PEL Pensamiento Educativo. Revista de Investigación Educacional Latinoamericana
2013, 50(1), 76-95

Pontificia Universidad Católica de Chile
Facultad de Educación

Classification of Higher Education Institutions: The European Case

Clasificación de las instituciones de educación superior: el caso europeo

Frank Ziegele

CHE Centre for Higher Education, Germany

Abstract

The relevance of classifications of higher education institutions is rising in Europe. As Europe is a diverse system, the concept of classification, including the sub-types of mapping and typology, is explained (and distinguished from other instruments such as rankings) in the context of horizontal and vertical diversity. After discussing the objectives of classifications in Europe, but also analyzing current criticism, "U-Map" is described as an approach to follow the objectives and to avoid potential problems. First experiences could be derived from the realized U-Map projects. The analysis leads to suggestions as to how politics should use (and not use) classifications. Finally, the productive relationship between classification and ranking is exemplified by the intended link of U-Map to another European project, the development of a multi-dimensional, user-driven ranking ("U-Multirank").

Keywords: classification, diversity, mapping, typology, ranking, U-Map, U-Multirank

Resumen

La clasificación de las instituciones de educación superior es cada vez más relevante en Europa. Puesto que Europa es un sistema heterogéneo, el concepto de clasificación, incluidos los subtipos de mapeo y tipología, se explica (y se distingue de otras herramientas como los *ranking*) en el contexto de la diversidad horizontal y vertical. Tras analizarse los objetivos de las clasificaciones en Europa y repasar las críticas de las que son objeto, se describe el sistema U-Map, orientado a alcanzar los objetivos y evitar posibles problemas. De los proyectos U-Map llevados a cabo se puede sacar las primeras lecciones. Este análisis redunda en sugerencias sobre cómo los poderes públicos deberían usar (y no usar) las clasificaciones. Por último, la relación productiva entre clasificación y ranking se refleja en el vínculo deliberado entre el sistema U-Map y otro proyecto europeo: el desarrollo de un ranking multidimensional guiado por el usuario, o U-Multirank.

Palabras clave: clasificación, diversidad, mapeo, tipología, ranking, U-Map, U-Multirank

Post to:
Frank Ziegele
CHE Centre for Higher Education, Germany
Postfach 105, D-33311 Gütersloh, Germany
Email: Frank.Ziegele@CHE.de

ISSN: 0719-0409 DDI: 203.262, Santiago, Chile
doi:10.7764/PEL.50.1.2013.7

Classification of Higher Education Institutions (HEI) was not a major topic in Europe for many years. In some European countries this was because of an egalitarian approach assuming that the higher education sector should provide good quality education and research throughout the country. In other countries there was traditionally a clear national segmentation of institutions with different and clearly defined types of institutions, each type standing for a specific segment or mission. Examples are the "universités" and "grandes écoles" in France, the "Universitäten" and "Fachhochschulen" (universities of applied sciences) in Germany, or institutions with a specific disciplinary focuses such as "technical universities", or "academies", "polytechnics", "colleges" and the like. These types were (and in many cases still are) legally defined and which type a specific institution belonged to was decided by the establishment and legal status of the institution.

At the moment this is changing dramatically: national structures are dissolving, the supranational European level is gaining more impact and the traditional types of higher education institutions are no longer sufficient to describe the complexity of HEI's missions. In Germany, for example, the Bologna Process was implemented in such a way that universities and "Fachhochschulen", which had been distinguished by the types of degrees they awarded, nowadays award the same degrees (Bachelor's and Master's). In the UK a unitary higher education system with only "universities" was created. National research excellence programs (for instance in France, Spain, and Germany) led to new forms of sectoral stratification; building a specific profile thus becomes an issue for higher education institutions of all kinds. Furthermore, the European and worldwide levels of higher education and research markets gain importance and make a great difference to the nationally determined structures of HE systems. All of this raises the issue of diversity in higher education systems, and has stimulated the development of instruments to assess and describe this diversity: horizontal diversity addressed by classifications and vertical diversity addressed by rankings.

In this paper we want to take a look at the rationale and the concept of classification in Europe, which has derived from these developments, and point out the objectives of a European classification. The classification concept will be differentiated by introducing the concepts of "mapping" and "typology" and distinguished from other tools intended to create transparency of institutional diversity. "U-Map" as the major European approach and current developments in this project will be described. Controversial European discussions about the effects of classification will be addressed. Finally, the relationship between classification and national/supranational HE policies will be analyzed and the link between classification and multi-dimensional ranking (the European project "U-Multirank") will be developed.

The concept of classification in the context of diversity measurement

Before addressing the specific idea and role of classifications we have to discuss the fundamental concept of diversity. Diversity is defined as a concept indicating the level of variety of entities within a system, whereas differentiation could be seen as a process in which new entities emerge in a system. While differentiation denotes a dynamic process, diversity refers to a static situation (van Vught, 2008). Classifications make a static description of a situation; hence they are able to give a snapshot of diversity. But if the development of classifications becomes visible over time then this could also lead to an analysis of the differentiation process itself.

There are different forms of transparency. To characterize the instrument of classification it is useful to introduce two dyadic concepts:

- Institutional diversity vs. programmatic diversity, and
- Horizontal vs. vertical diversity.

Institutional diversity refers to the differences between higher education institutions. More detailed categories are used by Birnbaum (1983), such as structural diversity (resulting from historical and legal foundations) and systemic diversity (referring to differences in institutional type, size and control found within a higher education system). Programmatic diversity will be seen as referring to the differences between the programs being offered by these institutions. Vertical diversity is understood to address differences between higher education institutions in terms of (academic) prestige, reputation and performance. Horizontal diversity will be assumed to regard differences in institutional missions and

profiles (Teichler, 2007) without saying that the one or the other is "better" or "worse", but merely saying it is the same or different.

Diversity within and across different higher education institutions and programs can be more or less transparent. Transparency is an attribute of an entity which allows the understanding of that entity through the provision of relevant, reliable and valid information. When the transparency about the diversity of a higher education system is low, there is only limited and weak information available about the differences in that system in terms of the dimensions mentioned (institutional, programmatic, horizontal and vertical). The major objective of transparency instruments is to offer relevant, reliable and valid information to stakeholders about the levels and forms of diversity in higher education systems. As a classification is such a transparency instrument, this is its major objective. But on the level of objectives below this general aim there are specific goals, depending on the particular situation. Here this will be analyzed for Europe. The rationale is: diversity is something good because it positively influences the performance of HE systems (because of more student choice, diverse needs of labor markets, flexible correction of errors, effective possibility of specialization, combination of elite and mass HE, innovativeness of systems), and if diversity becomes transparent it (and all the desired effects) will be promoted.

Yet, classifications are not the only potential transparency tool since there are other instrumental options. To understand the rationale of classifications, they have to be distinguished from the others by using the dyadic concepts from above.

Traditionally, institutional diversity is made transparent by the legal definition of types of HEI. Nationally this worked for a long time, but we find for instance no fully comparable concepts of a university of applied sciences between European countries, hence this approach to reduce nontransparency will not work internationally.

The HEI structure by legal definition used to be the major order in HE systems for many years in Europe. But it had worked only as long as the international dimension was not yet of crucial importance and the dynamics of institutional profiling processes and of heterogeneity within the system were low. This is why the need for classifications only emerged after internationalization and profiling trends: much later compared with the existence of the Carnegie Classification in the US where the institutional heterogeneity has a long history.

Given the recent developments in European higher education, a distinction can be made between classification and three other instrumental areas that are intended to enhance the transparency of diversity in the higher education sector:

- Harmonization,
- Quality assurance,
- Ranking.

Harmonization is aimed at increasing transparency through decreasing diversity to some extent: If diversity is reduced it does not have to be made transparent. This type of instrument appears to be of special relevance to the Bologna policy context on the level of programmatic diversity. The main instruments in the Bologna Process include firstly the two-cycle degree system (expanded after the Berlin follow-up conference in 2003 to the three-cycle degree system, integrating Ph.D training into the Bologna logic), thus reducing one sub-dimension of programmatic diversity; once all study programs in higher education institutions across the 46 countries of the European Higher Education Area converge into a three-cycle degree structure, it will be transparent to 'end users' that degrees are part of the first, second or third cycle. The second instrument for increasing transparency through harmonization in the Bologna Process is the European Credit Transfer System (ECTS) in which, first of all, a typical student's annual workload is divided into 60 Credit Points and in which courses are described in a standardized fashion, making their commonalities and differences much more transparent than before. As another step in the direction of harmonizing actual curricula, European qualification frameworks have been developed which are being operationalized in national qualification frameworks defining general level descriptors. However, all these steps towards transparency through harmonization do not negate an older axiom of higher education policy in Europe, namely that the very diversity of Europe is its strength. The harmonization is quite formal and is unable to capture institutional diversity. It does not say anything

about institutional or programmatic focuses, the role of research or internationalization in an institution. Hence the need remains for international transparency of diversity in higher education.

So we come to the second set of transparency instruments developed widely in higher education and research systems: quality assurance instruments. One of the functions of these tools in higher education (in addition to accountability, quality improvement and validation) is to provide information to stakeholders to help them make reasoned choices (e.g. for pursuing studies, for employing graduates or for contracting out research projects; Schwartz & Westerheijden, 2004). The information function of higher education quality assurance instruments certainly helps to make horizontal and vertical diversity transparent, but it does so by using a special perspective. It focuses on teaching and learning quality, either defined by minimum standards (accreditation) or by items for improvement. In addition, it rests heavily on the (inter)subjectivity of peer review judgments. Similarly, quality assessment instruments of research performance also rely heavily on peer review. However, in research assessment there is an increasing focus on metrics and bibliometric indicators, complementing peer review to make judgments more objective and transparent (Rinia, van Leeuwen, van Vuren, & van Raan, 1998).

A third set of transparency instruments increasingly receiving attention are ranking models. They focus on the transparency of vertical diversity. Ranking models vary considerably in purpose and scope, in their definitions of relevance and quality and in their methodological designs (Usher & Savino, 2006). In a global perspective the focus of rankings has so far largely been on research performance. The Shanghai Jiao Tong University Ranking has made no attempt to address functions of higher education other than research. The Times Higher Education (THE) World Ranking has tried to include the teaching and learning function, but to a large degree relies on reputation indicators and has not succeeded in producing valid indicators and reliable information on teaching performance. The existing global rankings focus on vertical overall institutional diversity and are not able to consider programmatic diversity (Marginson & van der Wende, 2007). In this way, the existing global rankings are only able to integrate one type of university: the large comprehensive, "world-class" research university. Therefore, the scope of vertical diversity is quite narrow, focusing on only one of the "products" of the university and filtering a very small segment out of the range of horizontal diversity. Figure 1, taken from a EUA report (showing the research performance and the number of universities) illustrates that the traditional league tables are only able to cover a small minority of universities worldwide (around 3%). At a later point we will come back to the implications of this for the development of a European classification approach.

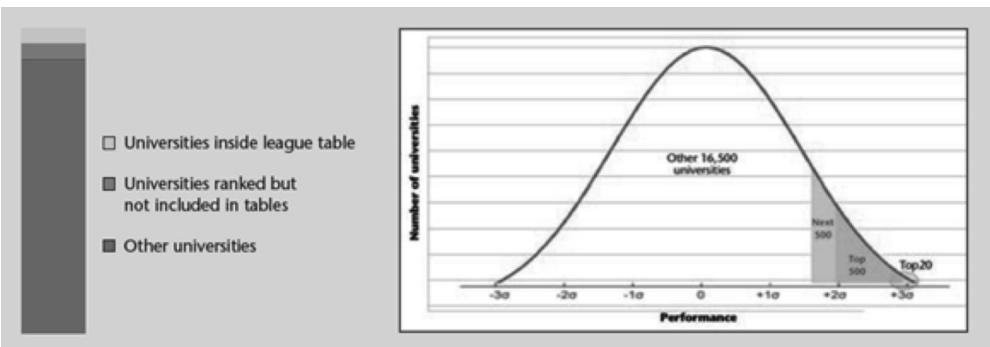

Figure 1. Proportion of universities considered by existing global rankings vs. the total number of universities in the world. Rauhvargers, Global University Ranking and their impact, Bruxelles: EUA, 2011.

That is, what we have described already is different from the approach of classification. Classifications are "spatial, temporal or spatio-temporal segmentations of the world" (Bowker & Starr, 2000, p. 10). They provide a systematic, nominal distribution among a number of classes or characteristics without any (intended) order of preference. They assess similarities and differences of entities and group these entities by similarity based on empirical data, so they are aimed at description (not assessment) and transparency of horizontal diversity. Classifications try to transform relevant features of HEI into quantifiable indicators allowing comparisons. They are aimed at finding a structure to cluster the indicators and are therefore

working with "dimensions" to describe horizontal differences. Classifications of HEI necessarily have to be multi-dimensional, as diversity in a multi-task institution like a university should not be reduced to one dimension. In European higher education a framework is currently being developed to create a multi-dimensional European classification (CHEPS, 2008; van Vught, 2009). This U-Map classification instrument (see below) is intended to provide descriptive information to stakeholders about the profiles of higher education institutions. It includes aspects of institutional and programmatic horizontal diversity.

Until now we have only discussed the concept of classification, but it is important to differentiate between two sub-types of this instrument, which should be called "mapping" and "typology". The distinction is important because the two forms of classification are related to different objectives and lead to different effects. The following table describes the differences between mapping and typology.

Table 1
Differences between mapping and typology

Mapping	Typology
Purely descriptive, showing all the indicators to map diversity, but not putting them together with a specific normatively fixed combination of features that stands for a type.	With prescriptive elements, because empirical observations on the indicators are combined to an explicitly described type of higher education institution.
An HEI identifies itself within the classification by a multi-dimensional empirical profile (because of multi-dimensionality too complex to be attributed with a concrete name representing the type).	An HEI identifies itself within the classification by being named as an "XY-university", characterized by a specific set of indicator values which stands for this predefined type.
The features represented by the indicators are flexibly combined by the user of the classification; the user creates his/her own type with the relevant indicators from his/her perspective.	The features represented by the indicators are combined by the producer of the classification, leading to a defined set of HEI types.
As there are no predefined types, depending on the combination of indicators an HEI could end up in different groups of comparable institutions.	The types identified are exclusive, each HEI could only belong to one type.

Both concepts are determined empirically; they both allow the position of an HEI to be changed in the classification (even in a typology a change in indicators might induce a change into a new group and a new "title" for the respective institution). Mapping is not possible without a tool allowing the user of the classification to choose and combine classification indicators. Typologies are impossible without an authority defining the different types in a plausible manner.

Classification, rankings and quality assurance as different transparency instruments should not be seen as alternatives; on the contrary they could play complementary roles. A combination of classification and ranking could create transparency of profiles and profile-related performance, while the data from these instruments is used in informed peer reviews to support decision-making by quality assessments. Nevertheless we should not confuse the instruments and their different functionalities.

The specific role of a classification will now be more precisely characterized by looking at its objectives and rationales in the following section.

Classification: Rationales, objectives, criticism

Specifying the general goal of transparency instruments from above, classifications are intended to offer relevant, reliable and valid information to stakeholders about the level and form of horizontal diversity

in higher education systems, including institutional and programmatic aspects. Reasons for the wish to create transparency on horizontal diversity in Europe are due to developments on three levels:

- The European/international aspect,
- National policy issues,
- Institutional profiling processes.

The objectives on these levels correspond to the arguments that proponents of classifications would use to justify their involvement in classification efforts: The objectives on the European level are the basis for the engagement of the European Commission in classifications, the national aspects would explain why a national government would be interested to implement a classification and the institutional objectives provide the reason for an HEI to be classified.

Some of the objectives might be more closely connected to the mapping and others more to the typology, but in general they all are valid for all kinds of classifications to a certain extent.

The European/international aspect

The following objectives of classifications could be explained in the international context:

Classifications should stimulate diversity in Europe by making it transparent. Both the Bologna and the EU research and higher education policy contexts address higher education and research at the supranational level. For the first time since the rise of the nation states, the 21st century appears to bring a renewed interest in a pan-European approach to this field. In these policy contexts the structural convergence of the various national higher education systems is one of the major foci of attention. Increasing compatibility and comparability are crucial objectives. But the importance of the diversity of European higher education as a counterpart is also regularly emphasized. The Bologna Declaration (1999) has already stressed that comparability and compatibility should be realized within the context of national legislative competences "taking full respect of the diversity of cultures, languages, national education systems and university autonomy". The Bergen Communiqué (2005) emphasized that "we must cherish our rich heritage and cultural diversity in contributing to a knowledge-based society" (p. 5). But so far the Bologna policy context has not made clear how diversity in higher education can be addressed beyond general traditions such as language and cultural diversity. As a matter of fact, only very recently has the topic of diversity entered the Bologna discussions. The Ghent (2008) and the Prague (2009) preparatory meetings for the following Bologna Minister's conference in Leuven (2009) showed a growing interest in diversity and the wish to make diversity transparent.

In EU policy contexts diversity in higher education is taken as an important point of departure. Actors involved in European higher education should attempt to "organize that diversity within a more coherent and compatible European framework" (European Commission, 2003, pp. 4-5). And although the Commission is also critical about Europe's higher education performance in a 2005 communication, the value of diversity is directly acknowledged: "there are deficiencies stemming from insufficient differentiation. Most universities tend to offer the same mono-disciplinary programs and traditional methods geared towards the same group of academically best-qualified learners […] but Europe has too few centers of world-class excellence and universities are not encouraged to explain the specific value of what they produce for learners and society" (European Commission, 2005, pp. 3-4). During the conference on "International comparison of education systems: a European model?" (Paris, 13-14 November 2008) the Commission made it clear that it considers diversity as a major challenge for the further development of European higher education and that it intends diversity to be made more transparent.

Classifications are intended to present diversity as a major strength of the European HE and research area. On the one hand diversity should be promoted, but on the other hand there is already a substantial degree of diversity. If this becomes transparent it is assumed that Europe could show its strength to the world. A European classification should therefore refer to the diversity of institutional profiles and thus take into account the high degree of linguistic, academic, educational and cultural diversity that is a strength of European higher education in a global context.

Classifications are meant to promote international collaboration in networks and partnerships. Especially in research, international collaborative structures become more and more important. To build up critical masses in research capacities and to be able to compete in the global context requires international cooperation. Research funding instruments typically reward collaborative research. And there is the tendency to strengthen institutional profiles through membership in international networks, not only focusing on research. For instance, in Europe there is a network of "innovative universities" with a specific profile in knowledge and technology transfer. Transparency through classifications could help to find the right partners with similar profiles and could support the formation of networks and alliances. Looking for partners might also be induced by the wish to realize (inter)national benchmarking: If a university with regional scope of activities wants to find partners in its country or abroad to benchmark strategies of regionalization it could use a classification that indicates the intensity of regional engagement to find the right benchmarking partners. Without the classification, at least on the international level, transparency would not be sufficient to identify the full scope of potential partners, especially for the example of regional orientation.

By focusing on horizontal diversity classifications should prevent that international rankings from transforming horizontal diversity implicitly into vertical diversity. International rankings such as the Shanghai or Times Higher Ranking are already on the market. And to a certain extent they are misleading for a number of reasons (van Vught & Ziegele, 2012): First, they focus mainly on research and reputation (the latter also depending highly on the perception of research performance in the academic community). Second, the bibliometric indicators used in these rankings have biases in language and disciplines, taking into account publication formats which are close to the publication culture in the sciences and medicine and favoring journals in the English language. Hence, the existing rankings are only able to measure the performance of one specific type of university adequately: the internationally acting, research-oriented, English-publishing comprehensive university with a strong element of natural sciences and medicine, as well as a high worldwide reputation (a "world brand"). But for the ranking recipient the focus on just one segment of the horizontal diversity does not become transparent; the user is under the illusion that "these are overall the best universities in the world". Universities with other profiles, for instance a strong regional orientation or a clear focus on social sciences and humanities, are perceived as "second class" universities, so some university types within the range of horizontal diversity are devalued. This horizontal diversity is, in politics as well as in the public perception, regarded as vertical difference. If a classification exists alongside these rankings it will become transparent that there are different profiles of HEI; the danger of misinterpretation of global rankings will be decreased, or at least there will be arguments to point to the shortcomings of those rankings.

Classifications should serve as a starting point for reasonable international rankings. Classifications could not only reveal the deficiencies of existing rankings, but they may also be linked to a "better" way of ranking. To explain the logic simply: With a classification you could distinguish apples from oranges. As soon as this was done, specific rankings could be made among the apples and among the oranges. In more technical terms: By describing horizontal diversity, institutions of similar, comparable profiles could be identified. The vertical difference then could be ranked for each set of comparable HEI separately, leading to a fair comparison. Rankings would no longer be limited to the world-class research institutions. Transparency would be possible over the whole range of HEI types and profiles without puzzling over incomparable things. Below the European approach to doing this, the "U-Multirank"project will be presented.

National policy issues

The following objectives are related to national contexts and higher education policies:

Classifications deal with the growth of national HE systems. The number of universities (and students) in European HE systems is growing. The complexity of the systems does not allow stakeholders to be informed about every institution anymore. A structure is needed to describe the "wilderness" within higher education systems. A classification could define (quantitative) criteria to deliver such a structure, the criteria intended to reduce complexity and create a "digestible" picture of diversity. The expansion of institutions in many countries is enforced by the establishment of private HEI. Eastern European countries such as Poland or the Czech Republic in particular carried out the massification of their HE

systems with a high number of private universities, enhancing intransparency rapidly. A classification should include the private sector to draw up a comprehensive picture of a national system and of the different missions and functions of public and private institutions.

Classifications serve the needs of various stakeholder groups and promote the public understanding of HE. Classifications inform students and potential partners about the profile of a university, allowing them to compare the profile with their own preferences (an objective closely linked to the mapping approach). This could be relevant for choosing a university in which to study (in the case of students) or to find an adequate partner (in the case of companies or other HEI). A classification enables the public to understand the profiles and missions of HEI better.

Classifications should stimulate diversity in national systems by making it transparent and by helping to avoid costly reputation races. Almost every country in the world aspires to have at least one or more "world-class" research universities, well-positioned in the traditional global rankings and being able to compete for research funds on the global market, having a recognized "world brand". To achieve this, governments focus their investments on top research groups, create expensive infrastructures, and so forth, often without taking account whether neighboring countries are on the same path. This reputation race increases higher education costs significantly (van Vught, 2008) and it implies the danger of damaging system diversity. In a situation of limited resources high investments in the world-class status could lead to an underinvestment in other tasks of HEI. Teaching excellence, regional orientation and other tasks tend to be neglected. Each university tries to be part of the reputation race, but the majority will not be able to succeed anyway. Hence they might develop an attitude of inferiority and feel "second class" in terms of academic reputation. A classification makes different objectives and missions transparent. Transparency could help to send the message that there are multiple ways of being excellent. With a classification that is able to describe all relevant tasks of HEI it will become easier to follow diverse strategies and to acquire reputation with different kinds of activities. Diversity in profiles is needed to provide an answer to increasing diversity in the student body, leading to more heterogeneous needs.

Classifications respond to the fact that classical legal definitions of university types do not work sufficiently anymore. In many European countries a typology of HEI with a more or less long tradition exists. Let us take the example of universities of applied sciences (UAS), existing as a legal type for instance in the Netherlands, Austria, Switzerland, and Germany. For instance, because of the stronger orientation towards teaching and practical issues of UAS, the teaching load of UAS professors is higher than in universities and–unlike the university professor–the UAS professor usually needs to have a certain minimum of work experience outside HEI. Clear distinct profiles for these specific types are assumed and transformed into government steering. To a certain extent this still works, as the legally fixed types are still elements of institutional profiling and they are still meant to promote horizontal diversity, since the official political position for example in Germany is that UAS compared with universities are "different but of equal status" (but there is still academic drift in the system). Nevertheless, for three reasons this system is insufficient: First, the dual typology is not comprehensive enough to cover all aspects of current processes of profiling. For instance HEI which build a specific profile in knowledge and technology transfer could belong to the university or UAS sector, but could show a similar profile in this respect. Or we have the fact that HEI distinguish themselves by focusing on specific topics for teaching and research; this approach could also occur for all types of institutions. A classification approach with more dimensions is needed which would allow similarities and differences of HEI across all legally defined types to be shown. Second, the legal status was determined at the moment the institution was established, but the development of performance could lead to situations where the institution would better fit into another type. You could find UAS with a higher research performance than universities of comparable size and structure, despite the fact that the legal typology would see greater research focus in a university. A fixed typology turns out to be too inflexible to react to dynamic developments, a classification using indicators to describe profiles would be able to adapt flexibly to developments. Third, in a situation of international competition it becomes difficult to work with these legally defined types because different countries will develop different ideas of what a certain type specifically means. For instance the German "Fachhochschule", the Austrian "Fachhochschule" and the Dutch "hogeschool" all are specifications of the UAS profile, but in fact they are quite different (regarding their student clientele, the balance between Bachelor and Master programs, the role of research, etc.). A classification would look behind the scenes of a mere legal definition and would make these institutions comparable in the examples mentioned by measuring the percentages of Bachelor and Master students, the percentage of the budget spent on research, and the like.

Classification could help governments to develop targeted steering approaches. If the state of the art regarding horizontal diversity is made transparent then government policies could react to the status quo. Governments could identify if there is a decent scope of profiles and missions of HEI within the system. If gaps are identified, policies could be targeted at closing them, for instance by the establishment of new institutions with specific profiles. If governments practice performance-oriented funding models they could do this based on better information, since classifications could help to identify comparable institutions and measure relative performance between the comparable HEI or the performance indicators applied in formula funding could be adjusted to the respective profile of a certain type of institutions. For instance, it could also be analyzed if there are tendencies to limit the access to certain funding sources to universities with a specific profile (such as opening specific research funds only to research-intensive institutions). This is one of the reasons why HEI are skeptical about classifications (see below). This objective of classification is more closely related to typologies.

Institutional profiling processes

The following objectives of classifications are related to profiling processes of HEI:

Classifications help to avoid overburdening with "overall mainstreaming" and to develop specific institutional profiles. There is a tendency in the HE sector to expand the idea of "mainstreaming" to as many aspects as possible. This means that certain standards are set in internationalization, contributions to regional development, gender equality, and so forth, and that each HEI has to meet all standards which become higher and higher. This might exceed the capabilities of an HEI; the alternative is to focus more on a differentiation in profiles, where not every institution reaches the same level for all aspects and focuses on its strengths. A classification promotes the identification of areas of priority. It is inherent in the idea of a classification that not all universities show the same intensity of dedication for all dimensions, otherwise a classification would not be needed.

Classifications help to find benchmarking partners. Benchmarking becomes an increasingly important instrument for HEI. But benchmarking only makes sense with the right, comparable partner. Comparability of potential partners could be checked with the help of a classification.

Classifications promote measurable profiles instead of profiling through reputation. Academic culture is reputation-driven; perceptions of HEI often depend on the brand and image of the institution. But reputation does not always represent reality; a university which used to act internationally might still benefit from that image even after changing strategy. Classifications help to promote evidence-based decisions.

Criticism

The debate about classifications in Europe is controversial. The following objections against classifications are being discussed:

The differentiation between vertical and horizontal diversity is clear in theory, but difficult in practice. Although in practice the identification of "types" of institutions (or institutional clusters of profiles) is meant to be neutral in terms of better-worse, there is an inherent danger that the profile of the research-intense university is always regarded as superior to other profiles. For some indicators it is difficult to tell if they say something about horizontal or vertical diversity. If, for instance, we look at the number of incoming and outgoing students, is this just describing the relevance of internationalization for a university or does it say anything about performance because high levels of internationalization are seen as quality criteria? Is the measurement of the number of patents information about engagement in technology transfer or a performance indicator? In general, classifications will imply more input-oriented aspects and rankings more output-oriented indicators, but the borderlines are blurred. This makes it difficult to use the different transparency instruments in a coherent way. There is some concern that classifications might come as "rankings in disguise".

Classifications are expensive and reliability of data is a problem. Empirically based classification systems, in particular multi-dimensional systems, depend on the collection and existence of a substantial number of data (in contrast legal classifications are cheap as they only have to specify certain criteria which define a particular type of institution). Data has to be provided in a comparable form. In a heterogeneous HE system this is not always easy because of a lack of common controlling standards. Sometimes there are doubts about the reliability of self-reported data.

HEI fear that classifications "put them into a box". Classifications run the risk of establishing once-and-forever typologies of institutions by defining fixed types of institutions ("the research university", "the community college", "the regional university for undergraduates"). In reality a number of institutions may perform on the edges of those types combining elements from different profiles. In addition, a classification may impede changes in the profile and strategy of institutions if they cannot leave "the box". This concern is closely linked to the typology approach and does not occur with the same intensity in the case of mapping.

Classifications are static. A classification represents a structure at a certain point in time. But profiles of HEI develop dynamically; static classifications might block such developments and endanger the flexibility of institutional diversity.

Classifications could create rigidity. If a classification develops into a static typology and if the state treats each type with specific funding and steering approaches the classification might hamper diversity instead of promoting it. Positioning as a certain type within a typology could lead to a self-fulfilling prophecy, raising the borders and lowering mobility between the types.

The discussion of U-Map in the next section will address these potential classification problems. In particular the danger of being put "into a box" and creating rigidity is avoided by using a flexible, user-driven mapping approach and the cost issue is addressed by "pre-filling" (see below). The empirical approach of U-Map allows a dynamic analysis of a change in profiles. The distinction between indicators of horizontal and vertical diversity could be ensured by directly relating classification to ranking in an integrated transparency tool.

European classification: U-Map

The objectives of classification listed above are the starting point for the development of classification models. In Europe the initiative for a classification started in a top-down approach related to the emergence of a European Higher Education Area as promoted by the Bologna Process. The European Commission, while not being the "owner" of the Bologna process, initiated a classification project called U-Map which leads to a classification tool (www.u-map.eu). U-Map was developed by an international consortium with the lead of the Center for Higher Education Policy Studies (CHEPS), Netherlands. In three subsequent projects the instrument was developed, tested and refined. Now it is adopted by a number of national governments in Europe and is about to be implemented in these countries by CHEPS.

Model and indicators

U-Map is an instrument to classify higher education institutions and to map the European higher education landscape; and it is an instrument that allows the various stakeholders to be active users of the classification so that they can decide for themselves on the elements of the multi-dimensional classification that are important to them. There are no fixed "types" of universities; the classification results from a user-driven combination of features (mapping).

In order to guarantee an instrument to be able to map diversity the design principles of U-Map are:

- The classification should be based on (reliable and verifiable) empirical data (rather than on legal regulations).
- The classification should be based on a multi-actor and multi-dimensional perspective. The relevance of the various dimensions and indicators applied in the classification should reflect the diversity of views of various stakeholders.

- The classification should be non-hierarchical.
- The classification should be open for all European HEI and all profiles.
- The classification should be descriptive and not prescriptive.
- The classification should use as much existing data as possible in order to minimize the burden of institutional data collection.

U-Map refers to six dimensions of institutional profiles, each of them measured by a number of indicators:[1]

- Dimension: Teaching and learning profile
  - ✓ Orientation of degrees.
  - ✓ Subject areas covered.
  - ✓ Degree level focus.
  - ✓ Expenditure on teaching.

- Dimension: Student profile
  - ✓ Mature or adult learners.
  - ✓ Students enrolled (headcount).
  - ✓ Part-time students.
  - ✓ Students enrolled in distance learning programs.

- Dimension: Research involvement
  - ✓ Peer reviewed academic publications.
  - ✓ Doctorate production.
  - ✓ Expenditure on research.

- Dimension: Regional engagement
  - ✓ First year bachelor students from the region.
  - ✓ Importance of local/regional income sources.
  - ✓ Graduates working in the region.

- Dimension: Involvement in knowledge exchange
  - ✓ Cultural activities.
  - ✓ Income from knowledge exchange activities.
  - ✓ Patent applications filed.
  - ✓ Startup firms.

- Dimension: International orientation
  - ✓ Foreign degree-seeking students.
  - ✓ Importance of international sources of income.
  - ✓ Students sent out in European and other international exchange programs.
  - ✓ Incoming students in European and other international exchange programs.
  - ✓ Non-national teaching and research staff.

The indicators were identified by applying a number of quality criteria, such as validity, relevance and availability. The overall activity profile of a university is illustrated by the "sunburst figure".

[1] See http://u-map.eu/U-Map%20dimensions%20and%20indicators%20overview.pdf

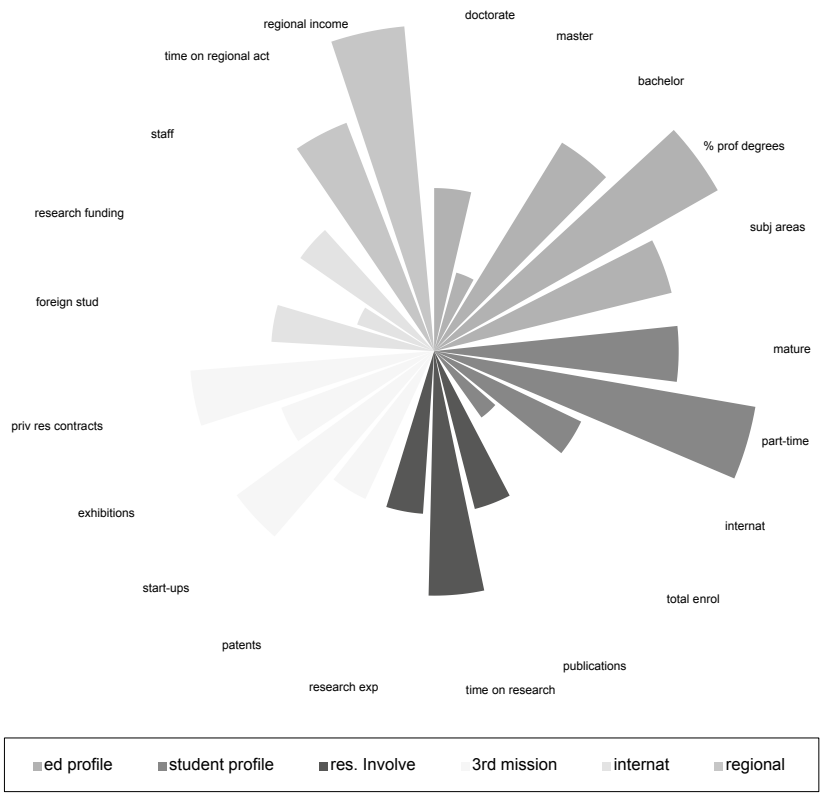

Figure 2. Example for an activity profile of a university.

The six different dimensions are illustrated by colors; each ray stands for an indicator which is rated in four groups. Quartiles are calculated for each indicator, with the ray representing the positioning of the respective indicator in one of the quartiles. The lowest quartile means a short ray, the highest a long ray (the four categories could be explained as none – some – substantial – major).

For instance the Figure 2 shows a regionally-oriented university with market-oriented transfer activities, a local but diverse student body, low internationality and a focus on undergraduates. An internationally-oriented research university with postgraduate focus would look completely different. The sunburst figure makes a university profile easily graspable. Adequate interpretation of the figure is important: If, for instance, all rays except one dimension are short, this does not mean that this is an institution of low quality, it merely means that this HEI focuses narrowly on one of the dimensions described. Many long rays are not better than just a few as we still are in the context of horizontal diversity. The profile is an activity profile, not a performance profile. The example shows that there is some danger of misinterpretation of the figure if users start thinking "the longer the better".

The European U-Map tool (van Vught, 2009) is in a less advantageous position than the Carnegie Foundation, as there is no European database available at the level of higher education and research institutions. U-Map has put great effort into defining indicators and collecting the necessary information from several sources. However, national statistics did not often prove rich enough for the information requirements, so an ad hoc collection of information from higher education and research institutions has been the main data source in U-Map until now.

U-Map has also tested 'pre-filled' higher education institution questionnaires, that is, the data available from national public sources are entered into the questionnaires sent to higher education institutions for data gathering. This should reduce the effort for higher education institutions and give them the opportunity to verify the 'pre-filled' data as well. The U-Map test with 'pre-filling' based on national data sources in Norway appeared to be successful and resulted in a substantial decrease of the burden to

gather data at the level of higher education institutions. Pre-filling could help to implement the same tool in different countries: in the end the indicators should be the same for all, but data collection could be adapted efficiently to the national availability of data.

As the "sunburst figure" already showed, an important aspect of classifications is their presentation mode. U-Map is aimed at being a multi-dimensional, user-driven tool; it is intended to enable users to pick out aspects of horizontal diversity that are relevant to them instead of defining a fixed "type" of HEI. To support this, a flexible web tool with two elements has been implemented: the "Profile Finder", where users can click on the indicators (e.g. high expenditure for teaching, low percentage of adult learners, high share of foreign students, etc.) and identify the HEI which are close to the profile they are interested in, and the "Profile Viewer", where the overall profile of an HEI is visualized by the sunburst figure.

The indicators used were mentioned above; behind all these indicators there is a clear concept for measurement. Just to mention a few examples:

- Mature students: number of students aged 30 years or older (headcount, all levels) as a percentage of the total number of students enrolled;
- Doctorate production: total number of doctorates awarded per number of full-time equivalent academic staff;
- Startup firms: average number of startup firms created over the last 3 years per 1000 full-time equivalent academic staff;
- Income from knowledge exchange activities: license income, income from licensing agreements, contracts with business and public sector organizations, income from copyrighted products and donations as percentage of total income;
- International academic staff: number of staff of a foreign nationality employed by the institution or working on an exchange basis.

U-Map roll-out strategy and experiences from national projects

A major lesson learnt during the first phase of developing the instrument was the importance of intensive stakeholder consultations. A classification that is meant to serve the needs of stakeholders requires indicators that are relevant to stakeholders and which have to be identified through stakeholder consultations. The logical steps of the consultation process are:

- Identification of HEI to be included in the classification,
- Development of relevant dimensions,
- Identification of indicators to measure the relevant dimensions,
- Determination of the position of the HEI for each dimension and indicator.

In fact the development of U-Map did not take place in such a linear manner, but more as an iterative process. Typically the design process often looked for a balance between reduction of information complexity and sufficient representation of diversity. For instance, the project started with 14 dimensions, but ended up with the 6 mentioned above. The iterative process included workshops, surveys, case studies, discussions in a web forum, and so forth.

After the development of the tool several national projects on the implementation of U-Map have begun since 2010 in the following countries:

- The Netherlands and Flanders,
- Portugal,
- Estonia,
- The Nordic Countries (Norway, Finland, Sweden, Denmark).

In all of the countries the decision to take part came from the governments, and implementation is being realized with the HEI. Participation rates differ in the various countries. Despite this, individual institutions from other countries are encouraged to enter the U-Map database voluntarily.

The typical implementation strategy in the countries used the following steps:

- It started with a kick-off meeting bringing together HEI representatives and stakeholders to clarify the intention of U-Map, to communicate the benefits of the mapping approach and to provide all necessary information.
- Then the opportunities for "pre-filling" were explored, existing data was collected and inserted into the questionnaires as far as was possible.
- A technical workshop with the HEI clarified the definitions and data concepts, led to a glossary and a clear protocol to deal with the U-Map data.
- The (online) data collection was realized.
- In an intensive phase of data verification, the data delivered was checked and tested (for instance by analyzing outliers, inconsistencies, unexpected results), questions were put to the institutions.
- HEI re-submitted data.
- The profiles were generated.
- A dissemination seminar presented the outcomes, experiences from the process, and feedback on lessons learnt. Discussions were held on whether the U-Map profile also allowed the identification of a typology of HEI for the respective country.

The pilot studies in the countries revealed some interesting insights:

- In general the implementation of U-Map in different countries works, the indicators are regarded as relevant, and the resulting institutional profiles are plausible. In most of the cases the outcome of the classification is not a surprise to the experts.
- Particularly regarding the research dimensions, the distinction between a vertical ranking and the indicators used in U-Map is difficult. There were a plenty of discussions on whether this dimension should be dropped because of this problem. But then research as a core function of universities would not have been included sufficiently. The question remains as to whether the distinction between classification and ranking for this dimension could become clearer.
- Another methodological issue is the representation of indicator results in four groups (illustrated by the length of rays in the sunburst figure). Since this is a relative method, the grouping depends on universities entering or leaving the classification. In countries with limited participation this could lead to a shift in positioning because of the dynamics to enter (or leave) the system. It seems to be rather important that the numerical results for the indicators also become transparent.
- In the workshops held in the countries, stakeholders were asked to use the U-Map outcomes to create a typology of HEI. When different groups worked on this task they always produced different incompatible typologies. This was seen as an important argument in favor of the flexible, user-driven and multi-dimensional mapping approach instead of a fixed typology.
- Great efforts have to be made in order to prepare data collection by providing clear data definitions and operationalizations. This requires intensive discussions with the experts from the universities. The reliability of self-reported data is still a controversial issue.
- In Estonia for instance the U-Map project led to a more intensive discussion about profiles and more awareness about this issue. It also induced a general discussion about the nationwide use of indicators in HE, which might be a typical effect for countries with no elaborate national data system.
- The message that the dimensions and indicators are not set in stone, but are adaptive to future developments is important for the acceptance of an empirical classification.

Classification and HE policies

Classifications –just like as any system of assessment of higher education institutions–are intended to be relevant, that is, they are aimed at having an impact on stakeholders and users. Yet, different instruments of assessment in higher education have different purposes and address different (main) target groups. Their methodologies and indicators should refer to their specific purposes and target groups. Although they may share a certain number of indicators, information and indicators that may be relevant for prospective students to help them make an informed choice of university should be different from information systems which are used by policymakers. To give an example: while measures of efficiency (in terms of use of public funding) are highly relevant for policymakers, this is not a major issue for most students (and hence is not included in most university rankings that address students as major users).

A multi-dimensional, flexible classification following the mapping approach, such as U-Map, is first of all made for a variety of stakeholders to support their decisions:

- It can help universities to start a process of self-reflection: Does the university really have the profile that it wants to have? And if there is also a multi-dimensional ranking, do the strengths and weaknesses measured in rankings correspond to the strategic positioning of the university?
- It can help universities to find benchmarking partners.
- It can help students compare their individual preferences with the profile of a university. A student who is not at all interested in an international context would most likely not choose a university which focuses on international exchange.
- It can help the private sector to find university partners with a profile they are interested in.

The question is how the instrument should be used by governments. Regarding the introduction of U-Map, the main focus of the governments is the general idea of transparency. But there is also a discussion about connecting the classification to policies and steering instruments:

- By means of classifications governments can analyze whether the real profile of a university is in line with its legal status. Does a university really invest enough in research? Is a university of applied sciences really transfer-oriented? The question, if a certain legal status could be maintained, might emerge.
- Governments could analyze whether, taking the HE system as a whole into account, all relevant dimensions are sufficiently covered. The tool could clarify whether there is institutional monoculture or diversity and if there are gaps regarding specific dimensions. The governments could react to the situation for instance by establishing new institutions or reducing existing ones, or trying to influence them to adapt their profiles to close gaps.
- Classifications could determine funding decisions. There could be links between the profile documented in the classification and funding: For instance only certain profiles might be eligible for certain funding streams or formula funding could be applied with specific indicators within certain types.
- Classification could direct steering instruments, such as performance indicator systems or quality assurance. It seems to be reasonable to adapt performance measurement to the profile of a university; for a research-intensive university a stronger focus on research performance indicators is plausible. And if the focus of quality control in quality management systems also adapts to the profile of a university this would help to ensure quality in important dimensions with limited cost.

How to deal with these opportunities is a difficult question. Governments should be careful in using classifications for steering. The overall analysis of the system is surely a desirable use. It could lead to funding instruments investing money in programs to stimulate neglected dimensions. But it is not a sufficient instrument to decide on the award or loss of a certain legal status. Furthermore, classifications could be an information input for political decisions, but should not directly lead to the decision. Funding decisions, as well as policies to direct the future development of higher education systems, have to be strategic and they have to take into account strategic preferences for future developments. This cannot be provided by quantitative indicator systems alone which –in contrast to in-depth evaluations–cannot give causal explanations of their findings. A direct link from classification to funding decisions should not be made. The same holds for rankings: universities with weak performance could need more money instead of starting a vicious circle of cutting funding and subsequently further falls in quality, which lead to more financial cuts. Indicators cannot replace discretionary decisions.

The concern about being "put into a box" was explained above. The danger of rigidities instead of flexibility and self-fulfilling prophecies would dramatically increase if funding took a typology into account. Of course a government could have a priority for certain profiles leading to higher funding for them. If for instance a government has high interest in promoting internationally-oriented universities it could support this with financial incentives. But why should this government define the type of "international university" and throw all the money at them? Implementing system-wide formula funding with internationalization indicators would still lead to favorable financial outcomes for universities with international profiles, but would not exclude other universities from the incentive and would avoid blockades for universities trying to enter the top group of internationalization.

Most German states use the system of target agreements to negotiate state budgets with the universities.

But they usually do this based on poor quantifiable information. A classification could be a good input for the negotiation process because it gives information about the positioning of the university within the HE system. So when starting negotiations between the ministry and university it would be a good idea to put the classification information on the table. But the final agreed performance targets should still be negotiated and not automatically determined by the classification.

A certain link between the design of steering instruments and profiles is recommendable. If, for instance, the student profile shows a high percentage of mature and part-time students, quality assurance should result in more effort being put into specific measures to promote quality for this student group. And in this example the indicator of length of studies is, for instance, not very useful as a performance indicator, since part-time studies require flexibility in study duration. The application of steering instruments should always remain flexible, avoiding the danger of rigidities mentioned above.

There are also steering instruments which may not easily be related to classifications. A classification might not say anything about minimum standards for institutional accreditation, as it is an instrument of horizontal diversity. There also seems to be no plausible way to link it to student funding: no student should be excluded from student support systems because they study at a university with a specific profile revealed by a classification.

The link between classification and ranking: U-Multirank

As outlined above we see classification and ranking as two complementary instruments to create transparency about higher education referring to different aspects of diversity: horizontal vs. vertical. Rankings should compare comparable units. With regard to higher education institutions this refers to institutional profiles and structures. It is obvious that it does not make much sense to compare Oxford University to a small regional teaching-only institution offering undergraduate education, or to compare MIT to a music conservatory. From a ranking perspective U-Map (and classification in general) is the tool to identify subsets of institutions (to distinguish apples from oranges) which can be compared in a meaningful way in the ranking. Based on this logic there have to be separate rankings for different institutional profiles (one ranking for apples, one ranking for oranges). From a ranking perspective this means that the indicators used in the classification should measure institutional profiles (in a neutral non-hierarchical sense) rather than performances, which are measured by the ranking. The Figure 3 shows the integrated process of classification and ranking.

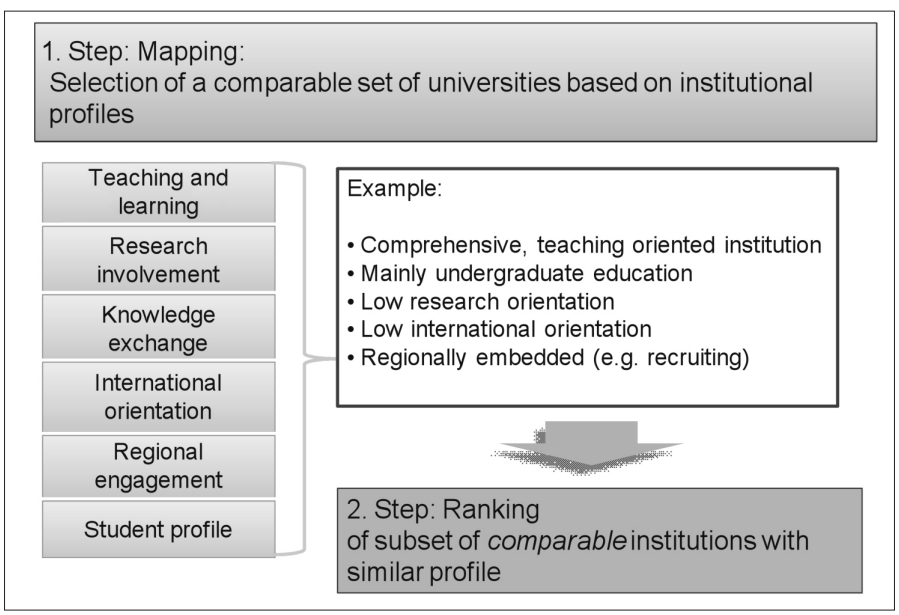

Figure 3. Two-step process of mapping and ranking in the U-Multirank system.

The ranking instrument related to U-Map is U-Multirank (www.u-multirank.eu). U-Multirank was developed in a feasibility study initiated by the European Commission by an international consortium led by the Centre for Higher Education (CHE) and CHEPS. The basic construction of U-Multirank has much in common with the German CHE Ranking, published for German-speaking countries and the Netherlands. The design principles of U-Multirank are in line with the model of U-Map:

- U-Multirank is multi-dimensional and user-driven. This implies that the different mission aspects of higher education institutions are addressed in the dimensions and indicators of the instrument (teaching and learning, research, innovation, community outreach, internationalization, etc.). This is very close to U-Map, but now represents performance criteria with a better-worse implication. U-Multirank does not aggregate individual indicators into an overall composite indicator (which is what all other global rankings do). Different users have different preferences and priorities in their decision making process. At the same time there are neither theoretical nor empirical reasons to assign particular fixed weights to individual indicators. The decision about the relevance of indicators should be left to the users of the ranking. They may choose from a range of available indicators according to their own preferences and produce their own ranking.
- U-Multirank is stakeholder-oriented. The instrument is relevant for stakeholders. This implies that categories of stakeholders are identified (students, researchers, presidents, policymakers, employers) and that their views on the usefulness and practicability of the instrument play a major role in deciding on the relevance and applicability of the dimensions and indicators.
- U-Multirank offers multi-level and multi-perspective information. U-Multirank combines indicators on whole institutions, which are relevant to some stakeholders (e.g. rectors) and field-based rankings which are relevant to most users of rankings (especially students). U-Multirank provides performance indicators from a number of perspectives: facts from different data sources (e.g. self-reported data, patent data, bibliometric data), as well as indicators from a student satisfaction survey.
- U-Multirank will not produce league tables. Instead it will rank universities or faculties–similar to the German CHE ranking–into a number of rank groups (e.g. top, middle, bottom) on each indicator. Looking at existing rankings we see that league tables tend to exaggerate differences between universities. In many cases small differences in the scores of indicators lead to big differences in league tables. League tables give false impressions of exactness ("number 123 is better than number 131") that do not pay sufficient attention to data quality.
- The instrument is flexible, suggesting a "learning capacity" of the instrument. This learning capacity will have to be twofold. On the one hand it must allow institutions and programs to "move" through the instrument over time, and on the other hand imply flexibility in the selection of dimensions and indicators, relating to changes in higher education systems.

The instrument adheres to the "Berlin Principles on Ranking of Higher Education Institutions" (Institute for Higher Education Policy, 2006), which imply the combination of information sources, sensitivity for contextual conditions of institutions and a user-oriented perspective, among other things.

From 2009 to 2011 a feasibility study was conducted to test the methodology and data collection instruments and processes, and to test the indicators empirically. This included a pilot study covering 150 institutions representing a wide range of institutional profiles from all over the world. The feasibility study was done at the institutional and the field level; the pilot fields were business and engineering.

The general result was that the model and the methodology proved to be feasible, as well as most indicators. Problems were found in the measurement of knowledge transfer activities and employability issues, as well as in regional engagement of universities. On those dimensions further refinement of indicators will have to be done. The willingness of HEI to take part in the pilot test was high, except in the US and China, where specific reasons led to reservations about participation.

In December 2012 a broad European consortium led by CHE and CHEPS will start the implementation of U-Multirank. The European Commission is funding a two year project (with another two year option) to further develop the instruments and to publish a first ranking in early 2014. U-Multirank will start with a sample of at least 500 institutions and four fields (business, mechanical and electrical engineering, physics). In the following years U-Multirank will be upscaled in terms of the number of institutions included and the range of fields. Part of the next phase will be the development of a business model for sustainable long-term implementation of U-Multirank.

Although the focus of U-Multirank in the first few years will actually probably be on European higher education institutions, the aim is to provide a global ranking. Hence U-Multirank is also open to universities from other regions of the world. In 2013 the U-Multirank consortium will also approach Chilean universities to take part in this system.

Discussion and perspectives

The analysis has shown the potentials of classifications to promote the diversity of higher education systems and to serve various stakeholder needs. But there are challenges ahead: Recent discussions in different countries reveal the intention to create a typology with research-intensive institutions as the "top group", separated from more teaching-oriented institutions. If this is the way forward for classifications there is the danger of fostering rigidity and vertical stratification instead of diversity.

The major challenge of systems such as U-Map and U-Multirank is the need to collect data from the institutions, due to a lack of international availability of comparable data. This leads to workload in the universities, and universities will only accept that workload if the benefits they perceive outweigh the costs (as long as it is not governments that decide on the national system). The realization of U-Map will be a continuous struggle to convince universities of the usefulness of the system.

Another issue to be solved is how to relate a national classification (and also a ranking) with similar international instruments. Developments of classifications will continue on both levels, and unrelated systems may be inefficient and endanger transparency (because it will become more difficult to understand a completely different position on the two levels). The recommendation would be to realize a certain overlap between national systems and U-Multirank, creating the opportunity to make international comparisons and at the same time integrate country-specific issues. Such a link could lead to an efficient combination.

An interesting field for future research would be the real effects of classifications: Did the implementation of a classification create profiling dynamics? Do they really influence the perception of a university? Do stakeholders really perceive horizontal diversity? What effects result from government use? At the moment many of the expectations and fears are plausible, but not sufficiently supported by results of empirical research on the effects.

The original article was received on December 19th, 2012
The revised article was received on February 7th, 2013
The article was accepted on February 14th, 2013

References

Birnbaum, R. (1983). *Maintaining diversity in higher education*. San Francisco, CA: Jossey-Bass.

Bowker, G. C., & Star, S. L. (2000). *Sorting things out: Classifications and its consequences*. San Francisco, CA: Jossey-Bass.

CHEPS (2008). *Mapping diversity. Developing a European classification of higher education insitutions*. Enschede: CHEPS, University of Twente.

European Commission (2003). *The role of universities in the europe of knowledge*. COM, 58.

European Commission (2005). *Mobilising the brainpower of Europe: Enabling universities to make their full contribution to the Lisbon Strategy*. COM, 152, Brussels.

Institute for Higher Education Policy (2006). *Berlin principles on ranking of higher education institutions*. Washington, D.C.: Institute for Higher Education Policy. Retrieved from http://www.ihep.org/assets/files/publications/a-f/BerlinPrinciplesRanking.pdf

Marginson, S., & van der Wende, M. (2007). *Globalisation and higher education*. Education Working Papers, No. 8, OECD Publishing. doi:10.1787/173831738240

Rauhvargers, A. (2011). *Global university rankings and their impact*. Brussels: EUA.

Rinia, E. J., van Leeuwen, T. N., van Vuren, H. G., & van Raan, A. F. J. (1998). Comparative analysis of a set of bibliometric indicators and central peer review criteria. Evaluation of condensed matter physics in the Netherlands. *Research Policy, 27*(1), 95-107. doi: 10.1016/S0048-7333(98)00026-2

Schwarz, S., & Westerheijden, D. F. (Eds.). (2004). *Accreditation and evaluation in the European higher education area*. Dordrecht: Kluwer Academic Publishers.

Teichler, U. (2007). *Higher education systems, conceptual frameworks, comparative perspectives, empirical findings*. Rotterdam: Sense.

The Bergen Communiqué (2005). *The European Higher Education Area - Achieving the Goals. Communiqué of the Conference of European Ministers Responsible for Higher Education, Bergen, 19-20 May 2005.* Retrieved from http://www.uniko.ac.at/upload/050520_Bergen_Communique.pdf

The Bologna Declaration (1999). *The European Higher Education Area. Joint Declaration of the European Ministers of Education. Convened in Bologna on the 19th of June 1999*. Retrieved from http://www.ugent.be/nl/univgent/reglementen/internationaal/bologna.pdf

Usher, A., & Savino, M. (2006). *A world of difference: A global survey of university league tables.* Retrieved from http://www.educationalpolicy.org/pdf/world-of-difference-200602162.pdf

Van Vught, F. (2008). Mission diversity and reputation in higher education. *Higher Education Policy*, *21*(2), 151–174. doi: 10.1057/hep.2008.5

Van Vught, F. (Ed.). (2009). *Mapping the higher education landscape: Towards a European classification of higher education*. Dordrecht: Springer.

Van Vught, F., & Ziegele, F. (Eds.). (2012). *Multidimensional Ranking. The design and development of U-Multirank.* Dordrecht: Springer.