



QUALITY INDICATOR SCOREBOARD

- *Quality indicator set & structured catalogue* -

SMART-QUAL

Structured Indicators to Manage HEI Quality System
Intellectual Output 1



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1. Executive summary

In response to increasing concerns and requirements around quality assurance, higher education institutions (HEIs) have implemented Internal Quality Assurance Systems (IQAS) with differing levels of maturity, specialization, and scope in order to meet their intelligence needs in terms of accountability and improvement.

These systems are often criticized for being too process-oriented, box-ticking and insufficiently focused on consequential and generalizable outcomes. One of the reasons underlying this criticism is the fact that IQASes tend to rely on a large quantity of quality indicators, which makes their accuracy and timely analysis difficult, and consequently acts as a hurdle to their adequate use for decision-making at different levels. Moreover, diverging definitions of indicators make them hard to apply in different contexts and hinder meaningful comparisons of HEI performance within the European Higher Education Area.

In this context, the Erasmus+ SMART-QUAL project addresses some existing important needs:

- a) The lack of a comprehensive framework of harmonized quality indicators.
- b) The lack of an IQAS assessment process for quality assurance agencies based on shared criteria and quality indicators, meaning the efforts by HEIs to implement IQASes are not officially recognized.
- c) The lack of comparable quality indicators between HEIs at the strategic, tactical, and operational levels, which would allow quality benchmarking exercises to be conducted.

Based on more than 500 indicators compiled in a review on the state of the art and actual HEI practices, 27 quality indicators are proposed as basic in this Quality Indicator Scoreboard (QIS), which aims to serve as a reference document for IQAS implementation and quality assurance processes.

The SMARTQUAL Wiki and the guidelines to implement that QIS will be fundamental complements for this intellectual output, mainly addressed to management boards, administration staff, professors and researchers from HEIs and quality agencies.

2. Introduction

2.1. Framework and needs

Data-driven policymaking is expanding within almost every sector. Broader availability of data, the development of suitable technologies and increased calls for accountability have boosted the use of data for monitoring, assessing, and making decisions. Indeed, higher education is no exception.

In parallel to increasing concerns and requirements around quality assurance, higher education institutions (HEIs) have implemented Internal Quality Assurance Systems (IQAS) with differing levels of maturity, specialization and scope in order to meet their intelligence needs. These IQASes lie at the core of HEIs when it comes to data-driven decisions, as they collect, monitor and assess different institutional dimensions using a set of quality indicators relating to the HEI's aims and challenges.

IQASes in higher education are often criticized for being too process-oriented, box-ticking and insufficiently focused on consequential and generalizable outcomes.¹ One of the reasons underlying this criticism is the fact that IQASes tend to rely on a large quantity of quality indicators, which makes their accuracy and timely analysis difficult, and consequently acts as a hurdle to their adequate use for decision-making at different levels. The approaches to implementing IQASes have been too bureaucratic and focused on inputs and activities, while lacking a results-oriented approach.² Therefore, it is highly doubtful that most HEIs' IQASes have been designed in the most efficient and effective way when it comes to the processes defined for IQASes with the indicators to monitor them outnumbering what would be expected.

As far as quality indicators are concerned, another relevant criticism points to the inconsistency regarding which quality indicators are in use, and the noticeable differences not only between countries but also between HEIs within the same country. This reality is a logical consequence of *a)* lack of standardized, shared references for IQAS implementation; and, *b)*

¹ <https://www.universityworldnews.com/post.php?story=20180911150857190>

² <https://www.universityworldnews.com/post.php?story=20190218123554751>

unequal capacities of HEIs to implement an IQAS holding the same level of maturity due to cultural, historical, legal, or technical reasons. The result is that comparisons between and benchmarking of IQASes become complex tasks.

In 2015, the *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) document was reviewed (the initial version was from 2005) and approved.³ The set of standards and guidelines in Part 1 of the ESGs contributes to ensuring that IQASes in the European Higher Education Area (EHEA) adhere to the same set of principles, and that the processes and procedures implemented are modelled to fit the purposes and requirements of their contexts. In 2018, among other institutions, the International Organization for Standardization published a new standard entitled “Educational Organization Management Systems”, providing criteria for the alignment of HEIs’ IQASes to the world-renowned ISO 9001 standard.

These initiatives have played a role in the integration and harmonization of higher education systems, specifically within the ESG framework in the EHEA, and have led to an evident impact on quality assurance growth in higher education worldwide. Nonetheless, and despite some relevant attempts to build a common set of performance indicators and to implement them for quality assurance, the above-mentioned criticisms are far from being smoothed.

The European Association for Quality Assurance in Higher Education (ENQA) raised the question of whether the methodologies agreed upon in the early 1990s are still up to date, and if new approaches to quality assurance should be included, such as “analysis of (big) data”.⁴ There have already been established common sets of indicators. In 2004, the Latin European Universities (ELU) working group published a document entitled “Quality Assurance: A reference system for indicators and evaluation procedures”, setting out excellent foundations, pointing to broader dimensions. Nonetheless, it lacks a specific proposal of operative indicators. In 2019, the European Universities Association (EUA) launched a working group on quality indicators in higher education focused on accountability and the added value of HEIs.

³ Retrievable at: https://www.engq.eu/wp-content/uploads/2015/11/ESG_2015.pdf

⁴ https://engq.eu/wp-content/uploads/2019/10/External-QA_Future-Perspectives.pdf

In addition, the ESG framework is focused basically on the Teaching & Learning mission and is limited to considering the overall reality of HEIs. It also does not provide a set of proposed quality indicators.

In this context, by widening the scope – including the three main university missions: Teaching & Learning, Research, and Relationship with Society – and defining quality indicators for each one, the SMART-QUAL project addresses some important existing needs:

- a) The lack of a comprehensive framework of harmonized quality indicators.
- b) The lack of an IQAS assessment process for quality assurance agencies based on shared criteria and quality indicators, meaning the efforts by HEIs to implement IQASes are not officially recognized.
- c) The lack of comparable quality indicators between HEIs at the strategic, tactical, and operational levels, which would allow quality benchmarking exercises to be conducted.

The main objective of the SMART-QUAL project is to support HEIs in the implementation of an effective IQASes by designing a set of quality indicators to be implemented and to improve the IQASes themselves (making them more efficient and effective, both in the short and the long term). Moreover, it strives to promote the alignment of the indicators used in a structured catalogue according to the three main levels of decision-making (strategic, tactical, and operational).

The tool for addressing these needs is the Quality Indicator Scoreboard (QIS), proposed in this report, which aims to serve as a reference document for IQAS implementation and quality assurance processes.

2.2. The SMART-QUAL project

SMART-QUAL-structured indicators to manage HEI quality systems⁵ is a project co-funded by the Erasmus+ KA2 program.⁶ It is carried out from September 2020 to December 2022 and aims to generate two main outcomes relating to the Quality Indicator Scoreboard (QIS):

- a) A set of harmonized quality indicators organized into a structured catalogue and used as a reference by those HEIs that wish to implement a more structured, efficient, and effective IQAS. The set of indicators will be the basis for the monitoring, assessment, and improvement of the HEI's main processes – Teaching & Learning; Research; Relationship with Society – and organized in the SMART-QUAL Wiki in a collaborative way.
- b) Guidelines to implement the QIS in an effective and efficient manner under the scope of the IQAS, addressing the institution's main processes and clearly defining the options for each decision-making level – strategical, tactical, and operational.

The resulting QIS can be used by the HEI for self-assessment, external assessment, and/or benchmarking exercises, allowing engaged institutions to monitor their quality as organizations and the quality of their processes.

Stakeholders will find the first outcome of the SMART-QUAL project in this report. The second one, planned for 2022, will be complementary to the implementation, analysis, and interpretation of the former outcome.

The consortium behind the SMART-QUAL project is a balanced international partnership composed by different European HEIs and quality assurance agencies, and a research & development organization. They are as follows:

- a) Minho University (Portugal)
- b) Conexx-Europe (Belgium)
- c) Aveiro University (Portugal)

⁵ Website: <https://smartqual.eu/>

⁶ Key Action 2: Cooperation for innovation and the exchange of good practices * Strategic Partnerships for Higher Education.

- d) A3ES Agency for Assessment and Accreditation of Higher Education (Portugal)
- e) Politecnico di Torino (Italy)
- f) Universitat Internacional de Catalunya (Spain)
- g) AQU Catalunya, Catalan University Quality Assurance Agency (Spain)
- h) Vrije Universiteit Brussel (Belgium)
- i) SKVC, the national agency for Quality Assurance in Higher Education (Lithuania)

The consortium is not only based on the expertise and know-how of each constituting partner organization,⁷ but also on their participation in previous joint projects and their networks. In fact, the universities, and in particular the quality agencies involved in the project, will take advantage of their extensive networks to spread the word and make the project visible to people within target groups with a desire to participate.

The stakeholders or target groups that the project aims to influence include management boards, administrative staff, professors, higher education researchers, and quality agencies. Furthermore, the project targets other stakeholders involved in quality management systems and end beneficiary groups, such as the students, who will experience the advantages of a more efficient QM system that will impact their education, and the societies that the HEIs interact with.

⁷ A brief description of the partners involved can be found on the SMART-QUAL website: <https://smartqual.eu/>

3. Methodology

The aim of the SMART-QUAL project is not to compile an exhaustive, extensive compendium of all possible quality indicators already in use or available for use, but rather a **SMART** set that could be defined as follows:

- a) **Short:** focused on the efficiency and effectiveness of IQASes and avoiding oversizing.
- b) **Meaningful:** useful for needs of stakeholders, mainly HEIs with IQASes, quality agencies, and the higher education community.
- c) **Appropriate:** meeting common and shared quality standards, which in a European context are specified in the ESGs and supported by the ENQA and other relevant stakeholders.
- d) **Reunified:** a harmonized set of good practices already in use.
- e) **Transversal:** suitable for different countries, contexts, and types of HEI.

Taking that into account, two main activities contribute to the outputs of SMART-QUAL:

- a) The compiling of practices, indicator uses, and quality indicators from actual IQASes around Europe. The clustering document on the state of the art considered up to 36 HEIs from 5 different countries, with different institutional types, maturity levels, and leaderships.⁸ The participant HEIs were asked to identify and report on relevant quality indicators and their uses within their IQASes.
- b) The compiling of quality indicators from literature sources. Documentary analysis of specialized sources was carried out trying to select relevant quality indicators and uses. Up to 39 unique, valid resources were analyzed, and different types of documents were considered:⁹ peer-reviewed articles, project and institutional reports, books, and management documents from HEIs or quality agencies. Almost half of the resources analyzed were published/released in the last 3 years.

⁸ The clustering document and references can be found at: https://smartqual.eu/wp-content/uploads/2021/05/IO1.A1_State-of-the-Art-QMS_Clustering_Report.pdf

⁹ The clustering document and references can be found at: <https://smartqual.eu/wp-content/uploads/2021/05/IO1.A2-Literature-review-Report-.pdf>

From both activities, a corpus of more than 500 quality indicators was compiled and became the initial input for the establishment of the QIS. The expertise of partners has been another key element for the grouping, prioritization, and harmonization needed for this set of compiled quality indicators, and for the identification of best and relevant practices.

Almost every partner of the consortium has already been working successfully with other partners in the field of quality management and quality in education, meaning their expertise has been growing in parallel in recent years. This certainly contributes to constant joint development between SMART-QUAL and the work carried out by the members of the partnership. Moreover, SMART-QUAL capitalizes on prior work related to this project.¹⁰

The result is that of more than 500 compiled indicators, the QIS is ultimately summarized in 27 basic indicators and 29 that are classed as recommended. The criteria followed during the research is specified in Table 1, envisaging both quantitative and qualitative points of view.

Table 1. Considered criteria in the development of the QIS

Quantitative criteria	Qualitative criteria
Number of times each (similar) indicator is compiled	Source relevance (IQAS & resource characteristics)
Number of different compiling partners	Scope of areas covered
	Simplification and avoidance of overlapping
	Simplicity of compilation and application

¹⁰ Specifically, these 5 are of utmost relevance due to their focus on quality management in higher education and/or on indicator development and analysis in the higher education sector: 1) LIREQA: Linking Academic Recognition and Quality Assurance. 2) SQELT: Sustainable Quality Enhancement in Higher Education Learning and Teaching. Integrative Core Dataset and Performance Data Analytics. 3) IBAR: Identifying Barriers in Promoting the European Standards and Guidelines of Quality Assurance at Institutional Level and Making Recommendations as to How These Might be Addressed. 4) EUSRExcel: Towards a European Social Responsibility Excellence Award. 5) TEFCE: Towards a European Framework for Community Engagement in Higher Education.

	Strengths and weaknesses identified
	Role in decision-making levels

The formation of the QIS was divided into three steps: *a)* grouping of similar indicators among those compiled; *b)* prioritization of the most relevant ones considering the compilation results and the expertise of partners; and *c)* the harmonization of their metadata. In every stage, partners carried out research and an in-depth review following the criteria presented above. At the end of this process, a review of both coherence and coverage was required, introducing or modifying elements when necessary. This final review took place in Transnational Meeting 2 in Barcelona (October 2021).

The QIS will be trialled and validated in an upcoming stage of the project through the participation of stakeholders in different activities such as the drawing up of guidelines for QIS implementation, or trialling in real study cases. Furthermore, the resulting QIS could (and should) be reviewed regularly in order to correct possible downsides identified during its application in different contexts, and to introduce potential new trends into higher education quality assurance.

The indicator catalogue is structured into three main themes:

- a) **University missions:** the scope of the QIS covers the three main missions of higher education.
 - a. **Teaching & Learning:** all processes surrounding the development of knowledge and scientific, technical, and transversal competences by students.
 - b. **Research:** all processes surrounding knowledge generation and dissemination.
 - c. **Relationship with Society:** all processes surrounding the impact on society, the economy, the environment, or the engagement of stakeholders.

It is not the aim of the project to review and discuss the missions as these are already widely known. We consider the core ideas of these missions, aware that they are not independent but rather they consist of differing feedback-based

processes that are scarcely understandable when compartmentalized. Processes within the field of Research, such as the attraction of international staff, could affect Teaching & Learning and impact the Relationship with Society. Taking this into account, and following the SMART-based character of the set, we assign each quality indicator to just a single mission, prioritizing the most useful and understandable setting.¹¹

- b) **Quality standards:** the discussion about what constitutes quality and how it is crystallized in standards also falls beyond the scope of the project. The QIS uses the ESGs supported by the main stakeholders in the EHEA as a guideline to how quality is understood, monitored, and assessed within the EHEA. The ESGs represent a consolidated and shared international framework to organize the set of SMART quality indicators.

It is necessary to highlight that the ESGs are focused specifically on the Teaching & Learning mission, as they refer directly to the quality of the educational program. The link with other missions is mostly indirect. When it comes to the missions on Research and Relationship with Society, the SMART-QUAL project suggests some general dimensions in order to organize the set of quality indicators (see Table 2).

- c) **Decision-making level:** the third theme has to do with the use of the quality indicators in decision-making. 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 others.
 - b. **Tactical:** useful for deans/managers, as it monitors and assesses the position of the college/school/department in relation to others.
 - c. **Operational:** useful for lecturers/coordinators, as it monitors and assesses the position of the degree/subject in relation to others.

¹¹ In spite of this, certain quality indicators are transversal to all three missions due to their nature. We classified them within Teaching & Learning, i.e., the main mission of HEIs in terms of quality assurance, while acknowledging their transversal nature.

Most quality indicators may be useful for all three levels of decision-making, depending basically on the level of aggregation/disaggregation of the indicator. In fact, it is believed that all the indicators should be made available to all actors within the institution. But there are some best practices and common uses that recommend the use of different indicators for each level of decision-making. This is what SMART-QUAL identifies and suggests, and it will be included in the second output (guidelines to implement the QIS in an effective and efficient manner), where it will be discussed in depth.

4. Quality Indicator Scoreboard: remarks and structure

4.1. Introductory remarks

Some introductory remarks concerning indicators and their usage are presented below. These elements are applicable globally to the QIS set and define its principles:

1. **Types of indicators:** indicators are tools to show or indicate, in a synthetic way, the existence of a fact or situation. Two types of indicators are considered according to their nature:
 - a. **Quantitative indicators:** users can apply mathematical operations (e.g., addition, division) and generally this is the most frequent type (e.g., ratio, percentage, score).
 - b. **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). Not to be confused with the quality standard, qualitative indicators specify whether the standard has been met, but they do not define the standard themselves.
2. **Implementation of indicators in higher education quality assurance:** data management and analysis are complex tasks that require skilled profiles and resources to achieve success. Depending on the level of maturity of the IQAS, an increasing level of complexity and accuracy can be achieved. In the following paragraphs we describe a list of aspects regarding implementation that should be taken into account. These are arranged from more to less fundamental (and from less to more complex).
 - a. **By time reference:** indicators should have a correct and clear time reference. Depending on the indicator, it could be an academic year, a calendar year, or different aggregations (biannual, triannual, etc.). It may seem unnecessary to highlight this, but it is essential for benchmarking and trend analysis and is particularly fundamental to clarify in IQAS implementation.
 - b. **By higher education level :** indicators should differentiate the four levels of higher education, as their aims, needs, and challenges are different. In line with the European Qualification Framework (EQF), the levels of higher education

range from 5 to 8 with a diversity of settings across countries.¹² This aspect is particularly important with regard to indicators on Teaching & Learning.

- c. **By aggregation level:** indicators should have the potential to be aggregated and disaggregated to fit the purpose of each analysis. This requires a high degree of data granularity, and a consistent catalogue setting out the levels and their codification. From a subject in a degree to the HEI globally, it is necessary to plan the data collection system, specifying at which level each indicator will be compiled, and how it will be aggregated with other relevant units. The handling of missing data and the high complexity of the HEI's activities should be taken into consideration, since this makes data management difficult (flexible enrolments, joint degrees, variety of teaching staff categories, dynamic research units, etc.).
- d. **By sociodemographic characteristics:** another level of functionality in the IQAS might be the inclusion of sociodemographic differences in the analysis and monitoring of indicators. Gender analysis has high relevance in policymaking, but ethnicity, maturity, or social background are also important dimensions of inequality in higher education. This means greater complexity arises in data collection, analysis, and management regarding each quality indicator. Our suggestion is for these dimensions to be transversal to almost every indicator included in the set.
- e. **Standardization of indicators using comparable criteria:** in order to enable the comparison between different contexts (e.g., units, years, regions, countries) it is advisable to standardize quality indicators. Some examples identified use the expenditure, the number of students, or the staff to give context to an indicator, specifically those related to Research. For example, the number of patents licensed would be more comparable if they are standardized using the total research expenditure of the HEI. In our suggested set, some indicators are already defined in a standardized way, even though it should be noted that it is not always possible to secure the information required to count them.

¹² A detailed definition of the framework and the Higher Education levels can be found here: <https://europa.eu/europass/en/description-eight-eqf-levels>

The foregoing aspects are relevant for the implementation of quality indicators and can generally be applied to most indicators. Nevertheless, in the following set we will specify the indicators in the simplest way and use these aspects as a framework to manage quality indicators.

3. **Strategies to avoid risks when using indicators in decision-making:** the use of indicators in decision-making carries some risks of misestimation and misinterpretation. Some strategies are proposed to manage these risks:
 - a. **Trend analysis:** indicators may involve certain inconveniences when it comes to their estimation and application which may give rise to difficulties in the analysis for a specified time (e.g., missing data, insufficient granularity, errors). But if consistency and coherence is provided over a period of time, trend analysis means these inconveniences are just a characteristic of the data. This is known as “error consistency” and allows for comparison and analysis among imperfect data. Trend analysis gives not only the position of the event measured, but also the changes in the position between different times. This is even more relevant when it comes to the cyclical quality assurance scheme for continuous improvement.
 - b. **Triangulation:** some data sources may present downsides and biases. This is specifically relevant for survey data. The best way to deal with the risk of using these data is to complement them with other sources of information (e.g., administrative data, focus groups, or interviews), analyzing their consistency and coherence. Data triangulation reinforces their robustness and reliability.
 - c. **Consideration of stakeholder feedback:** the analyzed indicators may be lacking important information, events, and/or dimensions which could be overcome through stakeholders feedback. This is important to understand the challenges and identify any improvements that are needed. When interpreting indicators, feedback from core stakeholders should always be considered.

4.2. Catalogue of Quality Indicators

The scope of the areas covered by the project is shown in Table 2.¹³ Each quality standard has at least one basic indicator (proposed as fundamental in the framework of SMART-QUAL project) and other recommended ones (suggested as indicators to consider depending on the aims of the HEI and their availability).

For the ESG “Cyclical external quality assurance”, for which any indicator is identified during the compilation activities, a proposal from the SMART-QUAL consortium is made considering the expertise of the group and the background acquired during the indicator set development. Additionally, some minor changes concerning the compiled indicators are applied through the harmonization of the final set, seeking to enhance its relevance and usability in different contexts without modifying the meaning, prioritization, or target of these indicators.

Table 2. Coverage of the SMART-QUAL project

Mission/ESG	ESG name/standard	Basic	Recommended	Total
Teaching & Learning		19	19	38
1	Policy for quality assurance	3		3
2	Design and approval of programmes	1	1	2
3	Student-centred learning, teaching, and assessment	2	5	7
4	Student admission, progression, recognition, and certification	3	4	7
5	Teaching staff	2	5	7
6	Learning resources and student support	2	2	4
7	Information management	1		1
8	Public information	1		1
9	Ongoing monitoring and periodic review of programmes	3	1	4
10	Cyclical external quality assurance	1	1	2
Research		5	5	10
11	Resources	2	3	5
12	Results and impact	3	2	5
Relationship with Society		4	6	8
13	Recruitment and social inclusion	1	2	3
14	Collaboration with stakeholders	1	2	3
15	Impact on society	1	1	2
Total		27	29	56

¹³ The catalogue of indicators presented below will also be available in the SMART-QUAL Wiki: <http://www.wiki-smartqual.polito.it>

As it was a commitment of the partners, the distribution of indicators between missions and standards remained reasonably balanced considering that quality assessment in the areas of Research and Relationship with Society is not as far developed as it is with Teaching & Learning.

Up to 11% of the indicators are qualitative, introducing evidence that is not specifically quantifiable. The indicator set is also balanced in terms of the main decision-making usage: 34% strategic, 38% tactical and 28% operational.

Lastly, it is the will of the SMART-QUAL consortium to review the indicator set ensuring it remains useful and up to date considering the cumulative experience of its application, the feedback from stakeholders, and further new trends in quality assurance in HE.

4.2.1. Teaching & Learning

	Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
1	Policy for quality assurance				
	Basic				
	Fulfillment of objectives	Percentage of strategic planning objectives fulfilled	Quantitative	$(\sum \text{Strategic plan objectives fulfilled} / \sum \text{Strategic plan objectives}) * 100$	Strategic
	QA procedures definition	Application of procedures for internal quality assurance	Qualitative	NA	Strategic
	QA results and impact	Percentage of improvement actions performed	Quantitative	$(\sum \text{Improvement actions performed} / \sum \text{Improvement actions planned}) * 100$	Operational
2	Design and approval of programmes				
	Basic				
	Design of programmes	Appropriateness of intended learning outcomes, teaching, and assessment methods	Qualitative	NA	Operational
	Recommended				
	Programmes offer	Percentage of second and third cycle programmes	Quantitative	$(\sum \text{Second and third cycle programmes offered} / \sum \text{programmes offered}) * 100$	Strategic
3	Student-centred learning, teaching and assessment				
	Basic				
	Student engagement	The design of programmes promotes the student as a co-producer of his/her training	Qualitative	NA	Operational

Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
Teacher - student balance	Ratio of students to FTE teaching staff	Quantitative	$\Sigma \text{ Students} / \Sigma \text{ FTE teaching staff}$	Tactical
Recommended				
Academic staff workload	Ratio of teaching hours offered per FTE teaching staff	Quantitative	$\Sigma \text{ Teaching hours delivered} / \Sigma \text{ FTE teaching staff}$	Tactical
Assessment system	Teaching staff peer evaluation of assessment/examination protocols	Qualitative	NA	Operational
Efficiency rate	Ratio between credit units required for graduation and credit units actually enrolled since first year on program	Quantitative	$(\Sigma \text{ Credit units required for graduation} / \Sigma \text{ Credit units enrolled from first year until graduation}) * 100$	Operational
Student mobility	Ratio of international agreements that have incoming or outgoing mobility per programmes offered	Quantitative	$\Sigma \text{ International agreements that have incoming or outgoing mobility} / \Sigma \text{ programmes offered}$	Strategic
Time to degree completion	Average duration of study pathway	Quantitative	Average time until degree competition	Tactical
4 Student admission, progression, recognition and certification				
Basic				
Drop-out rate	Percentage of students dropping out from a program	Quantitative	$(\Sigma \text{ Students not enrolled or graduated in a year (t)} / \Sigma \text{ Students enrolled in a previous year (t-1)}) * 100$	Operational

	Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
	Graduation rate in specified time	Percentage of students completing the study programme within expected number of years	Quantitative	$(\sum \text{ Graduates who completed the programme within the expected time established by curriculum} / \sum \text{ Graduates}) * 100$	Tactical
	Progress rate	Percentage of passed credit units	Quantitative	$(\sum \text{ Passed credit units} / \sum \text{ assessed credit units}) * 100$	Operational
	Recommended				
	Student academic results	Average of the final qualifications of graduates	Quantitative	$\sum \text{ Final qualification of graduates} / \sum \text{ Graduates}$	Tactical
	Student enrollment in postgraduation	Ratio of PhD students per students enrolled	Quantitative	$\sum \text{ PhD students} / \sum \text{ Students enrolled}$	Tactical
	Student profile	Sexual and socioeconomic diversity	Qualitative	NA	Strategic
	Student's placement by first choice	Demand coverage index	Quantitative	$(\sum \text{ Candidates in 1st option or equivalent}) / (\sum \text{ Vacancies}) * 100$	Operational
5	Teaching staff				
	Basic				
	Teaching staff holding a PhD	Percentage of FTE teaching staff holding a PhD per all FTE teaching staff	Quantitative	$(\sum \text{ FTE teaching staff holding a PhD}) / (\sum \text{ FTE teaching staff}) * 100$	Tactical
	Training of teaching staff	Percentage of FTE teaching staff who participated in activities to improve their teaching skills per FTE teaching staff	Quantitative	$(\sum \text{ FTE teaching staff who participated in activities to improve their teaching skills}) / (\sum \text{ FTE teaching staff}) * 100$	Operational
	Recommended				

Name of harmonized indicator		Description	Nature	Formula	Main decision-making level
	International staff	Percentage of international visiting teaching staff	Quantitative	$(\Sigma \text{ International visiting teaching staff} / \Sigma \text{ FTE teaching staff}) * 100$	Strategic
	Student satisfaction with teaching staff	Average satisfaction with quality of teaching staff, teaching quality, and teaching staff engagement	Quantitative	Average valuation of quality of teaching staff, teaching quality, and teaching staff engagement	Tactical
	Teacher - non academic staff balance	Ratio of FTE teaching staff to FTE non-academic staff	Quantitative	$(\Sigma \text{ FTE teaching staff}) / (\Sigma \text{ FTE non-academic staff})$	Tactical
	Teaching staff mobility	Percentage of teaching staff joining the ERASMUS programme	Quantitative	$(\Sigma \text{ FTE teaching staff joining ERASMUS programme}) / (\Sigma \text{ FTE teaching staff}) * 100$	Operational
	Teaching staff profile	Percentage of teaching staff in each professional category	Quantitative	$(\Sigma \text{ FTE teaching staff by professional category}) / (\Sigma \text{ FTE teaching staff}) * 100$	Operational
6	Learning resources and student support				
	Basic				
	Facilities	Percentage of classroom hours offered compared to the total need	Quantitative	$(\Sigma \text{ Total number of hours required}) / (\Sigma \text{ Number of hours available}) * 100$	Operational
	Library services	Ratio of library resources per FTE student	Quantitative	$\Sigma \text{ Library resources} / \Sigma \text{ FTE students enrolled}$	Tactical
	Recommended				
	Student satisfaction with facilities	Average satisfaction with facilities and other resources	Quantitative	Average valuation of facilities and other resources	Operational

	Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
	Teaching & learning expenditure	Percentage of expenditure dedicated to Teaching & Learning activities	Quantitative	$(\Sigma \text{ Expenditure on Teaching \& Learning}) / (\Sigma \text{ Total institutional expenditure (by the HEI)}) * 100$	Tactical
7	Information management				
	Basic				
	QA data collection system	Application of a system for data collection in different processes	Qualitative	NA	Tactical
8	Public information				
	Basic				
	Public information	Percentage of degree programmes with public information about quality	Quantitative	$(\Sigma \text{ Current degree programmes with public information about quality} / \Sigma \text{ Current degree programmes}) * 100$	Strategic
9	On-going monitoring and periodic review of programmes				
	Basic				
	Graduate employment rate	Percentage of graduates employed	Quantitative	$(\Sigma \text{ Graduates working} / \Sigma \text{ Graduates}) * 100$	Tactical
	Overall student or graduate satisfaction	Average valuation of overall quality of the courses offered	Quantitative	Average valuation of overall satisfaction with courses offered	Operational
	Student satisfaction with teaching & learning	Average satisfaction with the organization of course sessions	Quantitative	Average valuation of the organization of course sessions	Tactical
	Recommended				

	Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
	Graduate employment in related job	Percentage of graduates employed in a job related to the study program	Quantitative	$(\sum \text{Graduates working in job related to study programme} / \sum \text{Graduates}) * 100$	Operational
10	Cyclical external quality assurance				
	Basic				
	Compulsory accreditation of programmes	Percentage of programmes fully accredited through compulsory accreditation	Quantitative	$(\sum \text{programmes fully accredited through compulsory accreditation}) / (\sum \text{programmes assessed through compulsory accreditation}) * 100$	Strategic
	Recommended				
	Voluntary accreditation of programmes	Percentage of programmes fully accredited through voluntary accreditation	Quantitative	$(\sum \text{Programmes fully accredited through voluntary accreditation}) / (\sum \text{Programmes assessed through voluntary accreditation}) * 100$	Strategic

4.2.2. Research

	Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
11	Resources				
	Basic				
	Research funding	Ratio of revenue raised for research per FTE teaching staff	Quantitative	Σ Revenue raised for research / Σ FTE teaching staff	Strategic
	Research projects	Percentage of approved competitive projects	Quantitative	$(\Sigma$ Projects approved / Σ Project applications) *100	Strategic
	Recommended				
	Academic inbreeding	Percentage of academic staff recruited who have not obtained a PhD at the same university	Quantitative	$(\Sigma$ Academic staff recruited who have not obtained a PhD at the same university) / $(\Sigma$ Total academic staff recruited) *100	Strategic
	Members in research units	Percentage of teaching staff integrated in research units	Quantitative	$(\Sigma$ FTE teaching staff holding a PhD integrated in research units) / $(\Sigma$ FTE teaching staff) *100	Strategic
	Research engagement	Research effort index per FTE teaching staff	Quantitative	Σ Proportion of time devoted to research by teaching staff / Σ FTE teaching staff	Tactical
12	Results and impact				
	Basic				

Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
Intellectual property dimension	Ratio of revenue from royalties and license agreements per FTE teaching staff	Quantitative	Σ Royalty revenues and licensing agreements for intellectual property of HEI over the past 3 years / Σ Number of FTE teaching staff at HEI over the past 3 years	Tactical
Research citations	Ratio of impact scientific production per FTE lecturer	Quantitative	Σ Citations of indexed articles in SCOPUS where at least one author is affiliated to the institution / Σ FTE teaching staff	Tactical
Research publications indexed	Percentage of articles published in 1st-quartile journals in the scientific area per total number of articles published in year n in that area	Quantitative	$(\Sigma$ Articles published in 1st-quartile journals in the scientific area in year n / Σ Total articles published by HEI staff in year n in that scientific area) *100	Tactical
Recommended				
Patents	Ratio of patent grants registered by at least one member from the HEI per FTE teaching staff	Quantitative	Σ Patent grants registered by at least one member of the HEI / Σ FTE teaching staff	Tactical
Research grants	Ratio of ongoing scientific research grants per FTE teaching staff	Quantitative	Σ Ongoing scientific research grants / Σ FTE teaching staff	Tactical

4.2.3. Relationship with Society

	Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
13	Recruitment and social inclusion				
	Basic				
	Recruitment of international students	Percentage of international students enrolled	Quantitative	$(\sum \text{International students enrolled} / \sum \text{Students enrolled}) * 100$	Strategic
	Recommended				
	Financial aid to students	Percentage of students who receive a scholarship based on social background	Quantitative	$(\sum \text{Students receiving scholarship based on social background} / \sum \text{Students enrolled}) * 100$	Strategic
	Life-long learning	Ratio of participants in lifelong learning programmes per students enrolled	Quantitative	$\sum \text{Participants in lifelong learning programmes} / \sum \text{Students enrolled}$	Operational
14	Collaboration with stakeholders				
	Basic				
	Research partnerships	Ratio of cooperation agreements for research and transfer with third-parties per FTE teaching staff	Quantitative	$\sum \text{Cooperation agreements for research and transfer with third-parties} / \sum \text{FTE teaching staff}$	Strategic
	Recommended				
	Collaboration with stakeholders	Ratio of protocols/agreements established with external organizations per FTE teaching staff	Quantitative	$\sum \text{Protocols or agreements established with external organizations} / \sum \text{FTE teaching staff}$	Strategic

	Name of harmonized indicator	Description	Nature	Formula	Main decision-making level
	Students industry link	Ratio of students involved in external organizations per students enrolled	Quantitative	Σ Students involved in internships, projects, or dissertations conducted at external organizations / Σ Students enrolled	Strategic
15	Impact in society				
	Basic				
	Spin-offs	Ratio of spin-offs established per FTE teaching staff	Quantitative	Σ Spin-offs established / Σ FTE teaching staff	Tactical
	Recommended				
	Sustainability	Ratio of sustainable actions for environmental and social matters per students enrolled	Quantitative	Σ Sustainable actions / Σ Students enrolled	Strategic

Annex 1. List of acronyms

ENQA	European Network of Quality Assurance
EHEA	European Higher Education Area
EQF	European Qualification Framework
ESG	Standards and Guidelines for Quality Assurance in the European Higher Education Area
HEI	Higher Education Institution
IQAS	Internal Quality Assurance System
QIS	Quality Indicators Scoreboard

Annex 2. Summary of SMART-QUAL indicators set

	Name ESG / standard	Basic	Recommended
Teaching & Learning			
1	Policy for quality assurance	Fulfilment of objectives QA procedures definition QA results and impact	
2	Design and approval of programmes	Design of programmes	Programmes offer
3	Student-centred learning, teaching and assessment	Student engagement Teacher – student balance	Academic staff workload Assessment system Efficiency rate Student mobility Time to degree completion
4	Student admission, progression, recognition and certification	Drop-out rate Graduation rate in specified time Progress rate	Student academic results Student enrolment in postgrad. Student profile Student's placement by first choice
5	Teaching staff	Teaching staff holding a PhD Training of teaching staff	International staff Student satisf. with teaching staff Teacher – non-academic staff balance Teaching staff mobility Teaching staff profile
6	Learning resources and student support	Facilities Library services	Student satisfaction with facilities Teaching & learning expenditure
7	Information management	QA data collection system	
8	Public information	Public information	
9	Ongoing monitoring and periodic review of programmes	Graduate employment rate Overall student or graduate satisfaction Student satisf. with teaching & learning	Graduate employment in related job
10	Cyclical external quality assurance	Compulsory accreditation of programmes	Voluntary accreditation of programmes
Research			
11	Resources	Research funding Research projects	Academic inbreeding Members in research units Research engagement
12	Results and impact	Intellectual property dimension Research citations Research publications indexed	Patents Research grants
Relationship with Society			
13	Recruitment and social engagement	Recruitment of international students	Financial aid to students Lifelong learning
14	Collaboration with stakeholders	Research partnerships	Collaboration with stakeholders Students industry link
15	Impact on society	Spin-offs	Sustainability



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