Chapter 2 of the validation report, they should group the expected learning outcomes into these three categories, as shown in more detail below.

From 2007 to 2021, university degree programmes used the term "competences" to define what their students should know and be able to do at the end of their studies. Those competences are not necessarily the same as learning outcome competences. While competences are defined in terms of a proven ability to apply knowledge and skills in a professional environment, the 2007-2021 competences could in some cases refer only to knowledge or skills if written as learning outcomes.

Subject benchmarks

Subject benchmarks are qualifications frameworks that have been brought down to the more specific level of subject area. They therefore contain general statements about the learning outcomes that could be achieved by students completing a degree programme

[4] Spanish Ministry of Education, 'Royal Decree 1027/2011, of 15 July, establishing the Spanish Higher Education Qualifications Framework', Pub. L. No. 1027/2011, § I. General provisions, 302/2011 BOE 7 (2011).

[5] Gemma Rauret et al., *Catalan Higher Education Qualifications Framework* (Barcelona: AQU Catalunya, 2019).

(usually a bachelor's or master's degree) in a particular area. They are usually designed for the standard learner and are structured in the same way as qualifications frameworks, grouping learning outcomes into knowledge, skills and competences.

Subject benchmarks, like qualifications frameworks, should be the starting point for defining the learning outcomes of any degree programme. However, it should always be remembered that they represent an academic approach to the learning profile of different programmes in a broad field of knowledge and must therefore be adapted to the specificities of each programme.

LEARNING OBJECTIVES AND GRADUATION PROFILE

Learning objectives

Learning objectives are written in terms of the teaching intention and describe what the teaching staff intends to cover in their module/course or what the degree programme intends to provide for the student's education. The objectives are therefore written from the perspective of the teaching staff and/or the study programme, and describe the teaching process and learning management.

Objectives are usually under the direct control of the teaching staff or the study programme, as they are set and developed by them.

Teachers are fully familiar with learning objectives and their wording, as this has been the common way of indicating learning goals in their modules/courses and degree programmes. The challenge will therefore be not to develop the learning outcomes envisaged as learning objectives. In the validation report, degree programmes must specify these objectives in sections 1.11 and 1.11.bis (for mentions and specialisations).

The learning objectives of degree programmes will necessarily be more general than those of their modules/courses. The following are a few real examples of learning objectives:

> Example 1. Student will be acquainted to seminal artists and contemporary debates in filmic and photographic discourses.
> *Cinema and Photography: Methodology (5791V59). Bachelor's Degree in Arts, Media and Society, 180 ECTS credits. Universiteit Leiden (NL)*

> Example 2. The Bachelor of Agriculture provides students with a sound understanding of the structure and operation of agricultural production industries of Australia, as well as an understanding of Australia's role in global food and fibre production.
> *Bachelor of Agriculture, 3 years. The University of Melbourne (AU)*

> Example 3. Students will retrieve, evaluate, and interpret academic publications, and use this information to identify a gap in the extant research and to develop theoretical frameworks and research designs for their own research projects. *Doctoral Program in Second Language Acquisition University of Wisconsin-Madison (US)*

Graduation profile

The graduation profile (understood as the award of a bachelor's, master's or doctoral degree) is a statement of the general characteristics expected of a person obtaining a certain degree. They are usually descriptions, not lists, and are usually no longer than one paragraph. Degree programmes in Catalonia must explicitly state the graduation profile in Section 1.14 of the validation report.

Below is an example of a graduation profile:

> Example 4. This degree aims to train nutritionists – health professionals who focus their actions on the protection of human health – through the study of nutrition sciences, natural and exact sciences, social sciences, and medical and health sciences. It will also provide knowledge of nutrient metabolism, which plays an important role in health promotion and disease prevention; the pathophysiology of disease, whether due to nutrient excess or deficiency; and disease therapy, acting as a vehicle for nutrients that perform therapeutic functions. Finally, it will train students in the fields of food and human nutrition, clinical nutrition, community nutrition and public health, food service and catering, sport, the agri-food industry, and related research and teaching. *Degree in Nutrition Sciences, 240 ECTS credits. Universidade de Lisboa (PT)*

LEARNING OUTCOMES

The academic literature on education and quality assurance in higher education has defined learning outcomes in a variety of ways. However, these definitions are all very similar and share a key element: the desire for greater precision and consideration of the knowledge, skills and competences that students acquire when they successfully complete a period of learning. For example, Stephen Adam defines them as follows:

- Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate at the end of a period of learning. They are usually defined in terms of a mixture of knowledge, skills, abilities, attitudes and understanding that an individual will attain as a result of his or her successful

engagement in a particular set of higher education experiences.[6]

For Adam,[6] learning outcomes exemplify a particular methodological approach to the design and development of curricula (modules, courses and qualifications), determine the levels or cycles of education in an education system, and are included in subject benchmarks.

Heinz-Ulrich Schmidt,[7] meanwhile, describes them from three perspectives students, teachers and the world of work as follows:

> Learning outcomes describe what a student is expected to know, understand, apply, analyse, describe… and/or be able to demonstrate at the end of a study programme (on a more general level) and at the end of each module (on a more detailed level) and thereby the qualifications and competences to be achieved.
>
> Learning outcomes help academic staff to focus on what they want students to achieve in terms of knowledge, skills and attitudes, implementing the "Bologna process paradigm shift" from teacher-oriented teaching to student-centred teaching and learning.
>
> Learning outcomes provide a useful guide to inform potential candidates and employers about the general and subject-specific knowledge and understanding that a graduate will possess (important for the labour market, particularly graduate employability).

The following section describes why learning outcomes are key building blocks for curriculum design.

In the 21st century, learning outcomes have become an essential part of the educational reforms of the so-called Bologna process leading to the EHEA. They appear repeatedly in Bologna-related documents and in several ministerial communiqués, the first of which from Berlin,[8] which stipulates that bachelor's and master's degrees should be described in terms of learning outcomes rather than simply the number of hours of study. However, as Stephen Adam[6] says, their acknowledged importance stands in stark contrast to the poor level of understanding associated with them and their relatively rare practical implementation in EHEA degree programmes.

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[6] Stephen Adam, 'An Introduction to Learning Outcomes', in *EUA Bologna Handbook: Making Bologna Work* (Berlin: Raabe, 2006), 24.

[7] Heinz-Ulrich Schmidt, 'Learning Outcomes: Core Issues in Higher Education', in *Quality Assurance and Accreditation in Foreign Language Education*, ed. Donald F. Staub (Cham: Springer International Publishing, 2019), 179–90.

[8] Conference of Ministers responsible for Higher Education in the EHEA, 'Berlin Communiqué: Realising the European Higher Education Area', 19 September 2003.

As noted above, unlike objectives, learning outcomes are not controlled by teaching staff. Rather, their achievement depends, among other things, on students' willingness or ability to learn. This is why they are always expressed as an expectation, aspiration or desire of the teaching staff and the degree programme. It is therefore essential to implement teaching methodologies and learning activities that help students achieve the intended learning outcomes, and to design relevant assessment methods so that teachers can confirm that they have done so.

Learning outcomes may be subject-specific or more cross-curricular, but should always take into account subject specificity. In terms of timing, learning outcomes can be used prospectively (to be achieved) or retrospectively (already achieved). For example, module or degree programme learning outcomes would be considered prospective, whereas the use of such outcomes for the recognition of prior learning would be considered retrospective.

Learning outcomes are used for a variety of purposes in higher education. Although they share a common general structure, their characteristics or scope may vary slightly depending on their use.

Characteristics of learning outcomes

In 1981, George Doran[9] was the first to use the acronym SMART to define management objectives. Since then, the concept has been extended to learning outcomes in education. [10] SMART stands for specific, measurable, achievable, relevant and time-bound. It may be useful for programme directors and teaching staff to consider these characteristics when writing learning outcomes. In this document we replace "measurable" with "assessable" to avoid giving the impression that a student's success in achieving a learning outcome can always be expressed on a numerical scale.

- **Specific.** *What action will be taken and by whom?* Outcomes should be specified for the degree programme or module/course and should not be vague or unobservable. A learning outcome such as "By the end of the course, students will be able to study Darwin's theory of evolution" is not appropriate because it is unobservable and far too broad. A better example would be, "By the end of the course, students will be able to cite examples to support Darwin's theory of evolution".

[9] George Doran, 'There's a Way to Write Management's Goals and Objectives', *Management Review* 70 (November 1981): 2.

[10] Nena Skrbic and Jane Burrows, 'Learning, Teaching & Development: Strategies for Action', ed. Lyn Ashmore and Denise Robinson (55 City Road: SAGE Publications, Inc., 2021), 39–69; Debnath Chatterjee and Janet Corral, 'How to Write Well-Defined Learning Objectives', *The Journal of Education in Perioperative Medicine*: *JEPM* 19, no. 4 (1 October 2017): E610–E610.

- **Assessable.** *How will success be assessed?* Learning outcomes must include the conditions for learning in order to be measurable. For example, "By the end of the course, students will know what caused the Spanish Civil War" is not a measurable outcome. In contrast, "By the end of the course, students will be able to produce a timeline of the events leading up to the outbreak of the Spanish Civil War" allows the students' level of knowledge to be measured according to the accuracy and thoroughness of their timeline.
- **Achievable.** *Can it be achieved in a given time frame with the resources available?* A learning outcome such as "By the end of the course, students will carry out independent research on the European Union" may be totally unachievable. This is a general learning outcome, not a specific one, and it is not achievable in the context of a single course.
- **Relevant.** *Are the learning outcomes in line with the learning objectives and the teaching and assessment methodology?* All outcomes must be relevant to the degree programme or module.
- **Time-bound.** *When will the outcome be achieved?* Learning outcomes must be achievable within a pre-defined time frame, be it a lesson, a module or the degree programme.

Crucially, learning outcomes should also be **inclusive** and have a universal design for learning that gives all students an equal opportunity to succeed. Finally, it is essential that learning outcomes are made **public and known** to all students.

Writing and describing learning outcomes

According to Jennifer Moon,[11] a well-written learning outcome is likely to contain the following three components:

- A verb that indicates what the learner is expected to be able to do at the end of the period of learning.
- Word(s) that indicate on what or with what the learner is acting. If the outcome is about skills then the word(s) may describe the way the skill is performed (e.g. "jump up and down competently").
- Word(s) that indicate the nature (in context or in terms of standard) of the performance required as evidence that the learning was achieved.

This structure can be seen in two real examples of module learning outcomes:

[11] Jennifer Moon, *The Module and Programme Development Handbook: A Practical Guide to Linking Levels, Outcomes and Assessment Criteria*, 2003.

> Example 5. **Construct** a reasoned list of possible causes for *common patient presentations*, based on information gathered directly from a patient or provided from a medical history, examination and initial management report.
> Foundations for Clinical Practice 1 (MEDS90031). Doctor of Medicine, 3+4 years. Curriculum 2021. The University of Melbourne (AU)

> Example 6. The student is able to **analyse** the impact of *the evolution of the international regulation in the financial sector* on the management of financial institutions.
> Financial Institutions and Markets (B-KUL-HBA02C). Bachelor of Business Administration, 180 ECTS credits. KU Leuven (BE)

The verb indicating what students should be able to do when they have passed the module is in **bold**. The aspects on or with which students will act (patient presentations, the evolution of international regulation) are in *italics*. The text specifying the nature of the performance required of students to demonstrate that they have achieved the expected learning (construction of a reasoned list based on information, analysis of the impact on the management of financial institutions) is underlined.

The following are some practical strategies for writing good learning outcomes:

- It is a good idea to start learning outcome statements with phrases such as "By the end of the learning period (module/course, qualification, degree programme), students will be able to…".
- When writing learning outcomes, think first about what students should know or be able to do by the end of the degree programme, module or course. Learning outcomes should specify the core knowledge, skills and competences that students will have at the end of the learning period.
- It is best to write learning outcomes in the future tense and to choose a verb that accurately describes the intended outcome. Ideally, only one verb should be used, and this verb should be the most appropriate for structuring each outcome, whether subject-specific or general/cross-disciplinary. In choosing the most appropriate verb, it may be useful to refer to a classification of learning by type, such as that proposed by Anderson and Krathwohl,[12] which revises Bloom's already well-known taxonomy (see Table 1).
- Avoid verbs that are open to different interpretations of the actions required of students. For example, verbs indicating behaviours that cannot be objectively measured/assessed, such as *know, understand*, *be aware*, *appreciate*, *learn*, *become acquainted* and *think*.

[12] Lorin W. Anderson and David R. Krathwohl, eds., *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives* (New York: Longman, 2001).

- Finally, it is best to write clear, simple and concise sentences that students, teachers and the wider community can understand.

The following are some typical mistakes that people make when writing learning outcomes:

- Phrasing them as learning objectives, i.e. focusing on what the teacher will do during the teaching-learning process.
- Including learning outcomes that are too specific and detailed.
- Writing more than one learning outcome in each statement: each statement contains more than one sentence and more than one active verb.
- Using a verb that implies a non-observable, non-assessable action, such as *learn*, *understand* or *know*.
- Setting unrealistic learning outcomes that are unbalanced in terms of the time frame, level or resources available to students to achieve them.
- Including learning outcomes that cannot be assessed and/or do not conform to the assessment system.

Table 1. Type of learning and possible verbs to use

Type of learning	Verbs
Knowledge *(recalling facts)*	cite, define, identify, illustrate, indicate, inform, list, match, name, perform, provide, recall, recognise, recount, relate, select, write
Comprehension *(seeing and understanding relationships)*	associate, compare, convert, defend, demonstrate, describe, discuss, distinguish, estimate, explain, infer, inform, interpret, organise, outline, rephrase, revise, suggest, summarise, translate
Application *(using knowledge)*	apply, change, classify, conduct, construct, demonstrate, determine, develop, discover, dramatise, draw, employ, illustrate, interpret, modify, operate, organise, practise, predict, prepare, produce, programme, research, restructure, solve, translate, use
Analysis *(deconstructing and researching knowledge)*	analyse, categorise, compare, critique, determine, differentiate, discriminate, discuss, distinguish, examine, experiment, identify, probe, question, relate, research, resolve, select, structure, summarise, test
Evaluation *(determining value or relevance)*	calculate, conclude, contrast, critique, defend, discriminate, disprove, estimate, evaluate, interpret, judge, justify, measure, prioritise, qualify, review, score, validate
Creation *(combing information into a new unit of connected knowledge)*	adapt, assemble, combine, compare, compile, compose, construct, create, design, devise, divide, explain, formulate, generate, integrate, plan, propose, relate, reorder, restructure, revise, synthesise, systematise, unify

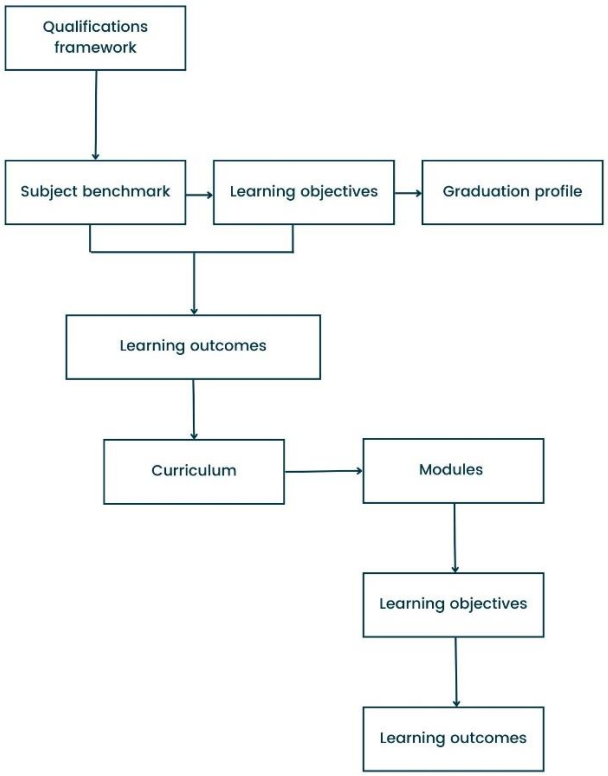
DIAGRAM FOR DEVELOPING DEGREE PROGRAMME QUALIFICATIONS PROFILES

As we have seen, learning objectives and outcomes become more specific as one moves from the degree programme itself to the modules that make it up. With this in mind, those designing new programmes should start with the most general aspects, and eventually specify them in smaller units of the curriculum. Figure 1 shows this general diagram.

Firstly, the degree programme must be designed from top to bottom in accordance with the MCQES. This means that its learning outcomes must be appropriate to the level of education. Relevant subject benchmarks (if any) should also be used as a reference, as they take the MCQES down to a more specific level, focusing more closely on the subject area concerned. At this point, the degree programme designers can begin to think about the desired learning objectives and graduation profile. These four components are key to defining the learning outcomes that students will achieve by the end of the degree programme.

Now that the learning outcomes for the degree programme have been established, it is possible to consider the components of the curriculum (modules/courses) and their specific learning objectives and outcomes. Remember that these should be consistent with those previously established for the degree programme.

Figure 1. Diagram for developing degree programme qualifications profiles



THE DEGREE PROGRAMME LEARNING PROFILE

In Catalonia, the learning profile is closely linked to the validation and accreditation process, and therefore to the approval of university degree programmes, their declaration as official and their publication in the Register of Universities, Higher Education Centres and Degree Programmes (RUCT) of the Ministry of Universities.

The profile must be clearly indicated in Section 2 (Outcomes of the teaching and learning process) of the degree programme report. According to Royal Decree 822/2011,[13] these outcomes must be specified in terms of "knowledge or content, competences, and abilities or skills to be acquired by students". In this way, the Royal Decree introduces a certain classification of learning outcomes. As seen above, this is one of the most commonly used classifications in qualifications frameworks and subject benchmarks. However, in the international understanding, content is not part of learning outcomes. For this reason, in the validation reports of university degree programmes in the Catalan university system, content is reserved for the module descriptions. It should also be emphasised that the logical order for defining learning outcomes is knowledge, skills and competences, since the latter involve the application of knowledge and skills in a work or academic environment for training in professional practice.

It is worth noting that the degree programme validation report deals mainly with the teaching-learning process for students to achieve specific learning outcomes. Whether this "statement of intent" has been successful will be determined during the degree programme accreditation process.

Learning outcomes were incorporated into degree programmes in the Catalan university system between 2007 and 2021, mainly in modules and courses (as in examples 5 and 6 above). The learning profile is constructed around the learning outcomes of the degree programme as a whole, and therefore encompasses more than just the sum of the learning outcomes of the modules/courses (which would be tantamount to viewing learning as cumulative). However, there must be consistency between the learning outcomes of the degree programme, those of the modules/courses and the learning objectives. The degree programme profile must also be consistent with the MCQES.

That being said, there is a clear difference between programme learning outcomes and module learning outcomes. Programme outcomes are written for the typical or average student, are necessarily more general than module outcomes, and are usually *aspirational*. They cannot always be determined directly or in a specific module, as they are the result of the teaching-learning process of the whole degree programme. Ideally,

[13] Spanish Ministry of Universities, 'Royal Decree 822/2021, of 28 September, establishing the organisation of university education and the procedure for quality assurance', Pub. L. No. 822/2021, § I. General provisions, 233 BOE 42 (2021).

however, most programme learning outcomes should be written in such a way that it is possible to ascertain whether they have been achieved.

There are several ways to lessen this inevitable mismatch between the degree programme profile and the learning outcomes of each module, namely by identifying the cornerstones of the programme:

- Construct the curriculum in modules rather than courses (atomisation of ECTS credits).
- Identify student achievements that involve the convergence of different modules/courses, e.g. integrated projects.
- Degree programme final projects.
- External training placements.

When designing a new degree programme, it may be useful to relate the learning outcomes defined for the programme to each module in the curriculum. As noted above, learning is not cumulative, nor does it depend on one module or learning activity alone. Nevertheless, constructing a table to visualise this relationship can be a useful way of checking whether all the proposed learning outcomes of the degree programme can be certified from the learning outcomes of the modules in the curriculum.[14]

Learning outcome	Module 1	Module 2	Module 3	Module 4	Module *n*
1	X				
2			X		X
3		X			
n		X		X	

Subject benchmarks, where they exist, are the natural starting point for constructing the learning profile. The learning outcomes of the degree programme must in some way match the specifications of the relevant subject benchmarks. Ideally, however, they should not be identical (which is unusual anyway). Subject benchmarks are written from an academic perspective, considering model degrees. The reality and needs of a university in implementing a particular degree programme are more complex. Multidisciplinary programmes are a good example of this. In short, subject benchmarks must be specified for each degree programme.

[14] The assessment and certification of learning outcomes will be covered in detail in other supporting methodological documents.

When writing the learning outcomes for Section 2 of the degree programme report, the same principles discussed above apply.

Classifying degree programme learning outcomes

The learning outcomes of the degree programme must be grouped into the three categories included in the MCQES: knowledge, skills and competences.

Some real examples of learning outcomes in university degree programmes are given below:

> Example 7. *Knowledge*. Graduates will be able to **cite** the essential parameters and underlying mechanisms involved in the pharmacological action of *various types of drugs and other substances with which people may come into contact in everyday life*.
> *Master of Drug Development, 120 ECTS credits. KU Leuven (BE)*

> Example 8. *Knowledge*. Graduates will be able to **identify** the descriptive and critical terminology developed in France and abroad in order to comment on *artistic productions and archaeological objects* […].
> *Bachelor's Degree in Art History and Archaeology, 180 ECTS credits. Université de Strasbourg (FR)*

> Example 9. *Skill*. On completion of this course, graduates will be able to **evaluate** rehabilitation models and settings in *current practices in older person rehabilitation*.
> *Older Person Rehabilitation MSc, 60 ECTS credits. University College Cork (IE)*

> Example 10. *Competence*. Graduates will be able to **engage** in advanced application of frameworks and techniques [related to information systems] in *organizational settings*.
> *Information Systems for Business Performance MSc, 90 ECTS credits. University College Cork (IE)*

> Example 11. *Competence*. Graduates will be able to **apply** engineering design *to produce solutions that meet specified needs* with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
> *Materials Science and Engineering, B.S., 4 years. University of Wisconsin-Madison (US)*

> Example 12. *Skill*. After completion of the degree programme, the student shall demonstrate the capability, both orally and in writing, to **report** *on biomedical problems/projects* for both the general public and experts.
> *Bachelor's Programme in Biomedicine, 180 ECTS credits. Karolinska Institutet (SE)*

As in examples 5 and 6, the verb indicating what students should be able to do on completion of the programme is in **bold**; the aspects on or with which students will act are in *italics*; and the text specifying the nature of the performance required of students to demonstrate that they have achieved the learning is underlined.

There is no hard-and-fast rule for determining the number of learning outcomes that should be included in the degree programme's qualifications profile, but in general there should be no more than 25. Finally, due to their characteristics, there are expected to be significantly fewer learning outcomes in the category of competences than in the categories of knowledge and skills.

REVIEWING LEARNING OUTCOMES

Learning outcomes, for both the degree programme and its modules, should be subject to a regular review process. The mechanisms for doing so will necessarily be different in each case.

At the end of modules/courses, teachers should ideally spend some time asking their students for their reasoned opinion on the learning outcomes, taking into account their experience of the module content, teaching methodology, learning activities, performances and assessment tests. This joint reflection can lead to clearer and more relevant wording, bringing it more into line with the educational intention of the module. This review process gives students a central role in the teaching-learning process and increases their engagement in the learning process. This is one of the key features of student-centred learning.

Programme learning outcomes should be reviewed as part of the institution's regular programme monitoring process. This review is particularly important and necessary when degree programmes are making changes to their curricula.

ANNEX I. CHECKLIST WHEN WRITING LEARNING OUTCOMES

Once the degree programme or module learning outcomes have been written, the following questions can be asked and answered to check that they have been appropriately worded. If the answer to any of these questions is "no", the learning outcome(s) concerned will need to be revised:

- Did we (degree programme, teacher) focus on outcomes rather than processes, i.e. on what students are able to demonstrate rather than what we have done or will do in the degree programme or module?
- Did we start each outcome with an active verb?
- Did we use only one active verb per learning outcome?
- Did we avoid terms such as know, understand, learn, be acquainted, be exposed or be aware?
- Are the outcomes observable and assessable?
- Do our learning outcomes include all types of learning: knowledge, comprehension, application, analysis, evaluation and creation?
- Do all the outcomes fit within the objectives and content of the degree programme or module?
- Did we write the recommended number of outcomes (maximum 8 per module and 25 per degree programme)?
- Can the learning outcomes realistically be achieved in the given time frame and with the resources available?

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