

Exploring higher education indicators

Tia Loukkola, Helene Peterbauer, Anna Gover

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European University Association asbl

Avenue de l'Yser 24

Rue du Rhône 114

1040 Brussels

Case postale 3174

Belgium

1211 Geneva 3, Switzerland

+32 (0) 2 230 55 44

+41 22 552 02 96

www.eua.eu · info@eua.eu

Table of Content

Acknowledgements

1. Introduction

Goals and methodology	5
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2. Mapping education indicators

External quality assurance	7
Rankings	9
Funding mechanisms	11

3. Measuring learning, teaching and education

Quality of learning: Learning outcomes	14
Quality of teaching	15
Quality of education	16

4. The challenge of measuring educational performance

Ensuring the fitness-for-purpose of an indicator	20
The proxy problem	21
The contextualisation of an indicator	22

5. Lessons learnt and conclusions

Annex 1: Survey to quality assurance agencies

Annex 2: Quality assurance agencies responding to the survey

Annex 3: Higher education systems covered by the performance-based funding survey

References

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Tia Loukkola

Director, Institutional Development Unit

Helene Peterbauer

Policy & Project Officer, Institutional Development Unit

Introduction

1

There is a valid demand among higher education institutions and their stakeholders for an evidence-based, data-driven analysis of higher education and its performance. Internally, institutions need such an analysis to underpin decision-making and strategic development. Externally, stakeholders need hard data on institutions' performance to be assured of their quality or value for money. Therefore, several high-profile tools rely on quantitative and qualitative indicators. These tools include rankings, funding formulae and other system steering mechanisms, such as teaching excellence frameworks and performance contracts, as well as initiatives to measure and compare achieved learning outcomes. In addition, a recent study indicates that quality assurance agencies encounter mounting expectations to give indicators more prominence in their processes (Gover and Loukkola, 2018, p. 16).

Attempts to measure the performance and added value of higher education through indicators are not a new phenomenon, and neither is criticism of their methodological soundness and adequacy. Research on teaching excellence dating back to the late 20th century already cautioned against an oversimplified use of indicators as a measure of quality in higher education. It noted that summative evaluations and quantitative indicators had become preferred elements of quality control and led to a focus on easily quantifiable goals of higher education, despite the downsides associated with such an approach (see, e.g. de Weert, 1990, p. 64, which in turn refers to previous publications on the same topic).

The challenge with using indicators is indeed two-fold. On the one hand, such an approach relies on an implicit agreement on what needs to be measured. However, stakeholder groups have different perspectives on the purposes of higher education and, consequently, on what constitutes quality education (ESG 2015, p. 7; Gover and Loukkola, 2018, pp. 6-7). On the other hand, even when a specific purpose is defined and agreed on, there is a general lack of appropriate indicators for measuring educational quality, resulting in a reliance on proxy¹ measures that are often over-simplified and taken out of context.

GOALS AND METHODOLOGY

This report aims to provide informed input to the debate about the use and validity of indicators currently applied to measure the quality, performance or effectiveness of higher education. It does so by examining three external tools that use indicators and have an impact on higher education institutions: external quality assurance, funding formulae and rankings. In addition, some selected international and national initiatives following the same objective are mentioned in the report. Rankings were included in the study in full awareness of their fundamental difference from the other two tools. While external quality assurance and funding mechanisms are part of system steering with a direct effect on the

¹ The term "proxy" is used in this report following the definition established by McCormick, 2017, i.e. as "measures that are used to represent an unobserved phenomenon" (p. 206).

functioning of an institution, the role of rankings is based on their influence on institutional reputation. The list of tools covered is not meant to be exhaustive but serves to contribute to the broader debate. Moreover, the report does not cover indicators used internally by higher education institutions since this would require a differently designed analysis.

This report covers indicators related to education in the broad sense, encompassing learning and teaching, but also the overall learning experience and environment. This broader perspective serves, on the one hand, to facilitate an understanding of the wider context in which learning and teaching take place. On the other hand, it reflects the reality that many of the indicators used in the tools examined are, strictly speaking, connected to education rather than specifically to learning and teaching.

The report is based on different sources of information:

- a survey among quality assurance agencies to map which indicators related to learning and teaching they use and how they use them;
- desk research to identify education indicators used by the most prominent global rankings and teaching excellence frameworks, or similar initiatives;
- a survey among the European University Association's (EUA) collective full members (national rectors' conferences)² to update the existing knowledge-base on funding allocation mechanisms and indicators used at system level.

The following sections will i) provide an overview of the education-related indicators used by the above-mentioned tools; ii) present common and diverging focal points with regard to types of indicators used; and iii) discuss challenges associated with the various ways in which indicators are currently used.

2 For further information on EUA's membership, see <https://eua.eu/about/member-directory.html>.

Mapping education indicators

2

This section provides information on the scope and methodology used to examine each of the tools covered in this report: external quality assurance, international university rankings and national or system-level funding mechanisms. It also provides an overview of the indicators linked to education used in these tools.

EXTERNAL QUALITY ASSURANCE

Since 2005, the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) have provided the framework for external and internal quality assurance of institutions' education provision. However, the ESG "are not standards for quality, nor do they prescribe how the quality assurance processes are implemented" (ESG, 2015, p. 6). In accordance with this, a diversity of approaches for both internal and external quality assurance is valued and encouraged.

In order to gather information on the use of indicators by external quality assurance agencies, a survey was carried out in autumn 2019 among full and affiliate member agencies of the European Association for Quality Assurance in Higher Education (ENQA).³ The survey asked whether the agency used indicators, and if so: which ones, how they are used, and where the data comes from (see annex 1 for the full survey). Twenty-four completed responses were received (see annex 2), from agencies with their headquarters in 16 different countries (this includes five agencies based in Spain and several others that regularly operate beyond the country where their headquarters are based). As of December 2019, 16 of the responding agencies were registered on the European Quality Assurance Register for Higher Education (EQAR). Four agencies reported that they carry out external quality assurance only at programme level, two carry it out only at institution level, and 18 operate at both levels. As such, the sample of quality assurance agencies is small and not fully representative of the European Higher Education Area, but it nonetheless provides some examples of whether and how indicators are being used.

Four of the responding agencies stated that indicators are not used at all in their external quality assurance processes.⁴ The responding agencies that do use indicators mention a variety of purposes, with the most frequently cited being to make a judgment of compliance against minimum standards (nine agencies) and to provide contextual information for the reviewers (eight agencies). Other uses include benchmarking, testing the institutional information system and to make a judgment against the ESG.⁵ In several cases, agencies use indicators for a combination of purposes.

³ The survey was sent to 96 agencies. For further information on ENQA's membership, see <https://enqa.eu/index.php/enqa-agencies/>.

⁴ Whether the reason why (some of) the agencies that did not respond to the survey was because they do not use indicators, or whether there were other reasons for not responding, cannot be determined.

⁵ It should be noted, however, that the ESG do not contain or prescribe any indicators.

In terms of the source and type of information collected, 65% of the agencies that use indicators ask institutions to provide data according to a specific list or template. In most cases, this correlates with the agencies that use the data for assessing whether the institution meets certain threshold standards. Fifty percent of agencies allow institutions to decide for themselves on the format and content of the data that they provide. Twenty-five percent of agencies draw their information from a national database or other system and 10% use another source, such as other publicly available information. Several agencies get their data in various formats and from multiple sources.

Table 1 lists the indicators related to education used by the responding quality assurance agencies.⁶ The most commonly used indicators are those related to students and staff (including numbers, profiles and ratios), and drop-out rates. Student satisfaction is also frequently mentioned, though it is not always clear how this is measured and translated into an indicator.

Table 1 - Education indicators used by quality assurance agencies

Type of indicator	No. of agencies (out of 16 that provided information on indicators they use)
Staff numbers	11
Drop-out rates	10
Student numbers	8
Student-staff ratio	7
Student satisfaction	7
Admission and enrolment data	6
Graduation rate	6
ECTS data/efficiency	5
Time to graduation	5
Graduate employment rate	5
Student mobility	5
Staff mobility	4
Staff publications	4
Funding data	3
Teaching hours	3
Student support	3
Size, facilities and resources	2
Academic achievement/grades	2

⁶ Sixteen agencies provided further details of the indicators that they use. This is a non-exhaustive list showing indicators used by two or more agencies. The list presents the authors' interpretations of the data provided by responding agencies, including those that do not ask for a specific list of indicators, but which gave examples of the sort of indicators that are generally provided to them.

No agency reported that indicators alone would be used as the basis for external quality assurance outcomes. Instead, they formed one element used to inform the work of peer review panels and complement a site visit to the institution. This is in line with the agreed approach to external quality assurance in the European Higher Education Area (ESG Standards 2.3 and 2.4). It is also clear that the diversity of approaches to external quality assurance (e.g. programme or institutional level) combined with the principle of institutional responsibility for the quality of education provision and the diversity of institutional and programme profiles make it challenging for agencies to use a single standard set of indicators.⁷

RANKINGS

Global university rankings are a phenomenon of the 21st century influencing the way higher education institutions are perceived, and how they react to these perceptions. They have been referred to as a wake-up call (Hazelkorn et al., 2014, p. 50), due to some institutions' positioning falling short of expectations. In time, the proliferation of rankings has also resulted in enhanced awareness among institutions on matters of accountability, transparency and quality (cf. Hazelkorn et al., 2014 and Loukkola, 2017, p. 111).

For the purposes of this report, eight rankings were examined. The selection drew inspiration from the International Ranking Expert Group (IREG) Inventory of International Rankings.⁸ Specifically, this report covers global rankings that use at least one indicator deemed to be related to education by either the ranking producers or the authors of this report. In addition, the Times Higher Education (THE) Europe Teaching Rankings were included due to the relevance of its specific focus. Other specialised rankings, such as subject-specific rankings or those related to a particular category of higher education institution, were excluded to allow for a synopsis of comparable indicators.

A list of the rankings, examined together with the main types of relevant indicators that they use, is presented in Table 2. The analysis was conducted solely on the basis of information publicly available on the ranking producers' website.⁹

7 The considerable differences that can exist even within regions with strong internal cultural ties and frequent exchange and collaboration in the higher education sector, such as the Nordic countries, have been exemplified in a 2019 report by the Danish Accreditation Institution (AI) entitled 'Calculating quality: An overview of indicators used in external quality assurance of higher education in the Nordics'.

8 See http://ireg-observatory.org/en_old/inventory-international-rankings/ranking-profile.

9 The information about indicators used in international university rankings referred to in this report comes from the rankings' respective websites, all of which are referenced in the bibliography. Ranking providers often adapt their methodology slightly from year to year, usually changing the weighting of specific indicators, whereas the amount and type of indicators is rarely changed. This report uses the published methodologies for 2018 and 2019 or, where available, 2020, while also drawing on supplementary information from previous years.

Table 2 - Education indicators used in international university rankings¹⁰

Type of indicator	U-Multirank	ARWU	QS World University Rankings	THE World University Rankings	THE Europe Teaching Rankings	CWUR	Emerging/Trendence Global	Round University Ranking
Student surveys	●				●			
Reputation surveys				●	●			●
Employer surveys			●				●	
Graduate employment	●	●				●		
Student progression	●				●			
Student and staff numbers	●		●	●	●			●
Internationalisation statistics	●		●	●	●			●
International elements in programmes	●							
Gender balance concerning staff and students	●				●			
Contact with work environment	●							
Others	●	●				●		

As can be seen from the table, there are only a limited number of indicators linked, even tenuously, to the quality of education. This lack of reliable indicators capturing the educational mission and performance of institutions has long been recognised (Rauhvargers, 2011, 2013) and may partly explain why most rankings primarily focus on research productivity, even if they do not explicitly present themselves as research rankings.

As with the quality assurance agencies, among the most common types of data are those related to student and staff numbers. Statistics relating to internationalisation also feature prominently and cover a variety of aspects such as the provision of foreign-language programmes, proportion of international staff and/or students, and mobility. The analysis shows that U-Multirank and the THE Europe Teaching Rankings are those which make the most use of indicators linked to education, which is consistent with the declared focus of these two tools. In addition, it is worth noting that almost every ranking makes use of at least one type of survey, with reputation surveys being the most common despite criticism of their validity and impact.

Beyond this, the analysis indicates that most rankings still see research excellence as a proxy for overall quality. Despite this, some rankings claim to address prospective students as their target group, even though it can be questioned to what extent prospective students would base their choice of an

¹⁰ The titles given to each type of indicator are summative and constitute compromises reflecting the sum of indicators of a particular type across all tools covered by this study. They may therefore not precisely reflect each specific indicator used by each individual ranking (see for example the section about the indicator type "Graduate employment" below).

institution on its research performance or reputation, and furthermore whether they are even aware that these rankings are predominantly a reflection of research performance.

FUNDING MECHANISMS

Funding mechanisms are used to distribute public funds, but they are also a steering tool that seeks to influence institutional behaviour in the direction of identified policy goals. Mechanisms used by public authorities to allocate public funding to universities vary across Europe and the various approaches are often used in combination. Methods used to determine the amount of basic recurrent funding have been evolving towards a more frequent use of funding formulae and performance contracts. Most formulae include input- and output-related indicators. While funding formulae relate to past activity, performance contracts, which are set up between a higher education authority and an institution, are based on goals to be achieved.

In 2019, and as part of its work on university financial sustainability and its study of funding models, EUA invited its member national rectors' conferences to update the information that they had provided a few years previously on funding formulae used in their respective higher education systems (see Bennetot Pruvot et al., 2015, p. 32). Respondents were asked to specify not only which indicators were used in their funding formulae, but also their relative importance. Information was received from 27 countries or systems (see annex 3).

Regarding the relevance of the funding formulae within the broader public funding model, 11 of the responding systems stated that it was the primary mechanism for calculating both research and teaching funding, whereas five named it as the primary mechanism for teaching funding only. It is important to keep in mind that funding models may include several funding formulae, composed of different indicators that were nevertheless reported as a whole.

The most common indicators in funding formulae are presented in Table 3. While funding systems generally use indicators that cover a range of institutional activities, this analysis looks at those linked to education as well as others that might have an effect on education provision.¹¹ As the list shows, these tend to be numbers and statistics that give a general picture of the institution and its profile (e.g. staff and student numbers, diversity of students, and proportion of international staff and students).

¹¹ The full list and analysis of indicators used in the funding formulae will be presented in a separate forthcoming EUA report.

Table 3 - Indicators used in national or system-level funding formulae

Type of indicator	No. of systems (out of 27 responses) that use this indicator: all levels of importance
Number of enrolled students at Bachelor level	22
Number of enrolled students at Master level	22
Amount of external funding obtained	17
Number of enrolled students at doctoral level/ doctoral candidates	17
Number of degrees obtained (Bachelor level)	17
Number of degrees obtained (Master level)	16
Amount of EU/international funding obtained	15
Number of ECTS attained	14
Number of degrees obtained (doctoral level)	13
Proportion/number of international students	13
Number of staff	12
Diversity-related indicators (gender/socio-economic background/special-needs students)	10
Graduate employment rate	10
Proportion/number of international staff	8
Number of completed doctoral theses	6
Floor surface	6
Community outreach	4
Student-staff ratio	2
International ranking outcomes	2
National ranking outcomes	2
Student placements	1

By far the most commonly used indicators are student numbers, with 22 respondents using numbers of Bachelor and Master students, and 17 using numbers of doctoral candidates. This reflects that many systems link funding for teaching activities to the number of students to be taught. The corresponding output indicator – number of degrees obtained – also plays a significant role, with almost two-thirds of systems taking the number of Bachelor and/or Master degrees into account and 14 using the number of doctoral degrees.

Almost two-thirds of systems also look at the amount of external funding obtained, though each system applies its own definition and interpretation of this indicator.

The updated information shows relative stability in the use of indicators since the original research in 2015. About a third of the systems implemented or planned significant changes in their models or in the indicators used, yet this has not substantially affected the overall picture provided by EUA's previous work. In most systems financial support for institutions consists of several components. Nineteen of the responding systems stated that they also made use of some form of performance contracts,¹² of which 15 stated that this also had an impact, at least in part, on the funding received by institutions.

Excellence initiatives can be identified as a further mechanism used in some countries to reflect or foster the quality of education or research. These schemes vary considerably in their scope, objectives, and the extent to which they are embedded into a system's main funding arrangements (Bennetot Pruvot et al., 2015, pp. 83-84).

Previous research has found that teaching plays a comparatively weak role in national excellence initiatives and in cases where schemes do focus on teaching, they are less uniform than those focused on research. In addition, these initiatives focus more on supporting innovation in teaching rather than evaluating its quality or effectiveness (Wespel et al., 2013; Land and Gordon, 2015). These observations appear still to be valid when examining different teaching excellence schemes that exist today, for example in Germany, France, Ireland and Norway.

The UK's Teaching Excellence and Student Outcomes Framework (TEF) is a rare example of a different approach. TEF is a government framework to assess the quality of undergraduate teaching provision in higher education institutions in the United Kingdom. It aims to encourage excellence in teaching and inform student study choices. However, it also has a small link to funding through student tuition fees.¹³ The indicators are similar to those used by the other tools mentioned in this report, such as student satisfaction, progression and graduation rates, and data on graduate employment and earnings. The data is benchmarked according to other contextual information such as student demographics, entry qualifications and provision type (Office for Students website). For the year 2020, a pause in the application of the framework has been announced.

¹² As described in EUA's earlier research, "a performance contract may also be used as a complementary instrument to a funding formula either to align the contract's objectives with the formula or to mitigate some of the negative effects of a formula by, for instance, setting additional objectives for the quality of teaching and research" (Bennetot Pruvot et al., 2015, p. 37).

¹³ Participation in TEF has been voluntary, but institutions operating in England with a TEF rating (among other conditions for implementing higher tuition fees) can charge slightly higher tuition fees than those without. There is no effect on tuition fees in Northern Ireland, Wales and Scotland (Office for Students).

Measuring learning, teaching and education

3

This section discusses the different aspects of higher education that the indicators outlined in the previous section aim to measure. They are grouped under three headings: quality of learning, teaching and education in its wider sense.¹⁴ In doing so, the section aims to assert whether the indicators used do in fact reflect the quality of learning, teaching or education, or whether they are rather proxies and measure something else entirely.

QUALITY OF LEARNING: LEARNING OUTCOMES

According to EUA's Trends 2018 study, the implementation of learning outcomes has progressed steadily in the past decade: 76% of responding higher education institutions had developed learning outcomes for all courses (Gaebel and Zhang, 2018, p. 35). At the same time, respondents also suggested more positive attitudes towards curricula based on learning outcomes than in earlier years.

This shift towards learning outcome-based education is not reflected in the tools examined for the purposes of this report. None of them include indicators that are based on learning outcomes as such or propose other indicators that directly measure the quality of learning. Some quality assurance agencies, particularly for programme accreditation, reported that they review a selection of final degree dissertations or equivalent, as a way of establishing whether learning outcomes have been achieved.

Beyond this there have been other attempts to assess learning outcomes in a comparable manner at international level by using standardised testing. Perhaps the most debated was the Assessment of Higher Education Learning Outcomes (AHELO) Feasibility Study. It was carried out by the OECD in the early 2010s and sought to develop and validate assessments in three core areas: generic skills, economics and civil engineering. The tests were taken by students in the final stages of their Bachelor degrees in 17 participating countries (Tremblay et al., 2012).

One of the starting points for AHELO was the perceived need to provide internationally comparable data on higher education learning as advocates of the study noted that rankings and league tables did not have valid or appropriate data to measure educational quality. The feasibility study largely confirmed the difficulty of the task and it was not followed by a full-scale exercise. The final report (Tremblay et al., 2012) highlights a set of challenges, including the lack of clarity around the purpose of AHELO, the diversity of the participants, methodological issues regarding the development of the assessment instrument and difficulties in the implementation that led to low student participation, along with challenges related to the project management.

¹⁴ The grouping of the indicators is the work of the authors of this report and does not (necessarily) reflect that applied by the individual tools themselves.

Since then the OECD has focused on developing a methodology for benchmarking higher education system performance, which focuses on system characteristics without addressing learning outcomes (OECD, 2019). There have been no further attempts to assess learning outcomes with the aim of producing a dataset that would allow comparisons between institutions at international level.

It is, however, worth mentioning that as part of its efforts to support member states in ensuring efficient and high-quality higher education, the European Commission has co-funded a project named “Measuring and Comparing Achievements of Learning Outcomes in Higher Education in Europe (CALOHEE)”. CALOHEE aims to develop an infrastructure that would eventually allow for the testing of Bachelor and Master students’ performance in Europe across a range of fields (CALOHEE website).

In the first stage the project has defined reference points or benchmarks for the targeted subject areas based on learning outcomes and the Tuning methodology.¹⁵ This is currently being followed by the creation of a multi-dimensional and multi-pillared assessment framework and work plan for the development and implementation of transnational assessments at subject level (ibid.). In contrast to AHELO, this project emphasises different institutional and programme profiles to be considered in the assessment and focus on subject level. However, the work is ongoing and so the results and success of the methodology remain unknown.

QUALITY OF TEACHING

Previous research has identified the lack of a clear definition of ‘quality teaching’ and pointed to the subsequent difficulties of establishing indicators by which to measure it (Strang et al., 2016). This is also evident in the tools examined for this study: there are no indicators directly related to the quality of teaching as such. This holds true even for the THE Europe Teaching Rankings, despite the explicit reference to teaching in the name.

Both rankings and quality assurance agencies use indicators to illustrate the profile and achievements of academic staff, for example by recording the number of staff at various academic ranks, the number of publications by staff, or even, in the case of ARWU, the number of Nobel Prize winners among an institution’s staff and alumni. However, in these instances the link to teaching quality is only implicit as such achievements primarily demonstrate research competence.

Considering the difficulty in finding appropriate indicators to measure teaching, it is worth mentioning some of the other approaches taken by higher education systems to evaluate and foster teaching quality. In addition to teaching excellence initiatives (see section 2), there is increasing attention paid to the need to recognise and incentivise good teaching, for example through teaching prizes or by reflecting teaching activities in academic career paths (cf. Land and Gordon, 2015; Gaebel and Zhang, 2018, p. 73-75; te Pas and Zhang, 2019).

Rankings and quality assurance agencies also seek to reflect teaching quality through indicators related to student satisfaction. These are typically captured through student surveys, which may also cover broader issues related to the student experience in addition to perceptions of the quality of teaching.

¹⁵ For further information about the Tuning methodology, see <http://tuningacademy.org/methodology/?lang=en>.

Seven quality assurance agencies reported using “student satisfaction” as an indicator in their work. It was not specified whether this is evidenced through student surveys nor whether this information is provided by the institution from their internal monitoring or collected by the agency specifically for the purposes of external quality assurance. In this regard, it is noteworthy that in many European countries there are student engagement or satisfaction surveys carried out by organisations other than quality assurance agencies.¹⁶ It is possible that some quality assurance agencies use the results of these surveys in their processes.

Student surveys also feed into the final score of higher education institutions in the two international university rankings with a stated focus on educational quality, i.e. U-Multirank and THE Europe Teaching Rankings. These surveys are conducted by the ranking providers themselves. Some questions ask specifically about teaching and teachers, for example, whether there are opportunities for interaction with teachers (U-Multirank and THE Europe Teaching Rankings), while others invite participating students to assess more generally the overall learning experience and the quality of learning and teaching (U-Multirank).

QUALITY OF EDUCATION

Previous studies on excellence in education highlight that “excellence in student learning may or may not require excellent teaching” (Little et al., 2007, p. 2) and that the student learning experience is influenced by many factors. Indeed, the indicators used by the tools covered in this report reflect the broader educational environment, rather than the quality of learning or teaching itself. Some of the most prominent of these are discussed below.

Student and staff numbers

All the tools examined make use of student and staff numbers, either in the form of absolute numbers or as a student-staff ratio. The use of absolute numbers may refer in some cases to the overall student or staff population, or to a breakdown across various categories, such as level of study, or academic staff with a doctorate degree. Information about staff numbers is the most commonly used data by quality assurance agencies (11 out of 16 agencies), whereas 12 out of 27 systems use it in their funding formulae.

The majority of funding formulae examined use the number of students as a core component of calculations for financial allocations as it provides a quantifiable measure by which to calculate the costs of education provision. Overall, student numbers at Bachelor level appear to be the most important indicator used in funding formulae. The importance attached to student numbers is particularly prominent when the formula is the main mechanism through which core public funding is allocated, as it needs to link directly to the costs incurred by the institution.

¹⁶ These surveys vary in how official they are: some are part of the formal system steering, others are carried out by private or student organisations. Such surveys exist for example in Finland (Kandipalaute – The Finnish Bachelor’s Graduate Survey), France (Enquête sur les conditions de vie des étudiant-e-s), Germany (conducted by the Centrum für Hochschulentwicklung (CHE)), Ireland (Irish Survey of Student Engagement), Norway (Studiebarometeret) and the UK (National Student Survey).

Only two systems (Poland and Slovakia) explicitly report using student-staff ratios in their funding formulae. In contrast, seven out of 16 agencies and five out of the eight examined rankings use them, sometimes in combination with staff and student numbers. The use of ratios may signal a quality-driven approach. However, student-staff ratios primarily reflect the conditions under which education provision takes place, not its quality per se.

Student progression

Another common element across all tools examined is the use of data on the progression of students during their studies, up to graduation. This includes indicators such as number of degrees awarded (funding formulae), graduation rate and time to graduation (rankings and quality assurance agencies) and drop-out rate (quality assurance agencies).

For quality assurance agencies, the most important of these is drop-out rates, which is used by ten out of 16 agencies. However, it is important to note that the conclusions to be drawn from this indicator depend significantly on the national context. Funding formulae rely more heavily on the number of degrees awarded.

With regard to rankings, U-Multirank distinguishes between data at the Bachelor, the Master level and at the level of a “long first degree”. It also takes into consideration total graduation rates and rates of graduation within the normative time. The THE Europe Teaching Rankings consider graduation rate and time but combine them into a single indicator measuring the share of first-degree students graduating within five years.

Graduate employment

In each of the tools examined for this report, about a third of the samples use indicators related to graduate employment: five out of 16 quality assurance agencies, three out of the eight rankings, and ten out of 27 funding models.

For external quality assurance and funding formulae, the surveys did not ask in detail precisely how this indicator is approached, e.g. in terms of definition of employment or methods of data collection. In the case of rankings, U-Multirank considers “relative” graduate unemployment rates separately at the Bachelor and the Master level, i.e. the percentage of graduates unemployed 18 months after graduation. Some rankings seek to go beyond basic employment percentages and reflect the type of employment or graduate achievements, for example, by considering the number of companies founded by an institution’s graduates as an indicator for “knowledge transfer”. The Center for World University Rankings (CWUR) measures graduate employment through publicly available data, such as the number of an institution’s alumni who have “won major international awards, prizes, and medals” and “held CEO positions at the world’s top companies”, both relative to the institution’s size. Finally, ARWU considers the number of an institution’s graduates who have won a Nobel Prize or Fields Medal as a proxy for “quality of education”.

In addition, two international rankings use surveys among a selected list of employers: the Quacquarelli Symonds (QS) World University Rankings and the Emerging/Trendence Global University Employability Ranking ask employers or recruitment managers to either identify or select from a predefined list those higher education institutions they consider to produce the most employable graduates.

Internationalisation

Many have noted the added value of an internationalised curriculum and education environment (cf. de Wit and Hunter 2015; Taalas et al. 2020). Across all three tools examined for this report, internationalisation is reflected in some way, albeit to varying extents.

Of the five international rankings that view internationalisation as an indicator of quality, two present it in the context of quality in education (U-Multirank and the THE Europe Teaching Rankings). In contrast, it is an indicator category of its own in QS World University Rankings, the THE World University Rankings and the Round University Ranking, where the extent of internationalisation is rather presented as being indicative of the institution's general quality and attractiveness.

Internationalisation is less of a factor in quality assurance agency processes and in funding formulae. Among the respondents to the survey, four agencies collect data on staff mobility, and five on student mobility. Additionally, many of the agencies that use data on staff and student numbers include a breakdown of whether they are international or domestic. Some agencies collect information on the language of instruction (national language vs. English).

In addition, some funding formulae take into consideration the number or proportion of international students and/or staff (respectively 13 and eight systems). Internationalisation may also be integrated in performance contracts.

Additional indicators

Besides the above-mentioned indicator categories which are present throughout all categories of tools presented in this report, albeit to varying degrees, some other indicators are used less consistently.

One of these is related to diversity. In the case of quality assurance agencies, this is considered in student and staff statistics, since many agencies ask for a breakdown of numbers into more specific categories distinguished by, for example, gender and socio-economic background. In addition, ten out of 27 surveyed funding models use diversity-related indicators, such as gender, socio-economic background, and special needs of students and/or staff. This type of priority is also found in performance contracts. Of the international rankings included in this study, two (U-Multirank and the THE Europe Teaching Ranking) use indicators reflecting the balance between male and female students and staff members.

In addition, U-Multirank includes an indicator on “contact with the work environment”, a composite indicator reflecting (at the Bachelor level and, separately, at the Master level) the inclusion of internships or other phases of practical experience, the percentage of students engaged in an internship, teaching by practitioners from outside the institution, and the percentage of degree theses studied for in cooperation with external organisations. In comparison, only Romania explicitly reported including student placements as an additional indicator in its funding formula, whereas only one surveyed quality assurance agency reported using the number of student placements as an indicator.

U-Multirank is the only example among the examined tools that specifically provides details on expenditure on teaching. The other examples of financial indicators concern income rather than expenditure and relate to either research or the institution in general, not to teaching activities. For example, the Round University Ranking considers institutional income per staff/student, while three quality assurance agencies specifically use indicators relating to funding sources. As might be expected, information about other funding sources features quite prominently in funding formulae, with 17 out of 27 systems using data regarding external funding gained by the institution and 15 using data about EU or international funding gained.

The challenge of measuring educational performance

4

As noted in the previous sections, it appears that there has been no major evolution in the past years in terms of indicators used. Therefore, the challenges and pitfalls related to them also largely prevail.¹⁷ This section discusses some of these and draws attention to issues to consider when using indicators. These concern 1) the choice of indicators needing to reflect the purpose for which they are used; 2) the validity of the portrayed link between the indicators in use and what they are supposed to reflect; and 3) the sometimes neglected importance of contextualisation when interpreting the indicators.

ENSURING THE FITNESS-FOR-PURPOSE OF AN INDICATOR

The choice of appropriate indicators is in the first place dependent on the purpose of the tool. External quality assurance aims to verify and enhance the quality of education provision at each individual institution. The indicators used are therefore those that provide a general picture of the institution, e.g. its size and profile, and to identify aspects that might need further investigation, e.g. high drop-out rates or low graduate employment. The aim is not to compare institutions but to gain a good understanding of the situation at the institution in question. As such, it is likely that some agencies do not define the information they collect as being “indicators”, particularly when referring to information linked to programmes and curriculum design, such as language of instruction and integration of work placements.

Rankings, on the other hand, have, by definition, comparison as their specific goal, aiming to identify the best performing institutions according to the criteria set by the ranking providers. While this aim in itself may be valid, two problems arise. Firstly, that the criteria may not be aligned with goals and criteria that are relevant for individual institutions, and secondly, the lack of knowledge about the criteria by the end-users of rankings, who might, for example, use rankings to inform study choices when they are in fact primarily based on indicators related to research.

Funding formulae have an altogether different purpose. They do not seek to measure quality but rather to provide institutions with sufficient resources to carry out their activities, as well as steer certain behaviours considered desirable by the funders. As such, these formulae tend to rely on numbers, for example using student and staff numbers rather than ratios. Ratios give a picture of the relation between staff and student numbers but no information about the actual costs of the institution, and therefore no indication of the funding required to support it.

¹⁷ For example, the observations made in an EUA report in 2004 by Tavenas about validity and limitations of individual indicators are still relevant today.

One approach that may help to identify appropriate indicators for education is the typology used in Bennetot Pruvot et al. (2015, p. 32), which differentiates between input, throughput and output indicators. A typical input indicator would be number of students; number of ECTS attained is an example of a throughput indicator; and number of degrees awarded is an example of an output indicator.

All three tools examined in this report use a combination of the three types of indicator. However, in each case, the most commonly used indicators are related to input, namely student and staff numbers or ratios. This type of indicator is much easier to quantify than output indicators such as learning outcomes (as discussed above).¹⁸ It has also previously been noted that funding formulae used specifically for teaching tend to focus on input indicators, whereas those specifically for research funds generally use output indicators (Bennetot Pruvot et al., 2015, p. 31).

Nonetheless, the choice of appropriate indicators entails significant challenges. The term “indicator” itself may signal universal validity whereas it is important to remember that the very selection of indicators is a subjective process based on, for example, cultural and disciplinary norms, and can vary significantly depending on the purpose behind their use.

THE PROXY PROBLEM

The examined tools focus on education in a wider sense with no indicators dealing specifically with learning and teaching. At best, all indicators discussed in this study are proxies for what they aim to illustrate and describe the conditions for education rather than its quality or effectiveness. As such, all tools presented are afflicted by “the proxy problem” (McCormick, 2017, p. 207), i.e. a tendency to favour the use of data that is measurable over that which might more adequately reflect the subject being measured.

Data about student progression, for example, is not an indicator of quality as such. Students can graduate within the normative study time either because they have sufficient support from teachers and administrative staff and because the facilities provide everything they need, or because the requirements for graduation are relatively low. Similar objections can be raised against the use of data on post-graduation activities, e.g. graduate employment rates. Employment rates only reflect whether a graduate is employed or not. This means they do not take into account whether the graduates are employed in positions that are commensurate with their level of education and require the skills obtained during their studies. In addition, graduate employment rates generally also depend on many external factors, such as the economic situation, and can thus not be ascribed to the effectiveness or quality of education alone.

Another example of a very distant proxy is to use reputation surveys conducted among representatives of the academic community, which is the case in three of the international rankings examined for this report, namely the THE World University Rankings, THE Europe Teaching Rankings and the Round University Ranking. These rankings invite “peers” to participate in an online survey and identify those institutions which, in their view, have a good reputation as far as teaching is concerned. It is not clear

¹⁸ In contrast, research output is commonly quantified through indicators such as number of publications, citations or journal impact factor, to name only some examples. However, such indicators may lose their dominance in the course of the current move towards open access (cf. Saenen et al., 2019).

whether these peers have the necessary knowledge of teaching in other institutions to make such a judgment. This in turn leads to these surveys serving to reinforce existing reputations as peers base their judgment on the historical reputation of an institution.

These are just a few examples that demonstrate the significant difficulty of finding indicators that are a direct measure of the quality of learning and teaching. Furthermore, a wide range of definitions and interpretations may be hidden behind each indicator. For example, the definitions of full and part-time staff and students can vary significantly and lead to distorted staff-student ratios. In terms of student numbers, for example, a different number may be used by different tools depending on whether international students and/or doctoral candidates are included. This variation can be seen not only from one tool to the next but might also be present within a single tool. Minor tweaks in definitions can have great effects and, for example, lead to a vastly different position in a ranking. The devil lies in the detail and, at least in the case of rankings, external users may not be familiar with the complexity behind each indicator.

THE CONTEXTUALISATION OF AN INDICATOR

The difficulty of understanding an indicator is further compounded by the fact that the information is often presented devoid of any context. A seemingly basic indicator such as drop-out rate can present very different degrees of information depending on the higher education system. For example, in some systems, students are permitted to enrol simultaneously in several programmes at the start of their studies, before deciding on which one to pursue, resulting in objectively high drop-out rates. In other systems, students can be inactive for many years before being considered as having discontinued their studies, resulting in very low drop-out rates.

The issue of context is equally valid when using qualitative indicators, such as student satisfaction, for example, as captured through student surveys. Both McCormick (2017, p. 213) and Hattie and Zierer (2019, pp. 26-42) highlight the issue of internal variation in the quality of the student experience, which is often overlooked and impossible to reflect in a single indicator that applies to the whole institution. Not only may different students perceive their educational experience in very different ways, depending on their expectations at the outset and personal experiences, but there may also be significant variations in satisfaction between different programmes in an institution.

The extent to which contextualisation is a problem varies considerably across the three types of tools examined in this report. With regard to funding mechanisms, the use of formulae, while conducive to transparency and accountability, offers limited potential to factor in institutional diversity. This explains in part the increasing use of complementary tools such as performance contracts, which allow for a more qualitative and contextualised approach. Contracts may set out the same indicators for all institutions, but allow for differentiated objectives; an individual contract may also be set up in a way that allows for a selection of sets of indicators depending on the institutional profile; finally, fully individualised contracts make tailored approaches possible.

In external quality assurance, context-sensitivity is provided by the fact that many quality assurance agencies operate within a single system or country, although cross-border quality assurance is gaining prominence. Furthermore, most agencies use indicators to provide context and information as part of a more comprehensive evaluation approach. Even agencies that use indicators to make judgments against minimum standards do not rely solely on indicators to make a decision about accreditation or similar, but usually organise site visits and interviews with stakeholders to complement the data obtained from institutions and provide important contextual information.¹⁹

Unlike funding formulae and external quality assurance, however, the very purpose of rankings is to compare institutions, and that of international rankings is to provide a comparison across higher education systems. Doing this through a single dataset to produce an easy-to-read list necessitates the removal of any contextual information. This is true regardless of which indicators are used and which activities are being measured. This poses a dilemma that appears difficult, if not impossible, for international rankings to overcome.

But as cautioned by Tavenas (2004, p. 19), even within a higher education system the use of a uniform set of indicators for all institutions carries a considerable risk. Unless the institutions have the same profile, a one-size-fits-all approach may jeopardise the necessary diversity within a system. Therefore, the most effective way to reduce the effect of context and allow for a meaningful use of indicators is to use them to monitor the performance of one unit (programme or institution) in a longitudinal manner rather than to compare different units at a given moment. Such a use of indicators for medium to long-term observation purposes would help to identify development trends of the unit in question.

¹⁹ The ESG state that external quality assurance should generally include a site visit (Standard 2.2) and that written documentation "is normally completed by interviews with stakeholders" (guidelines to Standard 2.2).

Lessons learnt and conclusions

5

With this report, and while acknowledging its limited scope, EUA seeks to provide a constructive input to the debate on indicators used to measure quality of or performance in higher education by rankings, external quality assurance and system steering. The study also sheds light on aspects of relevance for further debates on potential synergies between these tools, the validity of their methodologies and their use of metrics.

The key lessons learnt from the mapping of indicators presented in this report can be summarised as follows:

- The amount of hard data on educational performance has increased, yet the types of indicators used by both rankings and funding mechanisms have exhibited relative stability. Similarly, the use of indicators has not become a prominent feature in external quality assurance.
- The types of indicators are the same across different tools, even if those tools are used for very different purposes. However, the indicators are often based on varying definitions which can ultimately impact their very nature.
- There are currently no universally agreed-upon indicators to measure the quality of higher education across systems. Some international datasets including institutional data exist, but they tend to be purely for the purpose of information provision, without making any attempt to interpret what the data conveys about quality or performance of the institutions.²⁰
- There is a limit to what indicators can tell. They cannot replace more qualitative or descriptive tools such as qualification frameworks, peer-reviews or performance contracts, but need to be used in combination with them. If indicators are attuned to a carefully defined purpose and other context-specific considerations, they have the potential to make a useful contribution to an evaluation and to foster transparency and trust in the education provided.
- It is important to analyse, understand and question what the data stands for. An indicator may indeed reflect one aspect of an institution's performance, but it should not be generalised to reflect the institution's performance in relation to other aspects, or the entire institution altogether. Therefore, it is crucial to be clear about what each indicator can and should measure, and then examine whether it fulfils its purpose.

²⁰ One example at the European level is the European Tertiary Education Register (ETER), which is a database that provides a wide range of comparable basic information about higher education institutions. The information in ETER is provided by the national statistical authorities.

EUA emphasises that there is no single definition of quality in higher education, and that this should rather be considered in the context of national, institutional and departmental or subject-specific parameters (EUA 2010). However, this does not negate the fact that there is a legitimate need for transparent and comparable information on the performance and quality of higher education institutions' education provision, as it is relevant for the institutions themselves as well as for stakeholders and the public at large.

The higher education sector needs to address the demand for data so to be transparent, accountable and to facilitate evidence-based decision-making. Reliable data is also needed to rationally assess the status and developmental needs of a higher education system or institution. While indicators to capture the quality of higher education are frequently criticised, they are still better than no solution at all.

Periodic review and adjustment are needed to ensure the fitness-for-purpose of indicators, even if that might jeopardise the comparability of evaluations across longer periods of time. The debate on which indicators might adequately be used to reflect quality in each context should involve various stakeholders of the higher education community with higher education institutions being proactive in this debate.

Such an inclusive debate about indicators and their purpose would also counter the risk of “recycling” data and indicators for purposes other than the one for which they were originally intended. It should not be taken for granted that indicators are transferable, even though data collection and processing, especially if repeated on a periodic basis, entail a considerable workload (cf. Loukkola and Morais, 2015, p. 9).

Questions remain about the impact of the use of different indicators on higher education institutions and their behaviour as well as about the use and usefulness of these indicators for institutions themselves. Another important question is what kind of indicators institutions use for their internal monitoring, because they are likely to be significantly different from those used by the tools discussed in this report. The methodology chosen for this study did not allow for these questions to be addressed, but they would certainly merit further exploration.

Annex 1: Survey to quality assurance agencies

1. Background information

- Quality assurance agency:
- Country:
- Name:
- Position:
- Email address:

2. What type of external quality assurance does your agency conduct?

- Programme level
- Institutional level
- Both programme and institutional level

3. Please provide a list of the indicators related to learning and teaching used in your external quality assurance processes (e.g. quantitative measures such as staff-student ratio, drop-out rate, time to graduation etc). You can provide the list by uploading a document, providing a weblink to an online list, or providing the list in the text box below. If possible, please provide the list in English. Or select:

- Indicators are not used in our external quality assurance processes

4. From where does your agency collect the data and in what format? (please select all that apply)

- Institutions are required to provide data according to a specific list or template
- Institutions are required to provide data but can decide for themselves on the format and contents
- Data is received from another national system or database in an agreed format
- Other (please specify)

If other, please specify (max. 2000 characters)

5. Please give a short description of the way in which indicators are used by your agency (e.g. for contextual information, for benchmarking/classification, to make a judgment against minimum standards). (max. 2000 characters)

6. Please use this space for any further comments or reflections on the use of indicators in external quality assurance that you wish to bring to our attention. (max. 2000 characters)

7. Are you willing to be contacted by EUA for an interview to explore your responses in more detail? (Interviews will take place via videoconference in January 2020)

Yes

No

Annex 2: Quality assurance agencies responding to the survey

AAC-DEVA – Andalusian Agency of Knowledge, Department of Evaluation and Accreditation (Spain)

AAQ – Swiss Agency of Accreditation and Quality Assurance (Switzerland)

ACPUA – Aragon Agency for Quality Assessment and Accreditation (Spain)

ACSUCYL – Quality Assurance Agency for the University System in Castilla y León (Spain)

AEQES – Agency for Quality Assurance in Higher Education (Belgium)

AQAS – Agency for Quality Assurance through Accreditation of Student Programmes (Germany)

AQU Catalunya – Catalan University Quality Assurance Agency (Spain)

ANACEC – National Agency for Quality Assurance in Education and Research (Moldova)

ANVUR – National Agency for the Evaluation of Universities and Research Institutes (Italy)

ASHE – Agency for Science and Higher Education (Croatia)

AVAP – Valencian Agency for Strategic Assessment and Forecasting (Spain)

CTI – Commission des Titres d'Ingénieur (France)

CYQAA – Cyprus Agency of Quality Assurance and Accreditation in Higher Education (Cyprus)

FIBAA – Foundation for International Business Administration Accreditation (Germany)

IEP – Institution Evaluation Programme (Switzerland)

IQAA – Independent Agency for Quality Assurance in Education (Kazakhstan)

NAB – The National Accreditation Bureau for Higher Education (Czech Republic)

NOKUT – Norwegian Agency for Quality Assurance in Education (Norway)

NQA – Netherlands Quality Agency

NVAO – Accreditation Organisation of the Netherlands and Flanders (Netherlands)

QB – Quality Board for Icelandic Higher Education (Iceland)

QUACING – Agency for Quality Assurance and Accreditation of the EUR-ACE Courses of Study in Engineering (Italy)

SKVC – Centre for Quality Assessment in Higher Education (Lithuania)

UKÄ – Swedish Higher Education Authority (Sweden)

Annex 3: Higher education systems covered by the performance-based funding survey

Austria

Belgium – Flanders

Belgium – Wallonia-Brussels Federation

Croatia

Czech Republic

Denmark

Estonia

Finland

France

Germany

Hungary

Iceland

Ireland

Italy

Lithuania

Luxembourg

Netherlands

Norway

Poland

Romania

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UK – England

UK – Scotland

Slovakia

Spain

Sweden

Switzerland

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The Association provides a unique expertise in higher education and research as well as a forum for exchange of ideas and good practice among universities. The results of EUA's work are made available to members and stakeholders through conferences, seminars, websites and publications.