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ASSESSMENT OF LEARNING OUTCOMES

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ASSESSMENT OF LEARNING OUTCOMES

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CONTENTS

INTRODUCTION

Context and regulatory framework

In Europe, as a result of the implementation of the European Higher Education Area (EHEA), there has been a growing demand from society and government bodies for universities to specify what graduates of a degree programme will know and be able to do, i.e. what the expected learning outcomes are. As programmes have worked to specify their educational profile in terms of learning outcomes, they have been confronted with the need to demonstrate that their graduates have achieved them.

In the 1980s, a debate began in the United States and Canada around the need to include the achievement of learning outcomes in the accreditation processes of degree programmes. In Europe, the push for greater emphasis on these aspects has gained momentum in recent years as a result of increased demand for higher education, social and technological change (and the consequent need to educate people in new, highly diverse areas), and the introduction of new educational structures and new higher education providers. The COVID-19 pandemic has brought this change to an even faster pace. As higher education expands and diversifies, institutions' assurances about the quality and validity of their degree programmes are becoming increasingly important. All this has put the assessment of learning outcomes high on the agenda of the European Union; national, federal and regional governments; and, of course, quality assurance agencies.

The new Spanish regulatory framework[1] has embraced this trend by making it compulsory to specify the intended learning outcomes for graduates. However, this paradigm shift will only succeed if there is institutional commitment to provide teachers with the necessary tools and training, and to truly place the student at the centre of the teaching-learning process. In this regard, a recent report by the European University Association (EUA) found that universities still pay insufficient attention to assessment in their regulations and activities. This means that there has been little institutional reflection on assessment as part of student-centred learning and on the operational alignment of the parts involved in the teaching-learning process.[2] A curriculum approach based on learning outcomes, in which all parts of the teaching-learning process are aligned, is still at an early stage of implementation in European universities. This raises many questions about the nature of

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[1] Spanish Ministry of Universities, 'Royal Decree 822/2021, of 28 September, establishing the organisation of university education and the procedure for quality assurance', Official State Gazette (233), 29 September 2021, pp. 119537-119578. BOE-A-2021-15781.

[2] European University Association, 'Curriculum and Assessment: Thematic Peer Group Report', *Learning & Teaching Paper* #16 (Brussels, Geneva: European University Association, 11 March 2022).

their assessment, such as:

> What does it mean to assess learning outcomes?

> What is assessed?

> What methods and tools are used to assess knowledge, skills and competences and to provide positive and encouraging formative feedback?

The scope for assessing learning outcomes is enormous. Where learning outcomes are defined, an assessment system may be set up to determine their achievement.

Aims and structure of this document

The main theme of Focus 2 is the assessment of learning outcomes for degree programmes and modules/courses. It is intended as a resource to help the management teams and teaching staff of universities, other educational institutions and degree programmes to develop assessment strategies that best suit their disciplines, their graduates' professions, and their intended learning outcomes. Its aim is therefore purely **operational; it is not an academic document attempting to define the nature and foundations of learning assessment**. It does, however, draw on the most relevant academic work available to date to offer teachers and universities valid solutions for assessing learning outcomes.

In the sections below, we first present the aims and characteristics of assessment. Next, we describe the various components of an assessment strategy and how they fit together. Assessment is sometimes disconnected from the teaching-learning process, a process that teachers think about after the curriculum has been designed and the lessons delivered. For this reason, it is important to ensure that learning outcomes, content, teaching methods and activities, and assessment methods and criteria are all aligned. The strategy for assessing the learning outcomes of degree programmes is also important for ensuring their continuous improvement, quality assurance, accountability and accreditation. Institutional policies and resources for assessment are key to a successful paradigm shift. Throughout this document and its annexes, we provide examples and documentary resources that institutions can adapt for their own degree programmes.

Terminology

Focus 1 discussed the wide range of definitions found in the literature on the concepts of learning outcomes, competences and skills.[3] In some cases these differences are minimal, but in others they are so significant that a single term can convey very different concepts and ideas. For example, there are many definitions of learning outcomes, but there is little difference between them. It is in the way they are classified that the differences become more relevant.

All these possible differences affect how the achievement of learning outcomes can be assessed. For example, we defined competence as 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. It is clear, therefore, that the achievement of a given competence can only be assessed through action and in a real-world setting.

The same is true for the assessment of learning outcomes and their components. For example, much of the English-language literature on learning assessment uses the terms "assessment method" and "assessment task" interchangeably. Other authors make a clear distinction between assessment method, strategy, technique and task. As Focus 2 is primarily operational, we adopt the first interpretation.

ASSESSMENT OF LEARNING OUTCOMES

Assessment is the mechanism by which students can demonstrate the quality of their learning and teachers can score and certify it. However, there is a general consensus in higher education – especially in Europe since the implementation of the EHEA – that assessment should go beyond testing student learning. Instead, it should be seen as part of the overall strategy to help students learn. In this regard, researchers Catherine Palomba and Trudy Banta define assessment as the systematic collection, review and use of information about educational programmes undertaken for the purpose of improving student learning and development.[4]

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[3] Catalan University Quality Assurance Agency, _Degree programme profiles: learning objectives, graduation profile and learning outcomes_ (Barcelona: AQU Catalunya, 2022).

[4] Trudy W. Banta and Catherine A. Palomba, _Assessment essentials: planning, implementing, and improving assessment in higher education_, 2nd ed., Jossey-Bass Higher and Adult Education Series (San Francisco: Jossey-Bass & Pfeiffer Imprints, 2014).

Thomas A. Angelo[5] offers a view of the nature and purpose of assessment that can be summarised as follows:

> It is an ongoing process aimed at understanding and improving student learning.

> It involves making teachers' expectations public and explicit.

> It sets appropriate criteria and standards for quality learning.

> It systematically gathers, analyses and interprets evidence to determine how well student performance matches those expectations and standards and, where necessary, to improve performance.

Assessment is therefore a key part of student-centred learning and, depending on the aims it encompasses, is referred to as an **assessment strategy**. This strategy should closely link the formulation of learning outcomes, assessment methods, assessment criteria, and the planning and scheduling of assessable tasks or tests. It should serve several purposes, including verifying the achievement of learning outcomes and assessing the quality of that achievement, giving feedback to students to improve their learning, and providing information to teachers so that they can improve their own effectiveness or (re)define the learning outcomes or content of the module being taught.

The assessment process and its outcomes also have obvious implications for quality assurance, as they can provide the necessary evidence to demonstrate to society that graduates have achieved the intended learning outcomes and are prepared for further work or study.

Mantz Yorke sets out three purposes for which students are assessed: to promote learning, to certify achievements and to provide data that can be used for quality assurance purposes (see Table 1).[6]

Assessment is therefore a more complex and value-added process than simply marking and certifying student achievements. Ultimately, it should help students learn and teachers to be more effective in their role.

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[5] Thomas A. Angelo, 'Reassessing (and Defining) Assessment', *American Association for Higher Education Bulletin* 48, issue 3 (November 1995): 3.

[6] Mantz Yorke, *Grading Student Achievement in Higher Education: Signals and Shortcomings,* Key Issues in Higher Education Series (London; New York: Routledge, 2008).

Table 1. Purposes of student assessment

Broad purpose	More detailed purpose
Learning	To motivate students To diagnose strengths and weaknesses To provide feedback To consolidate work done to date To help students develop their capacity for self-assessment To establish the level of achievement at the end of a unit of study
Certification	To establish the performance level at the end of a programme of study To pass or fail a student To grade or rank a student (with reference to norms and/or criteria) To underwrite a "licence to practise" To demonstrate conformity with external regulations, such as those of a professional or statutory body To select for employment, further educational activity, etc. To predict future performance
Quality assurance	To assess the extent to which a programme's aims have been achieved To judge the effectiveness of the learning environment To provide feedback to teachers regarding their personal effectiveness To monitor levels of achievement over time To assure interested parties that the programme or unit of study is of an appropriate standard To protect the relevant profession To protect the public

Characteristics of learning outcomes assessment

For the assessment of learning outcomes to be relevant and appropriate, it must have a number of characteristics. These should be considered by both teachers and programme directors when designing assessment strategies. Phil Race, Sally Brown and Brenda Smith identify sixteen ideal characteristics of any relevant assessment process.[7] Assessment must be:

> **Valid**, meaning it should measure exactly what it is supposed to measure: the achievement of the intended learning outcomes. It should be designed in such a way that the intended learning outcomes are put into practice by the students and their level of achievement can be verified. Valid assessment should discriminate between students on the basis of how well they have achieved the learning outcomes. In other words, it must provide for a wide range of marks.

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[7] Sally Brown, Phil Race and Brenda Smith, _500 Tips on Assessment_, 1st ed. (Routledge, 2004).

> **Reliable**, with objective assessment methods that are consistent with the achievement of student learning outcomes. Two students who have achieved the learning outcomes to a similar degree should receive similar marks.

> **Realistic**. Assessment should require students to apply the knowledge, skills and competences they have acquired in situations that simulate as closely as possible the context of the discipline or profession for which the degree programme prepares them. That is, it should require students to use the same knowledge, skills and competences that are expected of professionals in that discipline. The authenticity of an assessment task depends on how closely it resembles the reality of professional or disciplinary practice.

> **Transparent**. Students should know every detail of the teaching-learning process at the beginning of the module/course: intended learning outcomes, learning activities, assessment methods and criteria, rubrics, etc. There can be no hidden agendas or surprises in student assessment.

> **Motivating**. Assessment should motivate students to learn and help them to structure their learning so that it continues throughout the period of study. Assessment should enable students to self-assess and monitor their progress and help them to make informed decisions about what to learn, how to learn it and how best to demonstrate their achievements in learning.

> **Conducive to deep learning**. Students should not be led towards superficial learning or the repetition of knowledge or skills.

> **Fair**. All students should have the same opportunities to succeed in the assessment process, even if their educational backgrounds or experiences have not been the same.

> **Equitable**. While overall assessment may be designed to discriminate between students on the basis of how well they have achieved the intended learning outcomes, assessment practices must be non-discriminatory and should aim to place no individual or group at a disadvantage. The use of a sufficiently broad range of assessment methods will ensure that there is no bias.

> **Formative**. Assessment is a time-consuming process for everyone involved, so it seems a missed opportunity if it is not used as a means of letting students know how they are doing and how they can improve.

> **Performed at an early stage**. Formative assessment should begin as early as possible in a course or module. Students benefit greatly from early feedback on how they are doing, and can adjust their efforts accordingly.

> **Timely**. Assessment at the end of a learning period alone does little in the way of providing feedback, and also leads to "sudden death" syndrome, where students have no chance to practise for the assessment before passing or failing. Even where there is a single final formal assessment, opportunities for testing and feedback should be provided beforehand.

> **Incremental**. Ideally, students should receive feedback on an ongoing basis. Therefore, it makes sense to plan various assessment activities that add up to a final mark. This avoids surprises and can be much less stressful than systems where passing a module/course is based on a student's performance in a single, timed assessment test.

> **Open to second chances**. Students should be given an opportunity to pass a failed module/course before retaking it entirely.

> **Testing**. Passing an assessment or test should not be automatic or below the threshold of the learning outcomes.

> **Conducive to the demonstration of excellence**. Assessment methods should challenge students to achieve the highest possible learning outcomes.

> **Efficient and manageable**. Teachers' time and resources should be used rationally and efficiently. Assessment tasks should not place an excessive workload on teachers or students.

Components of the assessment process

The assessment process consists of several relevant components, including assessment methods and criteria, marks, and certification of learning outcomes.

> **Assessment methods** (or assessment tasks). The full range of written, oral and practical tests, examinations, projects, performances, presentations and portfolios used to assess students' progress and determine their achievement of the learning outcomes of a module/course or degree programme.

> **Assessment criteria**. The specific features or characteristics of students' work that allow teachers to judge how well they have performed and therefore how well they have achieved the learning outcome being assessed.

> **Assessment standards**. Descriptions of how students are expected to perform to demonstrate that they have achieved a learning outcome[8] to a particular degree. Teachers use them as a basis for determining the correctness of students' work.

> **Numerical marks**. Numbers indicating the relative quality of students' work in assessment tasks and, sometimes, in modules or courses. Our university system uses a numerical marking scale of 0 to 10.

> **Qualitative marks**. Labels used to indicate the different intervals along a numerical marking scale. In our system they are: fail (0-4.9), pass (5.0-6.9), good (7.0-8.9), excellent (9.0-10) and excellent with distinction (up to a maximum of 5% of students receiving an "excellent" mark).[9] They are most commonly used in

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[8] European Union, *ECTS Users' Guide* (Luxembourg: Publications Office of the European Union, 2015).

[99] Spanish Ministry of Education, Culture and Sport, 'Royal Decree 1125/2003, of 5 September, establishing the

modules/courses, although it is not unusual to see them in assessment tasks.

> **Rubrics**. Systems used to assign numerical and qualitative marks based on the assessment criteria and standards specified for each possible level of achievement.

> **Certification**. The formal act of awarding an academic qualification to students to certify that they have achieved the relevant learning outcomes (whether for a module/course or a degree programme).

OPERATIONAL ALIGNMENT

Operational alignment in modules

Operational alignment within a module/course refers to the link between the intended student learning outcomes and the processes and practices required to support those outcomes.[10,11] It is the internal consistency that must exist between the intended student learning outcomes, the content, the teaching methodologies and activities, and the assessment methods and criteria. Aligning all these aspects should help students to achieve the learning outcomes. For example, if a course has learning outcomes related to comprehension (i.e. actions involving demonstration, explanation, interpretation, etc.), but the teaching methodology is lecture-based, the student activities are note-taking and questioning in class, and the assessment is summative, there is no alignment. These activities do not allow students to put the learning outcomes into practice, meaning that they will have no opportunity throughout the course to practise for the assessment and monitor their progress.

Therefore, when designing a module/course it is important to ensure that the intended learning outcomes are well matched to the assessment methods, that appropriate assessment criteria are used, and that direct and useful mechanisms are in place to provide students with feedback on how well they have demonstrated their achievement of these outcomes.

Figure 1 shows the relationships between the aspects involved in the curriculum design of a module/course.

European credit system and the grading system for official university degree programmes valid throughout the national territory', *Official State Gazette* (224), 2003, p. 34355-34256. BOE-A-2003-17643.

[10] Pat Hutchings, 'Aligning Educational Outcomes and Practices', *Occasional Paper*, issue 26 (January 2016): 1-20.

[11] John B. Biggs and Catherine Tang, *Teaching for Quality Learning at University: What the Student Does*, 4th ed., SRHE and Open University Press Imprint (Maidenhead, England; New York, NY: McGraw-Hill, Society for Research into Higher Education & Open University Press, 2011).

Figure 1. Relationships between the aspects of curriculum design
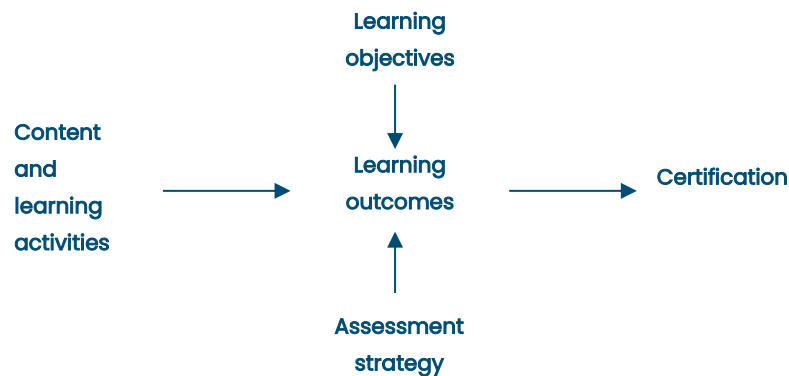
Below are some tips that teachers may find useful when checking the alignment of these aspects:[7]

> Determine what students will be expected to know and be able to do by the end of the module/course. Learning outcomes help students to know whether the module/course will be relevant to their learning needs or intentions.

> Do not write learning outcomes for which you cannot obtain observable evidence of achievement, or which you do not wish to assess at all. If it is important enough to be proposed as an expected learning outcome, it must be assessed in some way. Conversely, if an assessment task is designed to assess a relevant learning outcome that was not originally envisaged, add it to the list of learning outcomes.

> Determine what evidence will enable you to check that students have achieved the learning outcomes, and publish the assessment methods and criteria for students to see. When students know what they need to demonstrate to be successful, they are much more likely to achieve the required level.

> For each intended learning outcome, ask yourself how it can best be assessed. If it is easy to think of an assessment method, the outcome is probably well designed. If you find it difficult to come up with an assessment method, this is usually a sign that you need to rethink the outcome in order to relate it more closely to the tasks that allow it to be assessed.

Operational alignment in degree programmes

There must be evidence that students completing a degree programme have achieved the intended learning outcomes. There are two ways to do this:

> Through **final assessment activities** that require students to integrate the learning outcomes they have achieved throughout their studies. This is a very unusual practice in our university system, with the exception of the Objective Structured

Clinical Assessment (ACOE, for its initials in Catalan), which is used in some degrees in the field of health (especially in medicine), and the bachelor's and master's degree final projects, in which some of the learning outcomes can be integrated.

> By **aligning the learning outcomes of the degree programme with those of the modules/courses** in its curriculum. In this way, the assessment methods used in the modules/courses also serve to certify the achievement of the learning outcomes of the degree programme. As seen in "Focus 1",[3] learning is not cumulative, nor does it depend on one module or learning activity alone. Therefore, learning outcomes 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, however, most programme learning outcomes should be written in such a way that it is possible to ascertain whether they have been achieved. Each programme learning outcome is usually addressed in various modules/courses from different and increasingly complex perspectives.

The academic team responsible for the degree programme should answer these questions:

> Do the modules/courses of the degree programme as a whole address all the learning outcomes of the degree programme? Are there gaps? Is there overlap?

> Are the learning outcomes of the degree programme evenly aligned with those of the modules/courses? Is there too much emphasis on some of the programme outcomes over those of the modules/courses or vice versa?

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. Several examples of how this mapping can be done are given in "ANNEX 1. CURRICULUM MAPPING".

IMPLEMENTING CRITERIA-BASED ASSESSMENT

This section presents the various actions that should be considered when implementing criteria-based assessment aligned with learning outcomes in modules/courses. These are:

1. Defining learning objectives and expected learning outcomes
2. Identifying assessment criteria and establishing learning activities
3. Deciding what content to include
4. Choosing assessment methods
5. Establishing rubrics and a marking system
6. Providing student feedback

7. Certifying the acquisition of learning outcomes

1. Defining learning objectives and expected learning outcomes

When designing a module/course, the first step should be to specify its learning objectives, followed by drawing up the learning outcomes that students are expected to achieve.

Learning objectives **describe what teachers intend to cover in their module/course** in order to educate their students. Objectives are therefore written from the teacher's perspective and describe the teaching process and the management of learning.

Learning outcomes are **statements of what students are 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 students will attain as a result of their successful engagement in a particular set of higher education experiences.[12] For more information on this point, see "Focus 1".[3]

2. Identifying assessment criteria and establishing learning activities

The next step is to identify assessment criteria that will provide evidence that students have achieved these learning outcomes. Criteria are the **key features of students' performance in an assessment task**. They guide their efforts by telling them what is important and what they should do. Criteria are also called **assessment dimensions**.

Pay particular attention to the verb you use in the learning outcome to describe what students will be able to do on successful completion of the module/course. For example, if the active verb is "design", think about what the essential features of design are in the assessment tasks that students will be asked to complete. These features determine the criteria, but not all of them will be equally important. Any features that are not particularly important should be excluded. As with learning outcomes, a long list of criteria will be unwieldy for both students and teachers. It is therefore important to focus on the most critical and relevant criteria for demonstrating achievement.

Criteria can, for example, refer to something that must be present or absent (presence of correct grammar or absence of spelling mistakes) or to a performance that students must achieve (precise description of the processes involved in preparing an article and its results and conclusions). The following example presents a learning outcome for which the assessment method is the writing of a lab report.

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

By the end of the module, students will be able to write a concise, clear and well-organised lab report, structured in the specified format.

Some assessment criteria are included in the learning outcome itself, such as the quality of report writing and formatting:

> The report should be concise, clear and well organised.

> The report should be written in the specified format (template).

Other, possibly implicit criteria could be added, such as the identification of the method of analysis or the accuracy of calculations:

> The method of analysis should be correctly identified.

> The calculations in the report should be accurate.

Thus, assessment criteria can be developed from the learning outcomes, but also from the assessment tasks themselves, especially if they are implicit.

While defining the assessment criteria, it is also necessary to determine the most appropriate teaching methods and learning activities to pursue and achieve the learning outcomes. Again, criteria, methods and learning activities must be aligned with each other and with the intended learning outcomes.

3. Deciding what content to include

Now you can decide what content to include in the module/course. It is best to work in this order. If you start with the content and work backwards to define the learning outcomes, you may end up with an unmanageable amount when it comes to assessing and certifying their achievement. The choice of content is directly based on the expertise of the teaching staff, who must determine its scope and depth according to the learning outcomes and the level that these outcomes determine. It is also essential that all content can be covered in the time allowed by the ECTS credits of the module/course. Never plan more content than can be covered in the allotted time. This is unfair to students and undermines the European credit system.

When planning content and learning activities, keep in mind that the verbs used to define learning outcomes also determine the expected level of learning, from the least complex (e.g. recalling facts) to the most complex (e.g. combining information into a new unit of connected knowledge) (see Table 2). Content should also be aligned with these levels.

4. Choosing assessment methods

Intended learning outcomes and assessment criteria provide a guide for choosing assessment methods and designing tasks that will best assess the achievement of those outcomes. There are numerous classifications of assessment methods in the scientific literature: whether or not they are time-bound, whether or not students are allowed to consult outside material, etc. What matters is that they are fit for purpose, i.e. in line with the defined learning outcomes and learning activities. The nature of the learning outcomes will thus influence the type of assessment methods and teaching methodologies that can be used.

Clearly, a single method will not be enough to assess all the learning outcomes of the module/course or the degree programme. The use of multiple assessment methods will therefore be necessary. Assessment tasks are often designed to assess more than one learning outcome. If this is the case, consider which combination of learning outcomes can be adequately assessed. Similarly, a learning outcome may be addressed by more than one assessment method.

Subject specificities will also influence the choice of assessment task. Some assessment methods are more authentic (or realistic) than others because they assess knowledge, skills and professional competences specific to the subject area.

It is important that assessment tasks are manageable, both for students in terms of the time and resources needed to complete them, and for teachers in assessing student performance. Table 2 also suggests possible assessment methods for the different types of learning.

Table 2. Types of learning and possible assessment methods

Type of learning	Verbs	Assessment methods
Knowledge *(recalling facts)*	cite, define, identify, illustrate, indicate, inform, list, match, name, perform, provide, recall, recognise, recount, relate, select, write	essay, written exposition, glossary, technical note, fill-in-the-blank test, true/false test, location test (maps, graphs, pictures, diagrams, etc.), multiple-choice test, objective test, etc.
Comprehension *(seeing and understanding relationships)*	associate, classify, compare, convert, defend, demonstrate, describe, discuss, distinguish, estimate, explain, infer, inform, interpret, organise, outline, rephrase, revise, suggest, summarise, translate	essay, demonstration of laws and theories, diagram, outline, examples, infographic, oral report, concept map, presentation, short answer test, ordering test, review, summary, literature review, etc.
Application *(using knowledge)*	apply, change, conduct, construct, demonstrate, determine, develop, discover, dramatise, draw, employ, illustrate, interpret, modify, operate, organise, practise, predict, prepare, produce, programme, research, restructure, solve, translate, use	composition, construction, choreography, examples, lab report, oral report, performance (theatre, music), portfolio, poster, presentation, prototyping, problem solving, role play, simulation, text translation, etc.
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	critique (literary, film, etc.), debate, debugging, guided discussion, case study, laboratory practice/analysis, problem solving, etc.
Evaluation *(determining value or relevance)*	calculate, conclude, contrast, critique, defend, discriminate, disprove, estimate, evaluate, interpret, judge, justify, measure, prioritise, qualify, review, score, validate	self-assessment, peer assessment, critique (literary, film, etc.), case study, report, court trials, alternative solutions, simulations, etc.
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	case study, literary creation, model creation, criteria development, theory and hypothesis development, design, experiment design, news, project planning, computer programming, reporting, etc.

5. Establishing rubrics and a marking system

The next step is to determine how the assessment tasks will be scored and how the final module/course mark will be calculated. One way of constructively aligning marks with criteria and learning outcomes is to use a marking scheme or rubric. A rubric is a **grid that relates the key criteria or dimensions of an assessment task (rows) with the level of achievement of those criteria (columns).** These levels are described in the form of standards.

In a nutshell, a rubric is an assessment tool with three distinctive features: assessment criteria, standards and a scoring strategy.[13]

> Assessment criteria represent the assessable dimensions of an activity or task.

> Standards are qualitative descriptions that place student performance on a continuum, from the lowest to the highest level, for a given criterion.

> The scoring strategy is the process by which the qualitative assessments of performance for each criterion are converted into an overall judgement of the quality of the activity or task.

A well-designed rubric can benefit both teachers and students. Rubrics can help teachers to:

> Reduce the time they spend on marking.

> Ensure marking consistency and objectivity.

> Reduce student uncertainty and complaints about marks.

> Adjust their lessons or provide additional resources based on the overall performance of the class.

Rubrics can also help students to:

> Understand the teacher's expectations for a particular task.

> Understand how activities and tasks align with the learning outcomes of the module/course.

> Improve their performance through teacher feedback based on the assessment standards.

> Self-assess their own work.

Of course, the use of rubrics is not supported by all assessment methods. For example, a rubric cannot be used for objective or true/false tests: as there is only one right answer for each question, there is generally no room for distinct levels of achievement. Rubrics work well when assessment tasks require students to provide more elaborate responses. In these cases, rubrics help to **increase the reliability and validity of the assessment**.

Types of standard

Assessment standards can be used to set the threshold for learning outcome achievement or to describe the different levels of achievement in a marking scheme. In these cases they are called threshold standards or marking standards, respectively. In our university system, marking standards are generally used to determine the level of achievement of learning outcomes and to create rubrics. However, threshold standards

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[13] W. James Popham, *Modern Educational Measurement: Practical Guidelines for Educational Leaders*, 3rd ed. (Boston: Allyn and Bacon, 2000).

are also included in marking standards, as they determine the lowest mark required to pass a module/course and certify the achievement of learning outcomes.

From a quality assurance perspective, only threshold criteria are absolutely necessary, in that they set the minimum expectations of student performance for the achievement of learning outcomes. Nevertheless, the use of marking standards clearly provides an incentive for learning. This option is more demanding and allows students to demonstrate excellence and be rewarded accordingly with a higher numerical or qualitative mark.

Types of rubric

Depending on their use and scope, rubrics may be **analytic**, describing all levels of achievement for each criterion separately, or **holistic**, combining all criteria into one description of the student's performance so as to make an overall judgement about the quality of a task (or multiple tasks) in a module/course.

Rubrics can also be **general**, describing the quality of performance for a particular criterion across all module tasks (when criteria based on module learning outcomes are assessed in the same way, using the same descriptors or standards, e.g. outcomes related to critical thinking or teamwork), or **specific**, describing levels of performance for each particular task and criterion. General rubrics highlight learning outcomes that are not specific to a particular assessment task, whereas specific rubrics are used to assess criteria based on learning outcomes that are unique or specific to that task.

Table 3 shows a typical example of an analytic rubric structure used for a particular assessment method and learning outcome (the weighting is for illustrative purposes only). A good analytic rubric should have between **three and five levels of achievement** and at least **two assessment criteria**.[14,15] The levels may be the same as those used in official qualifications in Catalonia, or other classifications may be established (e.g. below competent, competent and above competent; emerging, developing, etc.).

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[14] Susan M. Brookhart, *How to Create and Use Rubrics for Formative Assessment and Grading* (Alexandria, Virginia: ASCD, 2013).

[15] Linda A. Suskie, *Assessing Student Learning: A Common Sense Guide*, 3rd ed. (San Francisco, CA: Jossey-Bass, 2018)

Table 3. Example of an analytic rubric structure

Criteria	Performance levels				Weighting	Score
	Level 1	Level 2	Level 3	Level 4		
Criterion 1	Stand. 1-1	Stand. 1-2	Stand. 1-3	Stand. 1-4	30%	Score × 0.3
Criterion 2	Stand. 2-1	Stand. 2-2	Stand. 2-3	Stand. 2-4	20%	Score × 0.2
Criterion 3	Stand. 3-1	Stand. 3-2	Stand. 3-3	Stand. 3-4	10%	Score × 0.1
Criterion 4	Stand. 4-1	Stand. 4-2	Stand. 4-3	Stand. 4-4	20%	Score × 0.2
Criterion n	Stand. n-1	Stand. n-2	Stand. n-3	Stand. n-4	20%	Score × 0.2
	↑ Description of the quality of the criterion at each level ↑				100%	Total score

Table 4 shows an example of a holistic rubric structure. Note how the levels of achievement are displayed in the rows. For each level, a standard is provided that describes the overall achievement of all the relevant assessment criteria. Holistic rubrics work best when there are few assessment criteria. As the number of criteria grows, it becomes increasingly difficult to achieve all of them at the same level and for the defined standard to encompass all possibilities.

Table 4. Example of a holistic rubric structure

Performance levels	Assessment standards	Score
Level 1	Standard 1	0-4.9
Level 2	Standard 2	5.0-6.9
Level 3	Standard 3	7.0-8.9
Level 4	Standard 4	9.0-10

"ANNEX 2. EXAMPLES OF RUBRICS" includes real examples of holistic and analytic rubrics.

The purpose of the assessment will determine the type of rubric. Formative assessment requires the use of analytic rubrics that allow for feedback on student performance with respect to the assessment criteria. If the aim is to assess the overall achievement of learning outcomes in the module/course, the class as a whole or the degree programme, holistic rubrics are usually more effective. Holistic rubrics can also be useful when intending to give a quick or approximate assessment (which would not normally involve a score), or in cases where the assessment task is not relevant or has a low weighting in the overall module/course. They may also be useful in cases where it is not possible to find

independent criteria for assessing a particular learning outcome.

A common mistake when creating rubrics is to focus on the assessment tasks themselves rather than on the learning that has been achieved. Imagine, for example, an assessment method that consists of writing an article on the main theories of psychodynamics. The criteria should not focus on the inclusion of a title page, a certain number of pages or an alphabetical reference list. These are yes/no criteria that do not indicate learning and therefore do not allow for a scaled assessment of achievement. While these aspects may be important, they should be assessed as a checklist or under a single format-related criterion. For the reference list, a good criterion might focus on the relevance of the sources, leading to a minimum pass standard such as: "The student uses a variety of relevant academic sources to identify the main theories".

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Annex 3. Checklist for rubric assessment" includes a checklist that teachers can use to see how well they have designed their rubrics.

The scoring and/or marking system

The next step is to appropriately weight each criterion and assign a score or range of scores to each level of achievement to arrive at a final mark (whether numerical or qualitative). In rubrics, scoring means converting the descriptions established for each criterion and level of achievement (i.e. the standards) into numbers. Identifying the weighting of each criterion or dimension in a rubric is a key step that will let students know the relative importance of each component of the task assigned to them. Not all assessment criteria are equally important in demonstrating the achievement of a learning outcome. Their weightings in the final mark should therefore be different.

6. Providing student feedback

After marking the assessment task, the teacher needs to explain to each student how they have performed, how they are progressing in the module/course and what they can do to better achieve the learning outcomes. This is called **formative feedback**, as opposed to **summative feedback**. Summative feedback is given after students have completed the module/course and, therefore, have finished learning. It consists of commenting on how well they have performed and to what extent they have achieved the intended learning outcomes.

Meanwhile, formative feedback requires that various assessment tasks be planned throughout the module/course so that students can check their progress and teachers can guide them towards achievement of the learning outcomes.

Feedback from teachers on their students' progress increases their chances of success.[11] Feedback should be conceived as a dialogue, with the teacher also being open to comments from students on their learning, as this helps them to get a better idea of their progress. Feedback can be given to students by teachers, peers and even themselves (self-assessment). This is why it is so important to have a rubric system that allows students to see where they are in terms of achieving the intended learning outcomes.

Feedback does not have to be given verbally. A one-to-one conversation with each student for each task is unfeasible. There are several ways to manage this:

> Provide written feedback. One possibility is to use the rubric system to benchmark the students' progress. Comments on how well they have met each assessment criterion can be made in the form of a numbered list, for example.

> Use digital tools designed specifically for feedback. These may be external tools chosen for this purpose or tools available on a virtual campus.

> In class, through students' responses to questions posed by the teacher.

> In tutoring sessions.

> Etc.

For certain tasks, there is the option to comment only on the most relevant criteria. A combination of feedback methods will ensure that this process does not place an unmanageable workload on teachers.

7. Certifying the acquisition of learning outcomes

ECTS credits for modules/courses are awarded when students have demonstrated through assessment that they have achieved the learning outcomes. If a student does not achieve the learning outcomes, no credit is awarded. The number of credits awarded to students who demonstrate achievement of the learning outcomes is equal to the number of credits for the module/course.

When students successfully complete all the modules/courses included in the curriculum, they are awarded the relevant university qualification. This qualification certifies that they have achieved the intended learning outcomes, which is why the degree programme needs to be able to link them in some way to the modules/courses.

ASSESSING THE LEARNING OUTCOMES OF DEGREE PROGRAMMES: QUALITY ASSURANCE

Obtaining information on the achievement of student learning outcomes is essential to finding out what does and does not work, identifying weaknesses in the degree programme curriculum and the learning strategy and, consequently, improving student performance.[16] Indicators of how well students are achieving learning outcomes also respond to external and internal demands for accountability. However, quality assurance processes should be undertaken not only to meet external requirements, but also to reflect on, understand and improve current teaching practices in specific degree programmes and in the institution as a whole,[11] in order to enhance student learning.

Assessing the acquisition of learning outcomes of a degree programme can be greatly beneficial in:

> Identifying strengths and weaknesses in the achievement of learning outcomes by graduates and acting on weaknesses to improve achievement or, where appropriate, to modify the learning outcomes themselves.

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[16] George Kuh and Stanley Ikenberry, 'More Than You Think, Less Than We Need' (National Institute for Learning Outcomes Assessment, October 2009).

> Improving the effectiveness of the programme based on actual student performance.

> Documenting graduates' learning outcomes for accreditation and accountability purposes.

> Demonstrating the quality of the programme to society, which can increase its prestige, the number of applications for admission and the employability of its graduates.

Degree programmes should therefore develop a plan for assessing the achievement of the learning outcomes they set for their students. The following actions should be considered when developing this plan:

> Identifying the expected learning outcomes of the degree programme.

> Mapping assessment methods throughout the curriculum.

> Collecting and analysing assessment results.

> Reviewing and improving the degree programme.

Identifying the expected learning outcomes of the degree programme

The first step in programme assessment is to clearly state what graduates are expected to know and be able to do, and how this can be demonstrated. A clear definition of these expectations is essential for developing an appropriate assessment strategy. It is important to communicate learning outcomes to students at the beginning of the programme and throughout their studies.

When determining the learning outcomes of a degree programme, the following should be taken into account: on the one hand, the structure of the curriculum, the regulatory framework and the subject-specific content and, on the other, the students' prior preparation (the knowledge, skills and competences with which they are admitted).

It is strongly recommended that the main stakeholders in the degree programme (especially students, but also relevant professional and academic associations and the institution's teaching-learning units) be involved in defining the learning outcomes.

Mapping assessment methods throughout the curriculum

Curriculum mapping is a useful tool for teachers and academic teams responsible for degree programmes, as it can help them to relate learning outcomes to the modules/courses included in the curriculum and to identify the points at which achievement can be assessed and certified. It is also useful for communicating to students how the learning outcomes will be achieved and what kind of assessment methods will be used to certify them.

It is important to identify how and when learning takes place in the curriculum and how it

is to be assessed. Mapping is a visual approach to analysing programmes and can be done using graphs, charts, tables, diagrams or any other process that yields an overview. It makes it possible to identify gaps in the assessment of certain learning outcomes or, conversely, learning outcomes that are over-represented and/or over-assessed in the curriculum.

"ANNEX 1. CURRICULUM MAPPING" gives several examples that can be used to relate the learning outcomes of a degree programme to the modules that will be studied and assessed.

Collecting and analysing assessment results

After designing/selecting the assessment tasks that will be used to measure students' achievement of the learning outcomes throughout the curriculum, the results should be collected on an ongoing basis and used to analyse and improve the degree programme. Specifically, this information can be used to:

> Determine how well students are achieving the pre-defined programme learning outcomes.

> Prioritise areas where the programme needs improvement.

> Demonstrate the quality of the programme to society: businesses, donors and benefactors, future students and their families, etc.

> Provide evidence of student performance and learning for accreditation and accountability purposes.

Ideally, assessment results should be collected once a year, at the end of the academic year. In any case, the analysis of the results must be linked to the monitoring process of the degree programme.

Of course, analysing all the information from the assessment of learning outcomes each year and for each learning outcome is an insurmountable task. It is advisable to design an assessment plan that provides a complete picture of the extent to which graduates are achieving the learning outcomes within a reasonable period of time. Below are some aspects to consider when designing an assessment plan:

> The plan should specify the assessment process for each of the degree programme's learning outcomes. Although several outcomes can be assessed simultaneously, each should have its own evidence-based analysis.

> A single assessment task can be used to demonstrate multiple learning outcomes (bachelor's and master's degree final projects, doctoral theses, integrated projects, etc.). It should be noted again that these assessment tasks are a highly relevant choice for analysing the achievement of learning outcomes, not only because of the large number of outcomes that are put into practice, but also because of the integration effort required of students.

> All programme learning outcomes should be assessed within six years, in line with the accreditation cycle of the programme or the institution delivering it. However, the number of outcomes assessed in a given year and the order in which they are assessed will depend on the interests, capacity and time required by teachers to collect and analyse the data. For bachelor's degrees with few students and master's and PhD programmes, it may be best to collect evidence over two or three academic years in order to make a more accurate analysis.

> Each assessment method must be carefully aligned with a learning outcome: assessment method type, assessment criteria and standards, etc.

> Wherever possible, evidence of achievement of learning outcomes should come from modules with different groups of students taught by different teachers.

> Wherever possible, the student tasks selected in the assessment plan should be assessed by at least two teachers.

> For the purposes of assessing the learning outcomes of the degree programme, the individual results of each student are irrelevant. Instead, they are aggregated with the results of all other students selected for analysis. Students will receive feedback from teachers in their modules/courses as usual.

Reviewing and improving the degree programme

The results of the analysis should be used during the degree programme monitoring process to make effective changes. This should be done by identifying opportunities for improvement that could lead to a revision of the learning outcomes, content, learning activities and assessment methods.

As always, the improvement plan should be structured and identify the people responsible, the expected outcomes, the priorities, the timing, the resources required and the indicators of achievement. Critically, the monitoring process must involve the main stakeholders in the degree programme.

ASSESSMENT POLICY

The degree programme must implement an assessment policy that is consistent with that of its centre and/or university. This policy should make explicit reference to the functions and purposes of assessment, i.e. the guiding principles. The three guiding principles of assessment have been discussed at length in this document: student learning and feedback, certification of achievements, and quality assurance and accountability (see Table 1). In addition to any other legal and regulatory aspects that may apply, these are the aspects that should be present in any assessment policy.

Learning and feedback

Alignment is key to promoting student learning. The policy should state the need to align learning outcomes with learning activities and assessment methods in modules. The policy should also set out possible systems for assessing the achievement of learning outcomes. Not all systems will be valid for every degree programme, so the policy should specify possible systems according to the programme's subject area and intended learning outcomes. An important factor in choosing the most relevant assessment methods is how much they can contribute to student learning.

The policy should set out the guiding principles for providing feedback to students on their progress towards achieving the intended learning outcomes. Aspects such as the possible formats or frequency of feedback should also be covered.

Performance certification

The policy should ensure that assessments are valid and reliable and meet the other basic requirements of a good assessment strategy (see "Characteristics of learning outcomes assessment").

Operational alignment is again fundamental in certifying the achievement of learning outcomes, not only within a module/course, but also between modules and across the whole degree programme.

As a matter of best practice, mechanisms should be put in place to ensure these characteristics and, in particular, the validity, reliability and fairness of assessments through a process in which teachers work together to review the results of the degree programme's assessment system and make improvements. Consistency of assessment results in relation to the achievement of learning outcomes should be maintained within cohorts and over time between cohorts. Clear guidelines for monitoring the results of the assessment strategy need to be included in the assessment policy to ensure that learning outcomes are appropriately certified. There are various strategies for doing this, e.g. cross-assessment, where teachers of other modules or other groups of the same module assess students' work, or external assessment, where students' work is assessed by teachers from outside the programme.

Quality assurance and accountability

The policy must include mechanisms for determining the extent to which graduates have achieved the intended learning outcomes and for making improvements where necessary. This review also makes it possible to demonstrate accountability for the quality of the education provided by the degree programme (see "ASSESSING THE LEARNING OUTCOMES OF DEGREE PROGRAMMES: QUALITY ASSURANCE").

Tips for implementing a learning outcomes assessment policy

Implementing a policy for learning outcomes assessment based on criteria that allow for continuous review and improvement is a complex task. It is certainly difficult without the involvement and acceptance of teaching staff, administrative and institutional support, and the leadership of the team responsible for the programme or institution. There needs to be a process to support implementation; a systematised approach to data collection, analysis and sharing; and most importantly, an institutional culture that values assessment and improvement. An institutional culture that sees assessment as a means of improving teaching and learning encourages teachers to do the same and to develop and use appropriate assessment tools. This directly affects and enhances student learning. Fortunately, there are now numerous sources, many of them publicly available, which can be of great assistance to institutions in implementing their assessment policies. A small sample of these sources is given in "ANNEX 4. DOCUMENTARY RESOURCES".

New degrees vs existing degrees

Defining the learning outcomes, modules and assessment policy for a new degree programme is less complex than for existing programmes, which require very careful planning.

A new programme will have already defined its profile and the learning outcomes of the modules/courses that make up its curriculum in its validation report. This previous work and the subject area will influence the learning activities and assessment methods to be used. The assessment policy will need to address these aspects and link them to feedback, certification and quality assurance. As new degree programmes are generally introduced on a year-by-year basis, the assessment strategy is first rolled out on a limited number of modules/courses. Meetings can be scheduled throughout the academic year to review the roll-out, share experiences and make improvements. At the end of the academic year, the strategy must be assessed, culminating in an improvement plan that covers both the first and the following academic year. This process is then repeated for each new year.

Both the assessment policy and the assessment strategy can be considered provisional, in the sense that they will need to be reviewed year by year, depending on the results, until the whole curriculum is implemented and the policy and strategy are more stable.

For existing degree programmes, it is advisable to introduce learning outcomes assessment gradually, starting, for example, with bachelor's and master's degree final projects, compulsory external work placements and integrated projects or similar. In these modules, the teaching staff should agree on the learning outcomes that students are expected to achieve, the learning activities and the assessment system. The results should lead to a reflection on the effectiveness of the system in place and, if necessary, an improvement plan. Once the system is well established in these modules, it can be

gradually implemented in the rest, e.g. by type, academic year or area, until the entire curriculum is covered. Teachers involved in the implementation in bachelor's/master's degree final projects, work placements and integrated projects can act as mentors for others as the system is rolled out.

Teacher training

Teacher training and support are essential when it comes to correctly implementing learning outcomes assessment. Training should cover the key issues presented in this document and provide the necessary written materials to enable teachers to adapt the assessment system to their respective subject areas. Sharing experiences and results can help to build a community of teachers interested in teaching-learning processes based on learning outcomes.

Assessment policy development

The following list describes some key actions that programme management teams should consider when developing a learning outcomes assessment policy.

1. Review best assessment practices in other similar degree programmes and in the academic literature.
2. Determine the degree programme's assessment objectives. These objectives should be consistent with those of the centre and the university.
   a. Identify the programme's regulatory and accreditation requirements.
3. Define the principles of the assessment system.
4. Determine the programme's capacity to implement the assessment policy.
   a. Teachers' knowledge, skills and competences in defining, implementing and assessing learning outcomes will determine the policy's scope and implementation. The assessment policy should therefore include training activities linked to the institution's teacher training policy.
   b. Other crucial aspects will need to be identified: technological tools to facilitate assessment, adapted spaces and infrastructure, etc.
   c. The involvement and motivation of the various stakeholders in the teaching-learning process must also be assessed if the policy is to be implemented and prove effective.
5. Assess the policy.
   a. A review and continuous improvement process should be built into the policy.
6. Prepare a draft document that can be submitted for public consultation to all stakeholders in the degree programme.
7. Incorporate relevant input from the consultation process and submit the document for approval by the competent bodies.

ANNEX 1. CURRICULUM MAPPING

A first approach to curriculum mapping could be to produce a table indicating the possible teaching activities that will enable students to demonstrate and achieve each learning outcome of the degree programme, and the assessment methods that will be used to certify their achievement.

Learning outcomes At the end of their studies, graduates will be able to...	Teaching activities What teaching activities will help students to achieve the learning outcomes?	Assessment methods What assessment tasks will be used to demonstrate achievement of the learning outcomes?
Learning outcome 1		
Learning outcome 2		
Learning outcome *n*		

This initial table can be developed into a more advanced tool by adding the learning outcomes from the Catalan Higher Education Qualifications Framework (MCQES) and, where possible, those described in the relevant subject benchmark.

Learning outcomes At the end of their studies, graduates will be able to...	Programme learning outcomes in the MCQES What learning outcomes are expected at this level of education?	Teaching activities What teaching activities will help students to achieve the learning outcomes?	Assessment methods What assessment tasks will be used to demonstrate achievement of the learning outcomes?
Learning outcome 1			
Learning outcome 2			
Learning outcome *n*			

The second table to be constructed should indicate in which modules the learning outcomes of the degree programme are worked on and assessed. (Note: M = module; LO = learning outcome; W = worked on; A = assessed.)

LO	M 1	M 2	M 3	M 4	M 5	M n	Summary
LO 1	W		W		W / A1		A1
LO 2		W		W / A2	W / A3		A2 / A3
LO n							

The assessment methods indicated here should match those in the first table. It is possible for a programme learning outcome to be worked on, wholly or partially, in more than one module, but not assessed in all modules, or assessed at different levels of intensity in some of them. Whatever the case, it is important to be able to identify assessment methods to certify the learning outcome in at least one module of the curriculum.

These tables are very useful in identifying gaps in the programme's curriculum that need to be filled, and in demonstrating to accreditation committees how the programme ensures that graduating students have achieved the intended learning outcomes.

In terms of assessing the learning outcomes of a degree programme as a whole, it may be helpful in curriculum design to use a table that identifies the learning outcomes to be assessed each academic year, the evidence to be used to determine their achievement, the point at which this evidence is collected and analysed, and the students to be selected for analysis. Below is an example of such a table:

Year	LO	Evidence	Population	Actions	Collection	Report
2022-2023	LO 1	Lab report	Students in the Foundations of Biology module	Teachers assess the learning outcome in each group according to the approved rubrics	End of semester 2	September 2023
	LO 6	Oral presentation	25% of students completing their bachelor's degree final project	1 out of 4 students is randomly selected and each panel assesses the learning outcome according to the approved rubrics	Project defence	September 2023
	LO 5	Integrated project report Direct observation	33% of students in the Integrated Project module (year 2)	1 out of 3 projects is randomly selected and the learning outcome is assessed according to the approved rubrics	End of semester 4	September 2023
2023-2024						
202X-202Y						

ANNEX 2. EXAMPLES OF RUBRICS

Example 1. Holistic rubric

This example is inspired by another rubric proposed by Jennifer Moon.[17] In this module of a bachelor's degree in Performing Arts, one of the learning outcomes has to do with the ability to work in a group to produce a performance piece. Students are therefore assessed on criteria relating to their participation, leadership and contribution to the group project. The main assessment task in this module will be the group production of a written piece. However, the best way for teachers to assess the achievement of this learning outcome specifically is to observe students' interactions with the group and to review the self-assessments and cross-assessments of group members.

Identification of the module

Module	Performance piece 1
Learning outcome 1	Students will be able to work with others in small groups, participating and interacting in a way that is productive for themselves and the group as a whole
Assessment criteria	Participation in the tasks assigned to the group Productive contributions Leadership
Assessment tasks	Direct observation by the teacher Self-assessment Peer assessment

The proposed rubric identifies four levels of student performance. In this case, the levels correspond to those used in Catalonia's official qualifications structure, but other equivalent taxonomies are possible. Scoring is optional, but may be useful in weighting this assessment in the final mark for the assessment task.

As a reminder, standards must be observable and assessable (even if they are qualitative in nature) and sufficiently distinct from one another. It is also important to note that the standard for passing has the same wording as the learning outcome itself. Remember that learning outcomes describe the minimum expectations of student performance with respect to knowledge, skills and competences. This minimum level is described by a threshold standard and therefore determines whether a student passes or fails.

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[17] Jennifer Moon, *The Module and Programme Development Handbook: A Practical Guide to Linking Levels, Outcomes and Assessment Criteria*, 1st ed. (London; Sterling, VA: Kogan Page: Stylus Pub., 2003).

Performance levels	Assessment standards	Score
Fail	The student is unable or unwilling to participate, work cooperatively or make useful contributions to the group.	0-4.9
Pass	The student works with others in a small group, participating and interacting in a way that is productive for themselves and the group.	5.0-6.9
Good	The student works well with the other members of the group, participating and interacting in a very helpful way, suggesting a growing awareness of their role in the group and an increasing readiness to take on leadership roles when necessary.	7.0-8.9
Excellent	The student is able to participate in and lead a working group, is aware of their role in the group, and is able to describe appropriate strategies and actions.	9.0-10

In order to determine the various levels, teachers may find it useful to set a maximum as well as a minimum or threshold. In this case, a teacher might expect a student at the highest level of performance to demonstrate the following: "The ability to work with and lead others in small task-oriented groups, participating and interacting with the group in a way that is productive for both themselves and the group as a whole; awareness of their role in the group; and the ability to describe its strategies and actions." The corresponding standard can be based on this description and will help to determine the rest.

Example 2. Analytic rubric

This example presents an analytic rubric for the same learning outcome as above. It can be applied to any task where one of the learning outcomes to be assessed is students' group work. This is an adapted version of a rubric developed by the Center for Teaching Innovation at Cornell University.[18]

In this case, the assessment criteria are extended and focus on the students' participation, leadership, contributions to the group project, commitment and ability to communicate. Four levels of student performance are also proposed, although no weightings or scores are built into the assessments.

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[18] Center for Innovative Teaching, *Sample group work rubric*, Cornell University (accessed: 1 March 2023).

Focus 2. Tools for university quality

Criteria / Dimensions	Advanced – Exceeds expectations	Competent – Meets expectations	Progressing – Does not fully meet expectations	Beginning – Does not meet expectations
Contributions	Routinely offers useful ideas, does more than others and is highly productive.	Usually offers useful ideas and does their share of the work.	Sometimes offers useful ideas and does not complete or has difficulty in completing all their work.	Rarely offers useful ideas, does not complete any work and does not contribute effectively to the group.
Attitude and cooperation	Works extremely with others in the group and is always willing to help. Always displays a positive attitude and never argues.	Is cooperative. Generally displays a positive attitude and rarely argues.	Is sometimes cooperative. Rarely displays a positive attitude and argues often.	Is seldom cooperative. Usually argues with teammates and disrupts the group.
Focus, commitment	Almost always focuses on the task and what needs to be done. Is very self-directed.	Focuses on the task and what needs to be done most of the time. Can count on this person.	Sometimes focuses on the task and what needs to be done. Must be watched and reminded to keep on task.	Does not focus on the task and what needs to be done. Lets others do the work.
Team role fulfilment	Participated in all group meetings. Assumed leadership role as necessary.	Participated in most group meetings. Provided leadership when asked.	Participated in some group meetings. Provided limited leadership.	Participated in few or no group meetings. Provided no leadership.
Ability to communicate	Always listens to, shares with and supports the efforts of others. Provides effective feedback to other members. Relays a great deal of information; all relates to the topic.	Usually listens to, shares with and supports the efforts of others. Provides some effective feedback to other members. Relays some basic information; most relates to the topic.	Often listens to, shares with and supports the efforts of others. Provides little feedback to other members. Relays very little information; some relates to the topic.	Rarely listens to, shares with or supports the efforts of others. Provides no feedback to other members. Does not relay any information to teammates.

ANNEX 3. CHECKLIST FOR RUBRIC ASSESSMENT

The checklist provided below can be used to determine the appropriateness of a rubric designed to assess learning outcomes. It is an adapted version of a checklist proposed by Mary Chaaban for Arizona State University.[19]

Statements	Yes	No
Performance levels (columns)		
There are three to five performance levels		
The labels of the performance levels are distinct, clear and meaningful		
Performance criteria (rows)		
There are two or more performance criteria		
The performance criteria are distinct, clear and meaningful (aligned with the learning outcomes)		
Performance standards (cells)		
The standards describe differences in performance that are observable and measurable		
The standards clearly articulate what the expectations are for each performance level for a given criterion		
For a given row, the standards assess the same criterion across all performance levels		
The standards represent meaningful differences in performance across the performance levels for a given criterion		

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[19] Mary Chaaban, 'Analytic Rubric Checklist' (Arizona State University, 8 February 2019).

ANNEX 4. DOCUMENTARY RESOURCES

Operational alignment

> Biggs, John B., and Catherine Tang. *Teaching for Quality Learning at University: What the Student Does.* 4th edition. SRHE and Open University Press Imprint. Maidenhead, England; New York, NY: McGraw-Hill, Society for Research into Higher Education & Open University Press, 2011.
> This book provides a framework that can be used as a guide to design programmes, modules/courses or lessons, from the definition of learning objectives and outcomes to their assessment and reflection on the results achieved. It explains the concept of constructive (operational) alignment used in the implementation of outcome-based education. Each chapter includes tasks and examples for implementing constructive alignment in university teaching.

> Houghton, Warren. "Learning and Teaching Theory for Engineering Academics". York, UK: The Higher Education Academy. Engineering Subject Centre, March 2004.
> This guide lays out a process for developing and constructively aligning learning outcomes in engineering degree programmes.

> Hutchings, Pat. "Aligning Educational Outcomes and Practices". *Occasional Paper*, no. 26 (January 2016): 1-20.

Assessment

> Armstrong, Susan, Sandii Chan, Janne Malfroy, and Rosemary Thomson. *Assessment Guide: Implementing Criteria and Standards-Based Assessment*. 2nd edition. Sydney: University of Western Sydney, 2015.
> This is a practical guide to developing an assessment strategy based on criteria and standards, with examples and case studies.

> Assessment Commons. "Assessment Commons: Internet Resources for Higher Education Outcomes Assessment". Accessed 1 March 2023.
> This is an open learning space that collects and organises resources and tools for assessing student learning outcomes, improving teaching and learning, and undertaking programme review and accreditation. All are aimed at teachers.

> Brown, Sally, Phil Race, and Brenda Smith. *500 Tips on Assessment*. 2nd edition. New York: Routledge, 2004.
> This resource provides basic guidance on how to address key aspects of assessment. It provides 500 ideas that teachers can use according to their needs. It is divided into six chapters and 47 topics with ideas and tips.

> Goff, Lori, Eleanor Pierre, Michael K. Potter, Thomas Carey, Amy Gullage, Erika Kustra, Rebecca Lee, et al. "Learning Outcomes Assessment: A Practitioner's Handbook". Toronto: Higher Education Quality Council of Ontario, March 10, 2015.
> This is a basic teacher's guide to implementing learning outcomes assessment in modules/courses and degree programmes. It contains examples and case studies.

> Moon, Jennifer. *The Module and Programme Development Handbook: A Practical Guide to Linking Levels, Outcomes and Assessment Criteria*. 1st edition. London; Sterling, VA: Kogan Page: Stylus Pub., 2003.
> This publication is essential for the proper development of degree programme profiles, learning outcomes and their assessment.

> National Institute for Learning Outcomes Assessment (NILOA).
> Founded in the United States in 2008, NILOA is a research and resource development organisation dedicated to documenting, advocating and facilitating the systematic use of learning outcomes assessment to improve student learning.

> Suskie, Linda A. *Assessing Student Learning: A Common Sense Guide*. 3rd edition. San Francisco, CA: Jossey-Bass, Wiley Brand, 2018.
> This is a comprehensive, practical and simple guide to learning outcomes assessment for teachers and those with academic and administrative responsibility for degree programmes.

Self-assessment and peer assessment

> Mulder, Raoul, Jon Pearce, Chi Baik, and Catherine Payne. "Guide to Student Peer Review: An Instructor's Manual for Incorporating Peer Review into Tertiary Courses". The University of Melbourne, May 14, 2013.
> This is a teacher's guide for incorporating student-to-student assessment into modules/courses. It contains examples from a variety of subject areas, as well as tools and documentary resources that can be used for peer assessment.

> Race, Phil. *A Briefing on Self, Peer and Group Assessment*. Assessment Series 9. York, UK: Learning and teaching support Network (LTSN), 2001.
> This short publication looks at student self-assessment, peer assessment and group assessment. It discusses the extent to which these assessments are perceived as valid, reliable and transparent by students and by those who assess the quality of higher education. The author also aims to increase teachers' confidence in the appropriateness and validity of using these assessment methods in the classroom.

Degree programme mapping and assessment

> Academic Degree Programs Assessment. Guidelines and Template and Assessment Plans. Northern Illinois University.
> The first is a guide to mapping a degree programme's learning outcomes across its curricular modules. The second is a guide to assessing programme learning outcomes and using the assessment results in the bachelor's degrees of that university.

> Banta, Trudy W., and Catherine A. Palomba. *Assessment essentials: planning, implementing, and improving assessment in higher education*. 2nd edition. Jossey-Bass Higher and Adult Education Series. San Francisco: Jossey-Bass & Pfeiffer Imprints, 2014.
> A major publication in the field of assessment. This book guides teachers and those with academic and managerial responsibilities through the process of developing a learning outcomes assessment plan for degree programmes. It contains more than 100 examples.

> Eberly Center. Carnegie Mellon University. "Curriculum Mapping Tool". Eberly Center. Carnegie Mellon University, June 30, 2016.
This is a Microsoft Excel tool that provides a basic template and an advanced template for mapping university degree programmes. It also provides examples of basic and advanced mapping using some generic learning outcomes from a bachelor's degree in Art and a master's degree in Public Policy.

> Judd, Thomas, and Bruce Keith. "Student Learning Outcomes Assessment at the Program and Institutional Levels". In *Handbook on Measurement, Assessment, and Evaluation in Higher Education*. Routledge, 2013.
In this chapter, the authors provide an overview of the background, purpose, context and methodology of a student learning outcomes assessment system at the institutional and programme level.

> Learning Outcomes Assessment Advisory Committee. "Student Learning Outcomes Assessment Guide". Fairleigh Dickinson University, September 15, 2015.
The purpose of this document is to provide guidance to teaching staff at this American university on the planning and implementation of degree programme assessment. The guide was developed in response to teachers' requests for concrete steps to take in planning and implementing programme assessment. It provides guidelines and examples that can help Catalan universities map and assess the achievement of expected learning outcomes at the degree programme level.

> Sher, Anna, and Julian Fernald. *Guidelines for the Development and Assessment of Program Learning Outcomes*. 1st edition. Santa Cruz, CA: University of California, Santa Cruz, 2013.
This is a practical guide that takes you through the process of assessing programme learning outcomes. It describes how to develop and align learning outcomes across curricula and provides numerous examples of mapping matrices and assessment rubrics. It also describes how to develop a multi-annual learning outcomes assessment plan and provides examples of how this can be implemented at all three university levels: bachelor's degrees, master's degrees and PhD programmes.

Assessment methods

> Angelo, Thomas A., and K. Patricia Cross. *Classroom Assessment Techniques: A Handbook for College Teachers*. 2nd edition. The Jossey-Bass Higher and Adult Education Series. San Francisco: Jossey-Bass Publishers, 1993.
This handbook for teachers at all levels offers advice on classroom assessment, describes what it is and how it works, and explains how to plan, implement and analyse assessment projects. It also includes case studies, 50 assessment techniques and examples of procedures for managing assessment tasks, and practical tips for analysing assessment data.

> Brown, Sally, and Peter Knight. *Assessing Learners in Higher Education*. 1st edition. Routledge, 2012.

> Kent-Waters, Joe, Olivia Seago, and Lydia Smith. "A Compendium of Assessment Techniques in Higher Education: From Students' Perspectives". Edited by Samantha Pugh. Leeds Institute for Teaching Excellence, October 17, 2018.

This publication describes 58 assessment methods, the learning outcomes they can assess, and the pros and cons of using them, from the perspective of both teachers and students.

> Race, Philip. *The Lecturer's Toolkit: A Practical Guide to Assessment, Learning and Teaching*. 4th edition. London; New York, NY: Routledge, 2015.
> This book presents the main features of the learning process and explains how to design assessment and feedback to improve student learning. It focuses on the pros and cons of 16 assessment methods and how to design and implement them correctly. It also includes chapters on teaching to improve student learning.

Assessment policies

> Walvoord, Barbara E. *Assessment Clear and Simple: A Practical Guide for Institutions, Departments, and General Education*. 2nd edition. San Francisco, CA: Jossey-Bass, 2010.
> This book provides a brief and clear guide to assessment. It examines how assessment can serve departmental and institutional objectives, not just external mandates, and how it can be carried out effectively and efficiently with the time, expertise and resources available. It aims to make assessment simple, cost-effective and useful for student learning, while meeting the assessment requirements of accreditation agencies and regulatory bodies.

> Thematic Peer Group 'Student Assessment'. "Student Assessment: Thematic Peer Group Report". Learning & Teaching Paper, no. 10. Brussels, Geneva: European University Association, 17 March 2020.
> This paper presents the work and findings on student assessment of the European University Association's Learning & Teaching Thematic Peer Group, which discussed an integrated framework for assessment practice that includes competence, design and assessment feedback. It includes a self-assessment questionnaire to assist institutions in the process of implementing an assessment policy.

Rubrics

> Association of American Colleges and Universities. Valid Assessment of Learning in Undergraduate Education (VALUE). Washington, DC: Association of American Colleges and Universities, 2009.
> In 2015, the Association of American Colleges and Universities (AAC&U) developed analytic rubrics for 16 general learning outcomes. The teams that developed them were made up of experts from colleges and universities in the United States. The VALUE rubrics are broad, subject-independent descriptions. They articulate key criteria for each learning outcome, with quality standards describing increasingly complex levels of achievement. The rubrics are intended for use by institutions in assessing and discussing student learning, not for marking.

> Boer, Ivo de, Femmie de Vegt, Helma Pluk, and Mieke Latijnhouwers. *Rubrics – a Tool for Feedback and Assessment Viewed from Different Perspectives: Enhancing Learning and Assessment Quality*. IAMSE Manuals. Cham: Springer International Publishing, 2021.
> This practical guide describes how rubrics can be used for assessment and feedback. It is aimed at teachers, students and guidance counsellors in higher education. It defines and

describes rubrics and explains how to design and implement them in modules and degree programmes. It also describes four best practices for using rubrics: for written work, for an oral presentation, for collaboration skills and for clinical skills. The focus is on feedback and assessment using rubrics.

> Eberly Center. Creating and Using Rubrics. Carnegie Mellon University.
> Examples of rubrics that can be used across various assessment tasks.

> Faculty Affairs Office. Learning Outcomes & Assessment Rubrics. University of Colorado, Denver.
> Examples of learning outcomes and assessment rubrics in different areas: arts, behavioural sciences, composition, cultural diversity, humanities, international perspectives, mathematics, physical and natural sciences, and social sciences.

> Learning Outcomes Project. University of Toronto.
> Examples of analytic rubrics for assessing learning outcomes related to communication, engineering design and teamwork.

> Olson, Jacqueline M., and Rebecca Krysiak. "Rubrics as Tools for Effective Assessment of Student Learning and Program Quality". In *Advances in Mobile and Distance Learning*, edited by Tamara Phillips Fudge, and Susan Shepherd Ferebee, 173–200. IGI Global, 2021.
> In this chapter, the authors highlight the potential of rubrics as tools for effective assessment, and describe the aspects and steps that need to be considered when developing and implementing them, with the critical involvement of stakeholders and the support and leadership of management teams.

> Poorvu Center for Teaching and Learning. Creating and Using Rubrics. Yale University.
> A guide with examples and recommendations on how to create rubrics for assessing learning outcomes.

> Stevens, Dannelle D., and Antonia Levi. *Introduction to Rubrics: An Assessment Tool to Save Grading Time, Convey Effective Feedback, and Promote Student Learning*. 1st edition. Sterling, VA: Stylus Pub., 2005.
> This book defines what rubrics are and explains how to create and use them. It provides a comprehensive introduction for anyone starting to integrate rubrics into their teaching. Processes for constructing rubrics are also described, including some that involve student participation.

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