



QIS IMPLEMENTATION GUIDELINES

SMART-QUAL
Structured Indicators to Manage HEI Quality System
Intellectual Output 2

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Table of Contents

1.	Introduction	2
1.1.	Goal	2
1.2.	Target audience	2
2.	Quality Indicators Scoreboard (QIS).....	4
2.1.	QIS Goals	4
2.2.	Target users	4
2.3.	Support methodology	4
2.4.	Indicators' overview	6
	General	9
	Teaching & Learning	12
	Research	47
	Relationship with society.....	57
3.	Design of the implementation process	65
3.1.	Planning phase	65
3.1.1.	Constitution of the coordination committee	65
3.1.2.	Definition of roles and responsibilities	66
3.1.3.	Institutional engagement.....	67
3.1.4.	Resources requirements	69
3.2.	Implementation phase	70
3.2.1.	Data collection and quality evaluation.....	71
3.2.2.	Indicators' estimation	72
3.2.3.	Visualization of the Dashboard	72
3.3.	Assessment phase	72
3.3.1.	Data analysis	72
3.3.2.	Usability analysis	73
3.3.3.	Discussion and validation.....	73
3.4.	Improvement phase	74
3.4.1.	Gaps and problems detection	75
3.4.2.	Action plan	77
3.4.3.	Results dissemination	77
	Appendix 1 – Indicator reference sheet instructions and tips prior to reading.....	80
	Appendix 2 – Discussion script for the Assessment phase	81

1

INTRODUCTION



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1. Introduction

1.1. Goal

The aim of this document is to provide guidelines that assist higher education institutions (HEIs) in the implementation of the Quality Indicators Scoreboard (QIS) designed within Project SMART-QUAL. The QIS development process showed that, although HEIs use different types of quality indicators, these are not always used effectively and with an impact on decision-making. Thus, the guidelines presented in this document are meant to help HEIs in the implementation of the QIS, so it can be a useful instrument by providing institutions with a set of data and information on their performance, crucial for decision making and quality improvement.

1.2. Target audience

The guidelines were designed to help all HEIs that wish to use the set of harmonized quality indicators (QIs) which is developed in line with the three main institutional processes “teaching and learning”, (ii) “research”, and (iii) “relations with society” within Project SMART-QUAL.

QIS provides indicators considered basic or recommended. Regarding decision-making levels, three levels are taken into account (strategic, tactical, and operational). Details on this subject are stressed in the next section.

In addition, these guidelines may also be used as an information tool to communicate the QIS to the entire academic community.

2

QUALITY INDICATORS SCOREBOARD (QIS)



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2. Quality Indicators Scoreboard (QIS)

2.1. QIS Goals

Quality management systems (QMS) implemented in HEIs are often criticized for being too process-oriented, box-ticking and insufficiently focused on consequential and generalizable outcomes. One of the reasons underlying these critics relies on the fact that QMS tend to rely on a large number of quality indicators, which makes their accuracy and timely analysis difficult, and consequently undermines their adequate use for decision-making at different levels (strategic, tactical, or operational).

Within Project SMART-QUAL, a QIS was devised to support HEIs in the implementation of a more structured, efficient, and effective Quality Management System (QMS).

The scoreboard has the following characteristics:

- **Short:** focused on the efficiency and effectiveness of QMS, avoiding oversizing;
- **Meaningful:** useful for all the stakeholders' needs, mainly HEIs, Accreditation Agencies, and the Higher Education community in general;
- **Appropriate:** meets the common and shared quality standards, which, in the European context, are specified in the ESG, supported by ENQA and other relevant stakeholders;
- **Reunified:** incorporates a set of good practices already in use;
- **Transversal:** suitable for different countries, contexts, and types of HEIs.

2.2. Target users

The resulting QIS can be used by HEIs at a strategic level for self-evaluation, external evaluation, and/or benchmarking exercises, allowing engaged institutions to monitor their quality as organizations and the quality of their processes.

Moreover, and at a tactical and operational level, the QIS can provide useful information for the academic community (e.g., directors/responsible of faculties, schools, departments, research units and different services offices, academic and non-academic staff) to better perceive the institution and its processes' performance and to act accordingly so as to contribute to quality improvement.

2.3. Support methodology

In order to reach the final list of indicators, several steps were taken:

- First, there was the **collection of quality indicators** used in QMS in a sample of European HEIs. This state-of-the-art analysis gathered data from 36 HEIs from 5 different countries, and from different institutional types, maturity levels and types of ownership;
- Second, the HEIs that belong to the project were asked to **identify and report relevant QIs used in their QMS**. In most cases, an email was sent to the vice-rector/co-president of the institution, asking for a list of the QIs most used in each institution, regarding the three missions (teaching and learning, research, and third mission);
- Third, **QIs were collected from different sources**. Documental analysis of specialized sources was carried out, trying to select relevant indicators. Up to 39 unique and valid resources were analysed, and different types of documents were considered: peer-reviewed articles, project and institutional reports, books, and management documents of HEIs or Accreditation Agencies. Almost half of the resources analysed were published/released in the last 3 years.

From these activities, a corpus of more than 500 QIs was compiled and became the initial input for the creation of the QIS. The expertise of partners has been another key element for the grouping, prioritization, and harmonization needed for this set of collected QIs, and the identification of good and relevant practices.

To reduce the list of indicators, the following criteria were used: number of times each indicator (or a similar one) was collected; number of different partners who collected the indicator; source relevance (QMS and source characteristics); coverage; role in decision-making levels; easiness of collection and application; identified strengths and weaknesses; and degree of overlap with other indicators.

The development of the final list of QIs involved three steps: a) grouping of similar indicators; b) prioritization of the most relevant QIs, considering the obtained results and the expertise of the partners; and c) the harmonization of the metadata. In every step, partners carried out an in-depth review following the criteria presented above. At the end of this process a review took place, introducing, or modifying elements when necessary.

The final list comprises 56 QIs: 27 basic (regarded as fundamental within the framework of the SMART-QUAL project) and 29 recommended (suggested, depending on the aims of the HEI and the availability of data to calculate them).

The indicators are structured in three main axes:

- **University missions:** Teaching and Learning (all the processes around the development of knowledge and scientific, technical, and transversal competencies in students); Research (all the processes around knowledge generation and dissemination); and Relationship with Society (all

the processes around the impact on society, economy, environment, or the engagement of stakeholders).

- **Quality Standards:** The list of QIs uses the ESG supported by the main stakeholders of the EHEA, as a guideline of how quality is understood, monitored, and assessed in the EHEA. The ESG represents a consolidated, shared, and international framework to organize the set of SMART Quality Indicators. It should be highlighted that ESG is focused specifically on Teaching and Learning, as they refer directly to the quality of the educational programmes. The relationship with other missions is mostly indirect. Thus, for the other two missions, some general dimensions were suggested by the partners of the project, in order to organize the set QIs.
- **Decision-making level:** Three levels are distinguished: a) Strategic – useful for rectors/directors or policymakers, as it monitors and assesses the position of the HEI in relation to other institutions; b) Tactical – useful for deans/managers, as it monitors and assesses the position of the college/school/department in relation to others; and c) Operational – useful for teachers/coordinators, as it monitors and assesses the position of the degree/subject in relation to others.

The final QIS was discussed with institutional stakeholders. For this exercise, a semi-structured interview was conducted with the vice-rector/co-president responsible for the promotion of quality within each HEI and with a member of the quality management office of each institution. The interviews were done by the researchers of each of the institutions that belong to the consortium. In total, 33 interviews were conducted.

2.4. Indicators' overview

The challenge with using indicators is to meet an approach on what needs to be measured. The answer to that challenge may be different to each Higher Education Institution (HEI). On one hand, external and internal stakeholders need to base their decision on the evidence and objective information. That information should be useful, on time, representative, reliable and aligned with strategic planning. On the other hand, every HEI has their own normative framework, organizational and structure dynamics, databases, etc. Therefore, any set of indicators proposed should preserve the institution's autonomy.

The objective pursued by this introduction is to step backwards to reflect on the institution's needs, strategy and goals, legal framework, etc. to adjust the definitions of the following indicators. The aim of the next indicator sheets is to become a shared framework among HEIs with common formulas. And the most important: to make clear what is measured by each indicator. However, the HEIs should consider the following questions to adjust the definition of the indicators to their reality:

1. To what purpose(s) /strategy goals are indicators chosen?
2. How are indicators selected and by which processes?

3. How should our institution judge the representativity and validity of indicators?
4. Are indicators reliable in the sense that the same value shows the same state of things? Do we need to deploy the indicator in more detailed ones?
5. What are the causes of an increase or decrease in the outcome of the indicators? Do we need additional information to interpret the data?

Another fact to consider is that 11% of the indicators are qualitative, introducing evidence that is not specifically quantifiable¹. The set of indicators proposes a large number of quantitative indicators that offer a wide range of objective data.

In conclusion, the set of indicators must be useful to the institution and also it has to be a tool to harmonize the formulas and definitions. The QIs may allow a comparison among similar institutions. The next illustration (Figure 1) shows the main elements that impact and have to be taken into account to adjust indicators.

Appendix 1 has Indicator reference sheet instructions and tips prior to reading the indicators in order to facilitate the implementation process.

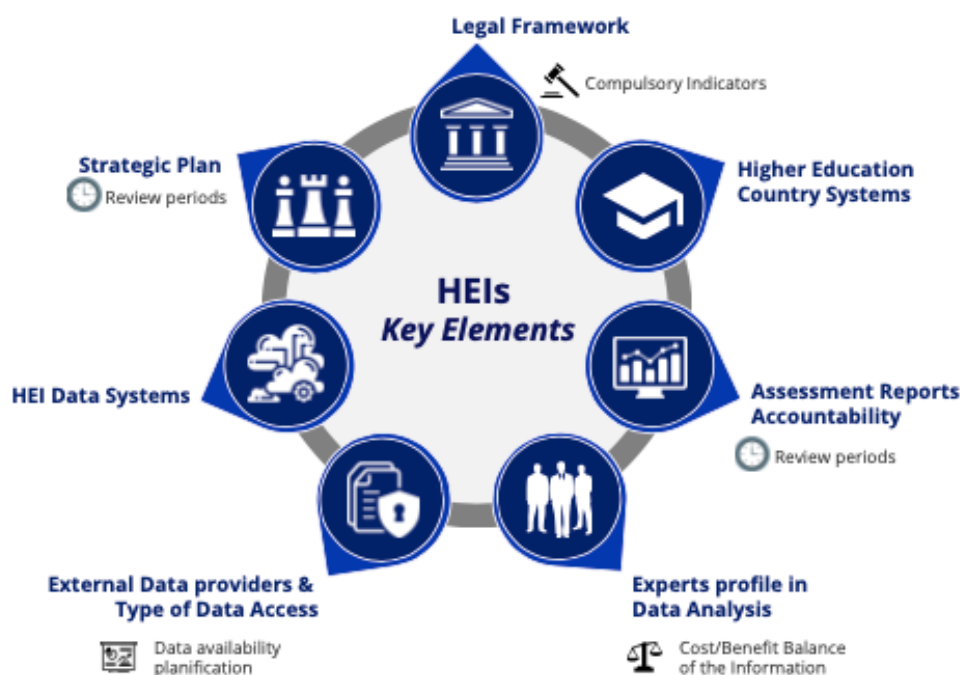


Figure 1 - Outline of the key elements

¹ Qualitative indicators: indicating a fact or situation, mathematical operations are not appropriate to these (e.g., meeting a condition, assessment results, outputs from qualitative methodologies), qualitative indicators specify whether the standard has been met, but they do not define the standard themselves.

General

Name of indicator:	Fulfilment of objectives
Goal:	Monitoring strategic goals achievement
Mission:	General (Teaching & Learning; Research; Relations with society)
Quality standard:	Policy for quality assurance
Decision-making level:	Strategic
Type:	Basic
Nature:	Quantitative
Formula:	Percentage of strategic planning objectives fulfilled $(\Sigma \text{ Strategic plan objectives fulfilled} / \Sigma \text{ Strategic plan objectives}) * 100$
Frequency:	Annually monitoring (depending on the goal maybe it is necessary a shorter period)
Timing of data collection:	The institution must consider the data needed to calculate the accomplishment of the objectives and when these data are available. It is important to work in shortened periods.
Data source(s):	It is recommended to have centralized data systems for collection and treatment
Observations:	It is recommended an analysis in two levels and times. First level and timing: a deployment data analysis in schools, faculty, departments, research institutes. Second level and timing: University level

Name of indicator:	Application of procedures for internal quality assurance
Goal:	To disseminate and to develop the culture of quality
Mission:	General (Teaching & Learning; Research; Relations with society)
Quality standard:	Policy for quality assurance
Decision-making level:	Strategy
Type:	Basic
Nature:	Qualitative
Formula:	NA
Frequency:	Biannual (the frequency depends on the maturity of IQAS and the process implementation state of art)
Timing of data collection:	Every process may have its own established period of review. To monitor the implementation and appropriateness of the process must have systematic data collection and for most of them it would be the end of the academic year
Data source(s):	It is recommended to have centralized data systems for collection and treatment
Observations:	

Name of indicator:	QA results and impact
Goal:	Improving and aligning IQAS with strategic plan and external assessments and stakeholders needs
Mission:	General (Teaching & Learning; Research; Relations with society)
Quality standard:	Policy for quality assurance
Decision-making level:	Operational
Type:	Basic
Nature:	Quantitative
Formula:	$(\Sigma \text{ Improvement actions performed} / \Sigma \text{ Improvement actions planned}) * 100$
Frequency:	Annual/Biannual (the frequency of every process should be specified in the improvement action plan)
Timing of data collection:	At the end of the academic year (recommended)
Data source(s):	It is recommended to have centralized data systems for collection and treatment
Observations:	<p>IQAS: Internal Quality Assurance System</p> <p>It is recommended an analysis in two levels and times. First level and timing: a deployment data analysis in schools, faculty, departments, and research institutes. Second-level and timing: University level</p> <p>It is recommended a systematic review of the impact at the process level for this reason it is important to fix a review frequency by every process, and if it is necessary partial reviews depending on the goal intended to achieve (example: improve the student engagement)</p>

Teaching & Learning

Name of indicator:	Design of programmes
Goal:	Assure the deploy of quality standards and institutional values through study programmes
Mission:	Teaching & Learning
Quality standard:	Design and approval of programmes
Decision-making level:	Operational
Type:	Basic
Nature:	Qualitative
Formula:	Appropriateness of intended learning outcomes, teaching, and assessment methods
Frequency:	Duration of a cohort. Bachelors / Masters / PhD should have different frequency depending of academic years of each one
Timing of data collection:	Recommended: an ex-ante review at the end of the design study program process. In order to have a preliminary data hypothesis as initial data to compare with future implantation data Once implemented the study programme: at the end of every academic year
Data source(s):	It is recommended to has centralized data systems for collection and treatment. Also, it could be interesting a data programme to treat external and internal assessment reports to systematize and to analyse qualitative data
Observations:	It is recommended to use external data such as external assessments and internal monitoring assessments conducted by a committee which internal stakeholders are represented (teaching staff, students, management staff)

Name of indicator:	Programmes offer
Goal:	Assure alignment second and third programmes offer and strategic plan priorities and institutional resources (facilities, teaching and support staff), lines of research or professional, industry or market needs.
Mission:	Teaching & Learning
Quality standard:	Design and approval of programmes
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of second and third cycle programmes $(\sum \text{Second and third cycle programmes offered} / \sum \text{programmes offered}) * 100$
Frequency:	Biannual (the stability of study programme's offer is an important criterion to establish frequency)
Timing of data collection:	To establish timing, it is necessary to have into account internal planification for approving and termination study programmes. Also, if there are any external compulsory assessment that can have as result the termination of the study programme
Data source(s):	It is recommended to have centralized data systems and connections with external resources such as Agencies or Government databases to get official data on current study programmes
Observations:	It is recommended to have a risk plan linked to a systematic internal study programs review to assure their alignment with the strategic plan, financial and budget objectives, student engagement, and fulfilment of external assessments.

Name of indicator:	Student engagement
Goal:	To promote environment stimulates students to play an active role in their learning process
Mission:	Teaching & Learning
Quality standard:	Student-centred learning, teaching and assessment
Decision-making level:	Operational
Type:	Basic
Nature:	Qualitative
Formula:	The design of programmes promotes the student as a co-producer of his/her training
Frequency:	Annually (depending on the study programme could be established a shorter period)
Timing of data collection:	At least at the end of every academic year
Data source(s):	To enhance objectiveness should be interesting to use structured self-assessment reports from teachers and students or satisfaction surveys. Also, satisfaction surveys could be complemented by focus groups that could help with data interpretation
Observations:	It is important to deploy the indicator to a subject level it could be an important input to review the learning outcomes achievement and adapt learning activities and methodologies.

Name of indicator:	Teacher - student balance
Goal:	To achieve a reasonable ratio teacher–students that assure to work and assess learning outcomes assigned to the subject or learning activity
Mission:	Teaching & Learning
Quality standard:	Student-centred learning, teaching and assessment
Decision-making level:	Tactical
Type:	Basic
Nature:	Quantitative
Formula:	Ratio of students to FTE teaching staff $\frac{\Sigma \text{ Students}}{\Sigma \text{ FTE teaching staff}}$
Frequency:	Annually (depending of study programme could be establish a shorter period)
Timing of data collection:	At least at the end of every academic year
Data source(s):	Human Resources Data Base. It is recommended a centralized data base including hours of teaching at every study programme
Observations:	It is very commonly used to consider like full-time professors in the equation in order to calculate as the ratio of students to employee work hours. However, not always easy to measure at programme level and depending on study programme characteristics it is necessary to do a preliminary definition of what FTE means (for example: artistic study programmes or study programmes with a high participation of external/associate teaching staff with a low dedication hours)

Name of indicator:	Academic staff workload
Goal:	To assure that the workload is reasonable for achieving teaching commitment in relation to their category, position at the organizational structure, and professional career progression
Mission:	Teaching & Learning
Quality standard:	Student-centred learning, teaching and assessment
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Ratio of teaching hours offered per FTE teaching staff $\Sigma \text{ Teaching hours delivered} / \Sigma \text{ FTE teaching staff}$
Frequency:	Annually (depending of study programme could be establish a shorter period)
Timing of data collection:	At the end of the academic year.
Data source(s):	Human Resources Data Base.
Observations:	To establish timing has to be considered (if there are): planning of internal or external assessment procedures where these data are taken into account. Also, contract staff temporary and its conditions

Name of indicator:	Assessment system
Goal:	To align teach staff to strategic plan
Mission:	Teaching & Learning
Quality standard:	Student-centred learning, teaching and assessment
Decision-making level:	Operational
Type:	Recommended
Nature:	Qualitative
Formula:	Teaching staff peer evaluation of assessment/examination protocols
Frequency:	Triannual
Timing of data collection:	At the end of the academic year
Data source(s):	Human Resources Data Base
Observations:	To establish timing has to be considered (if there are): planning of internal or external assessment procedures where these data are taken into account. Also, contract staff temporary and its conditions

Name of indicator:	Efficiency rate
Goal:	To align learning outcomes achievement and study program planning
Mission:	Teaching & Learning
Quality standard:	Student-centred learning, teaching and assessment
Decision-making level:	Operational
Type:	Recommended
Nature:	Quantitative
Formula:	Ratio between credit units required for graduation and credit units actually enrolled since first year on program $(\Sigma \text{ Credit units required for graduation} / \Sigma \text{ Credit units enrolled from first year until graduation}) * 100$
Frequency:	At the end of every cohort
Timing of data collection:	At the end of the academic year
Data source(s):	Centralized data base that should include ECTS assigned at subject level, every student assessment qualification
Observations:	It is recommended to deploy the indicator at the subject level and to monitor the results at the end of especially critical subjects aiming at learning outcomes with fundamental contents. Also, it is important to close monitoring when it is a new study program with no previous experience at the institution

Name of indicator:	Student mobility
Goal:	To promote internationalization profile
Mission:	Teaching & Learning
Quality standard:	Student-centred learning, teaching and assessment
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	<p>Number of international agreements that have incoming or outgoing mobility</p> $\Sigma \text{ International agreements that have incoming or outgoing mobility}$
Frequency:	At the end of every cohort
Timing of data collection:	At the end of the academic year
Data source(s):	Centralized files of international agreements. It should be categorized the different mobility programmes joined by the HEIS
Observations:	It is recommended to deploy the indicator at the study program level or Faculty level. Also, depending on strategic goals, it is possible that different Faculties have different international goals. The deployment of a study programme it could be necessary if learning outcomes are related to internationalization

Name of indicator:	Time to degree completion
Goal:	To align learning outcomes achievement and study program planning
Mission:	Teaching & Learning
Quality standard:	Student-centred learning, teaching and assessment
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Duration of studies Time until degree completion
Frequency:	At the end of every cohort and at the end of every cohort +1 year
Timing of data collection:	At the end of the academic year
Data source(s):	Centralized data base including ECTS and Qualification per Student
Observations:	It is recommended to take into account the student profile of the study programme: % of part-time students; % of full-time students; % of students with special learning needs. Also, it is important to close monitoring when it is a new study program with no previous experience at the institution

Name of indicator:	Dropout rate
Goal:	To detect special needs or adjustments on study programme design or student support
Mission:	Teaching & Learning
Quality standard:	Student admission, progression, recognition and, certification
Decision-making level:	Operational
Type:	Basic
Nature:	Quantitative
Formula:	$\frac{(\sum \text{Students not enrolled or graduated in a year (t)} / \sum \text{Students enrolled in a previous year (t-1)}) * 100}{}$
Frequency:	At the end of every cohort/the end of every cohort +1 year Recommended for Bachelors: at the end of the first academic year
Timing of data collection:	At the end of the academic year
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database
Observations:	It is recommended to calculate also first-year dropout rate. It will help to identify possible adjustments in the learning and teaching process or student support. It could be useful to define strategies to overcome academic failure as well as define improvement strategies for degrees or pedagogical support strategies/tutorials. Define new financial support or reinforce existing support, and review service activities

Name of indicator:	Graduation rate in specified time
Goal:	To detect special needs or adjustments on study programme design or student support
Mission:	Teaching & Learning
Quality standard:	Student admission, progression, recognition, and certification
Decision-making level:	Tactical
Type:	Basic
Nature:	Quantitative
Formula:	Percentage of students completing the study within expected number of years $\left(\frac{\sum \text{Graduates who completed the study within the expected time}}{\sum \text{Graduates}} \right) * 100$
Frequency:	At the end of every cohort/the end of every cohort +1 year Recommended for Bachelors: at the end of the first academic year
Timing of data collection:	The institution has to take into account the student's profile (part-time or full-time students), and the length of the study programme. It is recommended N +1 to collect the data
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database
Observations:	It could be useful to assess the workload and ECTS

Name of indicator:	Progress rate
Goal:	To detect special needs or adjustments on study programme design or student support
Mission:	Teaching & Learning
Quality standard:	Student admission, progression, recognition, and certification
Decision-making level:	Operational
Type:	Basic
Nature:	Quantitative
Formula:	Percentage of passed credit units $(\Sigma \text{ Passed credit units} / \Sigma \text{ Evaluated credit units}) * 100$
Frequency:	Annually
Timing of data collection:	The institution has to take into account the student's profile (part-time or full-time students), and the length of the study programme. It is recommended N +1 to collect the data
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database
Observations:	It could be useful to assess syllabus structure and review the planning of contents, learning outcomes assignments to subjects and learning activities

Name of indicator:	Student enrolment in postgraduation
Goal:	To measure the university capacity of engagement and attraction
Mission:	Teaching & Learning
Quality standard:	Student admission, progression, recognition, and certification
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Number of PhD students in the Department $\Sigma \text{ PhD students in the Department}$
Frequency:	Annually
Timing of data collection:	At the end of the enrolment procedure
Data source(s):	Each institution has to set its data resources. It is highly recommended to cover students from Bachelor to Master and PhD. It must be possible to know if the Bachelor's graduate has studied Master's or PhD
Observations:	It could be useful as a database with a guide capability to store graduate bachelor data for approximately 5 years It could be strategic for some HEIs oriented to research studies as well as useful when combined with research positions available in each Department

Name of indicator:	Student profile
Goal:	To achieve inclusion and diversity goals; to measure and assess the risk of underrepresentation of collectives and minorities
Mission:	Teaching & Learning
Quality standard:	Student admission, progression, recognition, and certification
Decision-making level:	Strategic
Type:	Recommended
Nature:	Qualitative
Formula:	Sexual and socioeconomic diversity
Frequency:	The frequency should be defined according to strategic goals. However, it would be recommended yearly
Timing of data collection:	At the end of the enrolment period
Data source(s):	It is highly recommended a data base connected or including enrolment data by study programme
Observations:	The integration of risk students and underrepresented social statements is correlated with the social aims of the HEIs

Name of indicator:	Student qualifications
Goal:	To detect special needs or adjustments on study programme design or student support
Mission:	Teaching & Learning
Quality standard:	Student admission, progression, recognition, and certification
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Final mean classification of each degree's graduates $(\sum \text{Final classifications of graduates in each degree in year X}) / (\sum \text{number of graduates in each degree in that year X})$
Frequency:	Yearly
Timing of data collection:	At the end of cohort or when the qualifications have been informed to the students
Data source(s):	It is highly recommended a database that comprises enrolment data by study programme as well as takes into account part-time and full-time students
Observations:	A hint of the level of integration success It would be highly recommended to deploy the indicator to every subject and academic year

Name of indicator:	Student's placement by first choice
Goal:	To improve institutional attraction
Mission:	Teaching & Learning
Quality standard:	Student admission, progression, recognition and, certification
Decision-making level:	Operational
Type:	Recommended
Nature:	Quantitative
Formula:	Demand satisfaction index/strength index $(\sum \text{Candidates in 1st option}) / (\sum \text{Vacancies}) * 100$
Frequency:	Yearly
Timing of data collection:	At the end of the enrolment process
Data source(s):	It is highly recommended a database that comprises enrolment data by study programme as well as takes into account part-time and full-time students
Observations:	

Name of indicator:	Qualification of teaching staff
Goal:	To align teaching staff profiles to research and teaching performance institution values and objectives; to identify needs of pedagogical investment
Mission:	Teaching &- Learning
Quality standard:	Teaching Staff
Decision-making level:	Operational
Type:	Basic
Nature:	Quantitative
Formula:	Percentage of teaching staff who participated in activities to improve their teaching skills $(\Sigma \text{ Teaching staff who participated in activities to improve their teaching skills} / \Sigma \text{ Teaching staff}) * 100$
Frequency:	Annually
Timing of data collection:	At the end of the year
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database
Observations:	<p>It is recommended to take into account:</p> <ol style="list-style-type: none"> 1. In the different stages of teaching staff career (junior, senior), it is important, if there are, to consider teaching performance assessment 2. The contractual relationship with the institution: <ul style="list-style-type: none"> • Assistants: who have been admitted or are about to be admitted to Doctoral studies. The purpose of the contract is to complete their training. Assistants will collaborate in teaching tasks • PhD assistant lecturers: PhD holders. The purpose of the contract is to carry out teaching and research tasks • Associate lecturers: specialists who have a professional activity outside the university. The purpose of the contract is to carry out teaching tasks in which they contribute with their professional knowledge and experience • Visiting lecturers: lecturers of recognized prestige from other universities and research centres. The purpose of this temporary contract is to carry out teaching or research tasks 3. The educational level that they teach 4. Other tasks assigned (management, research, relations with society) <p>All these data could be useful to understand indicator results. Not all, academic staff has the same needs</p>

Name of indicator:	Teaching staff holding a PhD
Goal:	To align teaching staff profiles with research institution objectives and learning outcomes assigned to study programme
Mission:	Teaching & Learning
Quality standard:	Teaching Staff
Decision-making level:	Tactical
Type:	Basic
Nature:	Quantitative
Formula:	Percentage of FTE teaching staff holding a PhD per all FTE teaching staff $(\Sigma \text{ FTE teaching staff holding a PhD}) / (\Sigma \text{ FTE teaching staff}) * 100$
Frequency:	Annually (recommended). The institution has to take into account the law constraints, the maturity of the staff, etc.
Timing of data collection:	At the end of each course if this data is necessary to plan next course teaching schedule
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database.
Observations:	It is considered important especially when the study programme is oriented to research. Also, in some countries is considered a quality requirement by law

Name of indicator:	International staff
Goal:	To align global teaching profiles with international institution objectives in teaching performance and research; to monitor international attractiveness and teaching staff quality
Mission:	Teaching & Learning
Quality standard:	Teaching Staff
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of international visiting teaching staff $(\Sigma \text{ International visiting teaching staff} / \Sigma \text{ Teaching staff}) * 100$
Frequency:	Annually (recommended)
Timing of data collection:	At the end of each academic. However, the institution has to consider the periodicity of mobility agreements or contracts
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database
Observations:	It is recommended to deploy the indicator at the Faculty or Department level and, in some cases such as Master & PhD, it would be interesting to deploy it at the study programme level This indicator results as well as student mobility and teaching mobility data could give a picture of the institution's international attractiveness

Name of indicator:	Student satisfaction with teaching staff
Goal:	To improve teaching performance and to identify needs of pedagogical investment
Mission:	Teaching & Learning
Quality standard:	Teaching Staff
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Level of satisfaction with quality of teaching staff, quality teaching, and teaching staff engagement
Frequency:	Yearly
Timing of data collection:	Per semester or at the end of every subject. For PhD programmes, at the end of every stage or planned activity
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database. Also, it is recommended to have an application for online surveys and the possibility to be delivered on different electronic devices, and control the number of answers to alert of possible lack of representativeness
Observations:	<p>It is recommended to deploy the indicator at the subject level. If the subject is delivered by more than one teacher at the end of each teacher intervention is important to do a brief survey. That survey should be planned to be delivered as soon as the teacher intervention has finished. It is important for the student to identify the teacher.</p> <p>It is recommended to send the survey to students before exam period.</p> <p>It is recommended to ask about:</p> <ul style="list-style-type: none"> • Satisfaction with the learning process: if the learning activities have been useful to achieve learning outcomes • Satisfaction with the resources: bibliography upgrade, experimental or applied activities (workshops, field trips, visits to institutions, etc) • Level of contents upgrade • Satisfaction with the workload • Satisfaction with the feedback that is given and its usefulness for their learning improvement <p>To improve survey results interpretation and to go deeper into strengths and weaknesses, it could be interesting to conduct structured focus groups. It becomes especially important to do it when the surveyed population is not representative enough</p>

Name of indicator:	Teacher - non-academic staff balance
Goal:	To align teaching staff profiles to learning outcomes assigned to each study programme
Mission:	Teaching & Learning
Quality standard:	Teaching Staff
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Ratio of teaching staff to non-academic staff $(\Sigma \text{ Teaching staff})/(\Sigma \text{ Non-academic staff})$
Frequency:	Annually (recommended). The institution has to take into account the law constraints, study program orientation, and main aims
Timing of data collection:	At the end of each course if this data is necessary to plan next course teaching schedule
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database
Observations:	It is considered important especially when the study programme is professionally oriented. Also, some study programs could be interesting specific professional profiles to deliver more applied or professional oriented subjects. In this case, it could be interesting to deploy that indicator at the study programme level

Name of indicator:	Teaching staff mobility
Goal:	To align global teaching profiles with international institution objectives in teaching performance, research and, internationalization; to monitor internationalization of teaching staff
Mission:	Teaching & Learning
Quality standard:	Teaching Staff
Decision-making level:	Operational
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of teaching staff joining ERASMUS Program $(\Sigma \text{ Teaching staff joining ERASMUS Program}) / (\Sigma \text{ Teaching staff}) * 100$
Frequency:	Annually
Timing of data collection:	At the end of each course if this data is necessary to plan next course teaching schedule
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database
Observations:	It is recommended to deploy the indicator at the Faculty or Department level and, in some cases such as Master's & PhD, it would be interesting to deploy it at the study programme This indicator results as well as student mobility and teaching mobility data could give a picture of the institution's international attractiveness

Name of indicator:	Teaching staff profile
Goal:	To align global teaching profiles with international institution objectives in teaching performance, research and, internationalization; to support the planning of recruitment and professional development of teaching staff
Mission:	Teaching & Learning
Quality standard:	Teaching Staff
Decision-making level:	Operational
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of teaching staff in each professional category $(\Sigma \text{ Teaching staff by professional category}) / (\Sigma \text{ Teaching staff}) * 100$
Frequency:	Annually
Timing of data collection:	At the end of each course if this data is necessary to plan next course teaching schedule
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database which is distributed by departments or academic fields
Observations:	<p>It is recommended to have into account:</p> <ol style="list-style-type: none"> The categories related to contractual relationship with the institution: <ul style="list-style-type: none"> Assistants: who have been admitted or are about to be admitted to Doctoral studies. The purpose of the contract is to complete their training. Assistants will collaborate in teaching tasks PhD assistant lecturers: PhD holders. The purpose of the contract is to carry out teaching and research tasks Associate lecturers: specialists who have a professional activity outside the university. The purpose of the contract is to carry out teaching tasks in which they contribute with their professional knowledge and experience Visiting lecturers: lecturers of recognized prestige from other universities and research centres. The purpose of this temporary contract is to carry out teaching or research tasks The organizational structure <p>It could be interesting to add assessments of teaching or research performance or other professional recognition. Also, it is important to take into consideration the ageing of the academic staff aiming at renovation and promotion planning</p>

Name of indicator:	Facilities
Goal:	To adapt facilities and the access to them by students, teachers, and researchers
Mission:	Teaching & Learning
Quality standard:	Learning resources and student support
Decision-making level:	Operational
Type:	Basic
Nature:	Quantitative
Formula:	Percentage of classroom offer on the total need $(\Sigma \text{ Total number of hours required}) / (\Sigma \text{ Number of hours available}) * 100$
Frequency:	Yearly
Timing of data collection:	At the end of each course
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database which is distributed by Campus or Faculty
Observations:	It could be interesting: <ol style="list-style-type: none"> 1. To compare with student's satisfaction with facilities 2. To compare with the number of students enrolled in study programmes assigned to each facility 3. To distinguish among levels of study programmes and levels of experimentation, applied activities (engineering, design, translation/interpretation studies, music performance, etc.)

Name of indicator:	Library services
Goal:	To adapt the range of bibliography and improve the access of students, teachers, and researchers
Mission:	Teaching & Learning
Quality standard:	Learning resources and student support
Decision-making level:	Tactical
Type:	Basic
Nature:	Quantitative
Formula:	Number of library resources Σ Library resources
Frequency:	Yearly
Timing of data collection:	At the end of each academic course
Data source(s):	Each institution has to set data resources. It is highly recommended to have a centralized database which is distributed by General and Faculty Libraries. Also, it would be interesting to use an app to register the number of access to the bibliography recommended/compulsory in study programmes
Observations:	<p>It could be interesting:</p> <ol style="list-style-type: none"> 1. To compare with the student's satisfaction with facilities 2. To connect syllabus bibliography and library management to upgrade resources (books, eBooks, articles database) 3. To compare with the student's satisfaction with library 4. To compare with the number of students enrolled in study programmes assigned to each library 5. To distinguish among levels of study programmes and level of experimentation, applied activities (engineering, design, translation/interpretation studies, music performance, etc.)

Name of indicator:	Student's satisfaction with facilities
Goal:	To adapt and improve facilities and the access to them by students, teachers and, researchers
Mission:	Teaching & Learning
Quality standard:	Learning resources and student support
Decision-making level:	Operational
Type:	Recommended
Nature:	Quantitative
Formula:	Level of satisfaction with facilities and other resources (Library) Assessment of facilities and other resources
Frequency:	Yearly
Timing of data collection:	At the end of each academic course if this data is necessary to plan next course teaching schedule
Data source(s):	Each institution has to set its data resources. It is highly recommended to have a centralized database which is distributed by Campus or Faculty. It is recommended to consider each programme level (Bachelor, Master, and PhD) once students have different needs
Observations:	It could be interesting: <ol style="list-style-type: none">1. To include virtual facilities2. Library covered only if it does not have its own satisfaction survey. However, it is highly recommended to have different surveys

Name of indicator:	Teaching & learning expenditure
Goal:	To align the Teaching & Learning expenditure with student success as one of the factors to measure cost-efficiency
Mission:	Teaching & Learning
Quality standard:	Learning resources and student support
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of expenditure dedicated to Teaching & Learning activities $(\Sigma \text{ Expenditure in Teaching \& Learning}) / (\Sigma \text{ Total institutional expenditure of the HEI}) * 100$
Frequency:	Yearly
Timing of data collection:	At the end of the budget period (December)
Data source(s):	Accountability database
Observations:	Results should be compared with the relative needs of each programme as well as the extent to which they are met Results should be compared with other indicator academic results There is no direct correlation between budget and usage, or between value, cost and efficiency (it is just an orientation)

Name of indicator:	QA data collection system
Goal:	To improve the IQAS and adjust the information generated to the institutional needs
Mission:	Teaching & Learning
Quality standard:	Information management
Decision-making level:	Tactical
Type:	Basic
Nature:	Qualitative
Formula:	Application of a system for data collection in different processes
Frequency:	Yearly
Timing of data collection:	Each Institution has to establish timing depending on its reviewed strategic planning
Data source(s):	It is possible that different databases have to be used. It is recommended the use of a Data Warehouse that links different data
Observations:	<p>IQAS: Internal Quality Assurance System</p> <p>These set of indicators and procedures provide information to face:</p> <ol style="list-style-type: none"> 1. Strategic needs 2. External context (opportunities/treats) 2. Internal context (weakness/strengths) <p>QA must have a certain level of future perspective</p> <p>It has to be compared with the results of the indicator QA procedures definition</p>

Name of indicator:	Public information
Goal:	To promote and to improve transparency and attraction policies
Mission:	Teaching & Learning
Quality standard:	Public information
Decision-making level:	Strategic
Type:	Basic
Nature:	Quantitative
Formula:	<p>Percentage of degree programmes with public information about quality</p> $\left(\frac{\sum \text{Current degree programmes with public information about quality}}{\sum \text{Current degree programmes}} \right) * 100$
Frequency:	Yearly
Timing of data collection:	Timing has to be defined considering the enrolment planning (information must be published at least three months before). It may be applied other legal or timing constraints, particularly for bachelor's students
Data source(s):	Web applications
Observations:	<p>It is important to define the level of details in publication</p> <p>It is important to publish:</p> <ol style="list-style-type: none"> 1. Student access profile 2. Syllabus 3. Teaching staff assigned 3. Main academic indicators (graduation, global dropout, level of satisfaction) 4. Main career opportunities for future graduates <p>It is important to establish criteria to publish the aforementioned information in different languages</p>

Name of indicator:	Graduate employment rate
Goal:	To align learning outcomes, professional orientation services to labour market expectation.
Mission:	Teaching & Learning
Quality standard:	On-going monitoring and periodic review of programmes
Decision-making level:	Tactical
Type:	Basic
Nature:	Qualitative
Formula:	$(\Sigma \text{ Graduates working} / \Sigma \text{ Graduates}) * 100$
Frequency:	At least three years since the student has graduated (3 years for AQU Catalunya students)
Timing of data collection:	Each institution has to establish its own planning. It should be considered: external assessments planning and reviews of study programme planning
Data source(s):	Database to collect, store, and analyse graduate data. It has to be centralized and deployed by study programmes and Faculties
Observations:	<p>It is important to offer services or establish links with graduates to assure that their contact and professional details are updated (Alumni services, conferences for graduates, etc)</p> <p>It would be interesting to complete the information given by this indicator with the recommended Graduate employment in related job indicator</p> <p>It is important to complete the analysis of the results of this indicator with surveys that ask about:</p> <ol style="list-style-type: none"> 1. The suitability of employment according to study programme level (Bachelor, Master, and PhD) 2. Most/Less useful learning outcomes in their professional position/careers

Name of indicator:	Overall student or graduate satisfaction
Goal:	Identify improvements to be applied in the programme
Mission:	Teaching & Learning
Quality standard:	On-going monitoring and periodic review of programmes
Decision-making level:	Operational
Type:	Basic
Nature:	Quantitative
Formula:	Average of valuation of overall quality of the programme Valuation of overall satisfaction with course
Frequency:	At least one year since student has graduated Student's satisfaction at the end of every academic year
Timing of data collection:	Each institution has to establish its own planning. It should be considered: external assessments planning and reviews of study programme planning
Data source(s):	Database to collect, store, and analyse data. It has to be centralized and deployed by study programmes and Faculties
Observations:	<p>It is recommended a standardized survey for all institutions. Although, it could be interesting apply a different survey to each level (Bachelor, Master, and PhD)</p> <p>It is recommended to ask about:</p> <ol style="list-style-type: none"> 1. Level of satisfaction with internships, Final Thesis, mobility 2. Syllabus structure 3. Teaching staff 4. Orientation and tutorial tasks

Name of indicator:	Student satisfaction with teaching & learning
Goal:	Identify improvements to be applied in the programme
Mission:	Teaching & Learning
Quality standard:	On-going monitoring and periodic review of programmes
Decision-making level:	Tactical
Type:	Basic
Nature:	Quantitative
Formula:	Level of satisfaction with the organisation of course sessions Valuation of the organisation of course sessions
Frequency:	Yearly
Timing of data collection:	At the end of the academic year
Data source(s):	Database to collect, store and, analyse data. It has to be centralized and deployed by study programmes
Observations:	<p>It is recommended a standardized survey for all institutions. Although, it could be interesting apply a different survey to each level (Bachelor, Master, and PhD)</p> <p>It is recommended to ask about:</p> <ol style="list-style-type: none"> 1. Level of satisfaction with internships, Final Thesis, mobility 2. Syllabus structure 3. Teaching staff 4. Orientation and tutorial tasks

Name of indicator:	Graduate employment in related job
Goal:	To align learning outcomes, professional orientation services to labour market expectation
Mission:	Teaching & Learning
Quality standard:	On-going monitoring and periodic review of programmes
Decision-making level:	Operational
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of graduates employed in job related with studies $(\Sigma \text{ Graduates working in related studies} / \Sigma \text{ Graduates}) * 100$
Frequency:	At least three years since the student has graduated (3 years for AQU Catalunya students)
Timing of data collection:	Each institution has to establish its own planning. It should be considered: external assessments planning and reviews of study programme planning
Data source(s):	Database to collect, store, and analyse graduate data. It has to be centralized and deployed by study programmes and Faculties
Observations:	<p>It is important to offer services or establish links with graduates to assure that their contact and professional details are updated (Alumni services, conferences for graduates, etc.)</p> <p>It is important to complete the analysis of the results of this indicator with surveys that ask about:</p> <ol style="list-style-type: none"> 1. The suitability of employment according to study programme level (Bachelor, Master, and PhD) 2. Most/Less useful learning outcomes in their professional position/careers <p>It would be interesting to complete that information with Graduate employment rate results</p>

Name of indicator:	Compulsory accreditation of programmes
Goal:	To increase the number of accredited study programmes by an external body
Mission:	Teaching & Learning
Quality standard:	Cyclical external quality assurance
Decision-making level:	Strategic
Type:	Basic
Nature:	Quantitative
Formula:	$\frac{(\Sigma \text{ programmes fully accredited through compulsory accreditation})}{(\Sigma \text{ programmes assessed through compulsory accreditation})} * 100$
Frequency:	Biannual (recommended) Observe specific laws
Timing of data collection:	Each institution must plan and define the timing of data collection according to the cycle of accreditation cycle of its respective country
Data source(s):	It is recommended national agency data base or EQAR
Observations:	It is important to achieve that all programmes are accredited by an external body

Name of indicator:	Voluntary accreditation of programmes
Goal:	To increase the number of accredited study programmes by an external body
Mission:	Teaching & Learning
Quality standard:	Cyclical external quality assurance
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	$\frac{(\sum \text{Programmes fully accredited through voluntary accreditation})}{(\sum \text{Programmes assessed through voluntary accreditation})} * 100$
Frequency:	Biannual (recommended) Observe specific labels
Timing of data collection:	Each institution must plan and define the timing of data collection according to the cycle of accreditation cycle of its respective label
Data source(s):	Each Institution has to include in its study programme database the achieved labels
Observations:	It is important to achieve that all programmes are accredited by an external body Professional bodies of some academic fields like engineering and business specific labels

Research

Name of indicator:	Research funding
Goal:	To measure the ability to raise funds for research
Mission:	Research
Quality standard:	Resources
Decision-making level:	Strategic
Type:	Basic
Nature:	Quantitative
Formula:	Ratio of revenue raised for research per FTE teaching staff $\frac{\Sigma \text{ Revenue raised for research}}{\Sigma \text{ FTE teaching staff}}$
Frequency:	Biannual (recommended) Observe specific law and research programmes duration
Timing of data collection:	At the end of every year. However, it should be done a tight follow up depending on every institution budget dynamic
Data source(s):	It is recommended a centralized database
Observations:	It would be interesting to take into account the number of teaching staff by categories (lecturer, professor, etc.) in each research unit It could be useful to analyse the correlation staff categories and level of attraction

Name of indicator:	Research projects
Goal:	To measure institutional attraction for research projects
Mission:	Research
Quality standard:	Resources
Decision-making level:	Strategic
Type:	Basic
Nature:	Quantitative
Formula:	Percentage of approved competitive projects $\frac{\Sigma \text{ Projects approved}}{\Sigma \text{ Project applications}} * 100$
Frequency:	Biannual (recommended) Observe specific research programmes duration
Timing of data collection:	At the end of every year
Data source(s):	It is recommended a centralized database which is deployed on academic fields
Observations:	It would be interesting to take into account the number of teaching staff by categories (lecturer, professor, etc.) in each research unit

Name of indicator:	Academic inbreeding
Goal:	To measure the Institutional capability to attract academic staff from other institutions; to prevent and avoid inbreeding practices
Mission:	Research
Quality standard:	Resources
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of academic staff recruited who have not obtained a PhD at the same university $\frac{(\sum \text{Academic staff recruited who have not obtained a PhD at the same university})}{(\sum \text{Total academic staff recruited})} * 100$
Frequency:	Yearly
Timing of data collection:	At the end of every year and before the academic course
Data source(s):	It is recommended a centralized database which is deployed on academic fields
Observations:	

Name of indicator:	Members in research units
Goal:	To improve research groups dimensions according their projects and objectives
Mission:	Research
Quality standard:	Resources
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of teaching staff integrated in research units $(\Sigma \text{ FTE teaching staff holding a PhD integrated in research units}) / (\Sigma \text{ FTE teaching staff}) * 100$
Frequency:	Yearly
Timing of data collection:	At the end of every year and before the academic course
Data source(s):	It is recommended a centralized database which is deployed on academic fields
Observations:	It would be interesting to complement the information of this indicator with: Research funding; Research projects; Teaching staff profile

Name of indicator:	Research engagement
Goal:	To measure the management of incentives and opportunities for research engagement
Mission:	Research
Quality standard:	Resources
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Research effort index per FTE teaching staff $\frac{\sum \text{Proportion of time devoted to research by teaching staff}}{\sum \text{FTE teaching staff}}$
Frequency:	Yearly
Timing of data collection:	At the end of every year and before the academic course
Data source(s):	It is recommended a centralized database which is deployed on academic fields
Observations:	

Name of indicator:	Intellectual property dimension
Goal:	To assess the capacity of rising revenue from knowledge transference per teaching staff
Mission:	Research
Quality standard:	Results and Impact
Decision-making level:	Tactical
Type:	Basic
Nature:	Quantitative
Formula:	Ratio of revenue from royalties and license agreements per FTE teaching staff $\frac{\sum \text{Royalty revenues and licensing agreements for intellectual property of HEI over the past 3 years}}{\sum \text{Number of FTE teaching staff at HEI over the past 3 years}}$
Frequency:	Yearly
Timing of data collection:	At the end of every year and before the academic course
Data source(s):	It is recommended a centralized database which is deployed on academic fields
Observations:	It would be interesting to compare these results with Research funding and research unit dimensions indicators results

Name of indicator:	Research citations
Goal:	To identify specific areas which need further support, incentives, and training to produce more impactful research
Mission:	Research
Quality standard:	Results and Impact
Decision-making level:	Tactical
Type:	Basic
Nature:	Quantitative
Formula:	Ratio of impact scientific production per FTE lecturer $\frac{\Sigma \text{ Citations of indexed articles in SCOPUS where at least one author is affiliated to the institution}}{\Sigma \text{ FTE teaching staff}}$
Frequency:	Yearly
Timing of data collection:	At the end of every year and before the academic course
Data source(s):	It is recommended a centralized database which is deployed on academic fields Access to SCOPUS or similar database and application for indexation
Observations:	It could be important for monitoring/evaluating Research Units performance. Also, it would be interesting to compare these results with Research funding and research unit dimensions indicators results It would be interesting to consider the number of teaching staff by categories (lecturer, professor, etc.) in each research unit

Name of indicator:	Research publications indexed
Goal:	To assess the excellence of research; to measure the efficiency of publications
Mission:	Research
Quality standard:	Results and Impact
Decision-making level:	Tactical
Type:	Basic
Nature:	Quantitative
Formula:	<p>Percentage of articles published in 1st-quartile journals in the scientific area per total number of articles published in year n in that area</p> $\left(\frac{\sum \text{Articles published in 1st-quartile journals in the scientific area in year } n}{\sum \text{Total articles published by HEI staff in year } n \text{ in that scientific area}} \right) * 100$
Frequency:	Yearly
Timing of data collection:	At the end of every year and before the academic course
Data source(s):	It is recommended a centralized database which is deployed on academic fields
Observations:	<p>It could be important for monitoring/evaluating Research Units performance. Also, it would be interesting to compare these results with Research funding and research unit dimensions indicators results</p> <p>It would be interesting to consider the number of teaching staff by categories (lecturer, professor, etc.) in each research unit</p>

Name of indicator:	Patents
Goal:	To monitor the performance and efficiency of research
Mission:	Research
Quality standard:	Results and Impact
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	<p>Ratio of patent grants registered by at least one member from the HEI per FTE teaching staff</p> $\frac{\Sigma \text{Patent grants registered by at least one member of the HEI}}{\Sigma \text{FTE teaching staff}}$
Frequency:	Biannual
Timing of data collection:	At the end of every year
Data source(s):	It is recommended a centralized database which is deployed on academic fields
Observations:	<p>It could be important for monitoring/evaluating Research Units performance. Also, it would be interesting to compare these results with Research funding and research unit dimensions indicators results</p> <p>It would be interesting to consider the number of teaching staff by categories (lecturer, professor, etc.) in each research unit</p>

Name of indicator:	Research grants
Goal:	To improve institutional attractiveness and retainment of highly skilled professionals
Mission:	Research
Quality standard:	Results and Impact
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Ratio of ongoing scientific research grants per FTE teaching staff $\frac{\Sigma \text{ Ongoing scientific research grants}}{\Sigma \text{ FTE teaching staff}}$
Frequency:	Biannual
Timing of data collection:	At the end of every year
Data source(s):	It is recommended a centralized database which is deployed on academic fields
Observations:	It could be important for monitoring/evaluating Research Units performance. It would be interesting to compare these results with Research publications indexed, Research citations, Members in research units, and international staff

Relationship with society

Name of indicator:	Recruitment of international students
Goal:	To assess publicity of study programs, teaching, and learning.
Mission:	Relationship with society
Quality standard:	Recruitment and social inclusion
Decision-making level:	Strategic
Type:	Basic
Nature:	Quantitative
Formula:	Percentage of international students enrolled $(\Sigma \text{ International students enrolled} / \Sigma \text{ Students enrolled}) * 100$
Frequency:	Yearly
Timing of data collection:	At the end of the enrolment procedure
Data source(s):	Each institution must set its data resources Data should be deployed in both levels (Bachelor, Master, and PhD)
Observations:	This indicator could be linked to internationalization goals It is important to take into account the results of the public information indicator

Name of indicator:	Financial aid to students
Goal:	To promote inclusion and support to the student with difficult social background
Mission:	Relationship with society
Quality standard:	Recruitment and social inclusion
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	Percentage of students who receive a scholarship based on social background $\left(\frac{\sum \text{Students receiving scholarship based on social background}}{\sum \text{Students enrolled}} \right) * 100$
Frequency:	Yearly
Timing of data collection:	At the end of the enrolment procedure
Data source(s):	Each institution must set its data resources Data should be deployed in both levels (Bachelor, Master, and PhD) and linked with enrolment database
Observations:	

Name of indicator:	Life-long learning
Goal:	To promote an offer of study programs with a continuous commitment to society and industry as well as linked to the labour market
Mission:	Relationship with society
Quality standard:	Recruitment and social inclusion
Decision-making level:	Operational
Type:	Recommended
Nature:	Quantitative
Formula:	Ratio of participants in lifelong learning programmes per students enrolled $\frac{\Sigma \text{ Participants in lifelong learning programmes}}{\Sigma \text{ Students enrolled}}$
Frequency:	Yearly
Timing of data collection:	At the end the academic year
Data source(s):	Each institution must set its data resources
Observations:	

Name of indicator:	Research Partnerships
Goal:	To strength link with regional and national territory (public sector, industry, commerce, etc.); to reinforce applied research
Mission:	Relationship with society
Quality standard:	Collaboration with stakeholders
Decision-making level:	Strategic
Type:	Basic
Nature:	Quantitative
Formula:	Ratio of cooperation agreements for research and transfer with third-parties per FTE teaching staff $\frac{\Sigma \text{ Cooperation agreements for research and transfer with third-parties}}{\Sigma \text{ FTE teaching staff}}$
Frequency:	Yearly
Timing of data collection:	At the end of every collaboration agreement
Data source(s):	Each institution must set its data resources Database should include or be linked to academic and research staff database It should be deployed by academic fields
Observations:	Actions to improve territory development

Name of indicator:	Collaboration with stakeholders
Goal:	To strength link with territory (public sector, industry, commerce, etc.); to reinforce applied research
Mission:	Relationship with society
Quality standard:	Collaboration with stakeholders
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	Ratio of protocols/agreements established with external organizations per FTE teaching staff $\frac{\Sigma \text{ Protocols or agreements established with external organizations}}{\Sigma \text{ FTE teaching staff}}$
Frequency:	Yearly
Timing of data collection:	At the end of every collaboration agreement
Data source(s):	Each institution must set its data resources Database should include or be linked to academic and research staff database It should be deployed by academic fields
Observations:	

Name of indicator:	Students' industry link
Goal:	To strength link with territory (public sector, industry, commerce, etc.); to reinforce applied research
Mission:	Relationship with society
Quality standard:	Collaboration with stakeholders
Decision-making level:	Strategic
Type:	Recommended
Nature:	Quantitative
Formula:	Ratio of students involved in external organizations per students enrolled $\frac{\Sigma \text{ Students involved in internships, projects, or dissertations conducted at external organizations}}{\Sigma \text{ Students enrolled}}$
Frequency:	Yearly
Timing of data collection:	At the end of every academic year
Data source(s):	Each institution must set its data resources Database should include or be linked to student enrolment, and deployed by study program level (Bachelor, Master, and PhD)
Observations:	It would be interesting to analyse the correlation with: Graduate employment in related job and Graduate employment rate It would be interesting to analyse the correlation with Research partnerships for masters and PhD study programmes

Name of indicator:	Spin-offs
Goal:	To improve the collaboration policies with the Society, particularly in the field of innovation and knowledge transfer
Mission:	Relationship with society
Quality standard:	Impact in society
Decision-making level:	Tactical
Type:	Recommended
Nature:	Quantitative
Formula:	Ratio of spin-offs established per FTE teaching staff $\frac{\Sigma \text{ Spin-offs established}}{\Sigma \text{ FTE teaching staff}}$
Frequency:	Yearly
Timing of data collection:	At the end of every academic year
Data source(s):	Each institution must set its data resources Database should include teaching staff categories and their contractual relationship with the institution
Observations:	

3

DESIGN OF THE IMPLEMENTATION PROCESS



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3. Design of the implementation process

This section contains guidelines for HEIs regarding the process that should be followed in order to implement the QIS, specifically the various phases it comprises – : (i) planning, (ii) implementation, (iii) assessment, and (iv) improvement (see Figure 2).

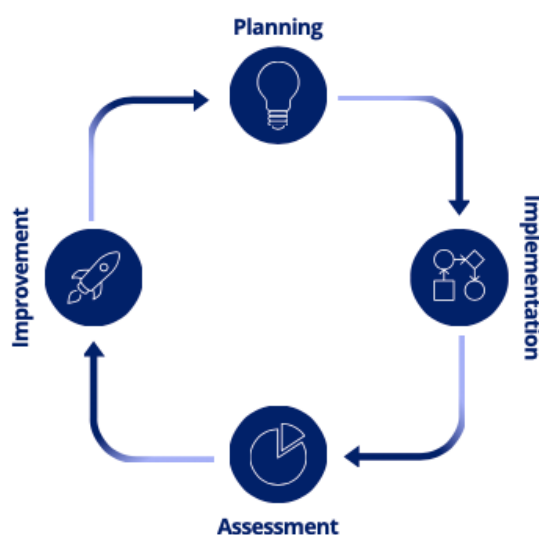


Figure 2 - Design of the implementation process

In the next subsections, the stages are described in detail:

3.1. Planning phase

Steps described in this section plan and permit proximity management within organs and structures of the HEI to reach the easy implementation of the QIS. Actions from an established committee should be a catalyst for the active participation of the actors involved while ensuring adequate support for strategic planning at various levels of responsibility.

3.1.1. Constitution of the coordination committee

Each HEI must define a coordination committee to head the dissemination of this QIS framework and its continuous improvement. Considering the QMS structure of each HEI, the required actors to compose this QIS-CC are listed below:

- The head responsible with decision-making power of the HEI;
- The head responsible for the promotion of quality within each HEI;
- Non-academic member;
- IT staff member.

To ensure the good performance of the QIS, the committee can then talk with other actors related to their HEI if doubts arise regarding the indicators.

3.1.2. Definition of roles and responsibilities

The responsibilities for the implementation of the scoreboard of indicators are explained in Table 1. It is recommended to elaborate and approve a matrix of responsibilities to not only guarantee a better understanding of the different roles of the committee, but also to evidence training, qualifications, and access permissions to the necessary information.

Table 1 - Main Responsibilities of QIS Coordination Committee

Position	Description
President of QIS-CC	<p>Homologate the QIS-CC resolutions relating to:</p> <ol style="list-style-type: none"> 1) Approval of strategic engagement plans and action plans; 2) Approval of the QIS guidelines implementation; 3) Promote a culture of quality, following the definition and adequacy of the instructions and rules of the HEI; 4) Allow access to the authorized person to access information; 5) Decide on how to disseminate the QIS priorities, indicators, goals and targets for the academic year; 6) Establish responsible for collecting data related to the indicators; 7) Decide on how and to whom to communicate/disseminate the indicators values along the time; 8) Dissemination of partial results of quality indicators; 9) Consideration and dissemination of the annual report.
QMS Manager	<ol style="list-style-type: none"> 1) Implementation of the quality strategy defined for the HEI; 2) Provide data related to quality indicators; 3) Ensure space management and equipment; 4) Implement and ensure the human resources management policy, material, and financial; 5) Implement Quality Monitoring Surveys; 6) Propose improvements to procedures for the proper functioning of QIS; 7) Support in solving obstacles with regard to data collection.
IT staff member	<ol style="list-style-type: none"> 1) Ensuring information security, accuracy, and reliability; 2) Provide credentials to access information; 3) Create new processes to increase QIS productivity: application development of back-office and support front office academic management; 4) Data analysis and indicators management;

	5) Systems programming and development; 6) Implement the necessary infrastructure for the functioning of the entire HEI technology system.
Others	TBD by each HEI.

Before the implementation of the scoreboard of indicators, all the indicators and their objectives must be reviewed by QIS-CC in the context of each HEI and respect what has been defined in 2.4. The determination or not of targets for each indicator must be evidenced also by QIS-CC. The level of disaggregation of the indicators (by type of education; by gender; by age group; by scientific area; by faculty; by degree program; etc.) also needs to be defined in advance.

Still considering the planning phase, each HEI must guarantee that the data needed to compute the indicators exist. Otherwise, the HEI should implement methods to collect it. The IT staff may support this stage, regarding the establishment of suitable methods and how the accuracy and reliability of data are checked.

To ensure the good performance of the QIS, the time frame to collect data and calculate the indicators may be reviewed by QIS-CC. The defined responsible for collecting data for each indicator should monitor the results along the time through the monitoring activities established by each HEI. Partial results, as well as eventual improvement actions, may be presented in quarterly meetings of QIS-CC.

3.1.3. Institutional engagement

This section entails identifying and defining institutional mechanisms and strategies that can be implemented by the institution to promote the engagement and commitment of institutional actors at various levels of institutional management (top, middle, and bottom) in the implementation of the QIS.

i) Communication, dissemination, and engagement plan

Action plans should be developed considering the established QIS strategic objectives. Related to the implementation of these action plans, HEIs would be expected to do the following for each objective:

- Determine who will be responsible and accountable for implementation.
- Provide detailed action plan steps that do the following:
 - 1) **Define** each step that must be accomplished;
 - 2) **Assign** the person or persons responsible for each step;
 - 3) **Establish** expected start and finish dates for each step.
- Establish a time frame for the completion of the entire action plan. It must be emphasized that the overall completion dates should be consistent with the completion dates for individual steps;

- Identify what resources are needed and any savings that are anticipated.

Concerning the balanced set of performance measures registered in a specific form, the use of structuring elements mentioned below for the development and implementation of indicators proves to be a facilitator of quality assurance processes and it provides the active participation of the actors involved while ensuring adequate support for strategic planning at the different transversal levels of competence and responsibility:

- Meetings;
- Critical analysis;
- Training²;
- Surveys (Feedback³).

To ensure greater effectiveness as a support instrument for reflection and internalization of the institutional culture of continuous quality improvement, the wide dissemination of QIS priorities and goals through internal communication is also an object of evolution and the use of institutional websites, intranet, and e-mail are recommended. Official documents signed by the rector or other similar positions or a person designated by them are released aiming at the dissemination of the QIS framework and elucidating their role and value-add.

The QIS-CC prepares schedules of the main meetings and training at the beginning of each academic year. Training plans must evidence the scope of the training, the period and who will participate, as well as who will be responsible for the training. After approval by the president of the committee, the planning is shared among the involved stakeholders and actors. Both schedules are updated as needs arise throughout the year and duly disclosed.

The established QIS goals are parameters to be achieved and are used in each evaluation of specific periodicities and defined in formally institutionalized strategic documents.

ii) Engagement monitoring measures

Some strategies are proposed in order to manage the assessment of the defined indicators. Related to that, institutional performance planning and monitoring activities are carried out throughout the academic year. Each quarterly meetings of QIS-CC are recommended.

² Training in the design, implementation and use of the QIS allows institutions to articulate the link between the new practices and organizational objectives, provides a mechanism for all stakeholders to understand, accept, and feel comfortable with the implementation process of performance indicators.

³ Stakeholder's feedback: assessment of indicators could be missing important information, events and dimensions not considered. The feedback of stakeholders should always be considered.

The set of plans cited below in harmony with defined indicators is the basis for the monitoring, assessment, and improvement of the HEIs main processes - Teaching & Learning; Research; Relationship with Society:

- HEI' Strategic Plan;
- Annual Activity Plan;
- Strategic Plan for internationalization;
- Action Plan for the Rector's Quadrennial term (if applicable).

For each meeting, the coordination committee should invite other actors it deems relevant for the success of the activities.

In the institutional performance monitoring meetings within the scope of the established indicators, the measurements of the indicators are presented as well as the proximity of the goals and the main obstacles. The perspectives of the other areas for an integrated vision may be verified, in addition to analysing the causes in the search for action decisions that impact the institutional performance.

This approach provides the conditions to determine the degree of conformity of the actions carried out and the results obtained in relation to the established objectives and the defined goals, which allows envisaging course corrections and, eventually, reformulating the objectives and goals.

The results of these follow-up meetings must be disclosed by the committee, respecting the decision-making levels, as oriented in item 3.1.2. Suggestions of sites for the dissemination of this information are considered, but not limited to these options: institutional website, intranet and e-mail.

With the above in mind, to assess the quality of the activities carried out, the QIS-CC may periodically prepare satisfaction surveys for its users. Surveys are important instruments for validating and possible readjustment of the regular committee activity, in a process of the continuous search for defined quality levels.

3.1.4. Resources requirements

In addition to all expected performance measurement benefits, related activities are intended to achieve not only efficiency and effectiveness through improved performance-based decision-making, but also improve the allocation of resources.

i) Physical resources

To be defined by each HEI. Regarding the necessity of custom software, the ability and implementation of information systems to provide required data and the extent to which organizations can define and develop appropriate measures. QIS with higher quality information systems is able to implement new

measurement systems more easily, leading to a positive relationship between information system capabilities and implementation success. IT equipment, document collection, access to ICT and internet, facilities net area.

ii) Human Resources

To be defined by each HEI. In the area of human resources, the implementation of the institutional policy for quality takes place in the process of recruiting people for activities related to the QIS of each higher education institution. Resources for training must be provided to support the implementation. In order to demonstrate the relevance that the higher education institution provides to the valorisation of its human resources, training actions are aimed at evaluators, so that they can be endowed with the appropriate skills in the performance of their functions. The provision of training resources also provides an indication that the top management is providing adequate resources, it means that the necessary conditions are being provided. If training resources are insufficient, the risk of failure is increased since normal development procedures may not be undertaken. Faculty and staff allocated to the QIS project.

iii) Financial Resources

To be defined according to the budget of each HEI and other funding opportunities. This QIS model ensures the fulfilment of the defined strategic objectives, through an integrated policy and management system, which work as a guarantee of the efficient use of financial, human and material resources.

It must be emphasized that HEI top management support for the QIS planning is crucial to implementation success once these actors can focus on resources to facilitate the achievement of QIS goals and strategies.

3.2. Implementation phase

The HEI defines the procedures for implementing the Smart-Qual instrument in accordance with their available resources and their information system. First, the required data are identified, collected and stored in a temporal “Raw Data File”. Second, all indicators are calculated and stored (according to the established frequency) in the final “Data Warehouse File”. Each calculated indicator is also recorded. Consequently, this “Data Warehouse File” stores the historic set of indicators. Third, indicators are shown whenever required. Figure 3 shows the flow of the implementation process.

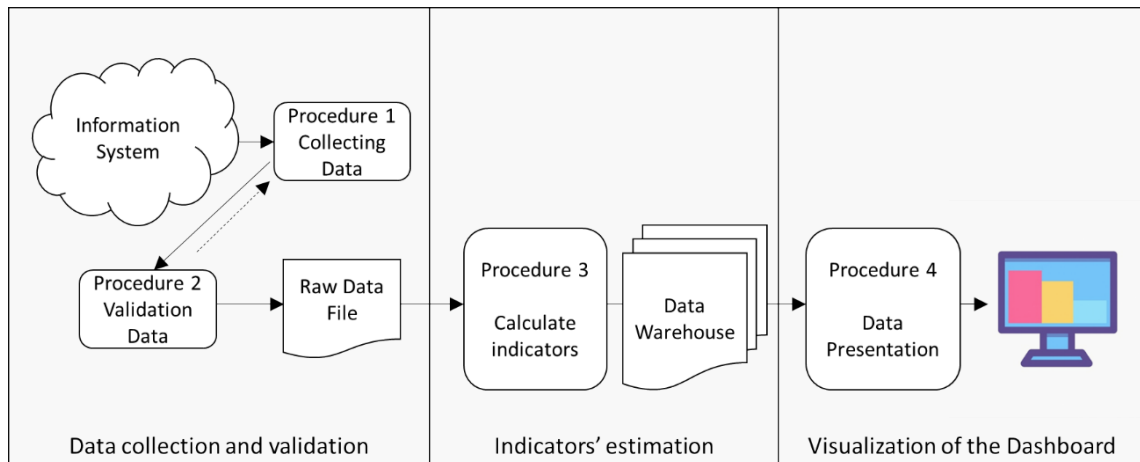


Figure 3 - Process of implementation of the Smart-Qual instrument

Four independent routines are required. The institution defines authorization roles for executing each routine.

3.2.1. Data collection and quality evaluation

The HIE defines how to collect the information required in order to calculate each one of the indicators. Three consecutive steps are followed.

First, it is required to *define the set of data* needed.

- Define the information required in order to compute each indicator.
- Define where this information is currently allocated in the information system of the institution.
- Define the “Raw Data File” format where all this required data will be stored.

Second, a procedure needs to be established in order to capture the data from the information system and poured it out into a unique file.

- Define when this data will be retrieved (which frequency).
- Develop a procedure (1) capable of retrieving data from the information system and upload it to the “Raw Data File”.

Third, a process to check *the validity and consistency of data*.

- Develop a procedure (2) capable of checking that data collected is complete, consistent and reliable. In case the result of this checking was negative, data would be collected again (procedure 1).

3.2.2. Indicators' estimation

First, the HEI defines the format for the “Data Warehouse File”, which allocates the values of the set of indicators (basic and recommendable). This “Data Warehouse File” records all historic indicators.

Second, a procedure (3) that computes all developed indicators. The routine retrieves information from the “Raw Data File”, and computes the value of the current indicator according to the formula for each indicator. This procedure finishes uploading the indicators to the “Data Warehouse File”.

3.2.3. Visualization of the Dashboard

An additional procedure (4) may be developed to assist in the presentation of data. The HEI defines which is the interactive data visualization software used. This procedure is fed by the “Data Warehouse File”, which contains historical data in order to provide and show both the current situation of the HEI and tendencies and longitudinal analysis.

For this purpose, there are some Business Intelligence tools for data visualizations and the creation of reports such as Data Studio (Google), Power BI (Microsoft), Tableau or QlikView.

3.3. Assessment phase

This section integrates steps that should be followed to assess the QIS, based on the data collected and on its usability.

3.3.1. Data analysis

Data analysis of the proposed SMART-QUAL set of indicators should be done respecting their established periodicities as well as the diversity of institutions and their internal management and governance. The intervals at which strategic plans are drafted (short term, medium term, long term) and differentiation between strategic, tactical, or operational levels of monitoring and assessment define the rationale for analysis frequency. Thus, the level and depth of data analysis go in line with the self-definition of the institution in terms of its own goals in Teaching & Learning, Research and Development (artistic activities), also Service to Society under 15 standards.

In terms of how the analysis should be carried out and by whom, efficiency and rationality should be the guiding principles. In practice, the QIS-CC monitors the data analysis conducted by the defined responsible. Different areas of the HEI may support this step, as follows:

- Technical and administrative staff of quality assurance offices;
- Members of study programmes committees and heads of academic units;
- Central administration units and the Rector or Director's office.

Depending upon the nature and relevance of the particular indicator, and also the source of data, the analysis might include a variety of methods. The Business Intelligence tools mentioned in the topic 3.2.3 of this guideline may be applied aiming at the good assessment of the indicators.

The data analysis and its validation involve:

- Verifying if the data is presented correctly and visualized properly;
- Validating all the calculation and aggregation logic performed;
- Simulating the change of data like the addition of new rows and deletion of rows;
- Ensuring the working of the QIS component for different kinds of data (like decimal values, very large values, negative values, null values, zero values).

3.3.2. Usability analysis

Usability analysis should be planned and grounded on a small sample/pilot, yet sizable enough to produce meaningful results to help determine how sensible it is to introduce the proposed indicator(s), if previously not used.

Moreover, it should be done with the aim to determine to what degree the data per particular indicator can be generated/calculated and introduced in the monitoring system; how reliable and representative data is; and what corrective actions and on which levels might be needed for data to become reliable.

In order to guarantee this, this analysis should involve:

- Checking if tooltips are present wherever necessary;
- Verifying if Title, Subtitle and other information convey clearly what data is shown;
- Verifying if there are warning messages at necessary actions;
- Verifying if all components should go well with the theme.

3.3.3. Discussion and validation

After the data collection and analysis, the QIS should be discussed and validated in order to understand its main strengths and shortcomings, as well as to identify the best way to improve it. This stage is intrinsically linked to the next phase (improvement phase) since it is the first stage of discussion and validation of the QIS.

The QIS Coordination Committee leads the discussion and validation of the indicator's results. Each QIS-CC from a different HEI may invite other stakeholders it deems relevant for the success of the assessment.

Academics without management roles and students should be invited to participate (depending on the size of the institutions, 2 or 3 academics and 2 or 3 students). Department directors could either address the invitation to the academic staff and to the students or simply select the academics and students who they think could be the most adequate.

The discussion should be developed in two moments, as follows:

- In the first moment, the stakeholders are divided into groups (a sort of focus group) to understand the perception of each group regarding the QIS, namely its main strengths and weaknesses. It is expected that different stakeholders have different perceptions, thus enriching the discussion.
- In the second moment, each group of stakeholders selects a 'representative' and the representatives of all the groups of stakeholders are involved in a final discussion, where the different perceptions are presented and discussed. The discussions should be 'mediated' and 'moderated' by 1 or 2 members of the quality management office.

The aforementioned moments of the discussion should be guided by a script with the main dimensions to be discussed. However, since this is an open discussion, the participants can raise other questions. These discussions should be recorded to facilitate the analysis. Appendix 2 covers the issues to be addressed in the discussion.

The recorded discussions should then be analysed by the QMS Manager of each HEI. The use of content analysis software (such as NVivo, Maxqda or other) is recommended. A final report with quantitative and qualitative analysis, as well as the final results and conclusions should be produced. This document represents the first 'working tool' for the 'improvement phase', namely for the first stage (3.4.1. gaps and problems detection), since its main goal is to identify the main gaps and problems of the QIS.

3.4. Improvement phase

The post-instalment improvement of a quality management system in higher education institutions can be visualized as a form of *continuous improvement*. A general schematic is visualized in Figure 4. This chapter specifically deals with the topic of *Measurement* (i.e., Gaps and problems detection), *Analysis and improvement* (i.e., action plan). Finally, some suggestions are presented with regards to the *dissemination of the results* of the aforementioned steps.

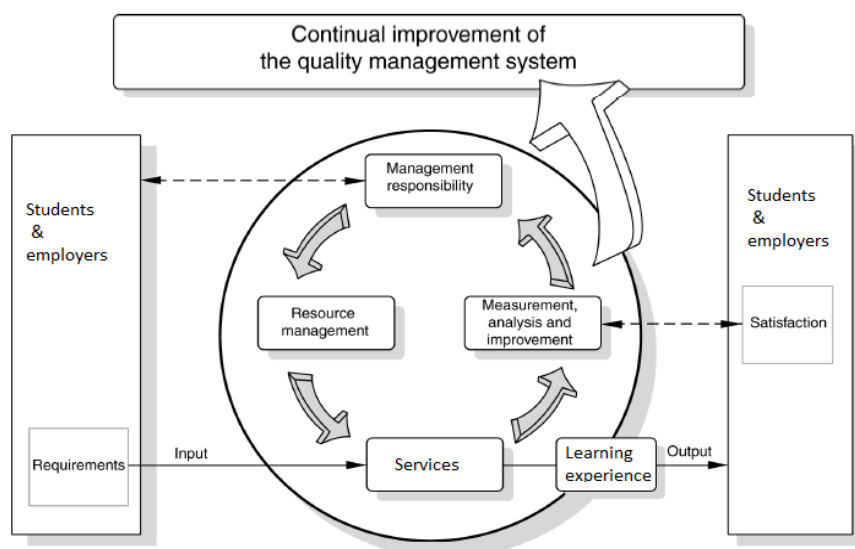


Figure 4 - Standardized visualization of continuous QMS improvement

3.4.1. Gaps and problems detection

After the implantation of a QMS, it is of paramount importance to continuously monitor the performance of the QMS. In particular, the following three types of potential issues (see Figure 5) may at some point arise, and require a proactive approach to create appropriate counter-measures.

Aiming at supporting the effectiveness of the process, each HEI should develop a schedule to ensure that the results regarding quality indicators are evaluated at least one time a year (recommended).



Figure 5 - Schematic overview of the three types of potential issues

- **Blind spots:** Blind spots are all aspects, procedures and elements which play a role in the provision of HEI services, which are nevertheless not as yet measured by the implemented QMS. In other words, the selection of indicators that are currently being used in the QMS does not sufficiently cover the topics that the QMS is intended to survey.
- **Outcomes with low reliability:** Unreliable outcomes are the result of improper use of one or more quality indicators. In this case, the measurements are erroneous and do not provide a

reliable insight into what is intended to be measured. An example would be measuring student satisfaction via surveys with too small samples of student participants.

- **Outcomes with low validity:** Outcomes with low validity are the result of improper use of one or more quality indicators. In this case, the measurements are not erroneous, in the sense that the measurements are reliable, but they measure the wrong parameter. An example would be using study efficiency (i.e., the percentage of enrolled ECTS obtained) as a measurement of the average time students need to graduate. While these concepts are *related*, they are not *identical* and as such should not be conflated.

Identifying these potential issues is a permanently ongoing and continuous process that would typically depend on multiple different initiatives.

- **Blind spots:** Two approaches to identify blind spots can be used:
 - a) Periodic and conceptually broad panel discussions with both stakeholders and external peers, to identify issues that would have otherwise flown under the proverbial radar. Especially the inclusion of external peers (such as teaching staff from other programmes or institutions) can lead to the generation of novel insights that are too often easily missed by people already accustomed to and embedded in the existing quality management system.
 - b) Benchmarking the QMS against QMS used by other institutions. By investigating what approaches other HEI take, and how they apply which indicators, deficits and blind spots in your own QMS can be more easily identified.
- **Outcomes with low reliability:** The detection of low-reliability measurements of quality indicators can be detected in two complementary methods.
 - a) Calculating the correlation between repeated measures of the same indicator. While various trends are to be expected, low reliability manifests itself as a notably large standard deviation that cannot be readily explained contextually.
 - b) Calculating the correlation between the specific indicator and related constructs. Related quality indicators should typically correlate at least to some extent when both measurements are reliable. When related indicators appear poorly, or not at all, correlated the possibility of reliability issues must be investigated.
- **Outcomes with low validity:** Low validity manifests itself by sub-optimal, and below expected, effects of measures taken to improve specific QIs. If the selected indicator is only tangentially related to the aspect to be improved, (significant) improvements in that QI will not directly translate to a similar improvement in the aspect itself. In such a situation, benchmarking this

specific quality indicator to investigate how other HEIs use that QI in their QMS may highlight an erroneous application of the aforementioned indicator.

3.4.2. Action plan

- **Blind spots:** After identifying any existing blind spots via the methods above, the next step would be investigating which quality indicator can be added to the QMS to resolve the issue. An efficient method to do so is by benchmarking this specific aspect of the QMS in other institutions and programmes, to identify indicators that can be added to the existing QMS. An alternative would be organizing focus groups or panel discussions, where external peers and QA professionals of other organizations discuss how they dealt with this in their own QMS, and see if any of these approaches can be imported into the QMS at the host's institution.
- **Outcomes with low-reliability:** Low reliability issues can be caused in different ways. Typically, reliability can be improved by increasing the data from which the quality indicator is calculated and improving data selection criteria. For example, in the case of unreliable measures of student satisfaction reliability can be improved by having more students provide feedback, and by assuring the feedback is obtained from a more generalizable sample of students.
- **Outcomes with low validity:** In the case of low validity, the two solutions would be two either use a different indicator that already exists within the system or, when no applicable one exists, add a more applicable quality indicator to the QMS.

3.4.3. Results dissemination

Disseminating the results of the QA cycle is a core aspect of a continuous improvement cycle as indicated in Figure 6.



Figure 6 - Schematic representation of the role of information flows in continuous improvement cycles

There are multiple stakeholders involved at various times, and the purpose of the dissemination depends on the type of stakeholder that is being communicated with. See Figure 7 for a schematic overview of the stakeholders and the objectives for communication.

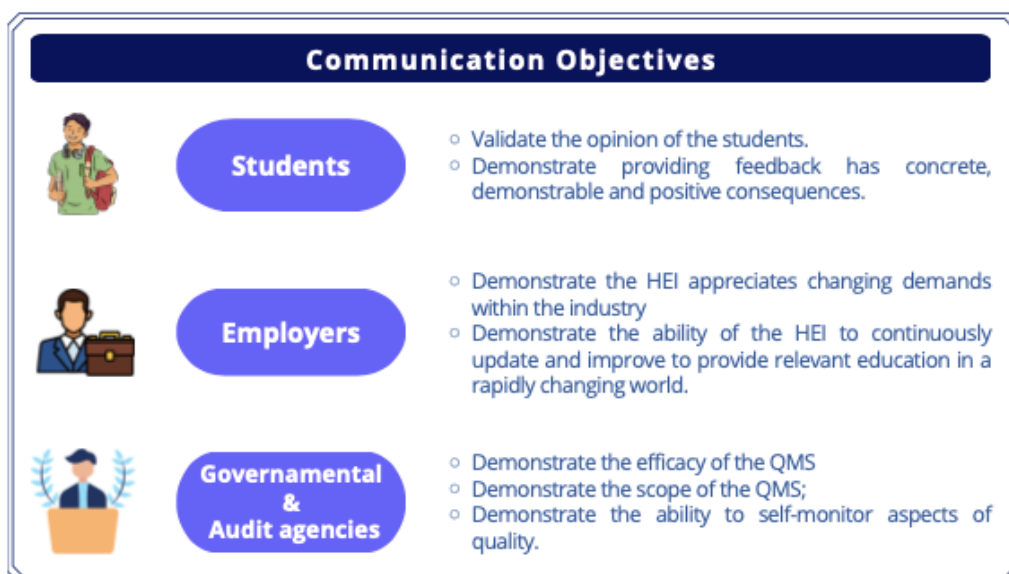


Figure 7 - Schematic overview of relevant stakeholders and communication objectives

In short, communicating adequately, timely and sufficiently with all relevant stakeholders helps assure the future compliance and cooperation of all stakeholders in future QA activities, reinforces the notion that the QMS has a positive and valuable contribution to the services provided by the HEI, and demonstrate the ability of the HEI to self-monitor and assess all relevant aspects within the organization.



APPENDIXES

Appendix 1 – Indicator reference sheet instructions and tips prior to reading

[!] Keep in mind the goals of this scoreboard:

- ★ A **comprehensive framework** of harmonized quality indicator that allows benchmarking between similar HEIs.
- ★ Indicators that provide **useful information** capable of addressing quality criteria applied by external systematic assessments.
- ★ Indicators that **supply valuable information** for the different **levels of managerial decision making**.

💡 Analyse cost/benefit of obtaining the indicators before their implantation.

[!] Remember: it is a general guideline. Each HEI must adjust goals, timing, and resources to their own characteristics.

[!] Remember: type (basic or recommended) or decision-making level is an orientation. The application could be different depending on each HEI's organizational structure and strategic plan.

[!] To improve the reading experience, there is a different colour for basic or recommended indicator:

Basic

Recommended

[!] Each indicator sheet includes mission, level of decision, and ESG (see Figure below). However, the border among these criteria is blurred so don't hesitate in adapted to your institution's context.



Figure 8 - Levels of indicators

Appendix 2 – Discussion script for the Assessment phase

1. Relevance of the indicators (to be addressed for each indicator):

- 1.1. Is the indicator relevant for the objective/standard it is trying to measure? If not, why?
- 1.2. Which other indicator(s) would be more relevant?

2. Adequacy of the nature of the indicators (to be addressed for each indicator):

- 2.1. Is the nature of the indicator (quality or quantitative) adequate? If not why?

3. Adequacy of the formula (to be addressed for each indicator):

- 3.1. Is the formula defined for the indicator adequate to measure it?
- 3.2. If not why, which formula would be more adequate?

4. Clarity of the indicators (to be addressed for each indicator):

- 4.1. Is the indicator clearly defined, so that everyone understands it? Or is it ambiguous?
- 4.2. What changes would you make, to make it clearer?

5. Missing indicators:

- 5.1. Are there missing indicators in the scoreboard? Regarding which standards?
- 5.2. Which other indicators should be included? (as well as their nature and formula)

6. Challenges of the scoreboard (in the two stages of the implementation phase: 3.2.1. data collection and quality evaluation and 3.2.3. indicators' estimation):

- 6.1. Which are the main challenges regarding data collection?
- 6.2. Were there any indicators that presented increased challenges in terms of data collection?
- 6.3. If yes, which ones? And how did you overcome those difficulties?
- 6.4. Which are the main challenges of the procedures to assess the accuracy, validity and consistency of the data collected? Can these challenges be overcome? If yes, how?
- 6.5. Which are the main challenges in the definition of the procedures for the estimation of the indicators? Can these challenges be overcome? If yes, how?

7. Strengths and challenges of the scoreboard (global evaluation):

- 7.1. Globally, which are the main strengths of the scoreboard?
- 7.2. Globally, which are the main challenges /limitations /shortcomings of the scoreboard?
- 7.3. What / how can it be improved?



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