U-Map

The European
Classification of
Higher Education
Institutions

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Rationale

The rationale for developing a European classification of higher education institutions lies in the desire to better understand and use diversity as an important basis for the further development of European higher education and research systems. In order to reap the full benefits of increasing diversity, a tool is needed to describe this diversity. This is the aim of the European higher education classification - an instrument for mapping the European higher education landscape which enables various groups of stakeholders to comprehend the diverse institutional missions and profiles of European higher education institutions. This will contribute to the creation of a stronger profile for European higher education on a global stage and to the realisation of the goals of the Lisbon strategy and the Bologna process.

The development of U-Map

We have called our classification U-Map. The title U-Map is intended to indicate two things: it is an instrument to classify universities and to map the European university landscape; and it is an instrument that allows the various stakeholders as active users of the classification to decide for themselves on the elements of the multidimensional classification that are important to them.

This is the third and final report of a multi-year research project on the development of a European classification of higher education institutions funded by the European Commission. The first report Institutional Profiles (van Vught Bartelse et al. 2005) was published in August 2005 and included a set of principles for designing a European higher education classification as well as a first draft of the components of such a classification. The second report Mapping Diversity (van Vught Kaiser et al. 2008) was published in October 2008 and reported on the extensive testing of the draft classification and the changes made in a revised second draft. This final report contains a firm proposal for a multidimensional and user-driven European classification of higher education institutions and an organisational model for its implementation.

Classifications and rankings

Global rankings intend to judge higher education institutions and they do so largely by focusing on research performance. They give only limited regard to disciplinary, language and institutional diversity. In addition global rankings offer composite institu-tional indicators on the basis of which league tables are constructed. Classifications are intended to do something very different. Rather than ignoring or limiting diversity, these instruments intend to make diversity transparent. Classifications are tools that try to describe and visualise the diversity of institutional profiles.

Stakeholder involvement

Stakeholders have played an active part over the past five years in the process of designing this classification of higher education institutions. We have established close ties to a wide range of partners, encompassing individual higher education institutions as well as students' associations, employers' organisations, researchers, and policy making bodies at national and European levels. Consultative mechanisms (such as a Stakeholder Group and an Advisory Board) and special information and communication tools were utilised to ensure a regular flow of information and ideas between the project team and the stakeholders. Concerns, of which there were many, and advice, which was abundant, were taken seriously, thus creating a maximum of acceptance and legitimacy for the European classification. Without the active support of many stakeholders U-Map would not have been designed.

Design process

Analytically five basic steps can be distinguished in the design process. The first step was to agree on which entities are to be classified. U-Map is focused on individual European higher education organisations that are recognized as separate and legally identifiable organisations in their own national systems. The next step was to identify the relevant dimensions in terms of which institutions will be classified and grouped. We include six dimensions:
• Teaching and learning profile
• Student profile
• Research involvement
• Involvement in knowledge exchange
• International orientation
• Regional engagement

The third step was to identify and define valid and feasible indicators to measure the different dimensions. This report outlines and defines the indicators to be used for each dimension. Once the indicators are defined, empirical information can be collected. In this fourth step, the reliability and timeliness of the data needs to be checked. International databases

comprising comparable data at the institutional level do not exist or cover only a very limited part of the data needed. In Europe the prime data provider will be higher education institutions through country-specific questionnaires that can be pre-filled with the information that is available from national databases. The questionnaires have been piloted with more than fifty institutions while the concept of pre-filling has been tested in the case of the Norwegian higher education system. Several other European higher education systems have shown interest in a similar process.

The final step is to determine the position of the institutions on the different dimensions. Based on the empirical information institutions are placed in the identified classes or cells of the various indicators. In this report we outline the classes that will be used for each of the 23 U-Map indicators.

Figure 1: An overview of U-Map dimensions and indicators

Teaching and learning profile	Student profile	Research involvement
• Degree level focus • Range of subjects • Orientation of degrees • Expenditure on teaching	• Mature students • Part-time students • Distance learning students • Size of student body	• Peer reviewed publications • Doctorate production • Expenditure on research
Involvement in knowledge exchange	International orientation	Regional engagement
• Start-up firms • Patent applications filed • Cultural activities • Income from knowledge exchange activities	• Foreign degree seeking students • Incoming students in international exchange programmes • Students sent out in international exchange programmes • International academic staff • The importance of international sources of income in the overall budget of the institution	• Graduates working in the region • First year bachelor students from the region • Importance of local/regional income sources

Institutional profiles

A multidimensional classification system is intended to provide a series of lenses through which important similarities and differences among higher education institutions can be described and compared. U-Map does this by providing a framework for creating and analysing 'institutional profiles'. An institutional profile is the set of positions of a higher education institution on the dimensions and indicators of the classification. Institutional profiles are important and useful instruments for higher education institutions: for internal strategy development, for external benchmarking, for developing inter-institutional cooperation, and for more effective communication. The classification offers a variety of ways of analysing institutional profiles. Stakeholders can use the classification tool for their own specific purposes. They can apply U-Map to compare different institutions on one or more dimensions - they are able to select the institutional profiles that best serve their needs and to identify the specific institutions that they are interested in.

U-Map on-line tools

U-Map provides two major on-line tools to enable institutions and stakeholders to utilise the classification to maximum effect. The Profile finder is an instrument to identify specific subsets of higher education institutions within the whole set of higher education institutions included in the classification. Only those higher education institutions that match the selection criteria set by the user are included in the subset. The Profile viewer provides a visual representation of the profile of an institution, or comparative information on institutions in a selected subset, in an 'eye-catching' way.

Figure 2: The Profile viewer
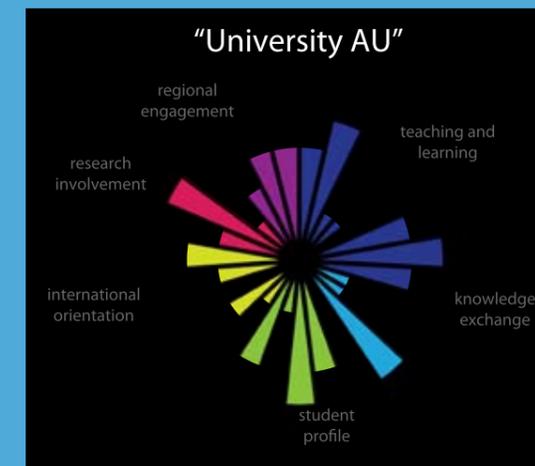
We have engineered a sunburst chart into a web-based tool. The six colours of the sunburst represent the six dimensions of U-Map while the segments represent the positions of the institution on the indicators. Each indicator is a segment (a 'ray of sun') in its own dimension and thus has the colour of that dimension. The U-Map tools can be found on the U-Map website (www.u-map.eu). The Profile finder and the Profile viewer are the operational tools of the European higher education classification.

Organisational implementation

In close consultation with stakeholders we developed five criteria as essential requirements for the organisational implementation of the classification: inclusiveness, independence, professionalism, sustainability and legitimacy. We propose a non-governmental and not-for-profit organisation that operates independently from its funding constituencies and stakeholders. Funding could come from public or private sources as long as independence from these sources and sustainability is guaranteed. The operating organisation would have a Board consisting of independent members which would be advised by a Stakeholder Advisory Council and a Scientific Advisory Committee.

Our assumption is that in the long-term the classification will be funded on the basis of system and/or institutional "subscriptions". The major implementation and funding challenge is to cushion early adopters against the heavy burden of the fixed costs of the classification being spread over a limited number of systems and institutions in the initial years of implementation. The optimal method for implementing the classification would be one where a group of European Foundations agrees to fund the start-up costs over the first three years and where institutions or Ministries fund the relatively low annual costs of participating in the classification after the three year start-up period. Both the level of initial start-up funding required and the longer term level of institutional contributions are relatively modest for a project of this scope and of this importance for European higher education.

With the identification of dimensions and indicators, the establishment of procedures for data collection, the development of the web-based tools, and the outline of an organisational model for its implementation, U-Map - the European multidimensional, user driven, higher education classification - now exists in a first and potentially broadly applicable version.

Intro

This is the third and final report of a multi-year research project on the development of a European classification of higher education institutions.

The first report 'Institutional Profiles' (van Vught, Bartelse et al. 2005) was published in August 2005 and included a set of principles for designing a European higher education classification as well as a first draft of the components of such a classification. Both were the result of an elaborate process of consultation with stakeholders.

The second report 'Mapping Diversity' (van Vught, Kaiser et al. 2008) was published in October 2008 and addressed the outcomes of the second phase of the project. It discussed the extensive testing of the draft classification and presented an adapted second draft. Once again a wide group of stakeholders participated in this second phase of the project.

This third and final report 'U-Map' evaluates and fine-tunes the components of the classification. It also offers two on-line classification tools and develops an organisational model for the implementation of the classification. In this last phase of the project the elaborate process of stakeholder consultation that has been a hallmark of the project since its inception in 2005 has continued. The major output of the project is a firm proposal for a multidimensional and user-driven European classification of higher education institutions. The finalisation of this classification instrument is an important step in creating greater transparency about the rich diversity of the European higher education landscape. The classification will contribute to the creation of a stronger profile for European higher education on a global stage and to the realisation of the goals of the Lisbon strategy and the Bologna process.

The project on developing a European higher education classification has been undertaken by the Center for Higher Education Policy Studies (CHEPS), University of Twente, the Netherlands in partnership with several other organisations. The following persons have participated as members of the research team in one or more phases of the project:

Mr. Prof. Dr. Frans van Vught (project leader)	CHEPS
Mr. Frans Kaiser	CHEPS
Mr. Dr. Jeroen Bartelse	CHEPS
Mr. David Bohmert	CHEPS
Mrs. Nadine Burquel	ESMU
Mr. Jindra Divis	Europees Platform
Mr. Jon File	CHEPS
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Mrs. Saskia Hansen	University of Strathclyde
Mr. Prof. Dr. Jeroen Huisman	University of Bath
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Mrs. Prof. Dr. Astrid Laegreid	NTNU
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Mrs. Prof. Dr. Marijk van der Wende	CHEPS
Mr. Dr. Peter West	University of Strathclyde
Mr. Dr. Don Westerheijden	CHEPS

This report is structured in three parts: Part One is the key part of the report and presents the final design of U-Map, the European higher education classification; Part Two situates the classification within contemporary developments in the quality assurance of education and research; Part three gives a detailed account of the process of stakeholder consultation and stakeholder views on the classification. At the end of the report the references and two annexes are included.

Part one

The development, design and implementation of U-Map

1. Concepts and Methods

This chapter introduces the basic idea of U-Map, the European higher education classification. It places this idea in a conceptual framework regarding the diversity of higher education systems, defines the basic characteristics of the classification, presents the methodology used to design the classification, and distinguishes it from the instruments of global ranking. Finally the chapter introduces the concept of 'institutional profiles' as an important outcome of the classification.

1.1 Diversity in higher education systems

The rationale for developing a European classification of higher education institutions lies in the desire to better understand and use diversity in the European higher education landscape. The principle of diversity should be an important basis for the further development of European higher education and research systems.

The higher education literature mentions several forms of diversity that are assumed to be relevant for understanding the dynamics of higher education systems. Birnbaum (1983) indentifies seven categories of diversity:

- systemic diversity refers to differences in institutional type, size and control found within a higher education system;
- structural diversity refers to institutional differences resulting from historical and legal foundations, or differences in the internal division of authority among institutions;
- programmatic diversity relates to the degree level, degree area, comprehensiveness, mission and emphasis of programmes and services pro vided by institutions;
- procedural diversity describes differences in the ways in which teaching, research and/or services are provided by institutions;
- reputational diversity communicates the perceived differences in institutions based on status and prestige;
- constituential diversity alludes to differences in students and other constituents (faculty, administration) in the institutions;
- value and climate diversity is associated with differences in social environment and culture.

For our purposes two distinctions regarding diversity appear to be relevant. A first crucial distinction is between external and internal diversity (Huisman 1995). External (or institutional) diversity refers to differences between institutions; internal diversity to the differences within institutions, particularly the differences in their programmes (of teaching and research). A second important distinction is between vertical and horizontal diversity (Teichler 2007). Vertical diversity refers to differences between higher education institutions in terms of (academic) prestige and reputation while horizontal diversity concerns differences in institutional missions and profiles. The distinction between vertical and horizontal diversity is part of the analysis of external (institutional) diversity.

In this report we focus on institutional and horizontal diversity. Our aim is to design a European higher education classification tool that reflects the variety of missions and profiles of European higher education institutions. The tool will focus on the differences between institutions (institutional diversity) in terms of their missions and profiles (horizontal diversity).

Diversity has been identified in the higher education literature as one of the major factors associated with the positive performance of higher education systems. The following arguments are advanced in favour of institutional diversity (Birnbaum 1983; Huisman 1995). First, it is argued that increased diversity in a higher education system is an important strategy to meet student needs. A more diversified system is better able to offer access to higher education to students with different educational backgrounds and with varied histories of academic achievement. In a diversified system in which the activity profile of higher education institutions varies each student is offered an opportunity to work and compete with students of similar background. Each student has the opportunity to find an educational environment in which their chances for success are realistic.

A second and related argument is that diversity enhances social mobility. By offering different modes of entry into higher education and by providing multiple forms of transfer, a diversified system stimulates upward mobility as well as 'honourable' downward mobility.

A diversified system allows for corrections of errors of choice; it provides extra opportunities for success; it rectifies poor motivation; and it broadens educational horizons.

Third, diversity is seen to meet the needs of the labour market. In modern society an increasing variety of specialisations on the labour market is necessary for economic and social development. A homogeneous higher education system is less able to respond to the diverse needs of the labour market than a diversified system.

A fourth and well-known argument is that diversity allows the crucial combination of élite and mass higher education. Generally speaking, mass systems tend to be more diversified than élite systems as mass systems absorb a more heterogeneous range of students and attempt to respond to a wider range of demands from the labour market. In his famous analysis of mass and élite systems, (Trow 1979) argued that the survival of élite higher education depends on the existence of a comprehensive system of non-élite institutions.

A fifth reason why diversity is an important objective for higher education systems is that diversity increases the level of effectiveness of higher education institutions.

Institutional specialisation allows higher education institutions to focus their attention and energy, and thus achieve higher levels of effectiveness.
Finally, diversity is associated with opportunities for experimenting with innovation. In diversified higher education systems, institutions have the option to assess the viability of innovations introduced by other institutions, without necessarily having to implement these innovations themselves. Diversity offers the possibility of exploring the effects of innovative behaviour without the need for all institutions to implement the innovation at the same time. Diversity permits low-risk experimentation.

These various arguments in favour of institutional diversity indicate that diversity is usually seen as a worthwhile objective for higher education systems. Diversified higher education systems are believed to produce higher levels of client-orientation (both regarding the needs of students and of the labour market), social mobility, effectiveness, flexibility, innovation and stability. More diversified systems, generally speaking, are thought to be 'better' than less diversified systems. And many governments have designed and implemented policies to increase the level of diversity of their higher education systems.

1.2   Diversity and classification

The relevant literature suggests that the institutional diversity of a higher education system increases as a result of a greater variety in the environmental conditions in which it operates (in particular governmental policy contexts) and of a greater variety in the norms and values espoused by the institutions in the system (van Vught 2009). The diversity of European higher education would increase if higher education institutions were enabled to develop and define a variety of activity profiles. Diversity would also increase if Europe's higher education institutions were operating within diverse policy contexts that were supportive of a variety of missions and profiles.

However, in order to reap the full benefits of increasing diversity, a tool is needed to describe this diversity. This is the aim of the European higher education classification - to offer a tool which enables various groups of stakeholders to comprehend the diverse institutional missions and profiles of European higher education institutions. The classification aims to provide relevant and easily accessible information on the institutional

diversity of European higher education systems. The classification is an instrument for mapping the European higher education landscape and the profiles of higher education institutions.

In order to provide relevant information for mapping the European higher education landscape we have designed a classification that will cater to the needs of different stakeholders - students, academic staff, industry, policy-makers and higher education institutions. For this reason, the building of the classification has been a user-oriented process, involving the various groups of stakeholders from the very start of the process (see chapter 5).

Like all analyses, classifications are by definition simplifications of reality. The major challenge when building a classification is to select the most 'relevant' attributes in such a process of simplification. These judgements are of course not value-free. The choices of attributes reflect the interests, needs and positions of those who are involved in creating this tool. Since there is no ob-

jective basis for making the choices, we have tried to involve the various stakeholders fully in the process. A crucial aspect of our work has been to determine who the potential users (stakeholders) are, how they will use the classification, how the classification can best serve their needs, and their preferences in terms of which attributes to include and which to discard.

In Figure 3 we briefly indicate how a classification of higher education institutions may serve the needs of different stakeholders. These indications are the result of a literature review and of extensive discussions with various groups of stakeholders who were part of the project.

Figure 3: Stakeholders' interests in the classification project

Higher education institutions
- Higher education institutions will be better able to develop their missions, to show their profiles to stakeholders and to engage more effectively in partnerships, benchmarking and networking.

Students
- Students will be better able to identify their preferred higher education institutions and make better choices regarding their study programmes and labour market perspectives.

Business and industry
- For business and industry, as well as for other organisations, the classification reveals which types of institutions are of particular interest for them, facilitating easier creation of mutual partnerships and stronger relationships.

Policy-makers
- Policy-makers in governmental and other contexts will benefit from a deeper insight into institutional diversity. National and European policies for higher education cannot be based on a 'one size fits all' approach. Instead, policies need to be attuned to diversity in such a way that they can be made to work most effectively.

Researchers and analysts
- A classification serves as a methodological tool for researchers. It will provide analysts and other experts with more insight into institutional diversity both methodologically and analytically which will assist them in policy analyses, international comparative studies, and institutional benchmarking studies.

1.3   Classifications and typologies

'A classification is a spatial, temporal, or spatio-temporal segmentation of the world' (Bowker and Star 2000, p.10). Or, in simpler terms, classifying is '… the general process of grouping entities by similarity' (Bailey 1994, p.4). Classifying is an activity inextricably related to the human desire to create order out of chaos. The general purpose of a classification is to increase transparency in complex systems, to grasp the diversity within such systems and – consequently – to improve our understanding of phenomena and systems and to support effective communication. Classifications have proven their usefulness in all areas of human life, even in those areas where the unique-

ness of each individual or element of the system is recognised.

Classifications aim to describe similarities and differences. In the literature on classifications, a number of related terms are used, sometimes interchangeably, which can lead to confusion. In order to be explicit about the conceptual approach used in this project we provide a short résumé of the relevant terms.

A classification should be distinguished from a typology. A typology is a conceptual classification. A classification orders empirical cases while a typology

addresses conceptual entities. The cells in a typology represent concepts rather than empirical cases. Taxonomies are a special type of classification generally used in biological sciences in with each cell (taxon) comprises an empirical case.

This project concerns a classification. We have developed a set of dimensions and criteria to allow stakeholders to describe and group empirical cases (higher education institutions) and to understand similarities and differences between these cases. Such groupings of higher education institutions can be created in many different ways. We have designed a multidimensional approach that allows various ways of clustering. This avoids a top-down approach with a predetermined set of categories. Our instrument provides a bottom-up approach to classification, allowing different stakeholders to create their own groupings according to their own priorities.

Internationally several stakeholders are already at-

tempting to understand higher education systems by developing classifications and typologies of institutions. It is important to clearly distinguish between approaches that result from conceptual distinctions and those based on the actual conditions, behaviour and characteristics of institutions. The first category (typologies) is usually government-driven, prescriptive and often defined by law. The best example is the binary systems that exist in many European countries that group higher education institutions into categories that are subsequently treated differently in terms of various policy-instruments (funding, legally defined permissions and prohibitions). The second category (classifications) consists of approaches that analytically categorise institutions on the basis of empirical descriptions of their similarities and differences. The most well known is the Carnegie Classification in the United States. In the next section, we focus on this classification as it provides important lessons for the development of the European higher education classification.

1.4 The US Carnegie classification

The Carnegie classification set the stage in the USA for a continuing debate on the advantages and disadvantages of classifications in higher education. The initial objective of the Carnegie Commission in the early 1970s was to develop a tool to help improve research on higher education. Given the large differences between US higher education institutions, it proved useful to analyse phenomena in fairly homogeneous groups of organisations. The classification was developed as a sampling device which provided various categories of higher education institutions.

Categorising higher education institutions has remained the basic approach of the Carnegie classification. The second edition (Carnegie Commission on Higher Education 1976) distinguished five main categories of institutions: doctoral-granting institutions (subdivided into research universities I, research universities II, doctoral-granting universities I, and doctoral-granting universities II); comprehensive universities and colleges (subdivided into comprehensive universities and colleges I and comprehensive universities and colleges II); liberal arts colleges (subdivided into liberal arts colleges I and liberal arts colleges II); two-year colleges and institutes; and professional schools and other specialised institutions. The qualifications 'I' and 'II' were indicators of size: levels

of federal financial support, number of PhDs awarded and student enrolment.

Over time the classification has gone through several changes, partly technical and partly in the labels used but the backbone of the classification has remained similar: institutions are classified on the basis of their research and teaching objectives, levels of degrees offered, their size and their comprehensiveness.

In 2005 the Carnegie classification was revised comprehensively. The challenge was to build on the achievements of the previous classifications and to improve particular elements. The new classification aims to reveal a range of ways in which colleges and universities resemble or differ from one another. Three major innovations were introduced (McCormick and Zhao 2005). First, instead of one single classification, the new Carnegie classification uses a set of multiple, parallel classifications, thus allowing different dimensions of the US system of universities and colleges to be addressed. These classifications are organised around three fundamental questions: what is taught, who are the students, and what is the setting. The result is a set of six all-inclusive classifications covering the following dimensions: (1) undergraduate instructional programme, (2) graduate instructional programme, (3)

enrolment profile, (4) undergraduate profile, (5) size and setting, and (6) an update of the existing classification. Second, a web-based tool has been developed to enable users to combine classification categories and thus generate subsets of institutions related to their own interests. Third, elective classifications are being developed based on the voluntary participation of institutions. These classifications offer opportunities to map institutions on special characteristics. The first elective classification concerned 'community engagement' and was introduced in December 2006.

The original Carnegie classification started out as an analytical tool for researchers and did not aspire to become the dominant classification for universities and colleges. Nevertheless, the higher education research community and the public at large adopted it as the major transparency instrument in US higher education. It is now used by a wide variety of stakeholders

and for many more purposes than only policy analysis or academic research. In retrospect the introduction of the classification is now seen as 'a great leap forward in describing the diversity of higher education in the United States' and as one of the Carnegie Commission's most influential projects (Douglas 2004, p.37). The 2005 version of the Carnegie classification includes elements that in our opinion are the most appropriate way of dealing with diversity in higher education systems. The introduction of multidimensionality, the web-based tool and the voluntary elective classifications allow stakeholders to make choices about which characteristics of higher education institutions are most relevant to them. This is precisely what makes classifications most valuable: the provision of a tool which enables various groups of stakeholders to create transparency regarding the institutional profiles of higher education institutions.

1.5 The European classification

There is a large body of literature about design and design processes. Generally speaking, designing is seen as a goal-oriented activity in which decisions are made in the face of uncertainty with the objective of creating something new (Asimov 1962; Archer 1965; Jones 1980). We have followed a design process intended to create a new instrument which should allow the descriptive grouping of empirical entities (in our case, higher education institutions). We deliberately applied a design perspective in which social communication and interaction processes play a crucial role. We see the process of design as incorporating the creation of a higher level of consensus among stakeholders with potentially different interests by including opportunities for participants to explore and discuss their views. We adopted an approach in which a user-oriented perspective is crucial and in which meaning can be constructed through direct interchange with the potential users (Bucciarelli 1994; Oudshoorn and Pinch 2003).

The design of the European higher education classification has been based on an analysis of the design principles that appear to have been of crucial importance in the various US Carnegie classifications over the years. In our project these design principles were widely discussed with the various stakeholders and were further developed during a process of consultation. The design principles resulting from this process are described in Figure 4 on the next page.

Generally speaking, designing a classification implies developing a set of grouping criteria to order empirical cases (Bailey 1994). In our view, designing a higher education classification entails developing a set of dimensions (as we have called the grouping criteria) to allow stakeholders (including higher education institutions) to group higher education institutions. Analytically five basic steps can be distinguished in the design process.

The first step is to identify what entities are to be classified. The European higher education classification is focused on individual European higher education organisations. It is aimed at institutions that are oriented towards higher education activities and that are recognized as separate and legally identifiable organisations in their own (national) systems. For higher education institutions this implies that they offer at least one programme that is accredited by a nationally recognised accreditation authority included in the European Quality Assurance Register in Higher Education (EQAR) .

The next step is to identify the relevant and adequate grouping criteria (dimensions). 'The secret to successful classification is the ability to ascertain the key characteristics on which the classification is to be based' (Bailey 1994, p.2). The choice of the dimensions should allow the stakeholders and potential

Figure 4: Design principles for the European higher education classification

The classification should be based on empirical data
There is a conceptual difference between the (legal) distinction of different types of higher education institutions (universities, polytechnics, colleges, hogescholen, Fachhochschulen, Ammattikorkeakoulut) and efforts to categorise different types of institutions on the basis of the actual characteristics of these institutions. In the European classification, higher education institutions will be classified on the basis of empirical data rather than on regulation or policy distinctions.

The classification should be based on a multi-actor and multidimensional perspective
We should employ a multi-stakeholder approach where different characteristics are relevant for classifying higher education institutions in Europe. The relevance of the various dimensions and indicators of the classification should reflect the views of the various stakeholders. We should pursue a multidimensional classification approach, which allows different stakeholders to create their own categories according to their own priorities.

The classification should be non-hierarchical
Classifications can be constructed hierarchically or non-hierarchically. A hierarchical classification implies a rank order of the constituent dimensions of the classification. The European classification should not incorporate hierarchy between dimensions, nor between the categories within a dimension.

The classification should be relevant to all higher education institutions in Europe
The classification should be relevant to all higher education institutions in Europe. However we suggest that only accredited and/or nationally recognised institutions of higher education should be eligible for inclusion in the classification. This implies that the classification should be related to European policy on quality assurance and in particular the European Quality Assurance Register in Higher Education (EQAR).

The classification should be descriptive, not prescriptive
The classification should reflect the actual profile of an institution. It should offer a description of the actual situation of an institution on the dimensions and indicators judged to be relevant by stakeholders, including the institution itself. It should not judge or evaluate institutions on the basis of this information or on the institution's position on any of the dimensions and indicators.

The classification should be based on reliable and verifiable data
Classifications can be based on subjective judgements (of peers, students, etc.) or on more or less objective data. The European classification should be based as much as possible on objective, verifiable and reliable data.

The classification should be parsimonious regarding extra data collection
In terms of data gathering, parsimony is important in terms of the cost and effort of collecting data. The European classification should be designed in such a way that extra data gathering needs are restricted to a minimum.will assist them in policy analyses, international comparative studies, and institutional benchmarking studies.

users of the classification to group the entities in terms of their own interests. The more dimensions that are selected, the more possibilities there are for describing and grouping the entities. This has a downside, however, as a larger number of dimensions also implies that there is less reduction of complexity which results in an instrument that is less manageable. There is no 'objective' standard for the optimal number of dimensions, but 'no more than seven dimensions' is a rule of thumb that is often used.

The dimensions identified are still abstract concepts that need to be translated into measurable terms. The third step is to identify and define the indicators needed to do measure the dimensions. Indicators are quantitative measures that allow the entities to be positioned in terms of the grouping criteria. Again, the views of stakeholders are crucial in the selection process for indicators. The choice of indicators is a vital step as it has an impact on both the validity of the classification and its feasibility. If a classification is built for international comparative use, the definitions used also need to be valid in the various national contexts.

Once the indicators are defined, empirical information — data — can be collected. In this fourth step, the reliability and timeliness of the data to be collected needs to be checked.

The final step is to determine the position of the entities on the dimensions. Based on the empirical information collected in the previous step, the entities are then allocated to the classes or cells of the dimensions. For each dimension, the classes must be identified: cut-off points in the range of indicator scores need to be defined, which requires the development

of algorithms to transform the empirical data into a limited number of classes for each indicator.

Given the user-oriented setting of this project, a sustainable classification needs to meet minimum standards. For this we have distinguished the following orientations (see chapter 2):

• creating and enhancing validity
• creating and enhancing legitimacy
• creating and enhancing feasibility

These three major orientations have played an important role in the actual design process.

The design process presented above as a linear, straightforward process, looks rather different in reality. Due to the fact that the three orientations are interrelated, progress in one orientation will raise new questions for the other orientations, which can lead to an upward spiralling of questions and analyses. The actual design process that resulted in the creation of the European classification of higher education institutions was iterative and interactive and entailed more complexity than the analytical five-step process outlined above. The design of the European higher education classification took place in three project phases over a period of five years (2005-2009). The first phase consisted of the first two steps indicated above (the identification of the entities and the grouping criteria). In the second phase we defined the indicators and developed the methods of data collection. The third phase included a reiteration of the steps relating to the identification of the grouping criteria and the choice of indicators, as well as actual data-collection and an experimental allocation of the entities to the classes of the indicators.

1.6   Dimensions and indicators

We propose a classification of higher education institutions which is made up of 6 dimensions and a set of indicators per dimension (for more details, see chapter 2). We have called our classification U-Map. The title U-Map is intended to indicate two things. On the one hand it suggests that the classification instrument intends to classify universities (a general term used to indicate all types of higher education institutions) and to map the university landscape. On the other hand the name indicates that the various stakeholders are the active users of the classification and can decide for themselves how to select and

apply the various dimensions and indicators in the classification.

In U-Map a dimension reflects a characteristic of higher education institutions along which differences and similarities can be mapped. Each dimension highlights a different aspect of the profile of the institutions. The multidimensional nature of U-Map implies that institutions can be described, grouped and compared in a variety of ways.

Our starting point in developing the dimensions

was the principle that the institutional diversity of a higher education system must be reflected in the relevant characteristics of the classification, while at the same time respecting the need for parsimony. As pointed out earlier, the relevance of the characteristics depends on the subjective interests of stakeholders. Hence, our approach to selecting dimensions has been heuristic. Through an iterative process long-lists of dimensions were discussed with stakeholders and higher education researchers. Next, we tested the relevance of the dimensions through in-depth case studies and both pilot and larger surveys. Detailed reports on the case studies and the outcomes of the surveys can be found in Mapping Diversity (van Vught, Kaiser et al. 2008). We have generated a set of dimensions that, on the one hand, provides ample opportunities for institutions to profile themselves in a variety of ways and, on the other hand, provides different stakeholders with

relevant information on the various higher education institutions in Europe.

The dimensions and indicators of the U-Map classification were selected after extensive consultation with various stakeholders and reflect their views and ambitions. Nevertheless, the dimensions and indicators are not set in stone. The classification is intended to be flexible, not only in the sense that higher education institutions can 'move' on the various dimensions and indicators given developments over time, but also in the sense that the dimensions and indicators themselves can be adapted and expanded. U-Map is intended to cater to the needs of various stakeholders and should allow these needs to have an influence on its development over time. This should be an important element of the role of a Stakeholder Advisory Board in the implementation and organisation of the classification (see chapter 3).

1.7 Data

As a European higher education classification U-Map needs to gather the required data. In the case of the Carnegie classification in the US these data are largely available at the level of the federal government. In 1968 the US federal government established the Higher Education General Information Survey (HEGIS) but this instrument had significant limitations, lumping together a broad range of institutions and hindering careful analyses. HEGIS later became IPEDS (Integrated Postsecondary Education Data System) which has had a major impact on US higher education. Postsecondary institutions wishing to establish or maintain their eligibility for federal student aid programmes must provide a wide range of data to the US Department of Education (USDE) annually. USDE collects the data through a series of surveys which together constitute the IPEDS. Most of the data are raw data on students, staff and finances, with some added performance measures. As with any data system, basic definitions and measures are necessary to collect the data such as what constitutes a full-time or part-time student, and how to categorise finances by activity area (teaching, research, administration and public service).

In European higher education an overall Europe-wide data system does not (yet) exist. The national statistical offices in the various European countries all have their own data systems with more or less

elaborate information on their higher education systems. Although these national data systems overlap, a Europe-wide data system cannot easily be created on the basis of these national data sets. A number of European and international surveys also exist that offer some information on European higher education institutions. However, these surveys are too fragmented and limited to provide a Europe-wide approach. As a consequence much of the data for U-Map will have to be provided by the higher education institutions themselves. The design principle of parsimony requires that the extra burden this creates should be kept to a minimum. (In chapter 2 we report on a pilot test on 'pre-filling' data questionnaires for higher education institutions using national data sources which would substantially limit the data provision burden for institutions.)

Recently the European Commission and EUROSTAT have launched an initiative to support the development of a European higher education and research census. If such a census can be developed an important precondition for 'filling' the European higher education classification with empirical data will have been met.

1.8 Classifications and rankings

Higher education classifications are descriptive tools that allow categorisations and comparisons of higher education institutions on the basis of a set of dimensions and indicators. Classifications are not rankings. In this section we briefly summarise the current discussions regarding worldwide rankings of higher education and research in order to indicate the differences between classification and ranking (van der Wende and Westerheijden 2009).

It is increasingly recognised that although rankings are far from problem-free, they seem to be here to stay. In particular global rankings (see chapter 4) appear to have a great influence on policy-makers at all levels in all countries. On the positive side they encourage decision-makers to think bigger and set the bar higher, especially in regard to research universities. Yet there are major concerns about their conceptual and methodological foundations.

Global rankings tend to concentrate on a few dimensions that are judged to be measurable but create the impression that the rankings relate to the institutions' overall quality. The dimensions that are the main focus of global rankings relate primarily to research productivity, research input and research reputation. Other dimensions are seldom addressed in global rankings.

Global rankings usually aggregate their diverse indicators into a composite overall position by giving particular weights to each indicator. The weights are necessary arbitrary – there are neither theoretical nor empirical arguments for assigning particular weights to individual indicators. The heterogeneity in stakeholders' perspectives is not addressed in the current global rankings: different targets groups and individual users have different priorities and preferences in comparing universities.

Most global rankings provide constructed league tables. Empirical analysis of existing league tables suggests that in many cases small differences in the numerical value of indicators lead to quite substantial differences in league table ranking. Hence league tables tend to exaggerate differences between institutions and take vertical stratification to the extreme. In statistical terms, the league table approach also ignores the existence of standard errors in data.

Largely because of their methodological biases and

shortcomings, existing global rankings do not give sufficient regard to disciplinary, language and institutional diversity. Even if one were to accept the one-dimensional focus on research performance, these rankings show various biases. First, they tend to ignore the fact that publication cultures and modes vary considerably between academic disciplines. A bibliometric concentration on journal articles to assess research performance favours the sciences and medicine in relation to engineering where conference proceeding are a highly relevant mode of publication modes and the humanities where books are crucial research outputs. Secondly, global rankings have a bias in favour of the English language. Because of the dominance of English language journals, research output from non-English speaking countries is undervalued and disciplinary fields that are not globally organized are disfavoured. Thirdly, global rankings appear to reflect a preference for the general model of the 'comprehensive research university' with a variety of academic disciplines and in which academic teaching and basic research are the two basic institutional pillars. Non-university research organisations without a substantial teaching function and higher education institutions without a major engagement in basic research are largely ignored in these rankings.

In summary, global rankings intend to judge higher education institutions and they do so largely by focusing on research performance. They give only limited regard to disciplinary, language and institutional diversity. In addition global rankings offer composite institutional indicators on the basis of which league tables are constructed. Their general approach is to limit diversity in order to create rank-ordered league tables of institutions according to a limited set of performance indicators.

Classifications are intended to do something very different. Rather than ignoring or limiting diversity, these instruments intend to make diversity transparent. Classifications are tools that try to describe and visualise the diversity of institutional profiles. More specifically, as a multidimensional higher education classification, U-Map is intended to create transparency of institutional diversity (on a number of dimensions, not only research involvement) and is designed in such a way that this diversity is not hidden by the creation of composite institutional indicators and institutional league tables.

U-Map is not a ranking tool but a multidimensional classification instrument. It does not ignore or limit diversity but seeks to show its importance. It does not limit the description of the institutional diversity to one dimension or one overall composite indicator but offers a broad set of dimensions and indicators to allow a varied and multidimensional picture of institutional profiles. It offers a descriptive tool for various stakeholders to design their own categorisations and comparisons on the basis of their own criteria and preferences.

1.9 Conclusion: institutional profiles

Classifications use the principles of ordering and comparison to analyse institutional profiles and to characterise similarities and differences among higher education institutions. The fact that classifications are clearly different from rankings will not stop users from developing their own rankings of tailor-made subsets of institutions included in the classification. This is not necessarily a bad thing: the comparison of subsets of largely similar institutions means that there is less diversity across the groups of institutions and that these institutions can be compared on a similar base and - if desired – can be more fairly ranked. In this sense, we believe that U-Map is a relevant and significant prerequisite for better rankings in European higher education.

A multidimensional classification system is intended to provide a series of lenses through which important similarities and differences among higher education institutions can be described and compared. U-Map offers higher education institutions and their stakeholders a set of varied pictures of the European higher education landscape, capturing in a useful way the true complexity and institutional horizontal diversity of European higher education. It does this by providing a framework for creating and analysing 'institutional profiles'. An institutional profile is the set of positions of a higher education institution on the dimensions and indicators of the classification. The classification offers a variety of ways of analysing institutional profiles. If an institution's positions on all the dimensions and indicators of the classification are combined, the result is a comprehensive or full institutional profile. Such a full profile can be analysed by the institution itself and/or by other stakeholders.

The stakeholders of higher education institutions can use the classification tool for their own specific purposes. They can apply U-Map to compare different institutions on one or more dimensions, using a larger or smaller number of indicators per dimension. By doing so they will be able to select the institutional profiles that best serve their needs and to identify the specific institution(s) they are interested in. Stakeholders may decide to establish relationships with these institutions, to enrol in their programmes, or to otherwise to engage in their activities. They may decide to contract them for specific services, to support them because of specific results, or to develop other forms of collaboration.

Institutional profiles can also be important and useful instruments for higher education institutions themselves, particularly for institutional management. Institutional profiles can be the basis for internal strategy development, for external benchmarking, for developing inter-institutional cooperation, or simply for effective communication. Institutional profiles can assist in institutional self-assessment, in comparing profiles with other institutions and in engaging in networking processes.

2. Dimensions and indicators

This chapter introduces the dimensions and indicators that are used in the U-Map classification. It describes the process of selecting the dimensions and indicators, as well as the criteria used in that process. This chapter also presents the data collection instruments and the interactive web based classification tools: the Profile finder and the Profile viewer.

2.1 The selection process

Designing a higher education classification is a complex and dynamic activity. The genesis of U-Map has been a lengthy process involving many in-depth discussions, analyses and consultations. Nevertheless, the various steps of the design process as described in chapter 1 were all followed, although in a more iterative and interactive way than the linear five-step process would suggest. The most crucial step was the selection of the dimensions and indicators that together form the heart of the classification.

The dimensions and indicators are the 'grouping criteria' of U-Map, in terms of which the actual identification of the entities of the classification (European higher education institutions) in the various categories of the classification will take place.

Several methods were used during the design process to guarantee maximal stakeholder influence on the final selection of these dimensions and indicators (see also chapter 5).

2.1.1 Literature review and the first rounds of stakeholder consultation

During the early phases of the project a number of design principles were formulated. These principles were derived from an analysis of the experience of existing international classifications and in particular the various US Carnegie classifications as they have been developed over the years. The results of this analysis were widely discussed with various groups of stakeholders and resulted in an agreed upon set of design principles for the European higher education classification (see chapter 1, figure 4). During the following phases of the design process these principles played a major and influential role.
Using the design principles, we constructed an inventory of potentially relevant dimensions and indicators (based on an analysis of the relevant literature). In an interactive process with stakeholders a first set of 14 dimensions, each with a long list of indicators, was developed. This first list was designed to cover the significant characteristics of higher education institutions in Europe and to allow for relevant differentiation between these institutions.

During the second phase of the project the draft-classification was elaborated, refined and tested. This process was again largely driven through a process of stakeholder involvement. In order to support the stakeholder decision-making process the following analytical activities were undertaken.

2.1.2 An exploratory analysis of existing (European) data sources

In order to establish whether the relevant information for the various indicators could be collected from existing (European) data sources, these data sources were analysed in terms of their scope, the availability of data to the public and the options that exist for tailor made access to these sources. The conclusion of the analysis was that international databases are suitable for a European classification of higher education institutions only to a very limited extent. Most of the data will therefore have to be collected at the institutional level.

2.1.3 In-depth-case-studies

Eight in-depth-case-studies were conducted in order to better understand the needs and expectations of individual higher education institutions concerning the classification. For this analysis, two institutions were visited and studied in terms of their potential use of the classification and then a pilot survey was sent to all eight institutions to explore their interest and ask for comments and suggestions. The case studies provided very positive reactions to the possible use of the classification. All institutions indicated that they would be able to work with the classification as a tool for their own strategic management processes. The classification was judged to be a relevant instrument for sharpening an institution's mission and profile.

2.1.4 Survey

The next step was to develop a European wide survey. The aims of the survey were:
- to assess the relevance of the dimensions selected
- to assess the quality of the indicators selected
- to provide data that would enable further analyses of the dimensions and their clustering, and of the potential and pitfalls of the indicators.

The survey played a major role in the process of designing U-Map. It allowed European higher education institutions to express their views on the general idea of the classification. In addition, it served as an important instrument for further defining the dimensions and selecting the relevant indicators for each dimension. It also presented a clear picture of the availability of data at the level of the institutions and the possibilities for, and willingness of the institutions to provide additional data. The outcomes of the survey were a major asset in the design process and helped us to develop an instrument that is on the one hand attractive and useful for various groups of stakeholders and on the other hand does not entail an unnecessary data gathering burden for higher education institutions.

The survey consisted of two questionnaires: a questionnaire on the dimensions, exploring the relevance of the dimensions and the indicators selected, and a questionnaire focused on the indicators themselves. The latter comprised questions concerning the required data for the indicators as well as an assessment of the indicators.

The intended size of the sample for the survey was 100 higher education institutions. To keep the non-response rate as low as possible, networks of higher education institutions represented on the Advisory Board were asked to introduce the project and identify contact persons. A second channel through which potential participants in the survey were identified was through an open web-based procedure. On the project website (for the second project phase: www.cheps.org/ceihe) higher education institutions could express an interest in participating. Institutions were also invited to participate through national and international conferences.
67 responses were received for the indicator questionnaire and 85 responses for the dimension questionnaire.

The outcomes of this survey provided a clear set of indications for the further development of the U-Map classification tool. (For a detailed overview of the results see van Vught, Kaiser et al. 2008.)

2.1.5 On-line stakeholder and expert consultation

In the second phase of the project two conferences were organised to disseminate the results and discuss further steps in the development of U-Map. One of the outcomes of the conferences was the need for more in-depth analysis and discussion on a number of indicators and dimensions. To stimulate and facilitate this discussion, a web-based discussion forum was created on the project website. Stakeholders and experts were invited to contribute to the discussion in six communities:

Business engagement
The major question was whether a specific dimension on business engagement was needed in the classification? Various stakeholders may be interested in different types of information on this dimension: universities may want to reflect their research co-operation with business and industry as well as their focus on lifelong learning activities within their teaching profile. Businesses may be interested in the special expertise of an institution if they are seeking to start cooperation in a certain field, or more generally whether an institution has an applied profile. Students may be interested in the job perspectives for graduates in defined areas of business. The challenge for the classification is how to incorporate these different stakeholder perspectives.

Cultural engagement
The dimension 'cultural engagement' appeared to be of particular relevance for specialised groups of institutions. This was the main reason for developing better indicators for this dimension. The major challenge here was to develop a set of indicators that capture the full range of cultural activities.

Innovation intensiveness
The innovation indicators selected during the first phases of the project had a strong commercialisation orientation. The community looked for indicators to signal innovative activities in teaching and curricula and in research, as well as in the innovative character of professionally oriented and artistic activities.

Internationalisation
The relevance of 'nationality' as the prime indicator for the international orientation of an institution was explored in depth. Other indicators such as the 'nationality of the qualifying diploma' (where the secondary education diploma was awarded) or the 'international experience of academic staff' were discussed as well as the availability of data for such new indicators.

Involvement in lifelong learning
The validity of the indicator suggested for this dimension was challenged in the stakeholder consultation. Although most stakeholders claimed that this dimension was relevant, there was no consensus on the indicators to be used to capture the dimension. The dimension and the underlying indicator (number of adult learners as a % of the total number of students by type of degree) were reviewed and their possible integration with another dimension such as 'mode of delivery' was explored.

Regional engagement
A number of regionally active higher education institutions argued that the set of indicators used at the end of the second stage was not broad enough to capture the full range of their regional activities and considered how to improve the set of indicators.

Although the invitations to join the discussions were widely distributed and published, participation in the on-line communities was very limited. Project team members were designated to co-ordinate specific communities and were active in seeking to involve special interest groups but met with only limited success. This meant that the on-line discussion fora did not add the value that we had hoped for.

2.1.6 Reducing the number of dimensions

The stakeholder and expert consultations during the second phase of the project led to a stakeholder supported list of dimensions and indicators. This list comprised 14 different dimensions. Further consultation with experts and stakeholders showed that this list was too long. If higher education institutions are to be classified on all 14 dimensions, the use of the classification will become tedious and (for many intended users) too time consuming and confusing. It was also argued that if all 14 dimensions were used as a 'filtering device' for institutional benchmarking this will very rarely result in a reasonable number of benchmark institutions being selected. During the third phase of the project a process was therefore started to reduce the number of dimensions from 14 to no more than seven. The results of the survey and other analytical work were presented at further stakeholder consultation processes that were organised to define and select a limited set of dimensions. The result was an agreement amongst stakeholders on a new set of six dimensions. Statistical approaches to cluster the dimensions were also used but this did not produce any viable outcomes, mainly because the number of cases in the survey (67) proved to be too limited for such methods. In addition to the six dimensions selected for classifying higher education institutions, a set of context indicators was identified.

2.2 Selection criteria

The U-Map classification is intended to be a descriptive instrument that can be used by various stakeholders to compare institutional profiles (see chapter 1). U-Map is designed to allow stakeholders to look for similarities and differences among higher education institutions. In order to reach a set of dimensions and indicators which was both acceptable to stakeholders and methodologically sound, a general framework was designed to support the selection process. This framework consisted of a conceptual framework to guide the selection and a basic set of methodological criteria. This combination of a conceptual framework and methodological criteria assisted stakeholders and the project team to select the dimensions and indicators for U-Map.

2.2.1 Conceptual framework

The conceptual framework applied in the project was based on a number of perspectives that together offer a general theoretical basis for the classification.

The commonly accepted general point of departure was that processing knowledge is the general characteristic of higher education institutions (Clark 1983; Becher and Kogan 1992). This 'processing' can entail the discovery of new knowledge (research) and its transfer either to parties outside the higher education institutions (knowledge exchange) or to various groups of 'learners' (education). A focus on the general purposes of higher education institutions as being the three functions of 'teaching and learning, research and knowledge exchange' is a simplification of the complex world of higher education but it does help to encompass the wide range of activities that higher education institutions are involved in.

The term 'processing' points to the second main conceptual perspective that was used, namely the major stages in any process of creation or production: input; throughput (or the process in a narrow sense); and output. The results of such processes in a higher education institution – their impact or outcomes – can also be termed the performance of the higher education institution. Performance measures imply a normative or judgemental approach when outputs are compared to predefined goals or standards. Performance measures indicate how well an institution is doing whereas the assessment of inputs, processes and outputs describe and quantify what an institution is doing. During the project it became clear that both stakeholders and experts strongly believe that the classification should not focus on performance but on activities and an institution's level of involvement in these various activities (as measured by indicators of inputs, processes and outputs). The classification therefore should focus on the volumes of different activities and not on the outcomes, impacts and quality of those activities. The U-Map classification is not designed as a nor-mative instrument that sets standards or goals, but as an instrument to describe an institution's profile in terms of its involvement in different activities that concern the processing of knowledge (teaching and learning, research and knowledge exchange).

A third conceptual perspective used was that the activities of higher education institutions may be directed at different 'audiences'. In current higher education policy discussions two main 'audiences' are stressed: the international orientation of higher education institutions that emphasises the role of higher education institutions as portals for societies to the globalised world (involving both 'incoming' influences and 'outgoing' contributions to the international discourse); and engagement with the region. The functions higher education institutions fulfil for international and regional audiences are understood to emanate from their primary processes - the three functions of education, research and knowledge exchange . This means that there may be educational elements of an international orientation, research elements of an international orientation and knowledge exchange elements of an international orientation. Similarly, regional engagement may be evident in a higher education institution's education, research and knowledge exchange activities.

The conceptual framework resulted in a matrix showing the types of indicators that could be used in the classification. The indicators to be used in the classification focus on the involvement of higher education institutions in the different activities that concern the processing of knowledge rather than on their performance. In addition to the information directly connected with these activities the classification will need to include contextual information on higher education institutions regarding their position in society and their specific institutional characteristics. This information concerns the conditions within which the primary processes of education, research and knowledge exchange take place. These contextual indicators are shown as a special aspect of the conceptual grid.

Figure 5: A conceptual grid for the indicators to be used in the classification

| | Description of envolvement | | | Assessment of performance |
	Input	Process	Output	Impact
Teaching and learning				
Research				
Knowledge exchange				
International orientation				
Regional engagemant				

Context

2.2.2 Methodological criteria

In addition to the conceptual framework, a number of basic methodological criteria were important tools for the final definition and selection of dimensions and indicators.

First, an indicator must convey a valid representation of the phenomenon it refers to: the validity criterion. The data the indicator produces should cover the concept that is supposed to be measured. This validity criterion refers to both the face validity of indicators as well as to their content validity.

Second, an indicator must be acceptable to the salient stakeholders as a relevant indicator: the legitimacy criterion. If an indicator is not legitimate in the eyes of the stakeholders its use and impact will be ineffective.

The third criterion is a practical one. Data collection for the indicator has to be feasible: the feasibility criterion. As major parts of the data will be collected through a questionnaire to higher education institutions, limiting the response burden will be crucial for the success of data collection. Indicators requiring the collection of new information or the unusual disaggregation of existing information need to be avoided. Figure 6 offers a general overview of the dimensions and indicators of U-Map.

Figure 6: Overview of U-Map dimensions and indicators

Teaching and learning profile	Student profile	Research involvement
• Degree level focus • Range of subjects • Orientation of degrees • Expenditure on teaching	• Mature students • Part-time students • Distance learning students • Size of student body	• Peer reviewed publications • Doctorate production • Expenditure on research
Involvement in knowledge exchange	**International orientation**	**Regional engagement**
• Start-up firms • Patent applications filed • Cultural activities • Income from knowledge exchange activities	• Foreign degree seeking students • Incoming students in international exchange programmes • Students sent out in international exchange programmes • International academic staff • The importance of international sources of income in the overall budget of the institution	• Graduates working in the region • First year bachelor students from the region • Importance of local/regional income sources

2.3 The dimensions and indicators selected

A glossary of concepts and indicators used and a brief description of how they are defined in U-Map is included as Annex A. In this section we present an overview of the six dimensions of U-Map and briefly describe the indicators for each dimension.

2.3.1 Dimension: Teaching and learning profile

Offering higher education programmes and awarding qualifications (degrees and diplomas) is part of the core business of most if not all higher education institutions in Europe. The mix of qualifications awarded provides a good profile of the focus of an institution in its educational activities.
The teaching and learning profile description is based on four pieces of information: the number of qualifications awarded by level; the number of qualifications awarded by subject group; the number of qualifications awarded by (professional or academic) orientation; and the proportion of institutional expenditure allocated to teaching activities.

Degree level focus

The mix of programme offering by level of programme is considered to be a key characteristic of higher education institutions as it indicates where the focus of the teaching activities of an institution is located. In the 'classic' Carnegie classification the level of degrees offered is a primary criterion. In the recent multidimensional version degree level remains a crucial dimension.
In the European and Bologna context, the level of degrees offered is also an essential dimension. The introduction of the two and three cycle degree structure has been at the heart of the first decade of the Bologna process. The bachelor/master/doctorate terminology has become well known throughout the European higher education area (EHEA) and this dimension links directly to the terminology used in the Bologna process.

Range of subjects

The range of subjects offered gives an indication of the scope of the teaching and learning activities of the institution. The wider the scope of subjects in which an institution offers programmes, the more comprehensive the institution is. This dimension was considered highly relevant for characterising and classifying higher education institutions. The assessment of scope is captured from information on the degrees awarded in various subjects. A subject is counted if a significant number of degrees are awarded in this area (more than 5% of the total number of degrees awarded).

Orientation of degrees

The process of massification of higher education has reframed the discussions on the basic functions of higher education in society. The substantial public investment in higher education has put its direct relevance for society high on the policy agenda. The economic focus of the wish to further develop the knowledge society has also contributed to closer links between higher education and the (direct) needs of society, leading to a strong growth of 'professional' programmes that are oriented (more directly) to the needs of the labour market. In many countries the 'academic versus professional' dichotomy underlies a binary divide in the structure of higher education but the actual diversity of institutions can in most countries no longer be captured by a simple academic versus professional distinction. Programme offerings have diversified and many institutions now have a hybrid profile in terms of the orientation of their programmes. Three types of programmes are distinguished within U-Map: general formative programmes; programmes leading to certified or regulated professions; and other career oriented programmes.

Expenditure on teaching

The final indicator in the dimension 'Teaching and learning profile' is the proportion of expenditure devoted to teaching and learning activities. This input characteristic reflects the institutional commitment to and involvement in teaching and learning. Including this in the profile of a higher education institution is particularly relevant for students as they are interested in the institution's involvement in teaching and learning.

2.3.2 Dimension: Student profile

The nature of a higher education institution is partly determined by its student body. Four characteristics of the student body have been chosen to create a concise student profile: the proportion of mature students; the proportion of part-time students; the proportion of distance education students; and the overall size of the student body.

Mature students

The average age of the student body and its distribution is an important element of the student profile of an institution. A mixed age profile may provide a different educational experience than a predominantly young student body. In the context of lifelong learning, a large proportion of mature students is used as an indication of a major involvement in this activity. To capture the student age composition, we measure the number of students aged 30 years or older (headcount, all levels combined) as a percentage of the total number of students enrolled (headcount, all levels combined).

Part-time students

Part time programmes are a distinct characteristic of the way programmes are offered to students. An institution that has relatively many part-time students is likely to have a specific attitude to its environment and its stakeholders, and is likely to offer special ways to enrol in its programmes.

Distance learning students

The existence and use of distance learning programmes is another distinct characteristic of the way programmes are offered to students. An institution that has relatively many students enrolled in distance learning programmes will have a different profile to institutions with fewer distance learning students. Distance learning programmes provide educational opportunities that do not require the physical on-site presence of students.

Size of student body

In addition to the composition of the student body, the overall size of the student body may also have an impact on the learning experience. The information gathered is the headcount number of students enrolled in all types of degree and certificate programmes.

2.3.3 Dimension: Research involvement

Research - scientific and applied - is one of the core activities of traditional universities and a growing number of other higher education institutions. In U-Map, research refers to scientific research in which scientific methods are used to generate new knowledge (both basic and applied) and other activities undertaken to develop, discover and interpret the results of scientific research.

The description of an institution's involvement in research is based on three pieces of information: the number of peer reviewed publications; the number of doctorates awarded; and the institution's expenditure on research.

Peer reviewed publications

For this indicator we use the institution's self-reported number of peer reviewed publications and not international databases on publications (such as the ISI Thomson or Scopus databases). The main reason for this is that counting publications rather than citations removes a potential bias towards certain (science-related) fields and includes more social sciences and humanities output as well as output in languages other than English. Books and other (peer reviewed) monographs are also considered to be publications in this indicator.

Doctorate production

In many higher education systems the 'production' of a doctoral degree is seen as a research intensive activity of a higher education institution. The doctoral thesis is in most cases a significant research publication. Doctoral degrees comprise PhD degrees as well as professional doctorates. To avoid size effects, the total number of doctorates awarded is divided by the number of full-time equivalent (fte) academic staff.

Expenditure on research

The proportion of total institutional resources spent on research activities is seen as an important indication of the involvement of the institution in such activities.

2.3.4 Dimension: Involvement in knowledge exchange

Knowledge exchange seeks to organise, create, capture or distribute knowledge and ensure its availability for future users. This link between the production of knowledge (through research) and the utilization of this knowledge in the wider society has become a crucial element of the role of higher education institutions in the knowledge society. Four indicators are used within this dimension.

Start-up firms

The number of start-up firms established is considered to be an indication of the relative innovative character of an institution. The more start-up firms are established the more the institution has succeeded in turning its knowledge production into knowledge usage. There is no clear cut definition of start-ups. The definition used within U-Map is: that a start-up firm is a company that initially was the result of a licensing/technology transfer process from the institution. Spin-off companies are also considered to be start-up firms. What is measured is the average number of start-up firms created over the last three years per 1000 fte academic staff.

Patent applications filed

The number of patents filed is a traditional indicator of innovativeness and the institutions involvement in this aspect of knowledge exchange. A patent is a set of exclusive rights for a fixed period of time in exchange for the disclosure of an invention. The exclusive right granted is the right to prevent or exclude others from making, using, selling or offering to sell, or importing the invention. In order to be patented an invention must be novel, useful and not of an obvious nature.

Applications for patents are filed to national states or application agencies. Most patents and applications for patents are listed in national and international electronic databases (like the database of the European Patent Office). Patents will be measured in comparison to the total fte academic staff of an institution.

Cultural activities

The number of exhibitions, concerts and performances in arts and architecture is a generally accepted indicator of the level of an institutions involvement in 'cultural knowledge exchange activities'. Cultural activities refer to the number of official exhibitions, concerts and performances (co)-organised by the institution or a department of it, that are registered as such and that are open to the general public.

Income from knowledge exchange activities

If a higher education institution derives a relatively large proportion of its income from knowledge exchange activities it is assumed to be significantly involved in those activities. The indicator includes license income, income from licensing agreements, contracts with business and public sector organisations, income from copyrighted products and donations as a percentage of total income.

2.3.5 Dimension: International orientation

In an era in which trends like globalisation and international mobility call for a strong international role for higher education institutions and where (supra) national policy makers have initiated the development of a European Higher Education Area and a European Research Area the international orientation of a higher education institution has become a relevant feature of its profile. International orientation will be measured on the basis of information related to both teaching and research activities.

Foreign degree seeking students

A high proportion of foreign degree seeking students (as % of all degree seeking students) reflects a high level of attractiveness of the higher education institution to international students, which is assumed to be related to a high international orientation. 'Foreign status' will be measured by the 'nationality' of the diploma or degree on entrance.

The number of incoming students in international exchange programmes

The assumption is that a strong international orientation will lead to a higher proportion of students coming to the institution as part of international exchange programmes (as % of all students). Initially this indicator was geared towards European exchange programmes, but it proved

that this was too restrictive for many institutions that welcome students in other official exchange programmes as well.

The number of students sent out in international exchange programmes
The assumption is that a strong international orientation will lead to a higher proportion of students sent out in international exchange programmes (as % of all students). This indicator too was initially geared towards European exchange programmes but was broadened during the stakeholder consultation processes.

The number of international academic staff
A high percentage of international staff (as a percentage of total academic staff) flags a strong international orientation. Foreign academic staff are defined as academic staff with a foreign nationality employed by the institution or working on an exchange basis.

The importance of international sources of income in the overall budget of the institution
If the relative proportion of international income is large this indicates a strong international orientation.

2.3.6 Dimension: Regional engagement
The rise of the knowledge society has strengthened concerns about the relevance of higher education. Activities need to have relevance for society, including the region in which the institution is located. A higher education institution may have a substantial impact on the region, not only in economic terms, but also in terms of social and cultural life. An institution's involvement in this regional role is captured in this sixth dimension. The definition of a region is not always clear. In U-Map the default definition of region is the NUTS2 definition. If the higher education institution sees itself as serving a different region U-Map allows for this.

Graduates working in the region
A substantial part of a university's relations with its region is the production of graduates who participate in the regional labour market. A high percentage of graduates staying in the region is seen as an indication of a high level of involvement in the region.

First year bachelor students from the region
The underlying assumption in this indicator is that a higher education institution that draws a large proportion of its students from the region has a stronger relation with the region than a higher education institution with only few new entrants from the region. The number of first year bachelor students (headcount) from the region as a percentage of total number of first year bachelor students is used as the indicator with the region determined by the home address of the student.

Importance of local/regional income sources
If the institution receives a relatively large part of its income from regional or local sources (public subsidies, public and private contracts) we assume that it will be relatively more involved in the region.

2.3.7 Other dimensions
As was indicated earlier, during the project several other dimensions and indicators were explored and discussed. In all cases the stakeholders and experts consulted during the process indicated that these other dimensions and indicators were insufficiently clear to include them in the current U-Map design. One potential dimension triggered a lot of discussion: the dimension of social inclusion. We are fully aware of the fact that the issue of social inclusion and the social inclusiveness of (higher) education stands high on political agendas in Europe. It is widely acknowledged that broadening learning opportunities and access to education is crucial in knowledge-based societies.

In their Leuven Communiqué (Conference of European Ministers Responsible for Higher Education 2009), the Bologna Ministers identified the development of the social dimension of European higher education as a major policy goal for the next decade. They emphasised the social characteristics of higher education and the aim to provide equal opportunities to quality education. Access to higher education should be widened by fostering the potential of students from underrepresented groups and by providing adequate conditions for the completion of their studies. Similarly, the European Union's modernisation agenda for universities stresses the importance of equal access and chances of success for students from disadvantaged social groups. European higher education institutions have adopted distinct approaches to these challenges: to increase the share of immigrant students, to foster access possibilities for underprivileged students and students with disabilities or to become more sensitive in regard to gender issues. In the years to come, social inclusion will become an increasingly important field of action for higher education institutions and, therefore, a crucial dimension of their institutional profile. Yet currently social inclusion presents itself as a rather scattered field of activity of higher education institutions in Europe. It includes highly diverse issues, approaches and instruments, which are often not comparable to one another. Such diffused, heterogeneous activities are difficult to operationalise in the classification as they cannot be captured in a set of indicators which consistently and comprehensively maps the social dimension of European higher education. This is why we decided not to include a separate dimension on social inclusion, at least for the time being. Nevertheless, it will be necessary to closely observe further developments in the European policy context with regard to the social dimension as well as the development of national and institutional action plans in this field.

2.3.8 Context characteristics
In U-Map a full description of the profile of a higher education institution will be based on the six dimensions briefly presented above. This information will be used to identify higher education institutions with specific profiles and to visualize these institutional profiles. In addition to the information on these dimensions, a set of context characteristics will be included that may be useful in further analysing and understanding different institutions with different or similar profiles. These context characteristics refer to information that is relevant for the interpretation of the results of the classification but which does not contribute to describing the profiles of the higher education institution. The context characteristics included are: country; the public or private character of the higher education institution; and the age of the institution (see also section 2.5.3).

2.4 Data

U-Map is a data driven instrument to categorise higher education institutions on a number of indicators, grouped into six dimensions. In Europe the prime data provider will be the higher education institution. International databases comprising comparable data at the institutional level do not exist or cover only a very limited part of the data needed (such as the data on patents from EPO). In many countries national databases exist but they are not comprehensive and, even more important, are seldom disaggregated to the institutional level, which makes their use problematic. This implies that the higher education institution will be the central source of information for the classification tool.

2.4.1 The on-line questionnaire

The main instrument to collect data from the higher education institutions is the on-line questionnaire for higher education institutions. The first version of the questionnaire was organised around the fourteen dimensions and their indicators as developed in earlier phases of the project. This implied that there were several duplications of questions. We also found that this way of organising and retrieving information was not in line with the way information is organised in many institutions. The questions in the new version of the U-Map questionnaire are organized around seven sections.

- General information: name and contact; public/private character and age of the institution
- Students: numbers; modes and age; international
- Graduates: level of degrees awarded; subjects; orientation; graduates in the region
- Staff data: fte and headcount; international
- Income: total; sources of income
- Expenditure: total; by cost centre; use of full cost accounting
- Research and knowledge exchange: publications; patents; concerts and exhibitions; start-ups

2.4.2 Pre-filling

One of the concerns voiced during the test survey was the administrative burden on the institution. The overburdening of higher education institutions in responding to information requests is a well known problem that leads in many instances to serious survey fatigue. In the evaluation of the survey it was suggested that this burden could be reduced by using relevant data from national databases. There are several modalities for using these databases.

The option selected for the classification is the country specific pre-filling of the questionnaire. This means that the data that are available from national databases are pre-filled into the questionnaires of each participating institution which are then sent to the higher education institutions for checking and completion. If U-Map uses national databases to pre-fill the questionnaires, the formal responsibility for providing the data for the classification will remain with individual higher education institutions that will have to 'vouch' for the data provided, including pre-filled data.

Given the variety in the scope and the set-up of the national databases that include data on higher education institutions, a 'standard' procedure is not feasible. For each country the databases available need to be identified and analysed to determine which data are available and how they can be used. The concept of pre-filling has been tested in the case of the Norwegian higher education system. Several other European higher education systems have shown an interest in similar pre-filling processes. (A description of the Norwegian test is included as Annex B.)

2.5 U-Map tools

The rationale of the U-Map classification is to make diversity in the European higher education area transparent. As has been indicated, dimensions and indicators have been identified that are relevant for characterising higher education institutions in Europe. The positions on those indicators will be calculated for each participating higher education institution, based on the data collected from national databases (through pre-filling) and from the higher education institutions themselves (through the on-line questionnaire).

In this section we describe how this information can be accessed and used. For using the information within the classification two publicly available tools have been developed: the Profile finder and the Profile viewer.

2.5.1 The Profile finder

The Profile finder is an instrument to identify specific subsets of higher education institutions within the whole set of higher education institutions included in the classification. The basic idea is that the diversity within a specific subset of higher education institutions will be less than within the overall population of higher education institutions. To achieve this reduction in diversity, the user of the Profile finder chooses a number of selection criteria. Only those higher education institutions that match these user defined criteria are included in the subset.

The choices that are available to the user in terms of selection criteria are determined by the classes distinguished for each indicator. An overview of the possible criteria is presented in Figure 7.

In principle, users may use any number and combination of selection criteria to create a subset of institutions according to their priorities. In practice, however, using more than four or five criteria will increase significantly the probability of ending up with an empty subset.

The resulting subset of higher education institutions comprises higher education institutions that are alike on the items the user considers most relevant. This subset can then be used for further analyses.

Figure 7: An overview of selection criteria, by indicator and dimension

Teaching and learning profile						
Degree level focus	doctorate	master bachelor	short first	doctorate-master	master-bachelor	bachelor-short first
Range of subjects	specialised	broad	comprehensive			
Orientation of degrees	general formative	licensed/ regulated professional orientation	other career oriented	mixed focus		
Expenditure on teaching	major	substantial	some	none		
Student profile						
Mature students	major	substantial	some	none		
Part-time students	major	substantial	some	none		
Distance learning students	major	substantial	some	none		
Size of student body	very large	large	medium sized	small		

Part 2 of Figure 7: An overview of selection criteria, by indicator and dimension

Research involvement						
Peer reviewed publications	major	substantial	some	none		
Doctorate production	major	substantial	some	none		
Expenditure on research	major	substantial	some	none		
Involvement in knowledge exchange						
Start-up firms	major	substantial	some	none		
Patent applications filed	major	substantial	some	none		
Cultural activities	major	substantial	some	none		
Income from knowledge exchange activities	major	substantial	some	none		
International orientation						
Foreign degree seeking students	major	substantial	some	none		
Incoming students in international exchange programmes	major	substantial	some	none		
Students sent out in international exchange programmes	major	substantial	some	none		
International academic staff	major	substantial	some	none		
Importance of international sources of income	major	substantial	some	none		
Regional engagement						
Graduates working in the region	major	substantial	some	none		
First year bachelor students from the region	major	substantial	some	none		
Importance of local/ regional income sources	major	substantial	some	none		

2.5.2 The Profile viewer

The Profile finder is an important instrument for creating subsets of higher education institutions that fit a certain profile or parts of a profile. The second U-Map tool, the Profile viewer, has been developed to support and extend the use of the Profile finder. In comparing the profiles of higher education institutions (to each other or to a benchmark) a verbal description may be an accurate way to make that comparison, but to communicate the comparative information in an efficient and 'eye-catching' way, a visual representation of the profiles is needed.

Visualising the results of the classification will help to convey the information to a broader audience and to characterise different higher education institutions at a glance.

Presenting complex information in a visually attractive and effective way is a challenge that has produced a kaleidoscopic range of graphic displays that are more or less appealing and intuitively interpretable. Most of those visualisations are based on large or very large datasets.
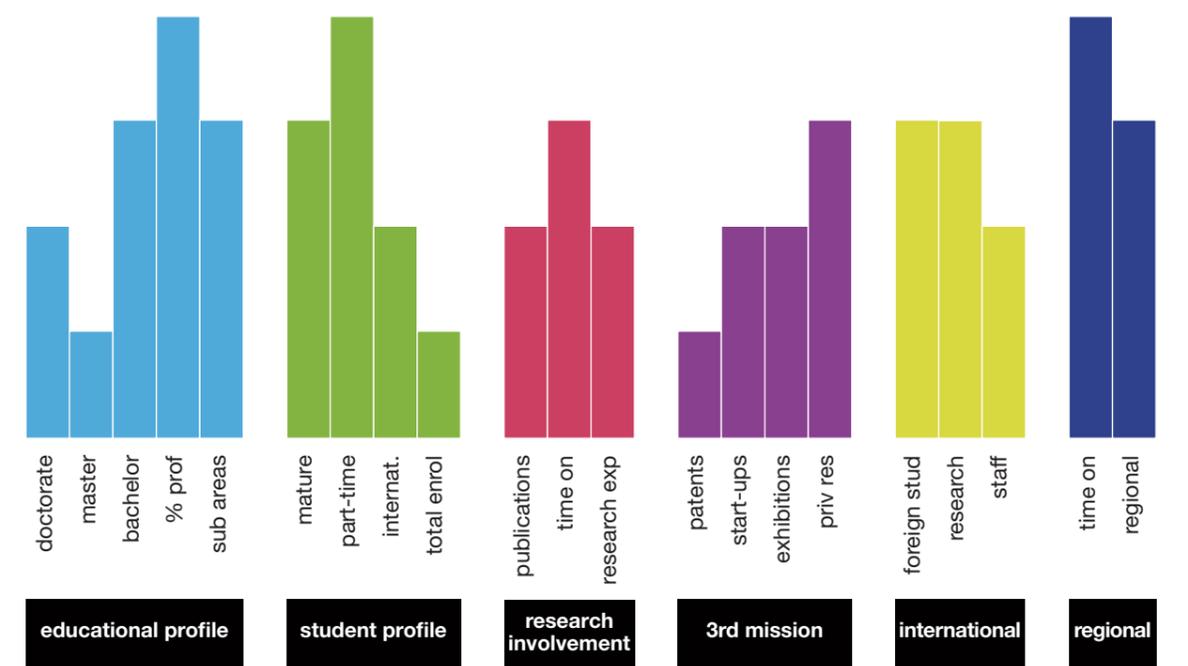
Visualising the U-Map profiles posed a specific challenge as the profiles are non-hierarchical and multidimensional. This excluded the majority of the most appealing graphic representations and required the adaptation of other existing solutions.
In this context several options for visualising institutional profiles have been explored. In a number of expert panel sessions the alternative visualisations were analysed and evaluated. Although no strict list of criteria was drafted a few general guidelines were used to provide direction. First of all, a visualisation should be 'intuitively readable': it should not require too much explanation. The rationale for a visualisation is that it conveys complex information in a 'user-friendly' way - extensive 'user manuals' need to be avoided. In addition a visualisation should allow for both the unambiguous presentation of a single profile as well as the easy comparison of two or more profiles. It is expected that users will use 'their own' institution as a benchmark. The visualisation then has to show the key characteristics of the institution on the different dimensions of the classification. It has to be an image that is easily understood and communicated. This means also that it must be suited to different media. It should be able to convey its message in print as well as in an interactive

web-based way. And last but not least: it should be appealing and intriguing. It should invite the user to dig deeper and learn more about the institutions.

With these general considerations in mind five different visualisations were developed: a bar chart, two modified radar charts, a circular tree ring and a tag cloud.

In the 'bar chart', the positions on the various indicators are presented alongside each other. To highlight the different dimensions, each dimension has its own colour. The bar chart is familiar to most users and therefore requires virtually no further explanation. It proved however that users have a tendency to use the class positions to calculate ratios to assess the performance of the institution. For instance 'time on research' and 'publications' were related to each other to assess the efficiency of the research operation of an institution. These types of assessments are invalid and produce spurious results. This together with the fact that putting more than 10 bars alongside each other was seen as information overload were the main reasons to look at other types of visualisations.

Figure 8: Bar chart

| educational profile | student profile | research involvement | 3rd mission | international | regional |

In the 'flower chart' the data are presented in a modified radar chart. The classification positions are again presented next to each other but now on a circular x-axis. Presenting the information this way differs slightly from ordinary presentations. The closed circle conveys a more holistic image of the institution, instead of a (long) set of bars in a row. This presentation has a 'continuous' feel as the positions on the various indicators are connected by a line and a dimensional surface is suggested. The suggestion that that surface represents the position on the di-

mension is an unintended side-effect. In the U-Map classification the positions on the indicators are not aggregated into an integrated position per dimension. This would require a weighting of the individual indicators. Since a non-normative character is a crucial U-Map design principle, assigning weights is not an option in the classification. A visualisation in which a profile is presented in such a way that the user is led to believe that a position on a dimension can be inferred is therefore inadequate.
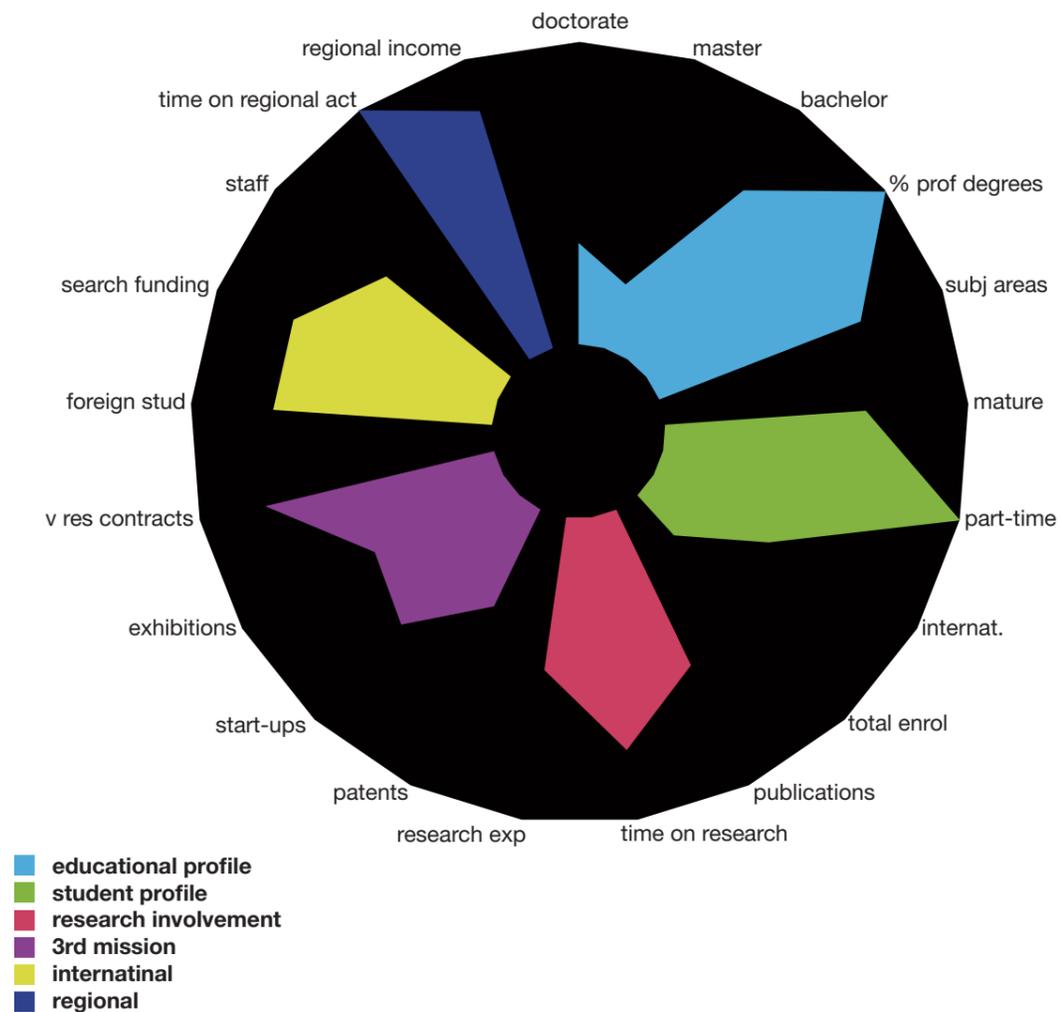
The 'sunburst chart' is also a modified radar chart. The chart coveys a more discrete picture, that does not suffer from the aforementioned unintended side effects. Each indicator has its own segment, showing the class in which the higher education institu-

tion fits on the indicator. The fact that the segments are not interconnected reduces the risk of aggregating the indicators, even though indicators are recognizable as part of a certain dimension through their colour code.

Figure 9: Flower chart

Figure 10: The sunburst chart
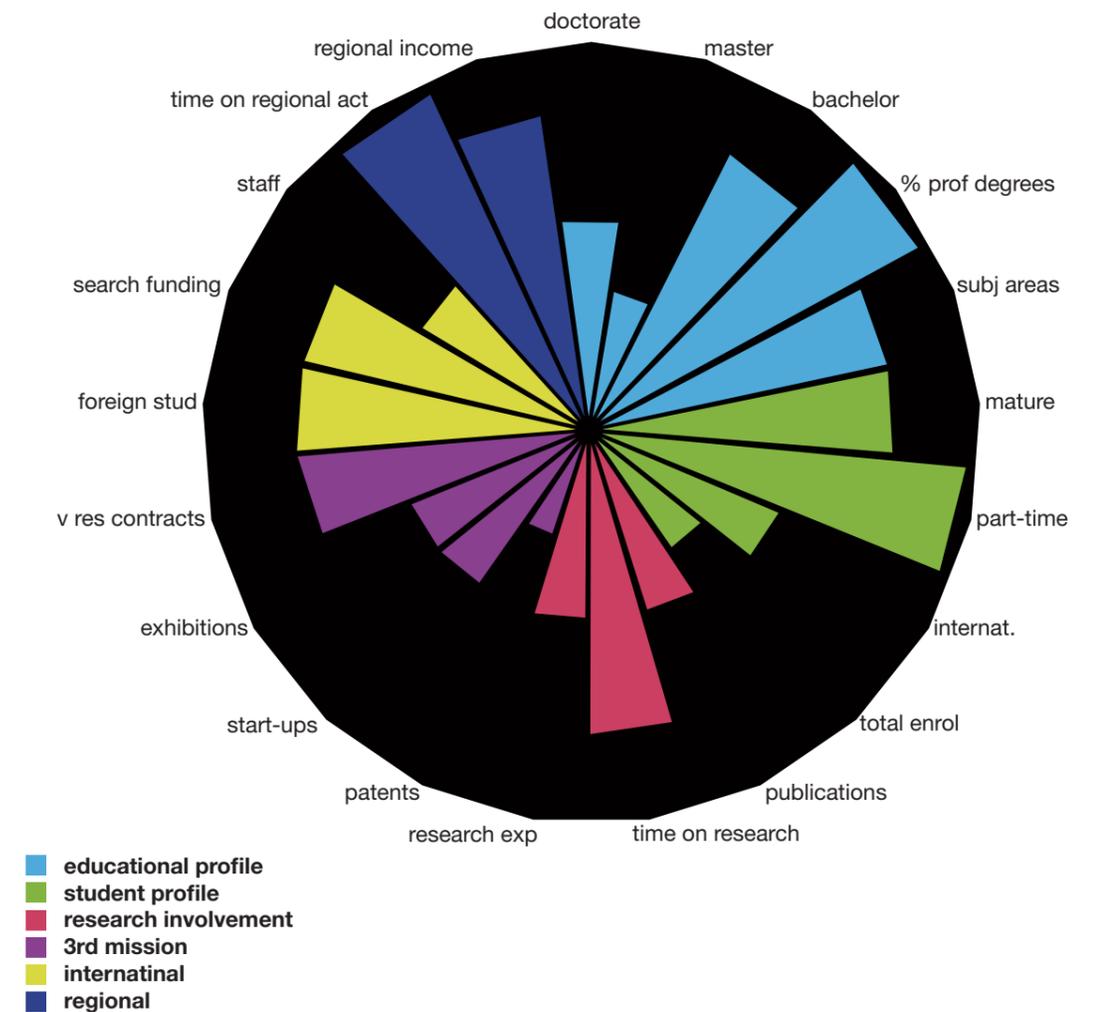
The 'circular tree ring chart' translates the positions into six paired concentric semicircles. This chart type has been developed from the idea of tree ring diagrams. Colour, size and patterns are used to visualise the information. The circular charts are the most 'innovative' visualisations of the five presented, but the long legend requires considerable effort on the part of the user to fully grasp the meaning of the chart. For each dimension the meaning of a particular colour, size and pattern needs to be understood. Although the resulting charts create attractive images, their limited user-friendliness makes this chart type a less promising option.

Figure 11: The circular chart
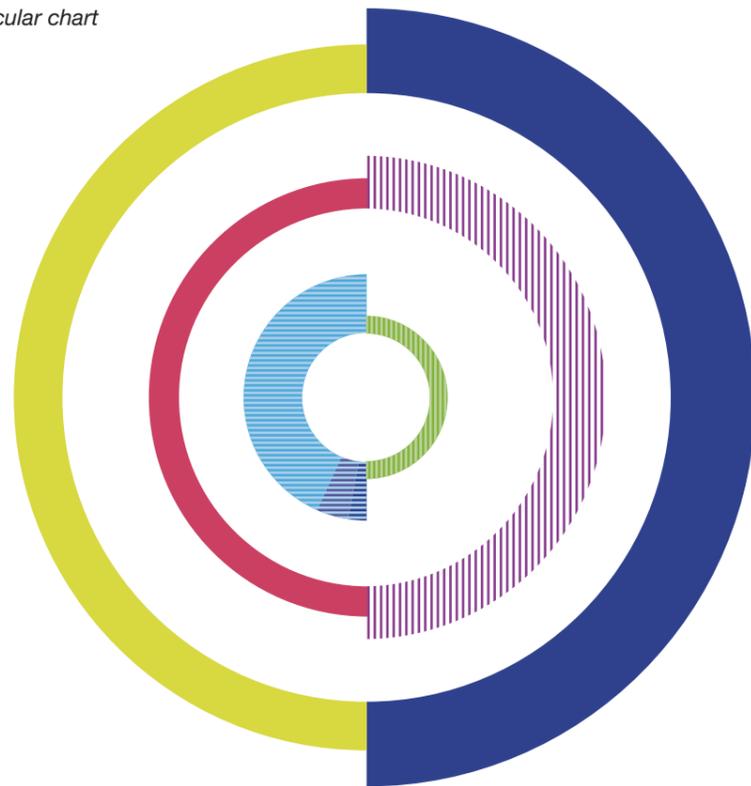
Legend:

Educational profile	light blue circle	colour: degree level focus
		pattern: professional orientation
		size: subject scope
Student profile	green circle	colour: % mature students
		pattern: % part-time students
		size: total enrolment
research involvement	red circle	colour: publications
		size: expenditure on research
involvement in third mission	purple circle	colour: exhibitions
		pattern: patents
		size: private research contracts
international orientation	yellow circle	colour: foreign students
		pattern: international staff
		size: international research contracts
regional engagement	dark blue circle	colour: importance of regional income
		size: time on regional activities

The fifth visualisation, the 'tag cloud', follows a popular way of analysing internet discussions and web databases. The logic is that very frequently used words or categories appear in a large font whereas rare words appear in small fonts. In the tag cloud visualization the position on the indicator is used as a proxy for frequency.

Figure 12: Tag Cloud

When comparing two or more profiles, the tag cloud and the bar chart are less usable as they require close attention to identify and interpret the differences between the institutions. The readability problems of the circular charts prevent their use in comparison, which leaves the two modified radar charts as the two most viable options. Because of the possible problems in the interpretation of the 'continuous' version (the flower chart) the option selected is the discrete version: the sunburst chart.

Figure 13: 'Sunburst' chart of University AU
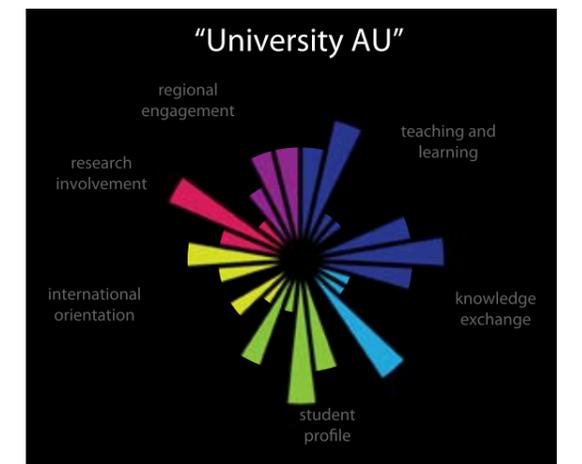
In the sunburst chart the visualisation of the six colours of the sunburst refer to the six dimensions of U-Map. The segments represent the positions on indicators, presented in four classes. Each indicator is a segment (a 'ray of sun') in its own dimension and thus has the colour of that dimension. The classes of each indicator are defined by the quartile scores of the higher education institutions in the classification database.

The U-Map tools can be found on the U-Map website (www.u-map.eu). The use of the Profile finder and the Profile viewer are demonstrated on the website in a demonstration version, using data on a limited number of actual higher education institutions. The names of the higher education institutions are not shown as the data used were not collected and verified according to U-Map procedures. Another reason for not mentioning the names of institutions in this demonstration version is the limited number of higher education institutions in the sample. Although there is a fair distribution regarding countries and the size of institutions, the number of institutions in this demonstration version is considered to be too small to serve as the basis for a solid and unbiased classification.

2.5.3 Future additional U-Map tools

On the basis of our experience with the demonstration version of the U-Map tools on our website a number of ideas have recently evolved on how to improve the functionality and sustainability of the U-Map classification tool. The most concrete ideas are described below.

The institutional 'business card'

When comparing institutional profiles, the context may become relevant. Contextual information includes information on specific institutional characteristics that contribute to the position of a higher education institution in society and that may be relevant for the interpretation of an institutional profile. The aspects of contextual information chosen in U-Map are the public/private character of an institution, its age and its legal status. These aspects are assumed to contribute to the understanding of particular differences in institutional profiles. The demonstration version of the U-Map tools does not show contextual information. In the full version of the on-line application the major contextual information will be presented on a so-called 'business card'. This 'business card', a pop-up screen behind the name of the institution, will comprise shorthand information on some basic context items. These items refer to the public or private character of the institution, size and age of the institution, as well as general information on location and links to further information. The business card will also display the full institutional profile, and information on the relative size of the different fields of education offered. The business card offers basic information at a glance and invites the user to take a closer look at the higher education institution selected.

Country specific classifications

The process of data-collection is based on the voluntary participation of individual higher education institutions. An individual institution has to take the first step and express its interest in participating in the classification. For the survey (in the second phase of the project) higher education institutions were 'recruited' through university membership organisations, calls for participation at (inter)national conferences and an expression of interest form on the project website.

Towards the end of the research project a different mode of recruitment of higher education institutions emerged. Representatives of national governments have become aware of the potential of the U-Map classification as a tool to create transparency. U-Map is designed to create transparency in the European higher education area, but it is also possible to use the method within a national higher education system. In a number of national higher education systems, there is a debate on the institutional landscape. The U-Map classification may be helpful in creating a new view on institutional diversity in a national higher education system. For this use of the U-Map classification to work, all higher education institutions in a national system have to participate which requires a different way of recruiting higher education institutions. It is likely that the role of national university associations and rector conferences will become more important.

This national perspective on classifying higher education institutions opens up new opportunities for the further development of the classification tool. An obvious opportunity is a practical one: national recruitment may increase the pace at which the clas-

sification is filled. Individual higher education institutions still have to decide whether they will participate or not, but through 'national recruitment' institutions can be approached, informed and stimulated to participate more efficiently.

A second opportunity is the possibility of producing national classifications. In U-Map the results of all participating higher education institutions determine the reference points (or cut-off points) for classification. In a national classification the cut-off points would be determined by the participating higher education institutions within that national system. The focus of the national classification would be on comparison within the national higher education area and not the European higher education area. By zooming in on the national comparison, differences between institutions will most likely be enhanced. As a consequence of this, a particular institution may have two profiles: an original U-Map profile (oriented to a European comparison) and a national classification profile (oriented to a national comparison). The national perspective could also be used as an experimental stage for new indicators. The lists of U-Map dimensions and indicators have been developed to cover the needs of a large group of stakeholders in a large number of national settings. It has been impossible to accommodate all specific 'national' needs regarding indicators. To enhance the relevance of the U-Map classification when used in a national setting, some specific national indicators can be added.

2.6   Conclusion: a multi-dimensional, user-driven tool

In this chapter we have outlined the content of the U-Map classification tool as well as a number of its conceptual and methodological assumptions. We have indicated how the six dimensions of U-Map and their respective indicators have been selected; we have introduced the conceptual framework from which the indicators should be interpreted and we have briefly described their characteristics. We have also shown how the data for the U-Map classification can be generated, and have concluded that the data will largely have to be provided by the higher education institutions themselves through a questionnaire. We have explored and tested the option of 'pre-filling' this questionnaire by analysing a specific country case (Norway) and believe this to be a viable way of reducing the information provision burden on institutions.
Finally we have described two publicly available web-based U-Map tools: the Profile finder and the Profile viewer. Both tools offer useful and user-driven approaches to categorising higher education institu-

tions. They are the instruments that allow users and stakeholders to create and analyse their 'own' classifications of institutional profiles and to use these for their own purposes. In this sense the Profile finder and the Profile viewer are the operational tools of the European higher education classification. The Profile viewer has been tested in various forms of visualisation. The most attractive and (according to a number of expert panels) most easily applicable visualisation (the sunburst chart) was engineered into a web-based tool.
With the selection of dimensions and indicators, the suggestions for the generation of the data, and the development of the web-based tools, the U-Map project has come to its end. The European multi-dimensional, user driven, higher education classification now exists in a first and potentially broadly applicable version. In the next chapter of this report we describe how U-Map could be operationally institutionalised.

3. Operational implementation of the classification

This chapter discusses the operational implementation of the classification; identifies criteria and models for its institutionalisation; describes the preferred organisational model; and indicates how the classification could be implemented and funded.

3.1 Criteria for institutionalisation

Taking into account the views, recommendations and concerns of different stakeholders during the consultation process (see chapter 5), we defined five criteria as essential requirements for the institutional implementation of the classification: inclusiveness, independence, professionalism, sustainability and legitimacy.

Inclusiveness

The classification must be open to recognised higher education institutions of all types and all participating countries, irrespective of their membership of associations, networks or conferences.

Independence

The classification must be administered independent of governments, funding organisations, representative organisations or business interests.

Professional approach

The classification must be run by a professional, reliable and efficient organisation. This will guarantee appropriate standards in the planning, implementation, communication and further development of the classification, hence contributing to an impeccable reputation for the classification which is essential to its success.

Sustainability

The administration of the classification must be properly funded on the basis of a long term financial commitment. This will secure sufficient capacity for carrying out the work at the required high level.

Legitimacy

The classification must have the trust of participating institutions and stakeholders. This means that the organisation managing of the classification will be held accountable and will be subject to continuous evaluation and assessment.

3.2 Models for operational implementation

We identified four possible options for implementation: a market model, a government model, a stakeholder model and an independent organisation model.

Market model

In this model a (consortium of) private organisations would implement the classification. Products and services would be made available to users at market-based tariffs. The strategy, further development and use of the classification would be driven by market demands.

In a market model, stakeholders assumed that the provider would only offer classification services on those dimensions for which it expects sufficient institutional demand. Hence some dimensions of the classification are likely not to be included. Therefore full inclusiveness cannot be guaranteed. On the criterion of sustainability, stakeholders argued that in a market model the continuation of the classification will depend on demand and will be subject to the volatility of the market. Hence, sustainability cannot be guaranteed. Finally, the stakeholders raised concerns about the perceived legitimacy of this model.

Government model

In this model governments would use their authority over higher education to organise the classification of higher education institutions as an integral instrument of their steering capacity. As the tool to be developed is a Europe-wide classification, it would operate either at the supranational level or within the framework of an inter-governmental agreement. According to the stakeholders, governments could use their authority to ensure full participation of higher education institutions, therefore potentially ensuring a high level of inclusiveness. However, the stakeholders voiced clear concerns about the legitimacy of the classification in such a model given the lack of ownership by the institutions.

Stakeholder model

In this model all major stakeholders, i.e. business, state, students and institutions, would co-own the operation and administration of the classification. This model might provide a good basis for a high level of legitimacy. Nevertheless, the finding of common ground in the stakeholder model is likely to be difficult. In addition, the lack of coherent representation of some types of institutions at the European level could lead to a bias in favour of better represented institutions. This would present a serious challenge to inclusiveness.

Independent organisation model

In this model an existing or new organisation independent of government or direct stakeholder interests would administer the classification. According to the stakeholders, this model in principle best meets the necessary conditions to fulfil all five criteria.

In the figure below, we present a summary of the assessment of the four models against the five criteria for operational implementation.

Figure 14: Assessment of the four models for implementing the classification

Criteria Model	Inclusiveness	Independence	Professionalism	Sustainability	Legitimacy
Market	-	+/-	+/-	-	-
Government	+	+/-	+/-	+/-	-
Stakeholder	-	+/-	+/-	+/-	+
Independent organisation	+/-	+	+/-	+/-	+/-

According to the stakeholders the independent organisation model best meets the five criteria. In addition, if aspects of the stakeholder model were incorporated into the independent organisation model this would ensure stronger legitimacy.

3.3 The preferred organisational model

Based on the analysis outlined above we recommended a combination of the independent organisation and the stakeholder models for the operational implementation of the classification by creating a legally independent organisation in which stakeholders have an important advisory role to play (van Vught, Kaiser et al. 2008). We proposed the creation of a non-governmental and not-for-profit organisation that operates independently from its funding constituencies or stakeholders (or the use of an existing organisation of this nature). Funding could come from public or private sources as long as independence from these sources and sustainability is guaranteed. The operating organisation would have a Board consisting of independent members and would be managed by a director supported by professional staff.

The Board of the organisation would be advised by a Stakeholder Advisory Council and a Scientific Advisory Committee. This structure is reflected in the organisational chart below:

Figure 15: Proposed organisational structure for implementing the classification

```
                    ┌──────────────┐
                    │    Board     │
                    └──────────────┘
  ┌──────────────┐         │         ┌──────────────┐
  │  Scientific  │─────────┼─────────│ Stakeholder  │
  │   Advisory   │         │         │   Advisory   │
  │  Committee   │         │         │   Council    │
  └──────────────┘         │         └──────────────┘
                    ┌──────────────┐
                    │   Director   │
                    └──────────────┘
                    ┌──────────────┐
                    │  Professional Staff  │
                    └──────────────┘
```

3.4 Implementation of the classification and organisational model

In the final phase of the classification project we have explored further how the classification could be implemented using the preferred organisational model. We have not made any changes to the basic structure of the model – an independent Board advised by committees of experts and stakeholders that supervises a professional team that implements and further develops the classification.

While the Board and its two advisory bodies will be composed of prominent individuals fulfilling these functions on a part-time basis (say four meetings a year in the initial stages of implementation), the major costs will relate to the professional staff responsible for implementation.

We believe that it is not sensible in the initial phases of implementing the classification to establish a new professional organisation for running the classification. Once the extent of participation of higher education institutions in the classification is known this option could be considered. The assumption is therefore that the classification would be operated (initially) on a project basis by an existing professional organisation on behalf of and under the supervision of the proposed Board and its advisory committees. This makes the estimation of the costs involved much easier as we can do this on the basis of daily tariffs that cover overhead costs (space, equipment, communications etc.) and need not attempt to specify budgets for these items. It also means that the professional team can be led by a project manager and that a full-time Director position is not

an upfront cost.

We have distinguished between the fixed costs of implementing the classification and variable costs that will be dependent on the numbers of institutions, countries and higher education sectors that participate in the classification.

The major fixed cost elements of implementing the classification are anticipated to be the following:

• Information technology support: further development and implementation of the on-line classification tool and related software development to be contracted from an organisation specialised in this field.
• Marketing and communication: the design and development of information packages on the classification and the dissemination of the outcomes of the classification as well as the staff time needed to do this.
• Research and analysis: the classification will need to be carefully monitored, refined and analysed and the results researched and reported on. Staff time is the key cost.
• Meeting costs for the Board and its two committees: honoraria and travel and subsistence costs. We have assumed that each body will consist of five members and that each will have four one-day meetings a year for the first three years of implementing the classification and two meetings a year thereafter.

The variable costs associated with classification are entirely related to professional staff time linked to the number of countries, sectors and institutions that participate in the classification.

We have worked on the assumption that the classification will be updated on a rolling three year basis (one third of the institutions in the classification are updated each year to avoid very uneven annual work load within the classification) with major revisions being made no more frequently than every six years. The major workload relates to the first institution from a 'new system' joining the classification as this is when a system specific institutional survey needs to be developed and tested, and when the opportunities for 'pre-filling' the survey with information from system-level data-sources need to be explored, and where possible implemented. The costs associated with a second institution from the same system

entering the classification are much less as this preparatory work has already been done.

To test the viability of implementing the classification we have worked on a scenario of achieving a 50% coverage of Europe's approximately 4000 higher education institutions within three years of launching the classification and with this 50% being spread across all European countries/systems rather than having full coverage in half of Europe's countries/systems. Thus we are assuming some 40 systems and 2000 institutions participating in the first three years.

We have taken all of the above mentioned parameters and worked them into the project planning and budgeting system that CHEPS uses for large, multi-national, multi-year projects. While it is beyond the scope of this report to provide a detailed implementation plan our broad conclusions are as follows.

3.5 Conclusion: a viable perspective

If one proceeds from the assumption that in the long-term the classification will be funded on the basis of system and/or institutional 'subscriptions' to the classification then the major funding challenge is to cushion early adopters against the heavy burden of the fixed costs of the classification being spread over a limited number of systems and institutions in the initial years of implementation. While there are numerous permutations of how this could be done, the optimal method for implementing the classification would be one where a group of European Founda-

tions agrees to fund the start-up costs over the first three years (and ideally then make a smaller contribution to the classification thereafter) and where institutions (or Ministries on their behalf) fund the relatively low annual costs of participating in the classification after the three year start-up period.
On the basis of our testing model both the level of initial start-up funding required and the longer term level of institutional contributions are relatively modest for a project of this scope and of this importance for European higher education.

Part Two

U-Map in context

4. Quality Assurance and Classification

In this chapter we address the following questions: What are the developments with respect to quality assurance schemes in research and higher education? How does the European higher education classification relate to these developments?

4.1 Introduction

In the communication between higher education institutions and their stakeholders (including political decision-makers), several ways have been used to convey the message of 'quality'. 'Quality' in the meaning of 'excellence' may have been the aura of higher education traditionally, but since massification the traditional trust that everything that higher education institutions did was 'excellent' has been lost. The first and still most encompassing systemic response from the side of higher education institutions to communicate the quality message to stakeholders has been through quality assurance. In recent years, this communication has also been joined by rankings, which have been published widely all around the world.

Quality assurance, as a policy instrument built upon the methods of evaluation, has been deployed in both main 'primary processes' in higher education: education and research. In research, it is connected with the centuries-old method of peer review, which has become the paradigm for practically all quality assurance schemes in higher education—although with substantial adaptations. We shall first give attention to quality assurance in research and then turn to quality assurance in education.

4.2 Quality assurance in research: peer review, bibliometrics and practical research assessment

Peer review originated in networks of correspondence among gentlemen-scientists in the middle of the 17th century. Henry Oldenburg, secretary of the British Royal Society, has been credited with this innovation, made in order to ensure the quality (i.e. truthfulness and originality) of the Royal Society's Proceedings (Boas Hall 2002). It began, then, as gentlemen-scientists reading other gentlemen-scientists' manuscripts for contributions to the Proceedings, a publication read by again other gentlemen-scientists.

When science became eligible for competitive grants from the public purse, the same method was applied: colleagues would read and judge others scientists' proposals, and rate (or rank) them to decide who would be awarded grants. Evaluating research proposals became a standard peer review practice in many countries for many decades, as national or disciplinary research councils distributed their funds (e.g. the NIH in the USA, Sweden's Vetenskapsrådet or the British ESRC). The peer review method itself remained widely accepted (Zuckerman and Merton 1971), because peers judged individual written pieces (manuscripts or proposals) against the background of the discipline as a body of accepted knowledge.

Peer review then made a dimensional jump to judging the state of large parts of research fields or even a discipline as a whole, through foresight exercises especially since the 1970s (e.g., Irvine and Martin 1984; van der Meulen et al. 1991). These exercises were often intended to inform decision-makers about the strategic funding of large research efforts or research programmes. These methods changed peer review from an individual reviewer's exercise to committee work.

The final step was to extend the method of peer committee review into countrywide research assessment exercises. These were first introduced in Europe in British higher education and research in the early 1980s (Leisyte et al. 2008; Westerheijden 2008), but other forms appeared as well, as in the Netherlands. The contrast between the British and Dutch approaches merits some attention, because it says something about principles of rankings and classsifications.

In the 'hard' New Public Management approach characterising the UK (Paradeise et al. 2009) the research assessment exercise (RAE) was meant to

determine funding, not of some individual research projects or programmes but for all public research funding in the 'normal' recurrent funding of higher education. In essence, its method was that ad hoc committees of peers were given publications and information by university departments, which they had to process to come to a single, semi-numerical judgement about the quality of the department's research. The best outcome was the judgement that a department's research was leading in the world (in different RAE exercises, this was expressed as '5' or '5*'). More than 25% of all the quality-related research funding went to four higher education institutions (Cambridge, Oxford, University College London and Imperial College), who were also among the institutions with more than 50% of their total recurrent governmental grant coming from research funding (Westerheijden 2008). The British RAE was meant first of all to inform the funding authorities and the continuation of RAEs since the 1980s suggests that the funding councils were satisfied with this type of information.

In the much softer approach in the Netherlands, after some initial controversial ad hoc budget reduction exercises in the first half of the 1980s (de Groot and van der Sluis 1986; Grondsma 1987), research evaluations were introduced that in fact were not used to redistribute governmental research funding (Spaapen et al. 1988). After two rounds, the government even relinquished control of the research evaluations completely, leaving them to the umbrella organisation of universities, for the sole purpose of informing research management decisions by institutional leadership (VSNU 1994). Accordingly, the Dutch research evaluations since the early 1990s had institutional leaders as their intended audience. And those leaders were happy to use the information for all kinds of decisions from bonuses for well-performing research groups to the reorganisation of badly-performing ones (Westerheijden 1997; Jongbloed and van der Meulen 2006). The information they were given consisted mostly of four numerical indicators about a research group's productivity, quality of products, relevance of its research and the vitality and feasibility of the research group and its programme (Vereniging van Universiteiten et al. 2003). Additionally, short texts about each research programme gave some qualitative argumentation for the indicators and could inform more detailed management decisions.

In some Central European countries, after the fall of communism around 1990, countrywide research evaluations were introduced too, in order to inform public funding of university research. In their effort to do away with the corrupting effects of the nomenklatura, these regularly recurring evaluations were strongly based on objective performance indicators: publication figures played an important role, for example in Poland and Slovakia.

It is interesting to observe that in 2008 the British research assessment exercise was considering a stronger reliance on an objective 'metrics driven' indicators-based assessment framework but after thorough consultation within the UK stakeholder community will now most likely adopt a hybrid system with both quantitative and qualitative sources. The Australian government on the other hand has as of 2009 embarked on the ERA (Excellence in Research in Australia) approach that is predominantly driven by quantitative performance indicators.

The types of indicators used in research assessment in recent decades have evolved from a crude counting of publications to sophisticated measures of impact. This helps explain why in the UK the indicators for the new type of RAE are called 'metrics' rather than 'performance indicators'. Bibliometrics are measurements of research outputs, in particular publications, and their impacts. They can be used for different purposes but are best known as indicators of research quality—as measured by impact (number of citations as a sign of use by fellow-scientists) (Cozzens 1981; Moed and et al. 1985; Leydesdorff and van der Schaar 1987; Moed 2005). As such they have given much new insight and are among the mainstays of 'informed peer review' (Rinia et al. 1998). However, their use is not without problems: the standard model of research from which bibliometric indices proceed – that the large majority of knowledge claims are published in international (English-language) peer-reviewed journals – applies only to a small portion of academic disciplines and—as far as the English language is concerned—to only part of the world (van Raan 2005). Alternative measures are being developed for knowledge areas where this standard communication model does not apply, for example focusing more on conference proceedings or book publications. Debates continue on what are the best indicators, for example the superiority of the field-normalisation citation impact indicator (the 'crown indicator') of the Leiden rank-

ings over the 'Hirsh index' and its expanding family of related indices (Hirsch 2005; van Raan 2006; Bornmann et al. 2008).

As a by-product, all of these research evaluations can be used to inform stakeholders and the general public by rating or ranking higher education institutions according to the 'points' earned in the assessment exercises. What these points actually mean, or how these meanings have shifted over the years, appears to have been less important to the 'rankers' than the fact that they could be ranked and rated: so

many '5-stars' etc. In the UK, the RAEs were given ample public attention through the media. In the Netherlands this was much less the case, probably because there was not a single major news event in the form of the publication of all national ratings at the same time. However, institutional leaders in the Netherlands often used the total number of points gained by research groups as a criterion for internal financial reallocation (Westerheijden 1997), despite the evaluating agencies warnings against adding up the scores on different dimensions.

4.3   Quality assurance in higher education: peer review, performance indicators, accreditation and audits

Quality assurance schemes for the educational function of higher education institutions have been designed since the 1980s or 1990s in diverse countries in Europe (Goedegebuure et al. 1990; Brennan et al. 1994; Neave 1994; van Vught and Westerheijden 1994; Westerheijden et al. 1994). This simple statement is the clue to much of the answer to the question regarding the information provided by quality assurance in higher education. First, the statement implies that current quality assurance schemes still bear the marks of their 15 to 30 year history: they were designed to answer questions relevant at that time (Jeliazkova and Westerheijden 2002; Westerheijden et al. 2007). Second, quality assurance was designed to answer to national agendas—although those agendas were partly inspired by international policy developments, such as the spread of variants of New Public Management (Paradeise et al. 2009) and more recently the Bologna Process.

The national agendas were mainly influenced by the dominant stakeholders, which in Europe means that public authorities play an important role and their perspective is one of the legal context. Nationally existing classifications of higher education institutions were taken for granted from the very beginning: there was no questioning of what constitutes a 'university', a 'polytechnic', or a Fachhochschule. Similarly, nationally defined degrees were taken for granted (Schwarz and Westerheijden 2004). Comparability across jurisdictions was hardly ever an issue in the initial design of quality assurance schemes.

Quality assurance schemes across European countries produce different types of information, some of them tending towards 'hard data' in (performance)

indicators, while others tend towards 'soft' judgements by external reviewers. The externally available data are a core product of quality assurance from the accountability viewpoint: objective and comparable information reassures government and the tax payer that their money was well-spent. Accountability is a major aim of quality assurance from a governance perspective, stimulated by New Public Management approaches which focus on improving performance across all public services. The other main aim of quality assurance, quality improvement or quality enhancement, is served more by judgemental information and specific recommendations from knowledgeable peers to the individual study programme or higher education institution. This judgemental type of information may benefit from not being too public; otherwise the open discussion among peers may be negatively influenced by considerations of what the public (the media) may make of statements about weaknesses and problems (van Vught and Westerheijden 1994). The line between helpful recommendations and 'naming and shaming' is no thicker than a newspaper.

Another type of problem surfaces when quality assurance is based solely on performance indicators. The natural tendency then is to give most attention to their being measurable. The title of a recent report on rankings in the United Kingdom—arguably a country that has been immersed in discussions on performance, indicators and league tables much longer and more intensely than others in Europe—was: Counting what is measured or measuring what counts? clearly implying that after all these years of experience and debate the former was still happening rather than the latter (King et al. 2008). In re-

search terms: reliability is given a higher priority than the validity of the indicators.

Quality assurance is almost invariably about ensuring that the provision of higher education does not fall under a threshold level of quality; public authorities want to protect students against 'rogue providers', 'degree mills' and the like. Accordingly, the information given publicly by quality assurance schemes in the large majority of cases is limited to statements that programme X or institution Y is of 'basic quality', 'sufficient 'or 'trustworthy', and that these programmes or institutions can be 'accredited'. Sometimes differentiations are made between 'confidence' and 'broad confidence', or between 'conditional accreditation' and 'accreditation', suggesting that some remain closer to the threshold than others, but the differences are not easily understood by outsiders such as potential students.

The main point is that quality assurance when applied in this way does not make the differences among study programmes or institutions very visible: all higher education seems to be lumped together as 'generally OK' (except the few that do not pass the test). The academic conception of quality as excellence (Harvey and Green 1993) is not supported by most quality assurance schemes, whatever the rhetoric of the decision-makers when justifying these policy instruments.
The pursuit of research excellence is rather uncontroversial - achieving excellence in the sense of contributing to scientific progress and pushing back the frontiers of knowledge has always been a key objective of leading researchers. As such, the implicit assumption that scientific excellence has a meaning across all scientific areas has never been questioned. The notion of excellence also informs quality assurance practices - seeking out talented researchers and promoting excellence (through incentive systems) have always been a major management objective among the world's leading research universities,

but have now also gained importance among a wider range of universities given the impact of global rankings on how universities and stakeholders now tend to perceive and assess research performance within an international perspective.

More recent academic work is focussing on the design and development of metrics and performance indicators to identify and assess the top end of quality distributions, often using citation impact measures, and applying the methodology as a supplement to expert panel reviews (van Raan 1996; Tijssen et al. 2002). The multi-dimensional analytical frameworks in which these indicators should be applied are usually referred to as scorecards or scoreboards, which provide a platform for including perspectives and preferences from various stakeholders, while presenting a wide range of information sources and quantitative indicators. Such context-specific and customized scoreboards show promise as a structuring tool in informed debate, indicator selection, comparative analysis and benchmarking studies of university performance (Tijssen 2003).

In quality assurance schemes focusing on the programme level, the information produced in the form of indicators is mainly about the educational process, its inputs, throughput and outputs, and about the processes supporting the educational process, including services such as ICT, libraries etc. In quality assurance schemes focusing on the institutional level, the balance of information tends to be different, with descriptions of the institutional organisation, processes, and administration being prevalent, and more summary information on the education function. When these institutional evaluations focus on the organisation and implementation of institutional quality assurance systems, they are usually called 'audits'. Audits address quality assurance at a meta-level, evaluating the mechanisms and processes that institutions have in place to assess their internal education quality.

4.4   European projects on quality assurance for education
The European involvement in quality assurance started in 1992, when an inventory was made of the then state of the art regarding external quality assessment in the EU-member states (van Vught and Westerheijden 1993). A small number of countries had operational quality assessment schemes at the

time and the EU member states initiated a first pilot project in 1994-1995 to acquaint other countries (17 countries participated) with external quality assessment, as well as a first experience with the involvement of foreign 'peers' in external evaluation teams (Management Group 1995; Kern 1998). Some other

experiments took place also in the early 1990s: the Dutch quality assessment coordinator VSNU initiated an international comparative assessment of electrical engineering (Vroeijenstijn et al. 1992) and a study was made of methods for international evaluation without site visits (Brennan et al. 1992).

These early evaluations led to more experimentation in the so-called Transnational European Evaluation Project (TEEP) with cross-national programme assessments in 2002-2003, focusing more on European commonalities and differences with the aim of investigating the operational implications of a European transnational quality evaluation of study programmes (ENQA 2004). By that time, European frameworks were beginning to take shape: the Bologna Declaration had been signed and 'shared descriptors for bachelor's and master's' had been drawn up (Harris 2003) which immediately were christened 'Dublin Descriptors' for better marketing (van der Wende and Westerheijden 2003). On this basis, TEEP I sought to evaluate fourteen programmes in history, physics and veterinary science across a number of countries. A major aim of TEEP I was to test the use of common criteria, as only common standards make comparisons possible. While not easy to apply strictly, the common criteria functioned as 'shared reference points' or a checklist, so that the same topics were evaluated across the three disciplines. An issue remained making reference points compatible with national and local contexts, and describing them in terms familiar to the disciplines and national contexts being evaluated (ENQA 2004): there clearly were limits to the amount of standardisation that could be achieved. A lesson from this project was that evaluation methodologies should keep these limitations in mind and provide leeway for adaptation to different fields of knowledge and to different national education systems and philosophies.

Subsequently TEEP II 'aspired to identify means and common elements for quality education in Joint Masters Programmes in three subject areas: water management; cultural and communication studies; and law and economics' (www.enqa.eu/projectarchive.lasso). The new elements in this project were especially the involvement of cross-national, joint study programmes and the testing of an early version of the 'European Standards and Guidelines for Quality Assurance' (ESG) (ENQA 2006). Some lessons from TEEP II are that integrated solutions for quality assurance of transnational education need to be de-

veloped but remain complex because of national arrangements and jurisdictions over higher education, and that international recognition of degrees remains a major issue. The Washington Accord was seen as a model to be followed: once a programme is recognised, degree holders should get equal access to the relevant labour market in any country, unless—as the UNESCO/Council of Europe Recommendation on joint degrees has it—authorities 'can demonstrate that there is a substantial difference between the joint degree for which recognition is sought and the comparable qualification within their own national higher education system' (Committee of the Convention on the Recognition of Qualifications 2004).

In the Bologna Process, the line of the TEEP projects seems to continue into the European-wide frameworks: the 'European Standards and Guidelines for Quality Assurance' (ESG) and the European Qualification Framework for the European Higher Education Area (EHEA). The latter is, briefly, a formalisation of the Dublin Descriptors, giving general descriptors of expectations common to all bachelor's and master's degree graduates. The former includes a checklist of seven elements that ought to make up the core of both internal and external quality assurance and also prescribes regular external evaluation of the quality assessment agencies themselves (European Association for Quality Assurance in Higher Education 2005). The ESG do not really prescribe any educational standards; in that sense their name of 'standards' may be misleading.

The Bologna Process operates at a high level of abstraction: general guidelines applicable to all areas of knowledge and all geographical areas and a very large collection of higher education systems, spanning many thousands of institutions. On the other hand, there are developments trying to put more flesh on the bones, in line with the concerns noted earlier about the need for adaptation to different disciplines and countries. This second line is associated with the Tuning projects - the Socrates-supported project Tuning educational structures in Europe (http://unideusto.org/tuning/), which has developed cross-national common descriptors of educational outcomes of study programmes in different disciplines, based on the voluntary co-operation of teaching staff from higher education institutions across many countries and institutions (Gonzáles and Wagenaar 2008). Tuning found that it was possible to agree on typical knowledge, skills

and competences of graduates per field, rather than about the way to get there, due to different structures and ideas about curricula and about teaching and learning in the different educational systems.

The Tuning project has developed an international following, notably in Latin America (Beneitone et al. 2007) and recently in some states of the United States of America (Adelman 2009).

4.5   European projects on quality assurance for research

While the involvement of the European Union with research predates its involvement with higher education, its involvement in methods of producing information about research is of a more recent date. For much of the EU's involvement in funding research projects, for example through the ESF or its Framework Programmes, it has relied on peer review of individual project proposals.

Moreover, much of the attention in the EU is directed to questions of a broader nature than those that concern us here. For instance, there have been interesting developments to gauge the innovative capacity of national R&D systems or of geographical regions (e.g. Autio 1998; Hong and Boden 2003; Miles and Cunningham 2006; Technopolis 2006). Evaluation and information on the role of university-based research has become an object of attention in recent years (AUBR Expert Group 2009); in fact, much of the work in this area is proceeding more or less in parallel with our classification project.

The European Commission's Expert Group 'Strengthening Research Institutions' reported in 2008 on the

identification and definition of possible measures and actions regarding the strengthening of research institutions with a focus on university-based research. Quality assurance is among its areas of interest, especially from the perspective of strengthening the institutional performance management of research. However, the Expert group did not go deeply into the methods or indicators needed for that purpose (ERA Expert Group Strengthening research institutions 2008). In 2008 the European Commission appointed an Expert Group that was mandated to prepare a more comprehensive, multidimensional approach to assessing the quality of university-based research (Mackiewicz 2008; AUBR Expert Group 2009). 'The multidimensional approach also considers the variety of university disciplines and research paths through which it tries to overcome the shortcomings of the existing methodologies' (Potocnik 2009). This to some extent parallels the U-Map project, though only for the area of university-based (fundamental) research. Information about 'applied' research is in need of better indicators, as evidenced by the ERIC initiative (Evaluating Research In Context) which will be described in the next section.

4.6   Recent developments

The information provided in the previous sections suggests that the quality assurance schemes in education and research in Europe have gone through clear development processes. In research, quality assessment is clearly impact-oriented. The impact of research publications on the scientific community, measured in terms of 'citations', is a fairly well-established comparable indicator of quality of the (fundamental) research. Its validity is discussed by the researchers specialised in this field, for example (van Raan 2005), perhaps more than by stakeholders and users, who appear to be satisfied with this approach to research quality measurement. Reports published by the European Commission now include performance indicators and comparative statistics on the citation impact performance of (European)

universities (European Commission 2008)

Nonetheless, the limitations of citation impact measures within various fields of sciences (engineering, social sciences, humanities) are a critical issue. Without calling the impact-orientation into question, the Expert Group on Assessment of University-Based Research argues in favour of an increased diversity of methods: for different purposes a tool box of assessment methods, both quantitative and qualitative, will be necessary, covering not only research outputs, but also elements of research inputs and processes (AUBR Expert Group 2009). A recent crucial discussion regarding research quality assurance concerns the assessment of 'other forms of research' (applied, practice-oriented research) and the diversity of re-

search impacts and outputs across fields of science. Here the specific mission of the research activity, its audiences and stakeholders, and its contexts appear to be important aspects.

In quality assurance of education the assessment approaches appear to have gradually shifted from a focus on input to more attention for process, and more recently from teaching to learning. In particular with respect to this latter trend, an emphasis on outputs appears to be developing in which attention is focussed on achieving 'learning outcomes'. In

addition, there seems to be growing interest in approaches that offer finer gradations than only threshold passed information (for instance on 'excellence') and in orientations that allow specific categories of stakeholders to use the assessment results for their own needs and purposes.

In the following sections we briefly consider four topics that appear to be prominent in recent discussions in the international quality assurance community in connection to these issues.

Figure 16: Topics in international quality assurance

Practical research assessment
The archetype of peer review which is still so influential in the quality assurance schemes for research was developed in the context of fundamental research; what does this mean for the evaluation of research in context?

Learning outcomes
The OECD recently decided to initiate a major international project on the Assessment of Higher Education Learning Outcomes (AHELO). Experts from quality assurance recognize that learning outcome assessment bears upon the dimension of accountability (publishing better data on what students actually learn), as well as being a means or diagnostic tool for institutional self improvement.

Global rankings
During the last years rankings have been increasingly debated in international higher education and research. In general two rankings dominate: those published by the Shanghai Jiao Tong University and the Times Higher. These rankings have met with substantial criticism.

Student information systems
In Europe, the Centre for Higher Education Development (CHE) has developed a wellknown student information system. The chief strategic virtue of the CHE 'rankings' is that they dispense with a holistic rank ordering of higher education institutions in favour of field and programme based assessments.

4.6.1   Practical research assessments

Much of the knowledge-generating activity in higher education institutions can be called applied research—this applies (to differing degrees) both to 'research universities' but also to, for example, 'universities of applied sciences' in Germany or the 'institutes of technology' in Ireland. The archetype of peer review, which is still so influential in quality assurance schemes for research, was developed in the context of fundamental research; what does this mean for the evaluation of applied research? The

term 'applied research' is contested: the characteristics of knowledge-creating activities can be manifold and it is difficult to come up with a single name for everything that is not the purest form of basic research - Mode-2 research is one of the more popular terms (Gibbons et al. 1984). The evaluation mechanisms for these other forms of knowledge-creating activities need to be manifold as well. The route from fundamental research to product innovation may be complex; indicators have been developed on pat-

ents, income from licences, co-authored papers, etc. (Debackere et al. 2002). Indeed, 'practice-oriented research' in universities of applied science may have a range of outputs; the Dutch HBO-council mentions 'publications, presentations and other products' (HBO-raad 2008).

It is worth mentioning the Dutch situation here, as it is one of the few places in the world where systematic approaches to evaluating other forms of research are being developed; their main thrust is the 'evaluation of research in context' (ERIC is the acronym of what was previously known as the sci-Quest method). Research is seen as more than just (international, peer-reviewed) publications for fellow-researchers, but rather as knowledge processes and products for use by non-academic or non-scientific stakeholders. This implies that we are not looking for an instrument to evaluate a specific research group or programme, but a process of interaction (Spaapen et al. 2007) . This requires indicators that go beyond how good or bad the 'quality' of the research is to whether the group succeeds in fulfilling its mission within its relevant context(s).

We call this evaluation of 'other' knowledge production 'practical research assessments'. The core

of the ensuing evaluation method is called the 'Research Embedment and Performance Profile (REPP)', including, in one of the pilots, several indicators in each of the following dimensions: science & certified knowledge; education & training; innovation & professionals; public policy & societal issues; and collaboration & visibility.

In its quality assurance scheme for such practice-oriented research, the HBO-council mentions a wide range of products and further refers to impact on, and satisfaction of, development of the field, the profession and society, and education and training (HBO-raad 2008). The HBO-council's quality assurance scheme also looks at the relevance and sustainability of networks with stakeholders.

These alternative evaluations are meant to inform research management within the higher education institutions; institutional leadership therefore remains the main audience. At the same time, they represent an attempt to give recognition to practice-oriented research as a different dimension of knowledge-creation to fundamental research; and are a sign that instruments to show and value diversity are on the rise. These methods have been developed recently so it is too soon to assess their impact.

4.6.2 Learning outcomes

The OECD recently decided to initiate a major international project on the Assessment of Higher Education Learning Outcomes (AHELO), as ministers of higher education agreed that following decades of expansion, greater attention should be paid to the quality and relevance of higher education. It was recognized that there is no reliable information that enables comparative judgements about the competences of students in different countries and different institutions, or about the quality of teaching. At the same time, the reputation of higher education institutions is largely based on (historical) research performance, reflected in international rankings, which may distort decision-making by students and other stakeholders.

The project aims to assess whether it is possible to measure at international level what students know and can do at the end of the bachelor degree programme. It consists of a study into the scientific and practical feasibility of assessing learning outcomes

across institutional, system, national, linguistic and cultural boundaries. To this end three instruments, one to asses generic learning outcomes and two for discipline-specific (engineering and economics) learning outcomes, will be tested for international validity and reliability in small scale pilot projects.

Stakeholders' concerns regarding the OECD-initiative focus in particular on whether the diversity that characterises most higher education systems, in particular with respect to the type of students accepted (admissions selectivity; demographic profile) and the different institutional profiles and missions (such as research vs. teaching intensiveness), will be sufficiently taken into account. As a lack of data on differences in these settings would indeed bias the validity of obtained results, may result in unintentional rankings, and would inhibit the use of results for the improvement of learning outcomes, substantive work on the contextual dimension of learning outcomes assessment will have to be undertaken.

Experts from quality assurance recognize that learning outcome assessment bears upon the dimension of accountability (publishing better data on what students actually learn), as well as being a means or diagnostic tool for institutional self-improvement. They also recognize the need to move beyond the assessment of inputs and processes and that AHELO could be very relevant in deepening the appraisal of outcomes. The aim for international comparison is in their and many others' view supported by the adoption of the Tuning approach. In the Tuning project (see above) intended learning outcomes were formulated across numerous countries for a range of disciplinary degrees at bachelor and master levels, including the definition of generic skills. The step from intended to achieved learning outcomes is seen as possible, provided that issues related to linguistic and cultural biases in their assessment (testing) are sufficiently addressed. Extended success in this area would obviously fuel and enhance the practices of mutual recognition of higher education credits and degrees.

Success may also contribute toward the improvement of university rankings (see below). The gaps that exist in indicators and data concerning the quality of teaching in higher education institutions may be addressed. However, AHELO itself explicitly rejects the idea of rankings, or that higher education performance can be reduced to a handful of criteria. Instead, AHELO sets out to identify and measure as many factors as possible influencing higher education, with the emphasis being always on teaching and learning. At the same time, there is an awareness of the risk that AHELO or part of its results will be used for rankings by others (for more information, see: www.oecd.org/edu/ahelo).

Although the emphasis on learning outcome assessment is growing at international level, it is not completely uncontested. Especially the notion that standardised testing is the appropriate way to assess learning outcomes at the university level has not been universally accepted. For example, in 2007 the University of California explicitly rejected this, noting that 'using standardized tests on an institutional level as measures of student learning fails to recognize the diversity, breadth, and depth of discipline-specific knowledge and learning that takes place in colleges and universities today' (Thomson and Douglass 2009).

'Learning outcomes' are viewed by many stakeholders, not only as a means to better understand the results of learning, but also as a method to measure the value added - the relative progress of students during their participation in the programme; their actual level as compared to their entrance level. As this takes the initial level of the student intake into account, it is considered as a measure of the quality and effectiveness of colleges and universities. Thompson & Douglass (2009), however, note: 'To veterans in the higher education research community, the 'history lessons' of earlier attempts to rank institutions on the basis of 'value-added' measures are particularly telling. There is evidence that all previous attempts at large-scale or campus-wide assessment in higher education on the basis of value added measures have collapsed, in part due to the observed instability of change measures'. AHELO has included the added value dimension for this phase of the project only from a conceptual perspective and through analysis of existing datasets.

4.6.3 Global rankings of higher education institutions

During the last years rankings have become much debated in international higher education and research. In general two rankings dominate: those published by the Shanghai Jiao Tong University (SJTU; www.arwu.org) and the Times Higher (www.timeshighereducation.co.uk/WorldUniversityRankings2009.html). More recently, the Taiwanese higher education evaluation council (HEEACT; http://ranking.heeact.edu.tw/en-us/2009/Page/Background) and Leiden University (www.cwts.nl/ranking/LeidenRankingWebSite.html) have added new rankings. Global

rankings have become highly popular publications, and they share broad principles and approaches, although they are driven by different purposes and differ in relation to their methodologies, criteria, reliability, and validity (Dill and Soo 2005; Van Dyke 2005; Usher and Savino 2006; van der Wende and Westerheijden 2009). The latter suggests that there is no commonly accepted definition of quality of higher education and/or research and hence a single, objective ranking cannot exist (Van Dyke 2005; Brown 2006; Usher and Savino 2006). This is shown

even by a cursory comparison of the indicators that they use: research output and impact form the bulk of most of the global institutional rankings (the THE being the exception, focusing mostly on reputation through peer judgements, which still may be more research-related than education-related), but they are measured in different ways. The Leiden rankings offer four 'colours' of rankings, of which the green (field-normalised impact) and orange ('brute force' of the university) may be the most interesting ones.

Combining different types of indicators in so-called holistic institutional rankings, leads to methodological anomalies. It is dubious to combine different purposes and the corresponding data using arbitrary weightings. The weightings vary across rankings and typically reflect the view of the publisher rather than being theoretically grounded. There is a general consensus that this arbitrary and subjective method is a fundamental flaw in the methodology of rankings (Salmi and Saroyan 2006). This criticism mostly concerns The Times Higher, as it is a more holistic ranking than the ones limited to research. For instance, the SJTU authors consider it impossible to compare teaching and learning worldwide 'owing to the huge differences between universities and the large variety of countries, and because of the technical difficulties inherent in obtaining internationally comparable data' (Liu and Cheng 2005, p. 133). They argue that the only data sufficiently reliable for the purpose of worldwide ranking are broadly available and internationally comparable data of measurable research performance. Despite the fact that research performance does not constitute a holistic comparison of universities, it has been widely interpreted as such. Research performance and student selectivity have become proxies for 'quality'; yet these qualities drive the reputation of a higher education institution more than they drive its educational programme.

Another criticism concerns the aggregation question: education and research are 'produced' in (study) programmes and (research) projects; each with their own qualities and this is what students and research partners encounter. University-wide rankings erroneously suggest, however, that quality is uniform across the whole institution. Since 2007, the SJTU and subsequently other rankings have responded to the criticism of university-wide rankings by also providing rankings by broad academic fields (and partly adjusting the indicators to these fields).

The question then arises if research-based rankings are what users need. Research information may be relevant to research partners, but most rankings are ostensibly directed at (and published in magazines for) prospective students and their parents. Arguably, they would be best served with information directly addressing the quality of education. Few rankings focus on teaching and learning, however, and none has been able to generate data based on measures of the 'value added' during the educational process (Dill and Soo 2005, p 503 & 505). As Altbach (2006) states, 'there are, in fact, no widely accepted methods for measuring teaching quality, and assessing the impact of education on students is so far an unexplored area as well'.

It is also unclear to what extent the prestige fostered by rankings is grounded in real differences in higher education institutions' quality; whether ranking feeds into a process of continuous improvement in quality and student servicing (e.g. Dill and Soo 2005); and whether there are downsides to rankings from the points of view of students, higher education institutions, systems or the public interest. Reputational surveys favour universities already well known; they recycle and augment existing reputation, and reinforce stereotypes and market stratification, a process described as the 'higher education reputation race' (van Vught 2008).

Research rankings tend to be biased towards the natural and medical sciences and the English language: the model global university is English-speaking and science-oriented. In this way global rankings suggest that there is in fact only one model that can have global standing: the large comprehensive research university (Marginson and van der Wende 2007; van der Wende 2008). The higher regard for research institutions cannot be blamed on the rankings as such, but arises from the academy's own stance towards the importance of research following the model of the 'hard' sciences. Although it can be argued that world class universities need to exist as role models, the evidence that strong institutions inspire better performance is so far mainly found in the area of research rather than that of education (Sadlak and Liu 2007; Salmi 2009). Critics even claim that world-class research universities need not be doing a good job at (undergraduate) education at all (Bok 2005).

Especially the biases favouring particular functions (research) and types of institutions (large, global research universities) make rankings problematic in informing stakeholders (especially students). Holistic institutional rankings not only ignore the fact that higher education institutions are internally differentiated, but also that rankings have different goals and missions. These rankings portray one kind of higher education institution with one set of institutional qualities and purposes (the comprehensive research university) as the universal norm, and in doing so strengthen its authority at the expense of all other kinds of institutions and all other qualities and purposes. This jeopardizes variation in institutional development and works against diversification at the system level, since academic drift and mission drift (isomorphism) can be expected to intensify as

a result of such a single global status model. In this way, global rankings do a disservice to the multitude of roles higher education systems are supposed to play in the knowledge society.

We argue that classification is needed to guide comparisons and rankings within groups of comparable institutions. In this way, higher education institutions could be stimulated and enabled to excel in different missions and to develop distinct profiles. This requires multi-dimensional approaches to ranking and classification and the development of more sophisticated indicators for measuring performance in areas other than basic research, such as teaching, lifelong learning, knowledge transfer, practical research, innovation and local and regional engagement (van der Wende 2008).

4.6.4 Student information systems

A quite different approach to rankings begins from the recognition that all rankings are partial in coverage, and that all rankings are purpose-driven. It is valid to engage in rankings provided that they are tailored to specific and transparent purposes (and only interpreted in the light of those), and customized to the needs of specific stakeholders. These are some of the ideas underlying the 'Berlin Principles', agreed upon by major institutions engaged in publishing and studying rankings across the world (International Ranking Expert Group 2006). Since quality 'is in the eye of the beholder', rankings should be interactive for stakeholders and users. Users should be able to interpret the data on institutional performance using their own choice of criteria. What students want to know is not which is the best university in the world, but which is the best university course for them individually. In fact, the purpose is not ranking, but matching. This purpose is answered by student information systems; although the term 'ranking' is sometimes used for these systems.

In Europe, the Centre for Higher Education Development (CHE) in Germany has developed a well-known student information system. The chief strategic virtue of the CHE 'rankings' and one with far-reaching implications for the character of competition in higher education, is that it dispenses with a holistic (overall or summative) rank ordering of higher education institutions, and instead provides a large range of indicator data in specific areas, focusing on single

study programmes in individual departments. As CHE states, there is no 'one best university' across all areas, and 'minimal differences produced by random fluctuations may be misinterpreted as real differences' in holistic rankings systems. Therefore, the CHE approach is to inform about separate study programmes, and not to use league table rankings but robust (good—average—bad) ratings. Even within a single subject, the CHE ranking does not calculate an overall value out of single, weighted indicators, as there is in their view neither a theoretical nor an empirical basis to do so. The CHE data are presented through an interactive web-enabled tool (English-language version: http://ranking.zeit.de/che10/CHE_en) that permits students to examine and rank their chosen programmes based on their own chosen criteria, that is, to choose their own weighting scheme from among a large number of criteria, including investment as well as consumption-oriented indicators.

Similar student information systems that evolved independently from the CHE system but follow the same logic exist in the UK (www.unistats.com) and in the Netherlands (English version: www.studychoice123.nl).

US and UK research suggests, however, that only certain groups of potential students are interested in reputation rankings of higher education institutions; these students tend to be drawn disproportionately

from high achieving and socially advantaged groups (Dill and Soo 2005). Others have also found that students from high income backgrounds and highly achieving students are the most likely to use rankings (Clarke 2007; Cremonini et al. 2008). Better design (choice of indicators, manner of presentation,

embedding in other support structures for college choice) may improve the reach of future student information systems to categories of students that may most need them (Cremonini, Westerheijden et al. 2008).

4.7   Conclusion: function of U-Map

This chapter has outlined the types of information produced by quality assurance schemes on the research and education functions of higher education institutions, has commented on the shortcomings of this information from the perspective of users, and has shown that some approaches are more promising than others. The less promising approaches are what might be called the 'standard' quality assurance schemes, including programme and institutional accreditation. Such schemes operate mainly in a context of accountability and the effectiveness of public spending, and in a context of protecting students from malevolent higher education providers. They mostly inform users only about what from a system perspective is 'acceptable' in contrast to 'non-acceptable' higher education.

Information that can help establish a match between students with their individual interests and higher education programmes and institutions needs to be more fine-grained. We have indicated that 'student information systems' relating to study programmes can go some way towards matching students with programmes fitting their needs. Establishing the actual value added by higher education in terms of learning outcomes, which is the ultimate aim of the AHELO project may in the future be another valuable type of information.

A crucial challenge for quality assurance schemes (which so far has only partially been met) is to come up with the types of information demanded by higher education stakeholders and users, and to combine them in such a way that stakeholders can make sense of it and actually use it to support them in their decision-making, but at the same time ensure that the information provided reflects the complexity of higher education systems. This reflects the tension between the efficiency and adequacy of information. On the efficiency side, the drive is for reducing the information provided to give users a quick grasp of the 'quality' of higher educa-

tion and research; this drive aims for standardisation of information. On the adequacy side, there is the need to accommodate the diversity of higher education institutions across Europe. Here the drive is to offer information that suits the specific needs of stakeholders and users and to allow for a variety of stakeholders' perspectives.

Current quality assurance schemes tend to emphasise uniformity. They trigger information on the inputs, processes and/or outputs of higher education institutions and present this information in the form of 'passing uniform thresholds' (accreditation), succeeding in generally accepted performances (audits), or 'ratings' on uniform scales (ranking). Only recently have some new initiatives been developed that intend to address the specific needs of stakeholders (student information systems, learning outcomes) or that try to diversify quality information according to the different intentions of the activity involved (practical research assessments). Here U-Map wishes to offer a new perspective.

U-Map aims to create transparency of the diversity of European higher education and research. The classification provides a sophisticated framework for constructing and presenting a variety of institutional profiles that give the foundation which is necessary for a sound interpretation when assessing and especially when comparing across Europe, the performance of higher education institutions in various areas. U-Map itself is not a performance or quality assessment instrument. It is a descriptive tool to identify higher education institutions that show similarities on certain dimensions and indicators. As such, we argue, U-Map is a highly relevant instrument for the further development of quality assurance approaches in European higher education and research, including more sophisticated ranking models.

U-Map makes the diversity in actual institutional missions and profiles visible in a comparable way. It is an

empirical question if this diversity can be clustered into categories or groups of similar institutions, and even more if these categories would resemble the a priori categories we all tend to work with, like 'university' or 'polytechnic'. We suggest that the clustering or grouping of institutions takes place from the perspectives of (various groups of) higher education stakeholders, including the higher education institutions themselves. U-Map does not offer a top-down, a priori categorisation of institutions. It allows stakeholders and institutions to create their own comparisons, based on their own priorities.

In addition, making information available about the diversity of the actual institutional missions and profiles contributes to the accountability of the higher education and research sector in European society. This will aid higher education institutions' leadership to make their profile and strengths better visible, in ways that are communicable and transparent to larger audiences than has been the case until now. In turn, this would help them attract the types of

students that best match the institutions' abilities, and to find partners and contractors for research and innovation activities and for benchmarking.

It goes without saying that in actual users' decisions, such as on college choice, many more factors play a role than those that could be included in even the most extended classification scheme – such as social factors and travelling distance (e.g. Vossensteyn 2005), but it equally goes without saying that in absence of good information reflecting the diversity of higher education, such as that included in the U-Map design, good decisions cannot be made.

U-Map is a relevant additional tool for the communication between higher institutions and their stakeholders. It allows stakeholders to find institutions with similar profiles according to their own priorities. When, in quality assessment schemes, the performance of these institutions is compared, U-Map will ensure that apples are compared with apples and oranges with oranges.

Part three

Stakeholders and the design of U-Map

5. Stakeholders' Views

This chapter outlines the involvement and input from various groups of stakeholders who participated in the U-Map project. It discusses how the stakeholders' involvement was organised and presents an overview of the various issues that were discussed during the intensive stakeholder consultation process. A list of stakeholders involved in U-Map is provided in section 5.5.

5.1 A stakeholder driven approach

The diversification of the roles and profiles of higher education institutions throughout Europe is closely linked to the growing impact of stakeholder views, needs and expectations. Higher education institutions are no longer ivory towers of research and advanced learning that define their roles and ambitions exclusively from their own perspectives. The transformation to a modern 'knowledge society' requires higher education institutions to be highly responsive to societal needs and, at the same time, highly adaptive to changing political and financial framework conditions.

European labour markets face a growing demand for academically trained personnel. As the participation rate of young people in higher education continues to increase and as the implementation of life-long learning policies gains momentum, the student body becomes more diverse. Higher education institutions need to be able to cater to a larger number of students with a wider range of backgrounds, talents, knowledge levels and expectations. The same is true for cooperation with business and industry which expect higher education institutions to provide them with an appropriately qualified workforce and a broad spectrum of research, development and innovation. In addition, various policy reforms at a European level encourage higher education institutions to shape and diversify their academic programmes with a focus on learning outcomes and employability, urging institutions to respond with greater flexibility to the needs of regional as well as (inter)national employers in business and industry.

Last, but by no means least, governments, at na-

tional or regional levels, being in most cases the main funding bodies for higher education institutions in Europe, are major stakeholders, influencing the competitiveness and future development perspectives of these institutions through the allocation of funds, quality assurance regulations and other specific policies, often based on political and social rather than academic priorities.

This is the background against which higher education institutions in Europe have to take strategic decisions on institutional missions and strategic orientations in order to position themselves successfully in an increasingly competitive environment at national and international levels. The diversification of European higher education systems is a natural reaction to this competitive environment and since the diversification of the European higher education landscape is highly stakeholder-driven, it has been an integral and essential part of the U-Map project to involve stakeholders in the attempt to make institutional diversity more transparent. From the very beginning, we adopted a user-oriented perspective: 'Cui bono?' ('Who will benefit?') was an important point of departure and remained a major concern throughout the whole project. Only when the relevant stakeholders are able to contribute to the overall design of the classification tool as well as to the selection and definition of dimensions and indicators will a relevant classification of higher education institutions in Europe be produced. Consequently, a crucial aspect of the project was to determine who are the potential or intended users (stakeholders) of the classification and how they would wish to use the classification.

5.2 Stakeholder involvement in the project

As a first step, five major groups of stakeholders, who could substantially benefit from a classification of European higher education institutions in various ways, were identified:

- Students
- Higher education institutions
- Business and industry
- Policy makers (at various levels)
- Researchers and analysts

Thereafter, we aimed at actively involving these five stakeholder groups in the process of designing a classification of higher education institutions in Europe. This was done by establishing close ties to a wide range of partners, encompassing individual higher education institutions as well as students' associations, employers' organisations, and research and policy making bodies at national and European levels. Consultative mechanisms (such as a Stakeholder Group and an Advisory Board) were installed to ensure a regular flow of information and ideas between the project team and the stakeholders. In addition, several information and communication tools were used to gather stakeholder opinions.

By far the largest group of stakeholders was formed by higher education institutions. It was our intention to consult very closely with institutions of different types and levels as the legitimacy of the classification depends in particular on its acceptance among higher education institutions. Institutions should in the end feel at ease with the classification and use it to develop their institutional strategies and profiles according to their mission and potential. The range of stakeholders from this sector included international and European umbrella organisations of higher education institutions and associations of institutions with specific profiles (research universities, comprehensive universities, specialised institutions in various fields, institutions of applied research, professional higher education institutions, etc.). In addition, several European networks and consortia participated in the consultation. A large number of individual institutions, including those that participated in the empirical testing of the classification, also contributed substantially to the process. Other stakeholder groups (students, business and industry, policy makers, researchers) were also involved in the project. All voiced their opinions and clearly indicated the needs they wished to be addressed in the classification. Stakeholder opinions have had a major impact on the development of U-Map.

In order to provide for maximal spread and coverage we decided to introduce a number of different mechanisms for stakeholder involvement:

- In the first and second phases of the project, stakeholders were invited to share their views on the project in a number of Stakeholder Group meetings which were held at regular intervals. On these occasions we reported on the interim results with regard to the conceptual approach to the classification and asked the stakeholders' opinion on important choices and options.
- Throughout all three phases of the project, stakeholders were represented on the Advisory Board. Regular meetings were held in which the current state of the project was presented and decisions of fundamental importance were discussed in depth. Board members had a strong impact and contributed substantially to the development of the classification.
- In the second phase of the project, the draft-classification was empirically tested at the level of European higher education institutions: a survey and a number of in-depth case studies were conducted in order to better understand the needs and expectations of individual higher education institutions regarding the classification. Feedback from participating institutions helped us to assess the validity of dimensions and indicators, the reliability of existing data and the feasibility of providing the necessary information. Some 100 higher education institutions from all over Europe took part in this empirical testing of the draft-classification.
- In the third phase of the project, an internet platform was introduced on the project website to further facilitate and widen stakeholder discussion. It was designed to provide detailed information on the project to the various stakeholders and the public at large. Additionally, it provided the possibility of feedback. For a more structured debate, the platform was organised in five subject-based communities. These communities dealt with major issues raised by the stakeholders, such as business engagement, innovation intensiveness, regional and cultural engagement, and involvement in lifelong learning.
- Throughout the project period, international dissemination conferences and seminars were held in various parts of Europe. The goal of these conferences was to present and disseminate information on the classification project to a wider circle of stakeholders. The discussions during the conferences and seminars proved to be very helpful in exploring and enhancing the legitimacy of the classification and in further developing its conceptual base.

- Presentations on the project were given on numerous occasions in different national and international settings and for various representative organisations of stakeholder groups. These presentations were usually followed by vivid debates which were fed back to the project team.

The discussions with stakeholders were extremely valuable for the development of the classification as they covered a wide range of issues and perspectives. Through the process of stakeholders' involvement the objectives and the conceptual framework of the classification were adapted and further developed. Furthermore, clarification could be given where necessary, background information improved, feasibility checked and procedures adjusted to meet the needs of all parties involved. Over the years, stakeholder contributions moved from general to more practical, helping to modify the U-Map classification as it developed.

5.3 Input and outcomes: issues of stakeholder involvement

In the following section we give a consolidated account of the various issues raised by the stakeholders and of how the stakeholders' views fed back into the conceptual and methodological design of U-Map. Comments, concerns and advice from stakeholders covered virtually all aspects of setting up a classification: from the overall rationale for a classification of European higher education institutions to the operational implementation of a classification system in Europe. In addition, broad design principles were discussed as well as the details of our preferred set of indicators.

5.3.1 The need for a classification

Throughout the whole project period, and especially during its first phase, stakeholder consultation concentrated on exploring the need for and the potential added value of a European classification of higher education institutions. From the very beginning we asked stakeholders whether they shared the view that there was a need for more transparency on institutional diversity in European higher education and whether they felt their own organisation would benefit from it. There was an early consensus among stakeholders that the evolving European Higher Education and Research Areas (EHEA and ERA) demanded more transparency on institutional profiles. Some stakeholders, especially those with a more regional or local focus, were initially more hesitant, but their views shifted considerably towards support of the initiative as the project progressed. Both European and international policy makers argued from the outset of the project that there was a need to develop a transparency tool to reveal the high level of diversity of European higher education, and encouraged us to operationalise our initiative.

Employers' organisations were, from the very beginning, adamant that more transparency was essential as institutional profiles and academic programmes diversified as a consequence of growing international competition. Beyond the business sector, support came from universities of applied science, universities of professional education and smaller universities with specialised missions and constituencies. This support was confirmed by several governments and the Bologna Follow-up Group, leading to the mentioning of the need for transparency in the Communiqué of the Bologna Ministers' Meeting in Leuven, April 2009. Similarly, the Communiqué of the UNESCO 2009 World Conference on Higher Education also stresses this point.

Despite the general consensus on the need for more transparency in European higher education, some stakeholders expressed (and sustained) their doubts about whether a classification would be able to serve this purpose. The question was raised of whether institutional diversity is perhaps too great to be adequately captured in one classification. Similarly, there was some doubt about whether it would be possible (and even desirable) to organise information on higher education institutions in such a way as to generalise beyond the level of the individual university. Stakeholders were also concerned that the data available might not be sufficiently comprehensive to allow for the identification of distinct types of institutions. Furthermore, it was pointed out that the classification might attempt to serve too many purposes (and too many stakeholders) simultaneously and thus lose focus.

The fear of unintended side-effects was another source of reservation. Some higher education institutions were concerned that the classification would become an instrument for use by regional/national governments or perhaps the European Commission as a basis for the allocation of funding or as a means to evaluate performance in teaching and research. The suspicion that a classification would be implicitly hierarchical and, therefore, would reproduce the traditional academic hierarchy while not adding other value was strongly voiced especially by students and some higher education institutions.

However, stakeholders support has gradually grown throughout the course of the project. As the consultation process evolved and the general design principles, dimensions and indicators of the classification were defined, re-defined and validated through intense discussions, the majority of representatives from all five stakeholder groups came to the conclusion that they can clearly profit from a classification. The case studies, for example, provided very positive reactions from the participating universities on the possible use of the classification. Similarly, during the survey which was undertaken to test the draft classification, many institutions indicated that they would find the fully developed instrument very useful. All these institutions appeared to be convinced that they would be able to work with the classification as a tool for their own strategic management processes. The classification was judged to be a relevant instrument

for sharpening an institution's mission and profile. By focusing on the relevant dimensions and indicators of the classification the institutions indicated that they would be able to strengthen their strategic orientation and develop and communicate their profile.

Another shift in stakeholder attitudes towards the classification occurred when in 2008 the French EU Presidency announced its plans to develop a European Ranking of Higher Education Institutions. Universities and other stakeholders voiced concern that a uniform ranking approach similar to the existing global rankings, which are all perceived to focus on the model of a comprehensive research university, would not be suitable to represent the multitude of institutional missions and achievements that relate to the diversity of institutional profiles of European higher education institutions. For a valid ranking it would be essential that standards of performance are defined in accordance with the institutional profiles and missions of higher education institutions. During the debate, the classification was suggested as an appropriate tool to understand institutional diversity in European higher education and, therefore, as a relevant prerequisite for ranking that takes into account the fact that not all higher education institutions are alike. Rather than being suspected of being a ranking in disguise, the classification became increasingly perceived by stakeholders as an essential foundation for an innovative ranking approach.

5.3.2 Design principles of the classification

During the first phase of the project a set of design principles was formulated which were the result of extensive communication with the various stakeholders. Throughout the second and third project phases, stakeholders permanently scrutinised the draft-classification to ensure that these principles had been followed. The following issues were of special importance for the stakeholders.

At an early stage, stakeholders agreed that it would be essential for the classification to allow for identifying and communicating a wide range of different institutional profiles, which can be compared and, if needed, grouped according to a variety of different characteristics. The question arose of whether it would be feasible to create one multi-purpose classification, or whether it would be necessary to

develop different classification schemes in parallel, serving different stakeholder needs. The latter option was dismissed after intense discussion as being too complicated and even confusing, bearing the risk of hampering transparency rather than facilitating it.

Consequently, we set out to developing one multi-dimensional classification that allows for the mapping of the activities of European higher education institutions in all relevant dimensions (teaching, research, international orientation, regional engagement, etc.) and categorising them in several ways. This, in turn, triggered doubts on the part of stakeholders as to whether such a classification could be inclusive of all European higher education institutions. Research universities in particular initially voiced some hesitation to participate in a multi-dimensional classifica-

tion, while acknowledging at the same time that a one-dimensional approach would be of no added value. In order to find a way out of this dilemma, we explored the option of introducing 'electives' - making some dimensions of the classification subject to voluntary participation. This idea, however, was dismissed by the stakeholders themselves, who argued that it is rather unclear how to determine which dimensions should be obligatory and which voluntary. Furthermore, to some stakeholders the idea of electives implied a notion of first and second order-classifications.

Against this background, we concentrated on improving the relevance of the dimensions and indicators, in order to provide for the inclusiveness of the classification. Especially the survey and the case-studies among European higher education institutions helped to further develop the classification scheme and, therefore, to ensure the relevance of the classification not only for research intensive universities, but for all kinds of higher education institutions in Europe.

As mentioned earlier, another key concern throughout the discussions with stakeholders was whether the classification would actually prove to be a ranking in disguise. Would it be possible to describe the different characteristics of higher education institutions without evaluating their performance? And would it be possible to describe different types of institutional profiles, without falling victim to an implicit preoccupation with/overestimation of research, which is still often assumed to be the most reputable mission of a university? Bearing these concerns in mind, we maintained the design principle of making the classification non-hierarchical in terms of dimensions, indicators and categories.

From the very outset, we have made it clear that a classification differs conceptually from a ranking, as it is not intended to evaluate performance, or to create hierarchical league tables. Instead, we see U-Map as a descriptive instrument, using principles of measurement, ordering and comparing to categorise higher education institutions in multiple ways. In order not to be associated with rankings, we maintained this distinction at a methodological level as well. For example, no numerical labels are used for classification, since they would imply a high risk of being (mis-) used for ranking purposes. Instead, more descriptive labels like 'low', 'middle' and 'high' are used, being

less biased, though not entirely solving the problem, since any kind of labelling can somehow be associated with evaluation. In terms of the selection of indicators, as an example, we dropped the sophisticated 'Crown Indicator' as an indicator of research involvement since it is commonly used in ranking exercises in order to evaluate research performance.

While the predominance of research could be avoided at both conceptual and methodological levels, stakeholders argued that 'academic drift' towards research still appears to prevail in many situations. On the one hand, stakeholders agreed that there has been a shift in public understanding of what higher education institutions should stand for and what their major contributions to society will be in the future. Yet while students, businesses and governments are clearly and increasingly stressing the importance of learning and innovation, institutional reputations are often still dominated by the ideal of the comprehensive research university. There is no way around this 'reputation race'. Classification should strive to provide valid information on the central aspects relevant for institutional missions in a coherent and balanced way. If this balance is tipped in the mind of the perceiver, this cannot be held against the classification itself. Such a way of interpreting the outcomes may even be a way of using the information provided, holding it (by way of a benchmarking process) against the strategic mission of the institutions. Yet it is very clear that transparency on institutional diversity will be of most value when diversity of missions is acknowledged and accepted by all stakeholders, including higher education institutions themselves.

From early on and throughout the whole project period, concern was voiced by higher education institutions that a Europe-wide classification could hamstring universities. Critics warned that higher education institutions might be 'pigeonholed' by the classification. Once an institution had been categorised, funding agencies and other stakeholders could start treating it according to its classification. This would restrict institutional development and strategic room to manoeuvre for university managements during a time of rapid change. Such a development would possibly lead to more rigidity at system level and hamper diversification at institutional level.

During the project we actively addressed these concerns, striving for a classification which is descriptive, not prescriptive, and which is flexible in the

sense that institutions can 'move' between categories and that dimensions, indicators and categories can be adapted. For the classification to be descriptive, it is crucial – though by no means enough – to build on empirical data. Even more importantly, the classification must be organised bottom-up, i.e. based on the institution's own priorities, wishes and ideas. Consequently, we conceptualised an approach, which allows higher education institutions to map themselves. The project never intended to categorise universities top-down. But stakeholders concerns about 'pigeonholing' and possible rigidity effects convinced us even more that the classification tool should not be a rigid instrument with a limited set of predetermined categories. Instead, institutions and other stakeholders should rather be offered the opportunity to analyse their own institutional profiles through the classification and then identify more or less similar (groups of) institutions along the various dimensions. This point of view became one of the most important leading principles during the project.

Furthermore, the classification is not to be imagined as a static instrument, which, once set up, will remain unchanged ever after. On the contrary, U-Map has been conceptualised to be an evolving system, intended to stay flexible and adjustable over time. Looking into the future, it will have to able to depict the profiles of emerging new forms of higher education, for example, the European Institute of Technology (EIT), networks of regional universities and other types of institutions. In this sense, stakeholder involvement will remain crucial in order to constantly adapt the classification to the rapidly changing realities of the European higher education landscape.

Access to and quality of data is paramount with

regard to the relevance and meaningfulness of the classification. Initially, many stakeholders were concerned that the necessary data would be either not available or not trustworthy. They urged us to make sure that the classification will be based as much as possible on 'objective', empirical and reliable data and will be parsimonious regarding the need for data-collection. The reliability of the statistical basis to be used for the classification was questioned. However, the testing phase showed that a useful data gathering process can be constructed with crucial feedback loops for the higher education institutions. We also undertook an exploratory analysis of existing data sources, in order to check which data can be retrieved from international and national data bases. During this process stakeholders suggested a number of reliable data sources which were explored and often taken on board in the project.

Furthermore, the survey among European higher education institutions allowed for the assessment of the feasibility of collecting the necessary data at institutional level. Interestingly, the majority of institutions involved acknowledged that the administrative burden of data collection played only a minor role, since collecting this data was seen as of strategic interest for the institution. Apart from access to information, the quality of data was explored as well. Data from international and national data sources was scrutinised with regard to the question of whether they are up to date and consistent through time. Higher education institutions participating in the survey were asked if they perceived the reported data to be trustworthy. The results from the survey and the analysis of data sources were extremely useful in order to develop sets of reliable and feasible indicators per dimension.

5.3.3 Contents of the classification: dimensions and indicators

Beyond the general design principles of the classification, stakeholders looked very closely into the more sophisticated details of the classification exercise, namely how to depict and measure the actual characteristics of higher education institutions. Since the validity of the selected dimensions and of the indicators for each dimension is crucial in this regard, we sought for intensive stakeholder consultation on this issue.

The empirical testing (case studies and survey) provided a large number of suggestions for the adaptation and elaboration of dimensions and indicators. Institutions participating in the empirical testing phase were asked among other things to evaluate the relevance of the proposed dimensions and to assess the quality of selected indicators. Following stakeholder input, the number of dimensions was reduced considerably for greater clarity and better comparability of institutional profiles in the European context,

yet bearing in mind the concern of some stakeholders to maintain an appropriate level of diversity.

As another consequence of stakeholder feedback, the question was raised as to whether the indicators on research and innovation intensiveness should be dropped from the classification as being inherently hierarchical. After an intensive exchange of views it was decided to leave in the aspects of research and innovation intensiveness, as omitting them would make the classification instrument irrelevant for research intensive universities and less attractive for stakeholders from business and industry. Instead, it was agreed to adapt the indicators to describe the volumes of the activities of higher education institutions, rather than to evaluate their performance. This approach better reflects the descriptive nature of the classification than the performance related indicators that are used in research assessment processes.

Apart from research intensiveness, stakeholders looked particularly closely at the indicators for innovation, life-long learning and international orientation. Regional involvement and community engagement proved to be particularly difficult to operationalise, yet it was decided that they, too, are relevant aspects that should be kept in the classification.

Furthermore, we adopted the suggestion made by several higher education institutions and representatives of other stakeholder groups to include an open question regarding the mission of the institution. Such a question will give the institution in the classification an opportunity to include its intentions and, where there is a large discrepancy with its empirical profile, to use this as a starting point for its further strategic development. This information will not be used to classify institutions, but will be presented as additional contextual information.

5.3.4 Institutionalisation of the classification: a model of operational implementation

As the classification took shape, stakeholder opinion was also asked on the appropriate institutionalisation of the instrument. There proved to be a broad consensus in favour of making the classification a reality. Stakeholders generally agreed that this would require an organisational framework, but insisted that there should be no large bureaucratic institution. They also pointed out that the organisation carrying out the classification has to be independent from both market forces and governmental influence in order to create a high level of acceptance, especially among higher education institutions, since an important purpose of the classification should be to serve the needs of these institutions. At the same time, however, the credibility of the classification was assumed to

depend on it being equally impartial to the interests of the higher education institutions involved. This implies the wish to keep the classification organisationally detached from higher education institutions, but also to ensure the trust of participating institutions and other stakeholders in the organisation.

These considerations led us to recommend the creation of an independent body, preferably supported by non-governmental sources. In order to provide for the indispensable advice from stakeholders, a stakeholder advisory council should be included in the organisational model of the body responsible for the classification.

5.4 Conclusion: stakeholders' support

The issues presented above and many other details were discussed in a very open and productive way and stakeholder views proved to be very helpful in developing the project. As this overview has shown, representatives of a wide variety of stakeholder groups from all over Europe were actively involved in shaping the classification with regard to its validity, reliability, feasibility and user-friendliness. Con-

cerns, of which there were many, and advice, which was abundant, were taken seriously. Considerable changes were made and relevant information provided, thus creating a maximum of acceptance and legitimacy for the European classification. Without the active support of many stakeholders U-Map would not have been designed.

5.5   A list of stakeholders involved in U-Map

Higher education associations

- Association Européenne des Conservatoires, Académies de Musique et Musikhochschulen (AEC)
- Hungarian Rectors' Conference (MRK)
- Association of Universities in the Netherlands (VSNU)
- International Association of Universities (IAU)
- BALAMA Group
- International Research Universities Network (IRUN)
- Coimbra Group
- Italian Rectors' Conference (CRUI)
- Compostela Group of Universities
- League of European Research Universities (LERU)
- Conference of Rectors of Spanish Universities (CRUE)
- Norwegian Rectors' Conference (UHR)
- European Association of Distance Teaching

- Universities (EADTU)
- PAEPON - Umbrella organisation for all qualitative privately funded education in the Netherlands
- European Association of Institutions in Higher Education (EURASHE)
- Rectors' Conference of the Swiss Universities (CRUS)
- European Consortium of Innovative Universities (ECIU)
- The Netherlands Association of Universities of Applied Sciences (HBO-Raad)
- European Network for Universities of Applied Sciences (UAS)
- European University Association (EUA)
- German Rectors' Conference (HRK)

Plus: individual higher education institutions from all over Europe participating in the case studies, the pilot survey and the survey:

- Aalborg University
- Radboud Universiteit Nijmegen
- Adiyaman University
- Rijksuniversiteit Groningen
- Agricultural University of Krakow
- Ruprecht-Karls-Universität Heidelberg
- Akdeniz University
- Sabanci University
- Alexandru Ioan Cuza University of Iasi
- Southern federal University
- Bahcesehir University
- Stoas Professional University
- Bilkent University
- Stockholm University
- Bishop Grosseteste University College
- Tallinn College of Engineering
- Budapest University of Technology and Economics
- Technical University of Catalonia
- Canakkale Onsekiz Mart University
- The Karol Adamiecki University of Economics in Katowice

- Catholic University of Lublin
- The Karol Lipinski Academy of Music in Wroclaw
- Charles University Praha
- The Royal Institute of technology (KTH)
- Codarts Hogeschool voor de Kunsten
- Umea University
- Conservatoire de Paris
- Universidad Politecnica de Valencia
- Corvinus University of Budapest
- Universitat de Barcelona
- Cukurova University
- Universitat Oberta de Catalunya (UOC)
- CVU Storkøbenhavn
- Université de Genève
- De Haagse Hogeschool
- Universite Paris-Sud
- Dicle University
- Universiteit Twente
- Ecole Polytechnique Fédérale de Lausanne
- Universiteit Utrecht
- Erciyes University
- Universitetet i Bergen

- Fachhochschule fuer Wirtschaft Berlin
- University Autonoma Barcelona
- Fachhochschule Osnabrück
- University College Jutland
- Fontys Hogescholen
- University College: Høgskolen I Oslo
- Harra University
- University of Aarhus
- Haute Ecole specialise de Suisse occidentale HES-SO
- University of Cantabria
- Hochschule Bremen
- University of Duisburg-Essen
- Hogeschool Antwerpen
- University of Glasgow
- Hogeschool Utrecht University of Applied Sciences
- University of Graz
- Hogeschool van Arnhem en Nijmegen
- University of Klagenfurt
- Instituto politecnico da Guarda
- University of Münster
- Instituto Superior de Contabilidade e Administração do Porto (ISCAP)

- University of Padova
- Jan Matejko Academy of Fine Arts in Krakow
- University of Silesia in Katowice
- Comenius University in Bratislava
- University of Strathclyde
- Kafkas university
- University of the West of England
- Kingston University
- University of Turku
- Kocaeli University
- Uniwersytet Jagiellonski Krakow
- London South Bank University
- Vilnius College of Higher Education
- Norwegian University of Science and Technology
- Vilnius Law and Business
- Polish-Japanese Institute of Information Technology in Warsaw
- Vrije Universiteit Amsterdam
- Politecnico di Torino
- Warsaw School of Social Psychology
- Polytechnic Institute of Coimbra (IPC)
- Webster University
- Polytechnical Institute of Leiria
- Wroclaw University of Economics

International Policy Organisations

- Bologna Follow-Up Group
- Council of Europe
- European Commission (DG EAC, DG RTD)

- Organisation for Economic Cooperation and Development (OECD)
- United Nations Education and Science Organisation (UNESCO)

Student organisations

- Erasmus Student Network
- European Students' Union (ESU, former ESIB)

Business and Industry

- European Roundtable of Industrialists (ERT)
- SQW Consulting

Others

- European Network of Quality Assurance Agencies (ENQA)
- European Centre for Strategic Management of Universities (ESMU)
- European Investment Bank

Annexes

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Annex A: Glossary

Data elements

Data element	Definition	Remarks
% of first year bachelor students from the region	Total number of first year bachelor students (head-count) from the region as a percentage of total number of first year bachelor students	Region refers to the NUTS2 region, unless indicated otherwise.
Academic staff (fte)	The number of academic staff in fte	Academic staff includes personnel whose primary assignment is instruction, research or public service. These staff include personnel who hold an academic rank with such titles as professor, associate professor, assistant professor, instructor, lecturer, or the equivalent of any of these academic ranks. The category includes personnel with other titles (e.g. dean, director, associate dean, assistant dean, chair or head of department), if their principal activity is instruction or research. It does NOT include student teachers or teaching/research assistants. If PhD students are counted as academic staff, their number should be specified.
Degrees awarded in agriculture	The number of degrees awarded in agriculture	The subject 'agriculture' comprises Agriculture, crop and livestock production, agronomy, animal husbandry, horticulture and gardening, forestry and forest production techniques, natural parks, wildlife, fisheries, fishery science and technology, as well as veterinary medicine and veterinary assisting http://browse.oecdbookshop.org/oecd/pdfs/browseit/9604031E.PDF
Degrees awarded in education	The number of degrees awarded in education	The subject group 'education' comprises the sub fields teacher training and educational science
Degrees awarded in health and social service	The number of degrees awarded in health and social service	The subject group 'health and welfare' comprises the subfield 'health' and 'social services'. Health comprises medicine (anatomy, epidemiology, cytology, physiology, immunology and immunoaematology, pathology, anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, neurology, psychiatry, radiology, ophthalmology), medical services (public health services, hygiene, pharmacy, pharmacology, therapeutics, rehabilitation, prosthetics, optometry, nutrition), nursing (basic nursing, midwifery) and dental services (dental assisting, dental hygienist, dental laboratory technician, odontology). Social services comprises social care (care of the disabled, child care, youth services, gerontological services) and social work (counselling, welfare)

Data element	Definition	Remarks
Degrees awarded in humanities and arts	The number of degrees awarded in humanities and arts	The subject group 'humanities and arts' comprises the sub fields arts (fine arts, performing arts, graphic and audio-visual arts and design) and humanities (religion and theology, native languages, other humanities).
Degrees awarded in natural sciences and mathematics	The number of degrees awarded in natural sciences and mathematics	The subject group 'science' comprises the subfields life sciences (excluding clinical and veterinary sciences), physical sciences, mathematics and statistics and computing
Degrees awarded in personal services	The number of degrees awarded in services	The subject group 'services' comprises the subfields personal services (hotel and catering, travel and tourism, sports and leisure, hairdressing, beauty treatment, cleaning, laundry, domestic science), transport services (seamanship, ship's officer, nautical science, air crew, air traffic control, railway operations, road motor vehicle operations, postal services), environmental protection (including labour protection and security) and security services (including military).
Degrees awarded in social sciences, business and law	The number of degrees awarded in social sciences, business and law	The subject group 'social sciences, business and law' comprises the sub fields social and behavioural science (economics, economic history, political science, sociology, demography, anthropology, ethnology, futurology, psychology, geography, peace and conflict studies, human rights), journalism and information, business and administration and law.
Degrees awarded in engineering	The number of degrees awarded in engineering	The subject group 'engineering. Manufacturing and construction' comprises the sub fields engineering and engineering trades, manufacturing and processing, architecture and building.
Concerts and performances	The number of concerts and performances (co-)organised by the higher education institution	The question refers to concerts and performances that are (co-)organized by your institution (or a department of it), that are registered as such and that are open to the general public.
Degrees awarded in bachelor programmes	The number of bachelor degrees awarded in the reference year	
Degrees awarded in master programmes	The number of master degrees awarded in the reference year	

Data element	Definition	Remarks
Degrees awarded in undivided programmes	The number of degrees awarded in 'pre-Bologna' programmes, spanning more than one cycle.	The Three cycle Bologna structure has been implemented recently or is not yet fully implemented. As a consequence, the coming few years there will remain a stock of students in 'old' pre-Bologna programmes that will receive the 'old' degrees after graduation.
Doctorate degrees awarded	The number of doctorate degrees awarded in the reference year	Doctorate degrees comprise PhD degrees as well as professional doctorate degrees. Habilitation degrees are excluded.
Exhibitions	The number of official exhibitions (co-)organised by the higher education institution	The question refers to exhibitions that are (co-)organized by your institution (or a department of it), that are registered as such and that are open to the general public.
Expenditure on research	Total expenditure on research in million euro in reference year	Expenditure on university hospitals are excluded. Expenditure on management and organisation of research is to be included.
Expenditure on teaching	The total amount of financial resources (in 1000 euro) spent on teaching activities	This data element is part of the question on the distribution of total expenditure of the HEI
Foreign degree seeking students with foreign qualifying qualification	The number of degree seeking students with a foreign diploma on entrance.	
Income from copyright protected products		
Income from CPD	Income generated by Continuing Professional Development activities in 1000 Euros	CPD is the means by which members of professions maintain, improve and broaden their knowledge and skills and develop the personal qualities required in their professional lives, usually through a range of short and long training programmes, some of which have an option of accreditation (UNICO 2008, p9)
Income from international sources	Income from international sources, including subsidies and contracts for teaching and research, from both public and private international sources	
Income from regional and local sources	Total income in million Euros from regional and local sources (both public and private)	

Data element	Definition	Remarks
Incoming students in international exchange programmes	The number of students who come from abroad to the institutions within the framework of an international exchange programme.	
Licensing income	The annual income from licensing agreements, in thousand Euros	If a patent is given, the owner of the patent may grant permission to a licensee to use the invention protected by the patent. In the license agreement the financial compensation the licensor will receive from the licensee is specified. Here we ask for the income the institution has received as licensor of the patents it holds.
Part time students	The number of students enrolled in part-time programmes, all levels combined	The programmes should be registered as part-time programmes.
Patent applications	The number of new patent applications filed by your institution	A patent is a set of exclusive rights for a fixed period of time in exchange for a disclosure of an invention. The exclusive right granted is the right to prevent of exclude others from making, using, selling or offering to sell or importing the invention. In order to be patented an invention must be novel, useful and not of an obvious nature. Applications for patents are filed to national states or application agencies. Most patents and applications for patents are listed in national and international electronic databases (like the database of the European Patent Office).
Peer reviewed publications	The total number of peer reviewed publications of the institution	
Qualifications awarded	Total number of qualifications awarded (all levels combined)	Only recognised qualifications from recognised programmes are to be included. A programme is 'a collection of educational activities which are organised to accomplish a pre-determined objective or the completion of a specified set of educational tasks' (OECD definition). A programme leads to a recognised qualification (diploma or degree). Programmes with a theoretical duration of less than 1 year are not considered to be a programme (in this project).
Qualifications awarded in career oriented programmes	The number of qualifications awarded in other career oriented programmes	Only recognised qualifications should be counted

Data element	Definition	Remarks
Qualifications awarded in general formative programmes	The number of qualifications awarded in general formative programmes	Only recognised qualifications should be counted
Qualifications awarded in other third cycle level programmes	Qualifications awarded in advanced education, e.g. MAS, Executive Master (minimum 60 ECTS)	
Qualifications awarded in programmes leading to licensed or regulated professions	The number of qualifications awarded in programmes that lead to professions on the national list of regulated professions and on the European lists	The EU has developed guidelines for the recognition of professional qualifications. A list of European regulation and national lists of regulated professions can be found on the website: http://ec.europa.eu/internal_market/qualifications/index_en.htm
Qualifications awarded in short first cycle programmes	The number of qualifications awarded in short first cycle programmes, like associate degree programmes or other 'sub-degree' programmes	
Start-up firms	The average annual number of start up firms established in the last three years	A start-up firm is a company that initially was the result of a licensing/transferring of technology process from your institution. Spin-off companies are also considered to be start-up firms. The number of start-up firms established in a period is considered to be an indication of the innovative character of an institution. The more start-up firms are established the better the institution has succeeded in turning its knowledge production into knowledge used. To reduce the influence of atypical years, we ask for a three year average.
Students aged 30+	The number of students (headcount) aged 30 years or older, in all programmes combined	
Students in distance learning programmes	The number of students (headcount) enrolled in distance learning programmes.	Distance learning refers to the offering of education to students who are not physically 'on site' to receive their education.
Students sent out in international exchange programmes	The number of students going abroad to another higher education institution within the framework of an international exchange programme.	

Data element	Definition	Remarks
Total enrolment	The headcount number of students, enrolled in all types of degree and certificate programmes	
Total expenditure	The total expenditure of the institution, in million Euros	
Total income	The total income of the higher education institution in million Euros	
Volume of privately funded research contracts	The financial volume of privately funded research contracts, in million Euros	Contract research refers to research activities arising from collaborative interactions that specifically meet the research needs of the external partners. Income from competitive or non-competitive public research funding is to be excluded here.

Indicators

Name	Definition	Rationale	Remarks
Cultural activities	The number of official exhibitions, official concerts and performances, (co)-organised by the institution or a department of it, that are registered as such and that are open to the general public, per 1000 fte academic staff	The number of exhibitions, concerts and performances is in arts and architecture a generally accepted indicator of the level of their activities	
Degree level focus	The number of degrees awarded in the reference year, by level of degree	The relative size of the various degree levels give an indication of the focus of the profile of the HEI. Degrees are counted and not enrolment to avoid double counting and the biasing effect of 'eternal students'.	Qualifications comprise all levels including sub degree, bachelor, master, doctorate and other diplomas and certificates. The categories are chosen to avoid a hierarchical connotation to appeared to be attached to the 'old' indicator 'graduate intensity'.
Expenditure on research	The percentage of total institutional expenditure dedicated to teaching activities in the reference year	This indicator highlights the priority given to teaching activities, in relation to research and knowledge exchange	
First year bachelor students from the region	The number of first year bachelor students (headcount) from the region as a percentage of total number of first year bachelor students. The region is determined by the home address of the student.	A HEI that draws many of its students from the region has a stronger relation with the region than a HEI with only few new entrants from the region.	The questionnaire will show a list on possible types of research expenditures. This list will be identical to the list used for the question on time budget.
Foreign degree seeking students	The number of degree seeking students with a foreign diploma on entrance as % of total enrolment in degree seeking programmes.	A high percentage of foreign degree seeking students reflects a high attractiveness of the HEI to international students, which is assumed to be correlated with a high degree of international orientation.	It refers to students who take a full degree programme and conclude it with a degree.

Name	Definition	Rationale	Remarks
Importance of international sources of income	Income from non-national sources, excluding tuition fees from nationals, as a percentage of total income	If the relative size of international sources of income is large this indicates a strong international orientation.	This indicator is based on an assessment of the relative importance of the various sources/levels of income.
Importance of local/regional income sources	Income from regional/local sources as a percentage of total income	A high proportion of income from regional/local sources indicates a intense relation between the higher education institution and the region	To be asked either as exact numbers or as broad categories. What is a region will be determined in two ways: the region the HEI uses in its data reporting (needs to be specified by the HEI) and the NUTS2 region the HEI is located
Income from knowledge exchange activities	Total amount of license income, income from licensing agreements, contracts with business and public sector organisations, income from copy righted products and donations as a percentage of total income	If a HEI gets relatively much of its income from 'knowledge exchange activities it is assumed to be more involved in those activities	
Incoming students in European and other international exchange programmes	The number of incoming students in international exchange programmes, as a percentage of total enrolment	The indicator reflects the international orientation of the institution. The assumption is that a strong international orientation will lead to a higher proportion of students coming in.	
Mature or adult learners	The number of students aged 30 years or older (headcount, all levels combined) as a percentage of total number of students enrolled (headcount, all levels combined)	The proportion of adult learners is seen both as an indicator for the involvement in lifelong learning as for the age distribution of the student body.	
Orientation of degree	The proportion of graduates (all levels combined) in three types of programmes: general formative programmes, programmes leading to licensed/regulated professions, and other career-oriented programmes	Programmes leading to certified/ regulated professions as assumed to have a clear professional orientation. Professional orientation thus can be described as having a direct link to the needs of the labour market.	The EU has developed guidelines for the recognition of professional qualifications. It is assumed that HEI can count the programmes leading to the qualifications on that list. A list of European regulation and national lists of regulated professions can be found on the website: http://ec.europe.eu/internal_market/qualifications/regprof/index.cfm

Name	Definition	Rationale	Remarks
Part-time students	The number of students enrolled in part-time programmes (headcount) as a % of total enrolment (headcount)	Part time programmes is a distinct characteristic of the way the programmes are offered to students. An institution that has relatively many part time students enrolled is likely to have an opener attitude to its environment/stakeholders.	Full time students who are de facto part time students (taking much more time to complete than the standard time) are not to be counted here.
Patent applications filed	The number of patents filed related to the total fte of academic staff x 1000	The number of patents filed is a traditional indicator of innovativeness.	A patent is a set of exclusive rights for a fixed period of time in exchange for a disclosure of an invention. The exclusive right granted is the right to prevent of exclude others from making, using, selling or offering to sell or importing the invention. In order to be patented an invention must be novel, useful and not of an obvious nature.
Peer reviewed publications	Annual number of peer reviewed publications relative to the total number of academic staff (FTE)	The number of publications is seen as an important indicator for the involvement in research	There are some issues to be resolved here. First of all it is not clear what lists of journal HEIs use and whether the quality of those journals is comparable across countries. Books and other monographs are also considered to be publications. Counting publications may bring in more social sciences and humanity output and output in languages other than English.
Start up firms	The average number of start-up firms created over the last three years per 1000 fte academic staff	The number of start-up firms established in a period is considered to be an indication of the innovative character of an institution. The more start-up firms are established the better the institution has succeeded in turning its knowledge production into knowledge used	There is no clear cut definition of start-ups. One possible definition is: A start-up firm is a company that initially was the result of a licensing/transferring of technology process from your institution. Spin-off companies are also considered to be start-up firms.

Name	Definition	Rationale	Remarks
Students enrolled (headcount)	The headcount number of students enrolled in all types of degrees and certificate programmes.	A basic size indicator	
Students enrolled in distance learning programmes	Students enrolled in distance learning programmes as a percentage of total number of students enrolled. Distant learning programmes provide courses not requiring students physical on-site presence to receive their education.	Distance learning is a distinct characteristic of the way programmes are offered to students. An institution that has relatively many students enrolled in distance learning programmes is likely to have an opener attitude to its environment/ stakeholders.	All levels combined.
Students sent out in European and other international exchange programmes	The number of students sent out in international exchange programmes as a % of total enrolment	The indicator reflects the international orientation of the institution. The assumption is that a strong international orientation will lead to a higher proportion of students sent out.	
Subject areas covered	The number of ISCED97 subject areas for which bachelor degree programmes are offered	The mix of subject offerings is an indicator of the width of the scope of activities of the HEI	The OECD ISCED97 classification distinguishes 8 broad subject areas or fields of education. These broad areas are likely to be used at the national level only, for reporting to Eurostat en OECD. The reporting agencies will have 'conversion tables' converting the national names into the broad international groups.

Annex B: Pre-filling: the Norwegian case

The context

Norway has a decentralised structure of universities and university colleges which has been successful in providing access to higher education in all parts of the country while at the same time supplying local and regional labour markets with people with higher education qualifications.

There is no formal binary system in Norway. Instead there is a partly overlapping system consisting of four categories of higher education institutions. The institutions have different mandates of service to the society; Universities and specialized universities have a national mandate, while the university colleges to a larger extent are expected to serve their region. The different institutions are, furthermore, distinguished by their degree of freedom to establish new study programmes:

- Universities have the right to establish new programmes at all levels and within any field.
- Specialised university institutions have the right to establish new programmes at all levels, at the bachelor, the master and the doctoral level, within their field of specialisation.
- Accredited colleges have the right to establish new bachelor programmes in all fields, but have to apply for accreditation for establishing master- and doctorate programmes.
- Unaccredited private higher education institutions have to apply for accreditation for all new study programmes. However, accredited study programmes at these private colleges range from units of half a year at the bachelor level to programmes at the doctoral level.

Among the university colleges, there is currently a drift towards obtaining university status. Today, the Norwegian higher education sector consists of seven universities of which three have recently obtained university status. There are five specialised university institutions, 2 national academies of arts, 25 university colleges and 25 private higher education institutions (of which most are rather small institutions.).

In May 2006, the Government appointed a commission to evaluate the structure of higher education and make recommendations for its development within a time frame of 10-20 years. The commission presented its report in January 2008. The report points out two main challenges for the Norwegian higher education system: The fragmentation of research and research training between many small institutions is a challenge to quality, while the academic drift also among the smaller university colleges may reduce the diversity in higher education if vocational programmes are given less priority.

The higher education institutions interest in developing their institutional profile for strategic reasons and a political wish to keep up a diversified higher education system were two of the main drivers for Norway to volunteer as pilot case for pre-filling. The existence of relevant national databases made Norway a suitable case.

The data situation

Statistics Norway under the Ministry of Finance has the national responsibility for the delivery of data to international databases such as EUROSTAT, OECD and UNESCO. They could have delivered institutional data to the project against a fee. This was not considered cost-efficient in this trial phase, but their services might be an alternative in a more permanent European classification system.

In the trial phase, to obtain data from the Database for Statistics on Higher Education (DBH) was considered more realistic. This database contains comprehensive data on universities, specialised university colleges and academies of the arts. The information covers most aspects about the running of an institution: studies and students, research, economy and personal. Norwegian Social Science Data Services

(NSD) takes care of the database as a contract project on behalf of The Ministry of Education and Research. The data, however, are delivered annually by the individual institution according to specifications given by the Ministry.

The higher education institutions could not instruct DBH to deliver the data which the classification project requires to pre-fill the questionnaire. After an initiative from the Norwegian University of Science and Technology (NTNU) in springtime 2009, the Ministry of Education and Research showed keen interest in the project and instructed DBH to deliver the data within their existing contract of delivery to the Ministry. The Ministry's positive reaction can be explained by their interest in monitoring the development in the sector and stimulate diversity.

The devil lies in the detail. Even if the U-Map indicators and data-elements were defined by the project, practical experience made clear that the data-elements still needed interpretation and further specification before DBH could deliver the desired data. Interpretations were called for on two levels. CHEPS further defined the data-elements sought for based on the project indicators and dimensions, while NTNU and DBH collaborated closely in interpreting the relevance of national data available. The DBH-staff has calculated that this trial process of data-delivery took about 17 days. If the format and questionnaire are identical next time data is collected or new Norwegian institutions are added, the process will be much easier. The DBH-staff calculates that a repetition of data-delivery would take approximately two days. Even if this trial process required a few weeks effort with emails back and forth, the advantage is clear. At least for the pre-filled data-elements, the data for the Norwegian institutions were based

on uniform definitions. The risk would otherwise be that each institution interpreted data differently, or that each institution had to go through the same motions of interpretation, reducing the reliability of data delivered.

DBH has data for most higher education institutions in Norwegian. These are open data accessible in Norwegian language from their website. CHEPS did, however, not want to extract data without the consent of the institutions. The Ministry of Education and Research also required the written consent from the institutions participating. NTNU turned to the Norwegian Association of Higher Education Institutions (Rectors Conference) to recruit more institutions. In September 2009 the institutions on the Board of the Association were orally informed about the project and in a letter from NTNU asked if they would allow DBH to deliver available data and supplement with additional institutional data later. The deadline was very short. It is probably typical that the smaller institutions responded quicker than the larger classical universities. The younger and more specialised institutions have possibly also a stronger interest in defining their profile compared to the classical universities whose profile to some extent is given by tradition and merit.

Summed up, the Norwegian case has been a real test of the availability of data in the national database (DBH) and the feasibility of using DBH for pre-filling the questionnaire. Further it has been a real test on the clarity of the data-elements, indicators and dimensions in U-Map. Last, but not least, the uniform interpretation of the data-elements across institutions in one country increases the quality of the data delivered to the classification system.

U-Map

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