U-Multirank

Project 'Design and Testing the Feasibility of a Multi-dimensional Global University Ranking'

Interim progress report:

Preparation of the pilot phase

CHERPA-Network

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Table of Contents

Preface

This interim report presents the results of the "Testing phase" of the project U-Multirank. The report elaborates on three project components:

- Pre-testing of designed instruments on ca 10 pre-test institutions;
- Compiling an updated indicator list after a number of consultation rounds, further analysis, and pre-test results;
- Preparing a pilot study for ca 150 pilot institutions.

This document is preceded by a previous report *"Design phase of the project: Design and testing the feasibility of a multi-dimensional global university ranking"* from January 2010. In this earlier report we list our general design principles and present an overview of indicators used in current quality assurance systems, rankings, student information sites and classification schemes.

1 Results from the pre-test

1.1 Description of the pre-test

The aim of the pre-test is to test the three data collection instruments (the institutional questionnaire, the department questionnaire and the student questionnaire) in terms of cultural/linguistic understanding, clarity of definitions of data elements, and feasibility of data collection.

Ten institutions were invited to complete and comment on the institutional and departmental questionnaire and to distribute 20 student questionnaires. The selection was based on the list of institutions that had expressed their interest in participating in the project. In selecting the institutions for the pre-test the U-Multirank team considered the geographical distribution and the type of institutions.

Five institutions (out of the ten invited) responded positively. The other five institutions either did not respond to our invitation or were not able to produce data on time. From the five institutions that originally agreed to participate in the pre-test[1], three institutions delivered data on time for this report: Reutlingen University, Aarhus University and University Pierre and Marie Curie .

To improve on the response to the pre-test, a "light version" of the pre-test was launched. Instead of asking institutions to provide all the data on relatively short notice over the summer months we asked institutions to offer their feedback on the clarity of questions and on availability of data. 18 institutions were contacted for the "light version" and until now we have received comments from 8 institutions. The list of institutions that participated in the pre-test include the following:

- Aarhus University (Denmark)
- Brno University of Technology (Czech Republic)
- Malmö University (Sweden),
- Oslo University College (Norway)
- Reutlingen University (Germany),
- Technical University of Sofia (Bulgaria)
- Technological Educational Institute of Patras (Greece)
- Strathclyde University (UK)
- University Pierre and Marie Curie (France)
- University of Toronto (Canada)
- University College Dublin (Ireland)

Pre-testing was carried out from June to September 2010. The sections below discuss the results from each of the questionnaires separately. The feedback includes a lot of suggestions and tips. The discussion below concentrates only on the biggest problems and weaknesses that were encountered by many respondents.

[1] The five universities that originally agreed to participate in the pretest are: Aarhus University (Denmark), University Pierre and Marie Curie (France), Reutlingen University (Germany), Warsaw School of Social Sciences and Humanities (Poland) and Nelson Mandela University (South Africa).

1.2 Institutional survey

According to the pre-test results, the general format and structure of the institutional questionnaire seem to be clear and user-friendly. The pre-test showed, however, two types of problems for some indicators. Several indicators require a more precise specification, definition, and/or examples. Respondents worried that for some indicators current definitions may not be sufficient for internationally comparable results. It was suggested by some respondents to provide transposition lists (from international to country specific definitions). Secondly, several indicators imposed difficulties to respondents because such data is not centrally collected. Main availability problems are presented below, separately for each dimension.

Teaching and learning. Questions about student numbers and study programmes seem to be unproblematic in most cases. Problems, however, emerge with some output related criteria. Most problematic indicators are graduate earnings and, to a somewhat lesser extent, graduate employment. Since such data is not collected at the university level, the respondents are often not able to provide the data. Interdisciplinarity of programs is another difficult indicator. The problems emerged from a somewhat ambiguous definition on the one hand, but also from a lack of such categorisation in existing data systems.

Research. Most items in this dimension do not impose any problems. Moreover, main indicators will be extracted directly from international bibliometric databases, not from the institutional survey. As expected, some difficulties emerged with 'art-related outputs' as well as with 'all relevant research-based output'. Sharper definitions could alleviate some of the problems.

Knowledge transfer and Regional engagement. Compared to teaching and research, these two dimensions are less prevalent in existing national and institutional databases and therefore one could expect problems with related indicators. Data availability problems emerge particularly with graduates in the region, student internships in regional enterprises and professional development courses. As for information on start-up firms, it is problematic that the interpretation of what qualifies as a spinoff or a start-up can vary significantly between institutes.

International engagement. Information on international students and staff, as well as programmes in a foreign language, is in general unproblematic. As expected, the issue of different definitions of an "international student" came up occasionally.

In sum, the institutional questionnaire worked well in terms of its structure and usability. The respondents did not find the questionnaire excessive or burdensome. The pre-test did reveal a need for better definitions of some indicators and the project team has revised the questionnaire accordingly. The results also indicate that some items, although highly relevant and valid, do not seem feasible because universities do not collect such data. With respect to this issue the project team, with the help from the Advisory Board, had a critical look at the problematic indicators and decided what items should be omitted and which ones could be kept for further testing through the pilot study.

1.3 Departmental questionnaire

The department questionnaire was filled out by five departments:

University of Aarhus

- Mechanical Engineering
- Electronical Engineering
- Business

University of Applied Science Reutlingen

- Mechanical Engineering

University Pierre and Marie Curie

- Engineering (not separated into our two foci)

From other institutions we received some general comments on particular issues and questions.

1.3.1 Comments

The University of Applied Science Reutlingen was in a particular situation as it is used to a quite similar questionnaire from CHE rankings. Their general comment was that there were no special problems with the revised and English questionnaire of U-Multirank. This can probably be generalized for all institutions in Germany, Austria and Switzerland taking part in the CHE ranking.

Problems with regard to the availability of data were reported mainly on issues of academic staff, links to business and the use of credits (ECTS) dedicated towards particular issues.

An issue that was raised in several comments is the length of the questionnaire. Some institutions wished to have a shorter questionnaire, yet some mentioned additional issues that could be relevant (e.g. on social issues, diversity).

In the following only the questions with remarks that are important for the usability and comprehensibility of the questionnaire are listed. Explanations of the data are not relevant for the design of the questionnaire and for this reason not listed below.

Professors. It was mentioned by one University that all Professors have a completed PhD. They could not deliver the information about the FTE and the professors hired from abroad. Another University gave an extra explanation about the academic structure whereby there are less professor titles and hence more associated professor titles existing.

Professors outgoing. Two departments had no information about the given credits and therefore the number of credits is an estimate made in relation to the number of hours taught at a foreign HEI. A

Work experience of professors. The data is not available at one department.

PhD. One department remarked that precise information about the number of PhD-s in co-operation with enterprises is not collected.

Number of students. Due to the structure of the programmes (no distinction between majors and minors) no data was delivered by two universities.

Internships/ Theses. Unclear situation in one country: Information was given by all three departments, but one mentioned, that those data are only estimates. The departments gave additional explanations to the questions about the study programme.

1.3.2 Conclusions

The limited participation in the "real" pre-test does not allow drawing far-reaching conclusions. Taking into account the additional feedback from the "light version" of the pretest, the main results are:

- The project has to find a compromise between two conflicting goals: To cover all relevant issues on the five dimensions of U-Multirank and to limit the questionnaire in length. A particular problem of a feasibility study is that we cannot decide a-priori which indicator will be valid, reliable and feasible. Some indicators may prove to be not usable for a multi-dimensional international ranking in the end. In order to come to a meaningful and comprehensive set of indicators at the end of the U-Multirank project we have to try to collect data for a broader range of indicators. The list of indicators will be limited in the end by the lack of data and by problems of validity and feasibility.

- There has to be a decision how to deal with "estimated" values (notably with regard to links to business (professional experience of staff outside universities, internships, degree theses in cooperation with business). We propose to give institutions the possibility to give estimates with a clear declaration as estimates in order to get an impression about the preciseness of data. Otherwise there is a danger that institutions provide estimates without identifying them as estimates.

- In the questionnaire it has to be explained clearly that the definition of the categories of academic staff ("professors" – "other academic staff") depends on national legislation and definition. Despite the problem reported in the pre-test the calculation of staff numbers as FTEs (Full-time equivalents) should not be a problem for the majority of institutions.

- The evaluation of the data collection process and of data quality will be increased by a follow-up survey in which departments will be asked about their experiences with completing the questionnaire.

1.4 Student questionnaire

83 students participated in the pre-test of the student questionnaire. 17 Students came from Denmark, 12 from Germany; the rest marked a number of other countries.

Box. A sample of comments by students

"Everything was clear, I understood everything"

"They were generally clear."

"They are clear formulated, sometimes described in a too complex form."

"The questions are very relevant."

"The asked questions are relevant to my learning experience."

"My learning experiences are well covered by answering this questionnaire. I wasnt really thinking of the situation in my country, but for people reading all the surveys. It can indeed be used to see differences between my country and others. So very relevant i guess."

„Missed more questions about social life at the campus, because that is a important issue for me. Maybe short commentation should be possible."

„I think you got it all..."

In general, the students' comments to the questionnaire are very positive. According to their comments the questions are clear and understandable. They consider them to capture relevant issues of their teaching and learning experience/environment and are adequate to the national situation. An important result is that according to the respondents no important aspects are missing. Some students would prefer more questions about the social climate at the university and about the city; although a number of reactions indicate that the questionnaire should not be longer.

For the students questionnaire the conclusion is that there is no need for changes in the design of the questionnaire.

In addition we received comments on the student questionnaire from some of the pretest institutions (enlarged pretest). Some fear that the length of the questionnaire may prevent students from completing it – which was no claim by the students themselves. The comments include a number of detailed proposals on individual items and on phrasing of single questions, in particular with regard to national structures and situation. We will check those comments carefully and revise the questionnaire accordingly. But again the comments show that the questionnaire is seen as a good instrument.

The major challenge to the student survey will be the comparability of students' assessment of their own universities across cultures. Similar instruments have been tested within some European countries in the CHE ranking and – on a smaller scale – internationally in the CHE excellence ranking. There are, however, no experiences yet with regard to a number of countries included in U-Multirank, in particular with undergraduate students in regional institutions in those countries. Based on approved instruments from other fields (e.g. surveys on health services) we will use "anchoring vignettes" to test socio-cultural differences in assessing specific constellations of services/conditions in higher education with respect to teaching

and learning. The anchoring vignettes will cover three areas at last: Consulting, IT-Infrastructure, course-offerings (access to courses).

1.5 Secondary data analysis

In addition to institutional, departmental and student questionnaire, U-Multirank will draw data from existing databases. This relates particularly to research output and patents. In the process of the pre-test, actual data was retrieved from relevant datasets for the 5 universities that originally agreed to participate in the full pre-test: Aarhus University, UPMC, Universities of Applied Sciences Reutlingen, Warsaw School of Social Science and Humanities, and Nelson Mandela University.

The pre-test was successful and no major complications arose during the process. Some helpful observations and the general process is described below.

1.5.1 Bibliometric analysis

Data source

All bibliometric data are derived from the October 2010 edition of the CWTS/Thomson Reuters Web of Science (WoS) database. The WoS is produced by Thomson Reuters. This upgraded 'bibliometric version' of the database is housed and operated by CWTS under a full license from Thomson Reuters.

As indicated in earlier U-Multirank reports this international multidisciplinary database has its pros and cons. In this particular study it is important to note that the WoS has a relatively poor coverage of non-English language publications and of publication output in the social sciences and humanities. Furthermore, the bulk of the research publications are issued in peer-reviewed international scientific and technical journals, which mainly refer to discovery-oriented 'basic' research of the kind that is conducted at universities and research institutes. Hence, publications referring to 'applied research' or 'strategic research' are underrepresented.

The three selected fields for the field-based rankings are: Business, Mechanical Engineering, and Electrical Engineering. The research publications in these fields are delimitated according to the WoS-indexed journal in which they are published, which are in turn classified by Thomson Reuters experts into one or more Journal Categories. The Journal Categories, sometimes referred to as Subject Categories, are treated as (sub)fields of science. Obviously, these fields should be seen as crude general representations of the corresponding knowledge domains. As such they may not (fully) align with the perceptions or institutional delineations of such a field within a main organization. These three fields comprise of the following Journal Categories: Business: 'Business', 'Management', 'Business, Finance'; Mechanical Engineering: 'Engineering, Mechanical', 'Engineering, Industrial'; Electrical Engineering: 'Engineering, Electrical and Electronic'. More sophisticated methodologies can be used for field delineation, but they are expensive and time-consuming, since they generally require several steps of interaction with senior experts of the field(s) to be studied. Therefore, we thought it not appropriate to use them in the pilot study. Given that these methodologies are well-known, there is no reason to question the feasibility of using them if needed.

The main organizations are delimitated according to the set of WoS-indexed publications that contain an author affiliate address explicitly referring to that organization. The address information may comprise of full names, name variants, acronyms or misspellings. This information was – as yet - gathered by CWTS in a 'top-down' manner, i.e. without an external 'bot-

tom-up' verification of the addresses or publications that involves interaction with one or more representatives of each organization. As a result, CWTS cannot guarantee 100% completeness for the selected set of publications. The use of a 'bottom-up' approach is substantially more costly and time-consuming than the top-down approach. As an experiment the indicators obtained by the two approaches were compared for French universities by OST, in order to analyse further their respective pros/cons.

Indicators

The following set of indicators was selected within the U-Multirank consultation process for usage in either the institutional ranking and/or the field-based ranking. The research publication counts refer to the following 'research-based' document types within the WoS: articles, notes, reviews, conference proceedings papers, letters. All count data is based on a 'whole counting' method where a publication is attributed in full to each main organization listed in the author addresses. In case of publication counts, the annual statistics refer to publication years (rather than database years).

1. Number of publications: Frequency count of research publications with at least one author address referring to the selected main organization.

2. Number of national co-publications: Frequency count of publications with at least one author address referring to the selected main organization and all other addresses referring to that same country in which the organization is located.

3. Number of international co-publications: Frequency count of publications with at least one author address referring to the selected main organization and one or more other addresses referring to another country.

4. Number of public-private co-publications. Frequency count of publications with at least one author address referring to the selected main organization (in the public sector) and one or more other addresses referring to another organization within the private sector. The definition and delimitation of private sector organization was done in accordance to a CWTS classification system of attributing institutional addresses into major institutional sectors, where organisations within the medical sector are excluded from the private sector.

5. Number of intra-regional co-publications. Frequency count of publications with at least one author address referring to the selected main organization and one or more other addresses referring to an other main organization located within the same sub-national region. The delimitation of regions was done according to EUROSTAT's NUTS-system. In this study the r NUTS2 regions will be used, which are basically equivalent to provinces within a country. This analysis is, by necessity, restricted to European main organizations.

6. Mean Normalised Citation Score (MNCS). This is a field-normalised citation impact score, where the fields are equivalent to the Thomson Reuters Journal Categories. We compare 'actual' citation counts to 'expected' counts based on the average impact score of all WoS-indexed journals assigned to a field. A score larger than one represents a citation impact above world average within than field of science, whereas scores below one represent below average impact. Scores between 0.8 and 1.2 are considered 'world average'; 1.2 to 1.5 is 'good' at the international level, and scores above 1.5 are associated with an 'excellent' research performance.

The citations to each publication are collected according to a variable citation-window, where each publication is tracked with the constraints of the pre-set time-period. For instance, within the time-period 2005-2009 all publications from 2005 will be tracked for 5 years up to and including 2009; those published in 2006 will be tracked for 4 years, et cetera. The most recent publication year is not included to prevent the occurrence of statistical biases in MNCS

score due to low citation counts and extremely low expected counts. The data refer to database years.

7. Top 10% most highly cited publications. The actual number of publications of a main organization within the world's top 10% most highly cited publication per field, is compared to the expected number of publications (i.e. 10% of organization's publication output in that same field). We compare 'actual' citation counts to 'expected' counts per field: a score larger than one represents a 'surplus' of highly cited publications; a score below one reflects a 'deficit'. A large surplus is associated with an excellent research performance in terms of internation scientific impact. The underlying citation impact distributions are calculated by applying a fixed citation-window, for two 'research-based' document types: articles, reviews. These data refer to database years.

General observations

Three of the pre-test organizations produce quantities of WoS-indexed research publications that are too low to warrant any valid statistical analysis of research performance profiles, at least when based on a single year's of data drawn from the WoS database. This caveat applies specifically at the level of selected fields. More robust data will therefore require an aggregation across a series of successive years; for instance 2005-2009. Furthermore, lower threshold values should be adopted in order to select those measurements that are amenable to detailed analysis of publication output or citation impact performance; for example, a threshold set at an annual average of 25 WoS-indexed publications (overall, or per field) in recent years.

1.5.2 Patents

Data source

For each institute, patent data were extracted from the PATSTAT database (EPO Worldwide Patent Statistical Database; version October 2009). EPO and USPTO patents were considered with application years between 2000 and 2009. For EPO, it concerns patent applications. For USPTO, it concerns only granted patents (USPTO only started publishing applications by the end of 2000). The number of patents per institute is retrieved by looking up the university in the "applicant" field in the PATSTAT database. This implies that patents of an inventor who is affiliated to the university, but for which e.g. a partnering firm is registered as the applicant, are not retrieved because the university's name does not appear in the applicant field. The queries also took into account alternative names / spelling variations under which individual organizations may register their patents[2].

Results

The analyses showed that two out of the five institutes have no patents in the considered time period. Overall, volumes are low hence relative variation over time and between institutes is high It would therefore be advisable to include a sufficiently long time period for the patent extraction.

Some points of attention that relate to the feasibility of using academic patent indicators should be kept in mind. First, the decision of considering grants and/or applications is first of all a matter of content-wise objectives. Grants may represent the more 'valuable' patents. However, they represent only a portion of the portfolio of technological developments that

2 See: Magerman T, Grouwels J., Song X. & Van Looy B. (2009). Data Production Methods for Harmonized Patent Indicators: Patentee Name Harmonization. EUROSTAT Working Paper and Studies, Luxembourg. & Peeters B., Song X., Callaert J., Grouwels J., Van Looy B. (2009). Harmonizing harmonized patentee names: an exploratory assessment of top patentees. EUROSTAT working paper and Studies, Luxembourg.

are potentially relevant for industrial practice. At the same time, there are limitations to the data availability as well, depending on the patent system(s) considered. At USPTO, before 2001, only grants were published. And if for example PCT (Patent Cooperation Treaty) patents would be included, it should be kept in mind that these represent applications only (which may, at a later date, lead to a grant in any of the states contracting to the PCT). As such, the decision to include other patent systems besides EPO and USPTO, like JPO, PCT and national patent offices is also one to be made carefully[3]. Second, academic patenting volumes are largely driven by national legislations. Especially when taking into account longer time periods for extraction, one should bear in mind international differences (and potential intra-national changes) in such national legislations. These may concern IP in general (e.g. the legitimacy of software patents) and IP at universities more specifically (e.g. the 1980 Bayh-Dole Act in the US; and the different timing of abolition of the "professor's privilege" across European countries: for more insight, see Van Looy et al., 2009[4]). Finally, the extraction of universities patents on a global scale precludes the identification of patents that have been invented by university professors but that are not owned by e.g. a partnering firm rather than by the university. The proportion of 'university-invented' patents that remains unidentified due to this limitation may be more or less pronounced depending on the national or regional texture. France and Germany may for example be more affected, due to the fact that university professors generally have more affiliations (large public research institutes) and they may register their IP under affiliations other than the university. Also, countries or period where the professor's privilege is still in effect are affected more heavily as only university-owned patents are considered.

To conclude, decisions on the required coverage of the extracted data, but especially also the interpretation of academic patent indicators, need to take into account specificities with regard to organizational textures and legislations at a regional and national level.

1.6 General feedback from pre-test institutions

After completing the pre-testing, we scheduled a phone interview with contact persons of all pre-test institutions for a general assessment of the process. We inquired about the time spent on the questionnaire, efficiency of the questionnaires, clarity of procedures, communication with the team, and other aspects of the process. From the institutions who did not fill out the questionnaires we inquired why they did not do so. By the time of finishing this report, we have had follow-up interviews with representatives of 10 institutions.

Data collection

Regarding the data collection processes, the interviews confirmed the general feedback mentioned above. While the questionnaires were clear and easy to use, two problems emerged with respect to some indicators. Some indicators were not sufficiently clearly defined, which made data provision difficult. One respondent mentioned a need for definitions in a "drop-down menu" format to make the process easier and suggested to present also examples next to a definition. Secondly, some data elements are not easily available and either cannot be provided or require a major time investment.

[3] Whereby it should be noted that data quality across national patent offices as represented in e.g. the PATSTAT database may not be sufficient for allowing cross-country comparisons.

[4] Van Looy, B., Du Plessis, M., & Callaert, J. (2009), "Evolution of innovation actors and the influence of legislation." Eurostat Series: Statistics in Focus.

Additionally it appears that greater attention is sometimes needed for defining disciplinary borders. Two universities mentioned that they do not have programmes that are titled "Business". At the same time they offer education and do research in this area and would like to participate in such a ranking. Additionally, the French institution pointed out that their students choose their specialisation only at their 3rd year of studies, which again makes a definition of a programme difficult.

Efficiency of the questionnaire

Efficiency of the questionnaire was evaluated "good" by most respondents. The institutional questionnaire seems to be most manageable, the departmental questionnaire is somewhat less so and the biggest concern seems to be the student questionnaire. Several respondents point to the fact that the student questionnaire is very lengthy. On the other hand, the CHE experience with a very similar questionnaire in Germany and a few other countries shows that students themselves do not consider the questionnaire overly lengthy. Also the U-Multirank pre-test among students in 3 institutions did not confirm the fear that the questionnaire is too lengthy for students to complete or that they find some questions irrelevant.

While most respondents are positive about the efficiency of the questionnaires, most of them do recognise that it is a significant time-investment for their institutions. Particularly one institution pointed out that if this will be a regular exercise, they need to coordinate these surveys with other similar surveys that they conduct for their own and other data collection purposes.

Time spent on data collection

The estimates of the time spent on collecting all the data vary greatly. Aarhus University, which was the only university that provided data at the institutional level as well as for the business and engineering fields and distributed the student questionnaires, gave the following estimate:

> *Not able to specify the number of hours, but over a 5 week period 3 people at the central level were occupied as well as an additional 3 people per each departmental questionnaire.*

Most institutions found the work load manageable, other institutions find the work a big burden on their institutions. Interestingly an expected time commitment does not seem to be the main factor explaining why some universities find the task burdensome and others not.

Clarity of procedures

Clarity of procedures was evaluated mostly 'good' and no significant problems were mentioned. Only in one case the respondent found that there were perhaps too many steps and too much information, but the overall evaluation of the respondent was "satisfactory". In one case a university would have expected more instructions from the project team and a more thorough explanation of the project. This institution also recommended national level workshops among pilot institutions to discuss various issues about filling out the questionnaires.

Communication with the team

Communication during the process with the U-Multirank team was evaluated as "very good" by most respondents.

Reasons for not participating

The main reason for not participating in the study seems to be a lack of time. Some institutions estimated that the data collection would be a too big time investment. In one case the issue came up particularly with respect to indicators that are not currently collected and included in existing national data bases. The university also raised a concern that if these data are not nationally collected, it is difficult to ensure its comparability and validity.

One university did not provide data because it considered the instruments still as "work in progress" and not fully finalised. Furthermore, they would like to know how the ranking will be presented and visualized in the end, to estimate if it will be useful for their own benchmarking.

In one case the university did not manage to respond within the requested time-span because it coincided with the beginning of the academic year. As an additional reason, one institution mentioned that they were expecting clearer instructions from the U-Multirank team regarding what needs to be done.

1.7 Response to the pre-test results

The results of the pre-test and the feedback from the follow-up interviews provided a lot of helpful information to the U-Multirank team. As a response to the feedback we have undertaken the following steps.

Glossary and Frequently Asked Questions section

Since the pre-test showed that some indicators were not sufficiently defined, we have sharpened the definitions and we have produced a *Glossary* that offers clear definitions and explanations (see appendix 6). Furthermore, we have created a *Frequently Asked Questions* section on the U-Multirank website where respondents can find helpful information regarding most common challenges (see appendix 7 and www.u-multirank.eu/faq). The section is continuously updated and extended. There is also the option to create country specific sections, in which national definition issues are addressed.

Work load

Some institutions participating in the pretest as well as some stakeholders raised the issue of the high workload for institutions due to the high number of indicators. The U-Multirank team is aware of the fact that the particular approach of U-Multirank indeed puts a heavier burden than do rankings like ARWU which completely rely on existing data. Already in the first report we outlined- and this approach was supported by most stakeholders – that U-Multirank is trying "to measure what counts". This is why we conducted the intensive stakeholder consultation on the relevance of indicators. A higher degree of commitment and involvement of institutions to deliver data is a direct implication of this approach.

U-Multirank is a feasibility study. In order to get to a final list of indicators that proved to be relevant, valid, reliable and available and in order to see which indicators will turn out to be the "best " indicators finally, we have to test a higher number of indicator than will be proposed as the final U-Multirank set of indicators for future implementations of U-Multirank. This means that the number of indicators and the workload for institutions is higher in the feasibility study than it will be in a future U-Multirank ranking which will be based on smaller set of indicators then.

Review of the indicator list

Pre-test results suggest that some indicators may be quite challenging for a majority of institutions. For example, information related to regional engagement is often not collected and

therefore institutions are not able to produce reliable data for U-Multirank. As a result we have had another critical look on our indicator list, paying attention to the availability criterion. In the cases where we think that other indicators are sufficient to capture the essence of a dimension we have omitted some indicators that appear to be highly problematic. In other cases, when we think that the indicator is really essential for the dimension, we have kept the indicator, hoping to call attention to the fact that universities and national systems should incorporate these data in their regular data collection procedures.

Review of Questionnaires

Based on the identified problems we have revised the questionnaires (see appendix 8). The revisions concern primarily the formulation of questions, but not only. Since we realize that for some important questions institutions do not have hard data but may be able to offer an estimate, we have introduced such an option. It is now clearly distinguished whether a response is based on verifiable data or on an "educated guess", to assess the reliability of the data.

While several institutional respondents thought that the student questionnaire is too long, we have not reduced the number of questions in the questionnaire. Earlier experiences with a very similar questionnaire in Germany and some other countries show that the length of the questionnaire does not prevent students from completing it. Furthermore, pretesting the questionnaire in 3 institutions for the U-Multirank confirmed the result, despite the concerns raised by the institutional representatives. Students do not seem to find the questionnaire too lengthy and they do not find the questions irrelevant or repetitive.

2 Selection of indicators

2.1 Introduction

The aim of this chapter is to summarise the selection of indicators for the U-Multirank project. It builds upon the project's first interim report *"Design and testing the Feasibility of a Multi-dimensional Global University Ranking"* (CHERPA-Network, 2010), which lists our general design principles and includes an overview of indicators used in current quality assurance systems, rankings, student information sites and classification schemes. The definition of a set of indicators for U-Multirank is highly stakeholder-oriented. The indicators selected for the pre-test phase in U-Multirank were first defined after a thorough literature review taking into account publications from the developers and also from the critics of previous rankings, benchmarking exercises and information systems, both international and various national projects (see the *Interim report*). In this report we present a list of indicators that incorporates additionally a feedback from international experts, the advisory board and various stakeholder organisations. The report also incorporates the results of pre-testing the instruments in eleven institutions. The contribution from this process is described in the next section.

2.1.1 Process of selecting indicators

The process of indicator selection is illustrated in figure 1. After an initial selection of indicators was completed, based on literature and other evidence in the area, the list was exposed for feedback to various expert and stakeholder groups. It is one of the basic ideas of U-Multirank that –in line with the Berlin Principles - that indicators should be chosen primarily for reasons of relevance , not for mere availability of data.

Stakeholder workshop

Stakeholder involvement is a cornerstone of the U-Multirank approach to ranking in higher education. A stakeholder workshop was organized in December 2009 in Brussels and welcomed more than 50 persons from various stakeholder groups. In an interactive setting, the participants were invited to state and discuss their views on the relevance of a first list of indicators (for a detailed description of the setup and results see www.u-multirank.eu). The results of this workshop were the major input for the scores on relevance in the assessment tables presented below.

Stakeholder survey

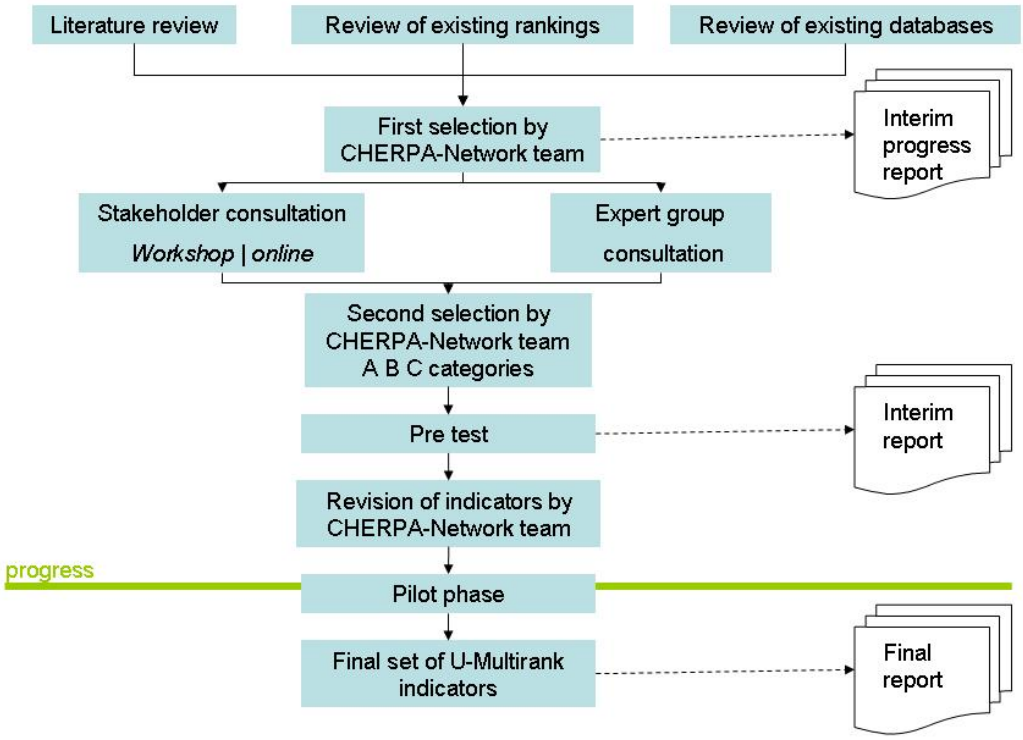
Several stakeholder representatives indicated at the workshop that they would like to think more about the indicators and consult with their colleagues and constituency. In February 2010, an on-line questionnaire was distributed among the stakeholders for another round of stakeholder feedback. The questionnaire asked to assess the relative importance of the indicators in the various dimensions. To facilitate the assessment process, the project team presented a simplified expert view on the indicators. Information on the availability of data, reliability of the indicator and frequency of use was provided based on literature, review of existing ranking and benchmark projects and existing national and international databases.

An invitation to complete the questionnaire was sent to over 80 national and international stakeholder organizations. 117 persons opened the questionnaire and responded to a part of the questions, 33 persons submitted a completed questionnaire.

Additional Feedback from a number of stakeholder organisations

In the last few months we have been contacted by some stakeholder groups who have offered their thoughtful comments and shared their concerns regarding U-Multirank. We have received input from the Coimbra group, LERU, and the HBO-Raad in the Netherlands, for example. We have seriously considered the comments and incorporated the feedback in our analysis as well as possible. Some of the main concerns articulated by the stakeholder groups are also listed below.

Figure 1 Process of developing indicators



Expert group consultation

The U-Multirank project has an international expert panel and the panel was invited to comments on the indicator list. The members of the panel received a preliminary version of the interim report (presented to the Advisory Board in June 2010) and they were asked to offer their feedback. Out of 6 people in the expert panel, 3 members responded to this request. The respondents indicated that the set of indicators cover the most relevant aspects with regard to the five dimensions to be included in the feasibility study. All experts agreed about the high quality ("the work looks solid and systematic") and sophisticated approach of the design of the study. At the same time they highlighted that this is a *challenging* exercise.

From one member of the Panel we received a list of detailed comments on individual dimensions and indicators. He highlighted the intense stakeholder consultation which was a major aspect in the development of indicators. "This type of true consultation at the development phase of the project serves as a good model for other organizations engaging in benchmarking activities." One expert raised concerns over the impact of the availability of data as a starting point. While the availability should not be the rationale for the selection of indicators, which is in line with the U-Multirank approach, the lack of availability in his view should not lead to an a-priori exclusion of indicators which are rated as highly relevant.

One suggestion was to include more social issues and indicators on equity. This proposal was similar to some stakeholder statements in the course of the stakeholder consultation. Yet no manageable definitions and operationalisation for concrete indicators to measures those issues could be given. In addition many measures on social issues are indeed relevant information to describe an institution but they cannot be translated into categories of better and worse, i.e. cannot be translated into an ordinal scale – which is the pre-requisite for using them in a ranking.

Advisory Board feedback

A preliminary version of this report was discussed at the Advisory Board meeting on 7 June, 2010. The discussion at the meeting provided specific feedback on a number of indicators. Furthermore, Advisory Board members were encouraged to offer further comments after the meeting and we received a thorough feedback from one Board member. All this input is incorporated in the analysis below.

Further availability analysis

Problems with data availability are one of the major obstacles for creating a comprehensive and transparent global university ranking. Three further steps were taken in order to examine the availability of various data elements: an analysis of the EUMIDA project, consultation of international experts, and an examination of the IPEDS system in the US (see also appendix 1).

EUMIDA

U-Multirank can gain a lot from several on-going international projects regarding various higher education indicators. One such project is EUMIDA, which assesses the feasibility of creating a consistent statistical infrastructure at the level of individual higher education institutions in Europe. The project analyses the availability of various data elements in European countries, many of which overlap with the proposed indicators in the U-Multirank project. Appendix 1 provides a detailed description of the results from the EUMIDA review.

Consultation with international experts

The EUMIDA results thus give a good overview about data availability in Europe, but not beyond Europe. As a second step we contacted experts in six non-European countries: Argentina, Australia, Canada, Saudi-Arabia, South Africa and United States. The experts were asked to report whether data on U-Multirank indicators is available in a national database or in institutional databases. Results from this analysis are considered in proposing availability scores for each indicator above. Appendix 1 provides a detailed description of the results from the expert consultation.

An examination of the IPEDS data system

IPEDS, Integrated Postsecondary Education Data System is a system of interrelated surveys conducted annually by the U.S. Department's National Center for Education Statistics (NCES).

IPEDS gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programmes. Since 1965 the Higher Education Act requires that all institutions that participate in federal student financial aid programmes have to report data on enrolments, graduation rates, faculty and staff etc. For this reason more than 6700 institutions deliver those data to IPEDS. The information is collected and published online at the College Navigator. The publication refers to institutional data only; i.e. data are not disaggregated for fields. The most recent data are from fall 2009.

Because the surveys of the IPEDS data collection project are highly extensive, one of the Universities that U-Multirank asked for participation in the feasibility study proposed to compare the existing IPEDS data with the information and indicators U-Multirank collects. Therefore we compared IPEDS indicators and definitions with the indicators that will be used in the U-Multirank feasibility study (see Appendix 1.3). The general conclusions from this examination are the following:

- Only a small number of indicators is included both in IPEDS and U-Multirank;
- Most of the IPEDS indicators are published in absolute numbers and not as percentages;
- U-Multirank collects information for 2008, the data published by IPEDS refers to fall 2009.

The conclusion that can be drawn is that it is not possible to work only with the data IPEDS collects for US institutions. Using the data would need access to the raw data set in order to be able a) to use the data for field based rankings and b) in general to calculate indicators in according to the definitions as used by U-Multirank. At the same time, having access to raw data is not a realistic option.

As there is only a limited overlap in indicators in IPEDS and U-Multirank, there will only be a small part of data requests in U-Multirank that would be available from IPEDS. Hence US institutions could draw on those data in order to deliver information for the U-Multirank feasibility study. The duplication of data delivery should not be a major problem for the participating US institutions. Of course there will be some extra work with the information and data we are collecting for the U-Multirank project only and that is not also collected for the IPEDS surveys. U-Multirank will provide a list of data available from IPEDS to participating US institutions.

2.1.2 Concerns of stakeholders

The project has received wide support as an attempt to design a tool that is more comprehensive and rigorous than existing rankings. At the same time stakeholders have articulated various concerns and issues. The criticism concerns specific indicators that have been proposed as well as more general conceptual issues. While the former is integrated in the analysis below, here are listed a few general concerns. It should be mentioned that it is difficult to point out any shared criticism since different organizations and experts emphasize different issues.

The concerns refer to the following issues.

- 'The indicators in the U-Multirank project are imprecise proxies and do not describe accurately the quality in the specified dimensions. For example the indicators proposed under teaching are not a proxy for quality of teaching but rather the quality of process'. We acknowledge that the indicators are proxies, which is the case with most quantitative indi-

project.

- 'Statistics from country to country will not be comparable'. Comparability issues are most certainly a major point of concern in this feasibility study. For a number of indicators, such issues can be solved by using clear definitions, and if needed country specific guidance by providing examples in the glossary (see appendix 6), in the additional information screens in the questionnaire (see appendix 8) and answers to frequently asked questions (FAQ) (see appendix 7). In the latter country specific sections will be set up. Participating institutions will comment when using different definitions, as the pre-test has shown us, and comparability issues can then be addressed fully. For other indicators, which are outside the 'standard' set of indicators, the definitions are more open to discussion and characteristics of national systems may have an impact on the exact data provided. In those cases contextualisation is required. The pilot study has to sensitise the U-Multirank team for contextual influences that need to be taken into account when interpreting the data. In our view, finding out whether internationally comparable data can be produced or not needs to be tested empirically and this is one of the major tasks of the feasibility project. The pre-test has revealed several occasions where more clarification or specification is requested by respondents for ensuring the comparability of data. Whether this will be sufficient or important biases will remain is a question that can be answered only in the final analysis of the project.

- 'A lack of fundamental a-priory reflection on what each of the dimensions is supposed to capture'. The dimensions have been chosen after a thorough process of stakeholder consultation regarding what characteristics of higher education are important in characterising it. During that process various expert and advisory groups have commented on the choice of dimensions, resulting in the five dimensions chosen (see also Interim progress report). In the choice of indicators within these dimensions we try to capture all relevant aspects of the dimension. Whether we have succeeded in that – the issue of validity – is addressed throughout this report.

- 'An example of an important missing indicator is "social inclusion" or "equity"'. A need for such an indicator has been mentioned in several occasions. This is indeed a criterion that is an important policy goal in great many countries, and perhaps not less important than efficiency and quality. Social inclusion, however, is a highly country specific issue. The patterns of social inequalities and their origins tend to be complex and diverse. Furthermore, the equity aspect includes not only a socio-economic but also an ethnic dimension. In addition one could argue that equity is more an issue of higher education systems, not of individual institutions. Hence it is a crucial element in concepts of benchmarking higher education systems, as e.g. by the World Bank. According to our view, in the limits of the U-Multirank project it is impossible to create such an indicator without sacrificing the transparency and rigour of the tool. We acknowledge that an attempt to design such an indicator can be a valuable task in the future.

- 'It is difficult to draw a line between different dimensions. There is a continuum from applied research to knowledge transfer. Similarly CPD courses are serving not only the "third mission" but are part of the teaching function.' This is correct, but we also think

ways) be separated.

- 'The U-Multirank indicators shy away from new, relevant indicators and favour indicators that are already in use'. The list of indicators proposed covers a large number of indicators that refer to issues that are not addressed elsewhere. Issues like regional engagement and knowledge transfer are considered to be very relevant in the U-Multirank project. The number of indicators in those dimensions that are already used elsewhere is very limited, which implies that the number of new indicators is relatively large. Within the framework of the feasibility study we look into the current use of an indicator.

- 'The list of indicators still does not reflect the diversity of missions and profiles of universities. The indicators have a bias towards a traditional research university'. This comment is a variation on the theme described in the previous comment. 'Non'-research universities have emerged in more recent times which implies that indicators for their 'new' activities are not yet very well developed. New indicators are incorporated but feasibility issues are more prominent there than with indicators for traditional research university activities.

Where possible we have incorporated all the feedback. We have changed our indicator list where needed. We have tried to communicate more clearly our conceptual and practical foundations. In some occasions we have no other choice than to recognise that the U-Multirank cannot produce a perfect ranking at the first attempt.

2.1.3 U-Map and U-Multirank

U-Multirank is inextricably connected to U-Map: U-Map aims to map higher education institutional diversity. It does not rank the institutions league-table-style, but describes institutions on a number of dimensions, each representing an aspect of the activities of higher education institutions (www.u-map.eu). The mapping focuses on the profiles shown through *activities* of the institutions. U-Map prepares the ground for comparing only those higher education institutions in U-Multirank's rankings that are comparable in the eye of the user.

U-Multirank adds the *performance* aspect to the mapping: how well are higher education institutions *performing in the context of their institutional profile*? In U-Multirank the emphasis is on indicators of performance. Therefore, the first requirement for the indicators used in U-Multirank is to reflect as closely as possible the institution's or unit's performance. As will appear below, the complexity of higher education and the paucity of (internationally comparable) data often necessitates aiming for proxy indicators. Unfortunately, this blurs the distinction between U-Map's focus on enablers (input and activity) and U-Multirank's focus on output and performance to some extent. Such overlap cannot be avoided at all times, but should become smaller with the maturing of U-Multirank over the years.

2.1.4 The analysis of indicators

Design principles that we identified previously (CHERPA-Network, 2010, pp. 65-67, 76-77) with direct bearing on the choice of indicators include:

- *Relevance* and *importance*: The perspectives of the different groups of users must be taken into account in the selection of dimensions and indicators; *relevance* of dimensions and indicators in their eyes should be one of the leading principles. In addition to the discussions with the stakeholders represented in the Advisory Board of the project, two events were organised to capture the opinions of as many stakeholders as possible. The first

event, the stakeholder workshop, focused on the relevance of the indicators. In the second event, the online stakeholder consultation, the net is cast even wider: participation was open to all stakeholders and the consultation addressed a more comprehensive assessment of the priority of individual indicators within their dimension. Capturing the stakeholders' overall opinion was shown under the heading of *importance*.

- *Validity*
  - *Concept validity*: focus on the *performance* of (programmes in) higher education and research institutions and not only on the factors enabling performance.
  - *Construct validity*: indicators should therefore be defined in such a way that they measure 'relative' characteristics, controlling for size of the institution. In addition, calculating composite overall indicators for a whole institution or a whole dimension, assigning fixed weights to each sub-indicator without theoretical grounding, should be avoided.
  - *Face validity*: If indicators are used in other benchmarking and/or ranking projects, the indicator seems to be available, reliable and relevant in other projects' eyes. In that case, we rather have to explain why we do *not* follow the same route as others instead of having to justify our choice of a certain indicator.
- *Robustness* and *reliability*: Indicators have to pay attention to issues of possible – in particular undesirable or perverse – incentives resulting from their use in rankings. Indicator definitions, data sources and data collection processes should be designed in such a way that they maximise *resistance against manipulation* ('gaming the results') by interested parties. Are data sources and the data they comprise reliable?
- *Availability, comparability*: are data expected to be readily available in higher education institutions or national databases worldwide? Are the same/similar definitions used so that data are comparable?

In the chapters below each indicator is assessed with respect to these four criteria. Criteria are linked with the process of selection of indictors: Relevance e.g. mainly refers to the processes of stakeholder consultation. Information on availability comes from reviews of existing data sets and from the pre-test. Each indicator is assessed as :  not a problem/high score;  there may be challenges ahead;  definitively a challenge/low score, with respect to each criteria. In addition the tables report the assessment of relevance and importance as perceived by stakeholders.

The selection process leads to three categories of indicators.

A. Indicators that will be used in the pilot study; indicators scoring well on most or crucial criteria. For those indicators we do not expect major problems.

B. indicators scoring less well on the criteria; data will be collected in the pilot study, although some problems may be expected. Those indicators might also be used as alternatives if Group A indicators have to be dropped during the process.

C. Certainly out: indicators scoring low on most or crucial criteria. Data on those indicators will not be collected.

Implicitly there is a D group of indicators: those no longer even considered at this stage of the process due to patently low scores on most of our design criteria.

2.2 Performance in the dimension of teaching and learning

Education is the core activity in most higher education and research institutions. It comprises all processes to transmit knowledge, skills and values to learners (colloquially: students). Education is best conceived as a process subdivided in *enablers* (inputs,[5] process[6]) and *performance* (outputs and outcomes[7]). Teaching and learning ideally lead to the *impacts* or *benefits* that graduates will need for a successful career in the area studied and a successful, happy life as an involved citizen of a civil society. Career and quality of life are complex concepts, involving life-long impacts. Moreover, the pace of change of higher education and research institutions means that long-term performance is of low predictive value for judgements on the future of those institutions. All we could aspire to in a ranking is to assess 'early warning indicators' of higher education's contribution, i.e. outcomes and outputs. Students' learning outcomes after graduation would be the best measure of outcomes. However, measures of *learning outcomes* that are internationally comparable are only now being developed in the AHELO project.[8] At this moment such measures do not exist and proxies must be found.

A combination of indicators will be sought, combining considerations of validity with reliability (e.g. opting for several data sources and methodologies), as well as the other criteria distinguished above.

Proxies will be sought in outputs and where necessary in enablers. It has to be kept in mind that the abstract conception of a process can be applied at different levels and from different perspectives. In the above, we used a high degree of aggregation and a perspective of the higher education and research institution in society. As one of the main objectives of our U-Multirank project is to inform stakeholders such as students, their perspective is important too. From their point of view, as we explained in the first *Interim report* (CHERPA-Network, 2010), the output to be judged is the educational process, so especially for the field-based rankings we will consider indicators that from a macro perspective are perceived as enablers.

Another approach to get close to learning outcomes lies in assessing the quality of study programmes. Quality assurance procedures, even if they have become almost ubiquitous in this world's higher education, are however too varied to lead to comparable indicators (CHERPA-Network, 2010, pp. 51-53): some quality assurance procedures focus on programmes, others on entire higher education institutions; they have different foci, use different data, different performance indicators and different 'algorithms' to arrive at judgements. 'Algorithm' was used in quotes because decision standards and rules are often not very explicit, especially not when external experts judgements ('peer review') are concerned. This is the current state even in Europe, where the *European Standards and Guidelines* (European Association for Quality Assurance in Higher Education, 2009) only bring some harmonisation of areas of attention, not of standards. The qualifications frameworks currently being developed in the Bologna Process and in the EU may come to play a harmonising role with regard to educational standards in Europe, but they are not yet effective (Westerheijden et al., 2010) and of course they do not apply in the rest of the world. For our field-based rankings, subject-level approaches to quality and educational standards do exist; we will return to the issue later on. At a fundamental level, quality assurance outcomes are used as well: in principle, only higher

[5] Inputs include resources for the education process: staff quality and quantity, facilities like libraries, books, ICT, perhaps living and sports, funding available for those resources, and student quality and quantity.

[6] The process of education includes design and implementation of curricula, with formal teaching, self study, peer learning, counselling services, etc.

[7] Outputs are direct products of a process, outcomes relate to achievements due to the outputs.

[8] http://www.oecd.org/document/22/0,3343,en_2649_35961291_40624662_1_1_1_1,00.html.

education institutions that have been accredited or otherwise officially recognised are allowed to be included in our databases.

Indicators of the type of studies offered have been taken into consideration as objective bases for different qualities of programmes, such as their interdisciplinary character. Besides, measures of students' progressing through their programmes can be seen as proxy indicators for the quality of their learning. Taking a perspective at degree programmes as a whole, several measures of how students attain their degrees present themselves.

Proceeding from the adage that 'quality is in the eye of the beholder'—which firmly underlies modern quality definitions such as ISO9000 but also higher education insights into quality (Conti, 1993; Harvey & Newton, 2004; Kells, 1995; Westerheijden, 2007)—proxy indicators can be sought in student satisfaction. The student experience of education is conceptually closer to what those same students learn than judgements by external agents could be. Students' opinions may derive from investment or from consumption motives (CHERPA-Network, 2010), but it is an axiom of economic theories as well as of civil society that persons know their own interest (and experience) best and therefore we shall choose tested indicators reflecting both.

An issue might be whether student satisfaction surveys are prone to manipulation: do students voice their loyalty to the institution rather than their genuine (dis-)satisfaction? This is not seen as a major problem as studies show that loyalty depends on satisfaction (Athiyaman, 1997; Brown & Mazzarol, 2009; Rojas-Méndez, Vasquez-Parraga, Kara, & Cerda-Urrutia, 2009). Nevertheless we should remain vigilant to uncover signs of university efforts to manipulate their students' responses; in our experience, including control questions in the survey on how and with which additional information (instructions?) students were approached to participate gives a good indication.

Another issue about using surveys in international comparative studies concerns differences in culture that affect tendencies to respond in certain ways (Cavusgil & Das, 1997; Harzing, 1997; Hofstede, 2001). Even among closely-related cultures in north-western Europe such effects could not be ruled out (*The CHE Ranking of European Universities: A Pilot Study in Flanders and the Netherlands*, 2008). Evidence from CHE rankings and from European surveys (e.g. EuroStudent[9]) shows however that student surveys can give valid and reliable information in a European context. One of the questions that will have to be answered by the current project is whether a student survey on judgments about their own programme/institution can produce valid and reliable information on a global scale.

2.2.1 Focused institutional rankings

The extent to which students are able to finish their study programmes successfully and on time (*time to degree* and *graduation rate*). These indicators point to the match between the institution's requirements and students' needs and expectations: mismatches would result in more drop-outs and transfers to other higher education institutions.

- Pro: objective statistics of actual performance. From the stakeholder perspective, graduation rate was considered the most relevant indicator. For the assessment of the teaching and learning performance, stakeholders opined that the effectiveness of the schooling process is more important than the success of the graduates on the labour market. The expert group consider this indicator to be very important.

[9] http://www.eurostudent.eu:8080/index_html.

- Con: Validity and comparability problems with these indicators may include the observation that more selective higher education institutions score better (open access systems will show more mismatched students); that they are sensitive to discipline mix of the higher education institution (lower scores in humanities, esp. philosophy) and to economic circumstances (with high unemployment, students remain in the institution longer); and that there is a small chance that they might be manipulated by the institution (without good quality assurance, lowering of standards might be a way to let more students graduate faster). Availability of data may be a problem as data are very hard to find in existing national databases. Data may be more available in institutional databases but even there, data are not always readily available.

The extent to which the institution's graduates succeed in starting a career (relative rate of *graduate unemployment*) may also indicate that the institution is 'in sync' with the demands of its environment and does not offer outdated study programmes.

- Pro: Objective statistics, cannot be manipulated by the higher education institution (employment at own institution excluded).
- Con: This indicator is sensitive to economic circumstances. Availability may be a challenge, but the pretest and expert consultation show that it is better than for graduate earnings. In some countries data are available at the national level and in some countries institutions have information. Comparability of the data is not always clear due to different definitions used. There may be some differences in the timespan (between graduation and surveying graduates) used.

Relative *graduate earnings* inform about the value society gives to an institution's educational outputs.

- Pro: Objective statistics, cannot be manipulated by the higher education institution (employment at own institution excluded).
- Con: This indicator is sensitive to economic circumstances. Availability may be low. There may be also some differences in the timespan (between graduation and surveying graduates) used. From the stakeholder perspective, this indicator was not considered relevant or important overall, but the pre-testing institutions did not share that view

Another indicator of the degree to which an institution's study programmes are leading to broadly-educated graduates is the *interdisciplinarity of programmes*. It was suggested to rename the indicator into flexibility, but that is seen as too broad

- Pro: Objective statistics. The expert group considers this an important indicator, even though it has its difficulties in measuring.
- Con: This indicator is sensitive to regulatory frameworks (some recognition and accreditation regimes are less open to interdisciplinary programmes than others) and to the specialisation of higher education institutions (very specialised institutions may have fewer options for students outside their core disciplines).

Finally, although it is an indicator of input rather than of performance, the share of an *institution's budget spent on education* was proposed.

- Pro: Is in principle available for all higher education institutions

- Con: The indicator is basically an input indicator. From the stakeholder perspective, not considered relevant or important overall.

Teaching & learning focused institutional ranking	Relevance	Concept/con-struct validity	Face validity	Robustness/ re-liability	Availability	CHERPA rating
Graduation Rate	▲	□	▲	□	□	A
Time to Degree	□	□	▲	□	□	B
Relative Rate of Graduate (Un)employment	▲	▲	□	□	□	B
Interdisciplinarity of programmes	□	□	□	▼	▼	B
Expenditure on teaching	□	▼	▼	▲	□	B
Relative Graduate Earnings	▼	▲	▲	□	▼	C

Legenda: ▲ not a problem/high score; □ there may be challenges ahead; ▼ definitively a challenge/low score

***Graduation rate*:** The percentage of a cohort that graduated after x years after entering the program (x is the normal ('stipulated') time expected for completing all requirements for the degree times 1.5);
***Time to degree**:* Average time to degree as a percentage of the official length of the program (bachelor and master)
***Relative rate of graduate (un)employment*:** The rate of unemployment of graduates 18 months after graduation as a percentage of the national rate of unemployment of graduates 18 months after graduation) (for bachelor graduates and master graduates);
Interdisciplinarity: The number of degree programs involving at least two traditional disciplines as a percentage of the total number of degree programs.
Expenditure on teaching: Expenditure on teaching activities (including expenditure on teaching related overhead) as a percentage of total expenditure
Relative graduate earnings: The rate of monthly earnings of graduates 18 months after graduation as a percentage of the national level of monthly earnings of graduates 18 months after graduation (for bachelor graduates and master graduates).

2.2.2 Field-based rankings

For our field-based rankings, subject-level approaches to quality and educational standards do exist. In business studies, the 'triple crown' of specialized, voluntary accreditation by AACSB (U.S.A.), AMBA (UK) and EQUIS (European) creates an amalgamate of expectations on study programmes in the field. In the field of engineering, the Washington Accord is an 'international agreement among bodies responsible for accrediting engineering degree programs. It recognizes the substantial equivalency of programs accredited by those bodies and recommends that graduates of programs accredited by any of the signatory bodies be recognized by the other bodies as having met the academic requirements for entry to the practice of engineering' (www.washingtonaccord.org).

- Pro: Knowing if programmes have acquired one or more of these international accreditations gives an overall, distant proxy to their educational quality.
- Con: The freedom to opt for international accreditation in business studies may differ across countries, which makes this less suitable for international comparative ranking. In engineering, adherence to the Washington Accord depends on national-level agencies, not on individual higher education institutions' strategies.

The quality of the learning experience is highly important information to (prospective) students and can best be judged by (current) students themselves. A student survey focusing on provision of courses, organization of programmes and examinations, contacts to teachers, facilities, etc. The questionnaire developed is based on more than a decade of experience of project partner CHE and was compared again for this project with other practices (UK, USA, Australia, the Netherlands, EuroStudent). Based on many sub-indicators in the questionnaire, the following aspects are included:[10]

1. *Quality of courses.* Evaluations of teaching quality by students are a good proxy of teaching quality

2. *Promotion of employability*: Practical orientation and inclusion of work experience;

3. The programme's *organisation* (The organisation of the programme is a relevant information for students; a proper organisation is a crucial condition to be able to graduate in time)

4. The opportunity to give feedback on their experiences in *evaluation of teaching* (Course evaluations by students are an important part of quality assurance in teaching; the participation of students in evaluations is a measure of how involved students are)

5. *Facilities*: Libraries, computer facilities, rooms and laboratories. The facilities listed are relevant for students to organise their studies and their student life.

6. *Social climate* (Information about aspects of social climate e.g. student diversity is relevant context information for students.)

7. *Support by teaching staff* (Quality of support is an important indicator for the students and relates to the sense of responsibility of the teachers)

8. *Overall judgement* (The summary, overall satisfaction of students is a good proxy of the overall quality of teaching & learning resp. programmes)

- Pro: student satisfaction is a proxy of high conceptual validity; besides it can be made available in a comparative manner through using our own survey.

- Con: global comparability must be tested in this project. Further aggregation to keep information manageable for (non-student) users must be tested as well.

The stakeholders have in general a positive view on the relevance of the indicators on student satisfaction. There is however a general feeling that the total number of indicators should be reduced by combining sub-indicators into aggregated indicators.

The overall assessment of the relative importance of the individual indicators highlights the student satisfaction regarding the website and the rooms as the least important indicators. In terms of the most important indicators, there are four indicators related to the way the program is organised or the general quality of the programme. This is consistent with the assessment of the focused institutional ranking indicators in this dimension. There the effectiveness of the programme (in terms of graduation rate) was considered to be most important.

Next to student satisfaction, objective indicators are used as proxies, just like in the focused institutional rankings (see above). It is supplemented with:

[10] The final decision about aggregation should be taken after an analysis of the scalability of data.

- the *student-staff ratio* as an indicator of the (expected) intensity of mentoring/tutoring and of contact between students and teachers.
    - Pro: fairly generally available
    - Con: low conceptual validity because it is an indicator of input, not directly of educational quality; depends on educational approaches and is sensitive to definitions of 'staff' (part-time staff, teaching assistants, etc.)
- Students' *gender balance* (High percentage of female students in engineering indicates good diversity policy and use up of potentials for engineering education. In general a balanced situation is considered preferable.)
    - Pro: generally available. Advisory board and experts want this indicator in as an indicator for social equity.
    - Con: ambiguous conceptual validity because it is an indicator of social context, not directly of educational quality. From the stakeholder perspective, not considered relevant or important overall.
- *teaching staff's formal qualifications* as a proxy for teaching staff quality, (Highly qualified academic staff is a precondition for high quality education/programmes. In an international perspective it can be measured and compared by reference to the percentage of staff which holds a PhD).
    - Pro: generally available
    - Con: low conceptual validity because it is an indicator of input, not directly of educational quality; depends on national regulations and definitions of 'staff' and employment (part-time staff, teaching assistants, etc.). From the stakeholder perspective, not considered relevant or important overall.
- In engineering high standard *laboratories* are essential for offering high quality education. The level of investments can show the efforts to keep the laboratories up-to-date.
    - Pro: higher validity than most other input indicators in engineering as it is an essential input into education
    - Con: specification of budget to his level of disaggregation may be difficult for many higher education institutions, and is prone to all complications of international comparisons of prices.

Student satisfaction regarding:	Relevance	Concept/construct validity	Face validity	Availability	CHERPA rating
1. Quality of courses	▲	▲	▢	▲	A
2. Promotion of employability	▲	▲	▢	▲	A
3. Organisation of programme	▲	▲	▢	▲	A
4. Evaluation of teaching	▢	▲	▢	▲	A
5. Facilities	▲	▲	▢	▲	A
6. Social climate	▲	▲	▢	▲	A
7. Support by teachers	▲	▲	▢	▲	A
8. Overall judgment	▲	▲	▢	▲	A

Student satisfaction:

Quality of courses: Index including: Variety of courses offered; engagement of teachers; quality of materials; coherence of courses (integration into curriculum)

Promotion of employability*:* Index of several items: Students assess the support during their internships, its organisation, the preparation and evaluation of internships, the links with the theoretical phases

Organisation of programme: The satisfaction of students with the organisation of a programme.

Evaluation of teaching: The satisfaction regarding the student's role in the evaluation of teaching.

Facilities including:

Libraries: Index including: availability of literature needed; access to electronic journals; support /services e-services.

Rooms: Index on rooms (lecture halls, seminar rooms, working rooms) including: condition of rooms; technical equipment; number of places (in courses)

Laboratories: Index including: Availability/access for students; number of places; technical facilities/ devices

Social climate

Support by teachers**:** Included items: Availability of teachers/ professors (e.g. during office hours, via e-mail); Informal advice and coaching; Feedback on homework, assignments, examinations; Coaching during laboratory tutorials / IT tutorials (only engineering); Support during individual study time (e.g. through learning platforms) Suitability of handouts.)

Overall judgement**:** Overall satisfaction of students with their program and the situation at their HEI

Other indicators	Relevance	Concept/con-struct validity	Face validity	Availability	CHERPA rat-ing
Student-staff ratio	▲	□	▲	▲	A
Graduation rate	▲	□	▲	□	A
Investment in laboratories [*for Engineering FBR*]	▲	□	▼	▲	B
Qualification of academic staff	□	▼	▼	□	B
Relative Rate of Graduate Unemployment	▲	▲	□	▼	B
Interdisciplinarity of programmes	▲	▼	▼	□	B
Inclusion of issues relevant for employability in curricula	□	▼	▼	□	B
Inclusion of work experience into the programme	□	▼	▼	□	B
Computer Facilities: internet access	▼	▼	▼	▲	B
Student gender balance	▼	□	▼	▲	B
Relative Graduate Earnings	▼	▲	▼	□	C

Student-staff ratio: the number of students per fte academic staff
Graduation rate**:** The percentage of a cohort that graduated after x years after entering the program (x is the normal ('stipulated') time expected for completing all requirements for the degree times 1.5);
Investment in laboratories [*for Engineering FBR*]: Investment in laboratories (average over last five years, in million national currencies) per student
Qualification of academic staff: the number of academic staff with PhD as a percentage of total number of academic staff (headcount)
Relative rate of graduate (un)employment**:** The rate of unemployment of graduates 18 months after graduation as a percentage of the national rate of unemployment of graduates 18 months after graduation) (for bachelor graduates and master graduates);
Interdisciplinarity**:** The number of degree programs involving at least two traditional disciplines as a percentage of the total number of degree programs.
Inclusion of issues relevant for employability in curricula: Rating existence of inclusion into curriculum (minimum levels/standards) of: project based learning; joint courses/projects with business students (engineering); business knowledge (engineering); project management; presentation skills; existence of external advisory board (incl. employers
Inclusion of work experience into the programme: Rating based on duration (weeks/credits) and modality (compulsory or recommended)
Computer Facilities: internet access**:** Index including: hardware; internet access, incl. WLAN; (field specific) software; access to computers support
Student gender balance: the number of female students as a percentage of total enrolment
Relative Graduate Earnings: The rate of monthly earnings of graduates 18 months after graduation as a percentage of the national level of monthly earnings of graduates 18 months after graduation (for bachelor graduates and master graduates).

2.2.3 Conclusion

The list of indicators for this dimension, especially in the field-based rankings, is relatively long and there is some demand from project partners including stakeholders to reduce the number of indicators substantially. A counterargument is that this dimension needs more indicators than the other dimensions because students (an important target group of the rankings) are focused on this group of indicators. A strong reduction of the number of indicators would reduce their information basis for choosing a location for further study.

2.3 Performance in the research dimension

Research is one of the core activities (missions) of many HEIs. When searching for indicators that can capture the research performance of a HEI or a disciplinary unit (e.g. department, faculty) within a HEI, one has to start with the definition of *research*. Research is defined by the conventions set out in OECD's *Frascati Manual*:[11]

> Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications

The term R&D covers three activities: basic research, applied research and experimental development. Given the increasing complexity of the research function of higher education institutions and its extension beyond PhD awarding institutions, U-Multirank adopts a broad definition of research, incorporating elements of both basic and practice-oriented (applied) research. There is a growing diversity of research missions across the classical research universities and the vocational HEIs (university colleges, institutes of technology, universities of applied sciences, Fachhochschulen, etc). This is reflected in the wide range of research outputs and outlets mapped across the full spectrum, from discovery to knowledge transfer, to innovation.

Looking at research performance we make the following distinction in the indicators used:

- *Input indicators* measure resources, human, physical and financial, devoted to research. Typical examples are the number of (academic) staff employed or revenues such as competitive, project funding for research.
- *Process indicators* measure how research is conducted, including its management and evaluation. A typical example is the total of human resources employed by university departments, offices or affiliated agencies to support and fulfil technology transfer activities.
- *Output indicators* measure the quantity of research products. Typical examples are the number of papers published or the number of PhDs delivered.
- *Outcome* relates to a level of performance, or achievement, for instance the contribution research makes to the advancement of scientific scholarly knowledge.
- *Impact and benefits* refers to the contribution of research outcomes for society, culture, the environment and/or the economy.

Research performance measurement still focuses heavily on traditional measurements of research inputs and outputs: numbers of research staff or doctoral students, research income, awards, and bibliometric data. The choice of indicators reflects the value judgements and priorities of the users of the indicators. There is no such thing as an objective indicator, because indicators are rarely a direct measurement. Rather they are proxies.

Bibliometrics is the generic term for the methods used to study data on publications, texts and information. Bibliometric analysis uses data on numbers and authors of scientific publications and on articles and the citations therein to measure the "output" of individuals/research teams, institutions and countries. Originally, it was limited to collecting data on numbers of scientific articles and other publications, classified by author and/or by institution, field of science, country, etc., in order to construct simple "productivity" indicators for

[11] http://browse.oecdbookshop.org/oecd/pdfs/browseit/9202081E.PDF

academic research. Subsequently, more sophisticated and multidimensional techniques based on citations in articles (and more recently also in patents) were developed. The resulting citation indexes and co-citation analyses are used both to obtain more sensitive measures of research quality and to trace the development of fields of science and of networks.

Publications are the single most important research output of higher education institutions. By publishing results into the open scientific literature, authors make their research available to the outside world – subjecting it to public scrutiny and disseminating it for others to use, consume and work with.

Most bibliometric data are from commercial companies or professional societies. Available sources are the *Web of Science* database (maintained by ISI – the Institute for Scientific Information, now taken over by Thomson Reuters), *SCOPUS* (recently launched by Elsevier) and *Google's Scholar* (a service based on the automatic recording by Google's search engine of citations to any author's publications (of whatever type) included in other publications appearing on the web)).[12] There is also the option to ask institutions/authors themselves to list their publications, allowing institutions to list all their publications without restrictions on the type, medium or quality. While this may improve coverage, self-reported accounts may not be standardized or reliable, because respondents may interpret the definitions differently. For example, they may overestimate unpublished but accepted articles. This means that in the case of field-based rankings, the choice of one of these options will depend on the field.

An important issue in the production of bibliometric indicators lies in the definition of items that are considered as relevant. Important work was done by the Expert Group on Assessment of University Based Research,[13] delivered to the European Commission's DG Research. The EG defines research output as referring to the individual journal articles, conference publications, book chapters, artistic performances, films, etc. While journals are the primary publication channel for almost all disciplines, their importance differs across research disciplines. In some fields, books (monographs) play a major role, while book chapters or conference proceedings have a higher status in other fields (see table 1).

While traditionally research has been published as academic texts, the complexity of knowledge has led to a diverse range of output formats, inter alia, audio visual recordings, computer software and databases, technical drawings, designs or working models, major works in production or exhibition and/or award-winning design, patents or plant breeding rights, major art works, policy documents or briefs, research or technical reports, legal cases, maps, translations or editing of major works within academic standards.

Table 1 identifies the primary form of communications for the main discipline groups. For example, while natural and life scientists write books, their primary outlet is peer-reviewed

[12] Web of Science (WoS) currently covers over 9,000 international and regional journals and book series in the natural sciences, social sciences, and arts and humanities. WoS is a broad multidisciplinary database covering about 1 million new papers per year. ISI has historically published two types of data, one in scientific and technical fields (Science Citation Index, SCI), the other in human and social sciences (Social Science Citation Index). According to the WoS website, 3,000 of these journals account for about 75% of published articles and over 90% of cited articles.
SCOPUS follows the same structure as WoS. However, the coverage of the sample is larger, including an abstract and citation database of research literature and quality web sources covering almost 18,000 peer-reviewed journals from more than 5,000 publishers. In addition, Scopus includes 3.6 million conference papers, 600 trade publications and 350 book series. Thus the coverage of SCOPUS is obviously broader; it covers the engineering sciences and the social sciences in a much better way than WoS. However SCOPUS is a quite new database and was not produced for bibliometric analyses and has various shortcomings in its data structure.

[13] http://www.kowi.de/Portaldata/2/Resources/fp/assessing-europe-university-based-research.pdf

journal articles. Engineering scientists primarily publish in conference proceedings although they also publish in journals and design prototypes. Social scientists and humanists have a wide range of outputs of which books are important sources of communication, while the arts produce major art works, compositions and media productions. In summary, Table 1 illustrates the diversity of research outlets, and why the focus only on journal articles cannot do justice to the contribution that other disciplines make.

Table 1: Primary form of written communications by discipline group

	Natural sciences	Life sciences	Engineering sciences	Social sciences & Humanities	Arts
Journal article	X	X	X	X	X
Conference proceedings			X		
Book chapters				X	
Monographs/Books				X	
Artefacts					X
Prototypes			X		

Source: Expert Group on Assessment of University-Based Research (2010)

2.3.1 Focused institutional rankings

Below we discuss the potential indicators for reflecting the quantity, quality and impact of research in the focused institutional rankings, along with some of the positive and negative features of each indicator – the pros and cons. The properties of the indicators are assessed against the selection criteria discussed in the Introduction of this report. The choice of indicators is based on international literature on research assessments and existing rankings/classifications – in particular the rankings that emphasise research. The indicators relate to the higher education institution (HEI) as a whole, while the next section relates to the indicators for the field-based rankings.

Research publication output (peer reviewed publications).

- Pro: Publishing in journals is vital for progress in science and scholarship. Bibliometric indicators are broadly accepted. The pre-test (section III) showed that publication data are largely available from national as well as institutional databases – both in Europe and elsewhere. Publication counts are widely used in research rankings (Shanghai, Leiden ranking, HEEACT).
- Con: There are important limitations due to disciplinary differences (see section above). Publication counts emphasise quantity, not quality. Some stakeholders argue that publications in trade journals should be included as well, since peer reviewed journal articles is too narrow. However, incorporating other research-based outputs brings along various definition problems.

Art-related outputs.

- Pro: This indicator, that reflects the volume of all relevant scholarly outputs (such as exhibition catalogues, musical compositions, designs) in the creative arts, recognizes output other than publications.
- Con: Data on art-related outputs suffer from lack of agreed definitions. No indication of quality, while quantities may be difficult to aggregate. The pre-test made clear that art-related output data is difficult to collect and definitions are unclear. Any data collection would have to take place by directly contacting researchers.

Number of research publications, within the top percentile of a global citation impact distribution within a field of science (Highly cited research publications).

- Pro: The number of research publications within the top percentile of a global citation impact distribution within a field of science is considered by peers as a relevant indicator of citation impact in assessments of research. Is widely used, especially in the exact sciences. Data is widely available.
- Con: The indicator is not appropriate for social sciences and humanities where expert rankings do not correlate very well with impact factors. In these fields, as well as in engineering, books and proceedings are important outlets as well. With regard to the field-based rankings, top-end citation indices are less useful in subfields of Business (& Economics) and in Engineering, where high-profile research findings are also published in other outlets (books, reports, conference proceedings). All of this was confirmed in the comments on the questionnaire received from stakeholders.

Citations (derived from citation indexes).

- Pro: Citations to publications reflect the impact of scientific research and are widely used and accepted, especially in the exact sciences (which tend to be well covered).
- Con: Citations are of limited value in disciplines not well covered by the citation indexes, especially certain parts of social sciences, humanities and engineering. It is necessary to standardise the observed citation rates by the expected ones to arrive at field-normalized citation rates. In the pre-test, some argued that there is no citation index for trade journals, even if such outlets are important communication channels for departments oriented towards practical research.

Number of prestigious national/international awards and prizes won.

- Pro: Awards are an indicator of research quality and impact. In rankings like the Shanghai ARWU, Nobel prizes or similar awards are used.
- Con: There is no agreed definitions that apply internationally and facilitate comparison across disciplines. Data will probably need collection directly from researchers. The pre-test shows that some institutions find the indicator definition unclear. One respondent argues that it is meaning less to sum up all kinds of very heterogeneous awards and prizes.

Within-country joint research publications. (Relative number of research publications that exclusively list author affiliate addresses within the same country).

- Pro: collaboration between authors indicates appreciation of each other's research. This is an indicator of successful national research cooperation with partners located in the same country. Data availability for this indicator is quite good.
- Con: Limited to national authors, despite the fact that research often is an international endeavour.

The number of post-doc positions as a percentage of total academic staff.

- Pro: success in attracting grants and post-doc positions in national and international competitive, peer reviewed grant programs indicates quality of research carried out by a HEI/department. Also indicates the attractiveness of the institution for young researchers.
- Con: Indicator affected by the characteristics of a country's science system, such as availability of funding, presence of other job opportunities for young researchers. Definitions may differ across countries. The pre-test indicates problems with data availability in many countries.

Research income from competitive sources.

- Pro: The willingness of research councils, government agencies, industry, business and community organisations (e.g. foundations) to pay for research is an indicator of the quality of the research unit competing for research funds and an indicator of its expected performance. The Expert Group regards the indicator as relevant
- Con: Levels of external funding vary greatly across disciplines and countries. For example, in countries where over half the total pool of funding is allocated to medical research, universities that do not have Medical Faculties will inevitably secure less funding than those with Medical Faculties. Data collection may be difficult because a lack of an agreed basis of capturing data and comparability could undermine legitimacy. The pre-test indicates that the categories for reporting data on funding sources are not always clear to respondents. Furthermore, data collection would be very costly for institutions, since their national categories do not include a category 'competitive research funding' and the delimitation of the category is not straightforward. In some countries, competitive public funding may be difficult to separate from other public funding.

Presence of clear promotion schemes (i.e. research related HRM schemes).

- Pro: the presence of a performance-based appraisal/ incentive system (e.g. tenure track system) to (help) steer career trajectories of researchers within the HEI indicates the attractiveness of the institution to (senior) academic staff and enhance the effectiveness of its in-house research capacities. In the comments received from stakeholders, an indicator capturing aspects of human resources management (HRM) was seen as useful. The pre-test results show that data is available in the institution (but not nationally).
- Con: The indicator is difficult to define uniformly (across institutions, borders, disciplines). This also was mentioned in the comments received from stakeholders. One stakeholder category stressed the need for a general indicator on staff incentives that not just captures research, but also education.

Expenditure on research.

- Pro: the relative amount of resources spent on research activities is a strong indicator for an institution's/department's involvement in (and priority attached to) research. The Ex-

oriented and not performance-oriented. The pre-test results indicate that in Europe, national databases in most countries contain information on research expenditure.

- Con: A high effort does not necessarily produce a high output, let alone high-quality output. From the pre-test it becomes clear that institutions find it difficult to separate teaching and research (and administration) expenditure. The pre-test also indicates that, despite international agreements laid down in OECD manuals (Frascati), there are some differences between countries as to how they go about in estimating the research expenditures of individual HEIs.

Interdisciplinary research activities. (Research publications authored by multiple units from the same institution).

- Pro: As research activities become interdisciplinary, this aspect should be reflected in the ranking.
- Con: Indicator is difficult to define uniformly (across institutions, borders, disciplines). The stakeholders' comments also point to the fact that some institutions may have separate research units that are interdisciplinary in nature and that the definition of the indicator is not very relevant.

Research focused institutional ranking	Relevance	Concept/con-struct validity	Face validity	Robustness/ re-liability	Availability	CHERPA rating
Field normalised citation rate	▲	▲	□	▲	▲	A
Number of post-doc positions	▲	▲	□	▲	□	A
Expenditure on research	▲	▼	□	▼	□	A
Research publication output	▼	□	▼	□	▲	B
Art-related outputs	▼	□	▼	▼	▼	B
Highly cited research publications	▲	□	□	▲	▲	B
International awards and prizes won	▲	□	▼	▼	▼	B
Research income from competitive sources	□	▲	▼	□	□	B
Interdisciplinary research activities	▲	□	▼	▲	□	B
Within-country joint research publications	▼	□	□	▲	▲	C
Presence of clear promotion schemes	▲	□	▼	▼	▼	C

Field normalised citation rate: The relative citation frequency of the set of research publications (relative to the citation frequency of all publications within the same field of science
Number of post-doc positions: The number of post-doc positions as a percentage of total academic staff
Expenditure on research: The amount of money (in euro's) spent on research activities in the reference year as a percentage of total expenditure
Research publication output: Number of research publications that were published in international peer-reviewed scholarly journals relative to fte academic staff
Art-related outputs: The volume of all relevant scholarly outputs in the creative arts. This includes major art works, exhibition catalogues, musical compositions, designs, media productions, and other tangible artefacts and outputs.
Highly cited research publications: Number of research publications, within the top percentile of a global citation impact distribution within a field of science as a percentage of total number of research publications
International awards and prizes won: The number of international prizes and scholarships won for research work, as a percentage of fte academic staff
Research income from competitive sources: The income from competitive sources as a percentage of total research income
Interdisciplinary research activities: Research publications with multiple units from the same institution listed in the author address files
Within-country joint research publications: Relative number of research publications that exclusively list author affiliate addresses within the same country; relative to fte academic staff
Presence of clear promotion schemes: Clearly documented current evidence of performance-based incentive systems, managerial structures and HRM policies to (help) steer career trajectories of researchers within the organisation (e.g. tenure track systems)

2.3.2 Conclusion

Bibliometric indicators (citations, publications) are part of every research-based ranking. To acknowledge the output in the arts, an indicator reflecting arts-related output would have to be included as well. However, data availability issues stand in the way here and point to the fact that it is essential that definitions be clarified before data collection can proceed. Research publications other than peer reviewed journal publications would need to be included, but this requires self-reporting by institutions and – before that clear definitions of the types of publications.

One might consider including indicators of peer esteem, such as the number of prizes and awards won, the number keynote addresses given at national/international conferences, or international visiting research appointments and editorships. However, given that there are hardly any agreed equivalences that apply internationally and facilitate comparison across disciplines, these indicators are not considered for inclusion in the focused institutional rankings. The indicator "awards and prizes won" will be included but we realize there may be challenges ahead in terms of agreeing on a clear definition.

Some of the indicators are of an input-type, such as expenditure on research, competitive grants or post-doc positions. These indicators, along with others such as awards, however, do pose some challenges in terms of their validity and reliability. Given that they are largely available from institutions themselves, we propose to keep them in the list of indicators for inclusion ("A list").

2.3.3 Field-based ranking

Below we discuss the potential indicators for reflecting research performance in the field-based rankings, along with some of the positive and negative features of each indicator – the pros and cons. The indicators are largely overlapping with the ones for the institutional rankings, but the fact that they are relating to a particular field opens up the door for a few additional indicators (e.g. doctoral output). The discussion of the indicators is grounded on the literature and existing rankings/classifications. We do not explicitly include the general com-

ments made by experts and stakeholders on the indicators, since these were addressing the focused institutional rankings mostly (see previous section).

External research income.

- Pro: The share of funding attracted by researchers and departments from contracts with external sources (including competitive grants and research income from government, industry, business and community organizations) signals success in attracting funding and research contracts from end-users.
- Con: Is an input-oriented indicator. Annual and accurate numbers hard to retrieve, contracts run over several years.

Research publication output.

- Pro: Publishing is vital for progress in science scholarship. Broadly accepted. Publication data is largely available. Indicator is widely used in research rankings.
- Con: There are important limitations due to disciplinary differences, but the fact that this indicator is used here in the field-based ranking will mitigate that problem. Publication counts emphasise quantity, not quality.

Student satisfaction: research orientation of educational programme.

- Pro: The students' appreciation of the research orientation of their programme is an aspect of the research quality of the department. Reflects opportunities for early participation in research, teaching of relevant research methods, introduction to research, preparation for research Masters (BA-programmes only). While difficult to judge by students for institution as a whole this is more easy for individual programme/field. Relevant indicator for students when comparing aspects of programmes.
- Con: May be less relevant for more professionally oriented programmes.

Doctorate productivity (as a percentage of academic staff).

- Pro: The 'production' of doctorate degrees (PhD; at ISCED 6 level) is a research intensive activity of a HEI. The doctorate thesis is in most cases a significant research publication.[14]
- Con: Indicator is affected by the characteristics of a country's science system, such as availability of funding, presence of other job/training opportunities for young researchers.

Doctoral production is also included in the list of indicators of U-Map, to signify research intensity.

Within-country joint research publications. (Relative number of research publications that exclusively list author affiliate addresses within the same country).

- Pro: collaboration between authors indicates appreciation of each other's research. Indicator of successful national research cooperation with partners located in the same country.
- Con: Limited to national authors despite the fact that research often is an international endeavour.

Field normalized citation rate.

[14] According to the OECD Frascati manual, research by students at the PhD level carried out at universities should be counted as a part of R&D.

- Pro: Citations to publications reflect the impact of scientific research and are widely used and accepted, especially in the exact sciences (which tend to be well covered).
- Con: There are important limitations due to disciplinary differences, but the fact that this indicator is used here in the field-based ranking will mitigate that problem. Necessary to standardise the observed citation rates by the expected ones to arrive at field-normalized citation rates.

Number of research publications, within the top percentile of a global citation impact distribution within a field of science (Highly cited research publications).

- Pro: The number of research publications within the top percentile of a global citation impact distribution within a field of science is considered by peers as a relevant indicator of citation impact in assessments of research. Is widely used, especially in the exact sciences. Data is widely available.
- Con: There are important limitations due to disciplinary differences, but the fact that this indicator is used here in the field-based ranking will mitigate that problem. Top-end citation analysis is less useful in subfields of Business (& Economics) and in Engineering, where high-profile research findings are also published in other outlets (books, reports, conference proceedings).

University-industry joint publications.

- Pro: the relative number of research publications authored by academics in collaboration with an author from a business enterprise or a private sector R&D unit indicates appreciation of each other's research. It indicates successful partnerships.
- Cons: reflects not so much research output, but rather knowledge exchange.

Research **Field-based ranking**	**Relevance**	**Concept/construct validity**	**Face validity**	**Robustness/ reliability**	**Availability**	**CHERPA rating**
External research income	▲	▲	□	□	▲	A
Research publication output	▲	▲	□	□	□	A
Student satisfaction: research orientation of educational programme	□	□	▼	□	▲	A
Doctorate productivity	▼	▲	▼	▲	▲	B
Field normalized citation rate	▲	▲	□	▲	▲	B
Highly cited research publications	▲	□	□	▲	▲	B
Within-country joint research publications	▼	□	▼	▲	▲	C
University-industry joint publications	▼	□	▼	▲	▲	C

External research income: Level of funding attracted by researchers and universities from contracts with external sources, including competitive grants and research income from government, industry, business and community organisations, as a percentage of total income.
Research publication output: Number of research publications that were published in international peer-reviewed scholarly journals relative to fte academic staff
Student satisfaction: research orientation of educational programme: Index of two items: research orientation of the courses and opportunities for early participation in research
Doctorate productivity: The number PhD and equivalent research doctorates awarded as a percentage of fte academic staff
Field normalized citation rate: The relative citation frequency of the set of research publications (relative to the citation frequency of all publications within the same field of science)
Highly cited research publications: Number of research publications, within the top percentile of a global citation impact distribution within a field of science as a percentage of total number of research publications
Within-country joint research publications: Relative number of research publications that exclusively list author affiliate addresses within the same country; relative to fte academic staff
University-industry joint publications: Relative number of research publications that list an author affiliate address referring to a business enterprise or a private sector R&D unit; relative to fte academic staff

The pre-test results indicate that there are some data availability issues – in terms of a need for clearer definitions and the cost of collecting particular indicators. The pre-test has shown that there may be cases where numbers need to be estimated by reporting institutions and departments.

2.4 Performance in the knowledge transfer dimension

Knowledge transfer refers broadly to the transfer of activities to economy, society and culture. This function has become increasingly relevant for higher education institutions as many nations and regions strive to make more science output readily available for cultural, social and economic development. There are large differences between efforts and performance of individual institutions in this respect, partly because of the official mandate of a HEI and partly because of the strategic profile chosen by individual HEIs. '*Knowledge transfer* is a broader and more encompassing concept than *technology transfer*. It may be defined as:

> The process by which the knowledge, expertise and intellectually linked assets of Higher Education Institutions are constructively applied beyond Higher Education for the wider benefit of the economy and society, through two-way engagement with business, the public sector, cultural and community partners. (Holi et al., 2008).[15]

The concept of 'knowledge transfer' in turn is being challenged by that of 'knowledge exchange', stressing the multiple and mutual interactions taking place between the three sectors of the 'triple helix', comprising HEIs, business and government (Etzkowitz & Leydesdorff, 2000)[16], to which some would also add the public. Measuring the impact of the knowledge transfer/knowledge exchange process in HEIs and ultimately on users, i.e. business and the economy, has now become a preoccupation of many governing and funding bodies, as well as policy-makers.

[15] Holi M.T., Wickramasinghe, R. and van Leeuwen, M. (2008), *Metrics for the evaluation of knowledge transfer activities at universities.* Cambridge: Library House.

[16] Etzkowitz, H. and Leydesdorff, L. (2000), The Dynamics of Innovation: From National Systems and 'Mode 2' to a Triple Helix of University-Industry-Government Relations, *Research Policy*. Vol. 29, No. 2, pp. 109–123.

So far, most attention has been devoted to measuring Technology Transfer (TT) activities. Traditionally TT is primarily concerned with the management of intellectual property (IP) produced by universities and other HEIs. TT means identifying, protecting, exploiting and defending intellectual property (OECD, 2003). HEIs often have *technology transfer offices* (TTOs), which are units that liaise with industry and assist HEIs' personnel in the *commercialisation* of research results. TTOs provide services in terms of assessing inventions, patenting, licensing IP, developing and funding spin-offs and other start-ups, and approaching firms for contract based arrangements.

The broader nature of Knowledge Transfer compared to TT also means it includes other forms – *channels* – of transfer than those requiring strong IP protection. A typical classification of mechanisms and channels for knowledge transfer between HEIs and other actors would include four main interaction channels for communication between HEIs and their environment:

- Texts, including scientific, professional and popular
- People, including students and researchers
- Artefacts, including equipment, protocols, rules and regulations
- Money

Along these channels, HEIs develop relations with a variety of potential 'users': entrepreneurs, consumers, policy makers, regional actors, etc. The above list includes a number of indicators to assess the quantity of the different facets of knowledge transfer.

Texts are an obvious knowledge transfer channel. Publishing (and reading!) through scientific or popular media, however, is already treated under the Research dimension in U-Multirank. In the case of texts, it is customary to distinguish between two forms: *publications*, where copyright protects how ideas are expressed but not the ideas themselves, and *patents*, which grant exclusive rights to use the inventions explained in them. While publications are part of the research dimension in U-Multirank, patents will have to be included under the knowledge transfer dimension.

Scientific articles and patents precisely describe new pieces of knowledge – *codified* knowledge. *People* is another channel of knowledge transfer. People carry with them *tacit* knowledge. Indeed, many knowledge exchanges will be person-embodied.[17] Many studies of the economic benefits of HEIs indicate that skilled graduates are one of the most critical mechanisms of knowledge transfer. This type of knowledge transfer, however, is captured through the Teaching and Learning and Regional Orientation dimensions included in U-Multirank. Knowledge transfer through people also takes place through networks, continuous professional development (CPD)[18] and research contracts.

Money flows are an important interaction channel, next to texts and people. Unlike texts and people, money is not a carrier of knowledge, but a way of valuing the knowledge transferred in its different forms. The money involved in contract research, CPD, consultancy and commercialisation is one of the traditional indicators of knowledge exchange, often used in sur-

[17] The saying goes: "The best technology transfer is a pair of shoes".

[18] CPD may be defined as: The means by which members of professional associations 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 (offered by education institutions), some of which have an option of accreditation.

veys of TTOs, such as the one carried out by the US based Association of University Technology Managers (AUTM) for its Annual Licensing survey.

Artefacts make up the fourth major channel of interaction. Artefacts are concrete, physical forms in which knowledge can be carried and transferred. They are more or less 'ready to use', such as machinery, software, new materials or modified organisms. This is often called 'technology'. Artefacts may also extend to art-related outputs produced by scholars working in the arts and humanities disciplines. These works of art, including artistic performances, films, and exhibition catalogues, have been included in the scholarly outputs covered in the 'research' dimension of U-Multirank.

It is a fact that most approaches to knowledge transfer measurement – such as the European efforts known as ProTon and ASTP [19] – have built upon the AUTM model. This means that they primarily address revenues obtained from the commercialization of Intellectual Property (IP). Clearly the measurement of income from IP is an incomplete and poor measure of knowledge transfer performance. For this reason, new approaches have been developed, such as the Higher Education-Business and Community Interaction (HE-BCI) Survey in the UK.[20] This UK survey began in 2001 and recognises a broad spectrum of activities with both financial and non-financial objectives. However, it remains a fact that many indicators in the area of Knowledge Transfer are still in their infancy - in particular the ones that try to go beyond the IP issues.

The European Commission-sponsored project E3M[21] aims to create a ranking methodology for measuring university third mission activities and incorporates many of the elements that are included in knowledge transfer activities. E3M defines third mission along three sub-dimensions: Continuing Education (CE), Technology Transfer & Innovation (TT&I) and Social Engagement (SE). This highlights the need for a clear definition of the knowledge transfer dimension in our project in order to delineate it from other dimensions such as Teaching, Research and Regional Engagement. Some of the indicators proposed in the E3M project may be considered for inclusion in our Knowledge Transfer dimension, while others may be part of dimensions such as Regional Engagement.

Like research, knowledge transfer (KT) is a process, where inputs, throughputs, outputs and outcomes may be distinguished. Until now, however, it has been difficult to measure how HEIs successfully engage in KT activities, mainly because there was no agreed set of measurement tools. Most measurements focus on the input, some on the output and even fewer on the outcome (or impact) side of this process.

In the U-MAP project, four indicators were selected to capture KT:

1. Number of new patent applications filed
2. Number of concerts and exhibitions organized
3. The average annual number of start-up firms established in the last three years

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[19] ProTon Europe is the pan-European network of Knowledge Transfer Offices (KTOs) and companies affiliated to universities and other Public Research Organisations. ASTP is the Association of European Science and Technology Transfer Professionals.

http://ec.europa.eu/invest-in-research/pdf/download_en/knowledge_transfer_web.pdf. The HE-BCI survey is managed by the Higher Education Funding Council for England (HEFCE) and used as a source of information to inform the funding allocations to reward the UK universities' third stream activities. See: http://www.hefce.ac.uk/econsoc/buscom/hebci/

[21] See: Montesinos; P., Carot; J.M., Martinez; J.M., Mora, F. (2008), Third Mission Ranking for World Class Universities: Beyond Teaching and Research, *Higher Education in Europe*, Vol. 33, Nr. 2, pp. 259-271.

4. Income from knowledge exchange activities (includes: Income from licensing agreements; Income from copyrighted products; Income from privately funded research contracts)

Apart from the second indicator, the indicators are quite similar to the traditional indicators used in other reports that describe an institution's KT activity. It is a fact that these four U-Map indicators are very much stressing an institution's *performance*, and perhaps not so much its *efforts*. U-Multirank, intends to capture performance, therefore it will at least have to include the above indicators. But to distinguish it from U-Map, the KT indicators in U-Multirank will have to go beyond U-Map and, where possible, capture additional aspects of KT performance. However, given the state of the art in measuring KT[22], and the near absence of (internationally comparable) data[23], it will be extremely difficult to identify additional performance-oriented indicators of KT performance. Most candidates for additional indicators are most likely to be of input-indicators, as we will see below. As mentioned in the introduction to this report, this may blur the distinction between U-Map and U-Multirank. However, when starting U-Multirank, U-Map was already well underway and being a self standing project that had to face the existing state-of-the-art in KT indicators, its set of KT indicators may seem less ideal if it is confronted with the choice of indicators in U-Multirank. In any case, if an outcome of U-Multirank – being a feasibility study – is that the U-Multirank indicators are overemphasising inputs or enablers of KT, this will have consequences for the U-Multirank indicator set, and – in a later stage – will also have consequences for U-Map in case the two projects continue to be closely connected, with one (U-Map) preceding the other (U-Multirank).

2.4.1 Focused institutional rankings

Below we discuss the potential indicators for reflecting the performance of HEIs on the dimension of knowledge transfer, along with some of the positive and negative features of each indicator. The discussion is inspired by the international literature on knowledge transfer metrics and existing surveys in this area. An important reference is the report published in 2009 by the *Expert Group on Knowledge Transfer Metrics* (in short: EGKTM) set up by DG Research of the European Commission.[24]

The size of the technology transfer office in terms of the number of employees (as a share of the number of academic staff).

- Pro: This indicator reflects an institute's explicit strategic orientation towards knowledge transfer. To facilitate knowledge transfer, many HEIs have installed a kind of TTO.[25] An indicator that limits itself to mere 'presence of a TTO' would provide a too narrow basis for distinguishing HEIs. In some countries data are already collected in surveys (e.g. AUTM, ASTP, ProTon). The pre-test indicates that data are mostly directly available from the individual institutions.
- Con: A bigger TTO usually indicates a higher *potential* for commercialization but may not be a reflection of *actual* performance. According to the report by the EGKTM, the TTO size

[22] See the report by Holi et al, (2008), cited above.

[23] See also the brief section on the EUMIDA project, included in the Appendices to this report. One of EUMIDA's findings is that data on technology transfer activity and patenting is difficult to collect in a standardised way (using uniform definitions, etc.)

[24] See: http://ec.europa.eu/invest-in-research/pdf/download_en/knowledge_transfer_web.pdf

[25] Debackere, K., & Veugelers, R. (2005), The role of academic technology transfer organizations in improving industry–science links, Research Policy 34 (2005), pp. 321-342.

across the HEI, a similar bias may emerge.

Incentives for knowledge exchange in staff appraisal system

- Pro: If a HEI includes knowledge transfer activities as part of its staff performance appraisal system, the HEI is likely to be more successful in this area as its staff members will be encouraged to engage in such activities. Information (using an ordinal measure) can be easily collected from the institutions themselves (as indicated by the pre-test). The indicator goes beyond any existing knowledge transfer indicators.
- Con: As was also indicated by the stakeholders and the pre-testing, the indicator is difficult to define uniformly (across institutions, borders, disciplines) and has not been used widely so far in other benchmarking/ranking exercises. The indicator is more linked to effort/intentions than to actual performance. In the pre-test it was also mentioned that, even if at the central level there is no procedure for considering tech transfer activities, such incentives may exist at the departmental level and in the recruitment process.

Number of Continuous Professional Development (CPD) courses offered.

- Pro: Continuing Education activities are an important part of knowledge transfer, as it reaches out to individuals from other professions who may not normally have access to academic knowledge and are not affiliated with the HEI. The CPD courses are not captured in the U-Multirank Teaching dimension or in its IP-oriented commercialization indicators, so they are not part of other dimensions. In the UK, the CPD indicator is included in the HE-BCI survey, so there is a precedent in some countries.
- Con: The supply of CPD courses may fluctuate over time due to demand. Due to its character, the definition of a CPD course proved difficult to describe uniformly – and the pre-test indicated a need for clear definitions. An alternative to the current CPD indicator might be a measure of the number of participants in CPD courses or income from CPD activity, as this information relates more to performance instead of effort.

University-industry joint publications (that list an author affiliate address referring to a business enterprise or a private sector R&D unit).

- Pro: Collaborative research is a key mechanism of knowledge transfer. The indicator represents successful joint research with active involvement of staff employed by business enterprises or corporate R&D units. This is a relevant indicator for 'technical' HEIs. The indicator is used in the CWTS *University-Industry Research Cooperation Scoreboard 2009-2010*, based on Web of Science data.[26]
- Con: The definition of 'industry' excludes the (private) medical sector. The indicator is of limited value for HEIs which are not active in fields of interest to the science-based private sector (especially large R&D intensive industrial firms). An unknown share of joint research is not published. One stakeholder group indicated that the definition of publication should be more broad, to capture the more laymen-type publications. The pre-test results

[26] http://www.socialsciences.leiden.edu/cwts/news/scoreboard.html

national or ISI-bas

Number of spin-offs.

- Pro: The formation of companies that have been spun-out from HEIs (measured over a three year period) is an essential mechanism of the knowledge transfer activities[27], particularly with regard to IP exploitation. The EGKTM regards Spin-offs as a core indicator. Data available from secondary sources. The indicator is also used in U-Map.
- Con: The definition of spin-offs can differ depending on whether its source was higher education or business-oriented. Clear definition and demarcation criteria will need to be specified and applied. A suggested definition is: "start up firms, that are dependent on the use of knowledge and intellectual property that was created or developed at the parent university". Merely financial (equity) participations might be better than just a count of spin-offs. The reason is that the indicator does not reveal the market value of spin-offs (at flotation) or the Exit value (i.e. at trade sale or buy-out), let alone the survival rate. In the pre-test, some respondents argued for using turnover or firm size of the spin-off in order to capture more of the impact (say qualitative) aspects of the actual knowledge transfer. Spinning-off is discipline-specific, so the disciplinary structure of the HEI will affect the inter-institutional comparisons. There is an overlap with the U-Map exercise, where spin-offs describe an institution's involvement in knowledge exchange. The pre-test reveals quite some data availability issues – most due to the difficulty of defining a spin-off.

Cultural awards and prizes won.

- Pro: The number of cultural awards won in (inter)national cultural competitions is a proxy of the output (or even: impact) of the cultural activities of a HEI. Such an indicator goes beyond the traditional technology-oriented indicators.
- Con: The indicator is difficult to define uniformly and has not been used widely so far in other benchmarking/ranking exercises. The indicator is discipline-specific. From the pre-test it became clear that data is difficult to collect and definitions difficult to agree on.

Third party co-operative funding (public and direct industry).

- Pro: The total amount of external research income and income from knowledge transfer (as a share of total income) signals success in knowledge transfer between academia and the outside world (business and public organisations). Collaborative research specifically meets the research needs of the external partners and can be expected to be transformed into practice. From the pre-test it became clear that in most countries/ institutions some data do exist (although definitions may vary).
- Con: The value/income of collaborative research agreements with firms is a core indicator suggested by the EGKTM and is part of the HE-BCI survey. If collaborative research includes research with/for public organizations, between-country differences in the organisation of the research landscape may distort data. The stakeholder consultation pointed at delimitation/definition problems.

[27] Di Gregorio, D., & Shane, S. (2003). Why do some universities generate more start-ups than others? Research Policy 32(2): 209–227.

The annual income from licensing[28] agreements (as a share of total income).

- Pro: Licensing, along with spin-offs, is a valuable method of exploiting the IP that is generated from HEIs.[29] License agreements mean that a licensor intends to use the patented invention (or software) for further development. Furthermore, the licensing of technology and IP to an organisation can also lead to other downstream knowledge transfer activities such as consultancy, collaborative research, or the formation of a spin-out/joint venture. Indicator is often used (e.g. in AUTM, HE-BCI, EGKTM). The indicator is used widely.
- Con: Ideally, the number of license agreements (see below) might also be interesting for combining with license revenues to get an indication of the volume of licensing. HEIs that are not doing research in natural sciences/engineering/medical sciences will hardly be covered.

The number of license agreements (as a percentage of the number of patents).

- Pro: Licensing is a relevant and frequently used indicator for knowledge transfer (in AUTM, HE-BCI surveys and core indicator in EGKTM study). Combined with license income (see above) and patenting (below) this indicator shows potential versus actual exploitation of inventions. In itself, however, the number of licences is seen as more robust than the measurement of income. Many countries have started to collect this information.
- Con: Licensing is not a condition sine qua non for commercialization. Very discipline-specific. Some stakeholders indicated that licensing is not a very relevant activity for their type of higher education institution.

Co-patenting.

- Pro: The share of university patents[30] for which at least one co-applicant is a firm indicates the extent to which a university shares its IP with external partners. A firm co-applicant indicates that research is being translated into technologies for further (commercial) development. Data available from secondary sources (PatStat) guarantee good inter-institutional comparability.
- Con: Patenting in itself does not guarantee the use of the IP in practical applications. Compared to patent applications and patents granted, co-patenting is not widely used in TT surveys. Again, some stakeholder organisations indicated that licensing is not a very relevant activity for their type of higher education institution.

Patents awarded to the university (related to number of academic staff).

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[28] Licensing is defined as: A formal agreement that allows the transfer of technology between two parties, where the owner of the technology (licensor) permits the other party (licensee) to share the rights to use the technology, without fear of a claim of intellectual property infringement brought by the licensor.

[29] Giuri P. et al. (2007) Inventors and invention processes in Europe: Results from the PatVal-EU survey. *Research Policy*, Vol. 36, pp. 1107-1127.

[30] A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. A patent gives an inventor the right for a limited period to stop others from making, using or selling the invention without the permission of the inventor.

- Pro: Patents are established indicators of technological developments that are potentially useful for further industrial/commercial development. Data are available from secondary (identical) data sources for each institution, which means this guarantees some inter-institutional comparability.
- Con: Patents granted[31] signals investment in knowledge transfer activities but does not necessarily reflect how much knowledge is actually being transferred. Considering only patents for which universities act as applicant means that often a considerable number of patents with an academic inventor but another institutional applicant(s) are not taken into account. Field-specificity needs to be taken into account. The indicator needs to be combined with licensing information to better capture exchange and use of patented knowledge (especially because only university-assigned patents are considered). Stakeholder organisations indicated that patenting is not a very relevant activity for their type of higher education institution and only relevant for the exact sciences.

Knowledge transfer focused institutional ranking	**Relevance**	**Concept/construct validity**	**Face validity**	**Robustness/ reliability**	**Availability**	**CHERPA rating**
Incentives for Knowledge Exchange	▲	□	▼	▼	□	A
University-Industry Joint Research Publications	▲	▲	□	▲	▲	A
Third Party Funding	▲	□	▼	▼	□	A
Patents	□	▲	▲	▲	▲	A
Size of Technology Transfer Office	□	□	□	□	▲	B
CPD courses offered	▲	□	▼	▼	▼	B
Co-patents	□	▲	□	▲	▲	B
Number of Spin-offs	□	▼	□	□	□	B
License Agreements	□	□	□	□	▼	C
Cultural Awards and Prizes Won	▲	▲	▼	▼	▼	C
License Income	▼	□	□	□	□	C

Incentives for Knowledge Exchange: Presence of knowledge exchange activities as part of the performance appraisal system
University-Industry Joint Research Publications: Relative number of research publications that list an author affiliate address referring to a business enterprise or a private sector R&D unit; relative to fte academic staff
Third Party Funding: The amount of income for cooperative projects that are part of public programs (e.g. EC Framework programs) plus direct industry income as a proportion of total income

[31] Please note: This is patents *granted* by the patent office, meaning that the invention has become the property of the inventor, which - like any form of property or business asset - can be bought, sold, rented or hired. Patent *applications* filed concern inventions that still will have to receive the status of granted patent. Patent Applications are included in U-Map to signal another dimension of a HEI's involvement in knowledge exchange.

Patents: The number of patent applications for which the university acts as an applicant related to number of academic staff
Size of Technology Transfer Office: Number of employees (FTE) at Technology Transfer Office related to the number of academic staff
CPD courses offered: Number of CPD courses offered per academic staff (fte).
License Agreements: The number of licence agreements as a percentage of the number of patents
Co-patents: Percentage of university patents for which at least one co-applicant is a firm, as a proportion of all patents
Number of Spin-offs: The number of spin-offs created over the last three years per academic staff (fte)
Cultural Awards and Prizes Won: Number of cultural awards and prices won in the reference year as a percentage of fte academic staff
License Income: The annual income from licensing agreements as a percentage of total income

2.4.2 Field-based ranking

Below we discuss the potential indicators for the field-based rankings that reflect the performance of HEIs on the dimension of knowledge transfer. The discussion is based on the international literature on knowledge transfer metrics and existing surveys in this area. The arguments are largely similar to the ones for the focused institutional rankings.

University-industry joint publications (that list an author affiliate address referring to a business enterprise or a private sector R&D unit).

- Pro: Collaborative research is a key mechanism of knowledge transfer. The indicator represents successful joint research with active involvement of staff employed by business enterprises or corporate R&D units. Relevant indicator for 'technical' HEIs. Indicator used in the CWTS *University-Industry Research Cooperation Scoreboard 2009-2010*, based on Web of Science data.[32]
- Con: The definition of 'industry' excludes the (private) medical sector. Indicator is of limited value for HEIs which are not active in fields of interest to the science-based private sector (especially large R&D intensive industrial firms). An unknown share of joint research is not published.

Academic staff with work experience outside higher education

- Pro: The share of academic staff with work experience outside higher education (experience gained within the last ten years) signals that the HEI's staff is well-placed to bring this experience into their academic work (teaching, research). This may enhance the employability of graduates and may benefit knowledge exchange between academic and non-academic partners.
- Con: Data are difficult to collect and require collection directly from the departments. The pre-test showed that there has to be a decision on how to deal with "estimated" values, as some figures may not be that precise. The indicator is discipline-specific, but the fact that this indicator is only used in the field-based ranking will mitigate that problem.

Co-patenting.

- Pro: The share of university patents[33] for which at least one co-applicant is a firm indicates the extent to which the university shares its IP with external partners. A firm co-

[32] http://www.socialsciences.leiden.edu/cwts/news/scoreboard.html

[33] A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. A patent

applicant indicates that research is being translated into technologies for further (commercial) development. Data available from secondary sources (PatStat) guarantee good inter-institutional comparability.
- Con: Patenting in itself does not guarantee the use of the IP in practical applications. Compared to patent applications and patents granted, co-patenting is not widely used in TT surveys.

Patents awarded (related to number of academic staff).

- Pro: Patents are established indicators of technological developments that are potentially useful for further industrial/commercial development. Data available from secondary (identical) data source for each institution guarantees good inter-institutional comparability.
- Con: Patents granted[34] signals investment in knowledge transfer activities but does not necessarily reflect how much knowledge is actually being transferred. Considering only patents for which universities act as applicant means that often a considerable number of patents with academic inventor but other institutional applicant(s) are not taken into account. Needs to be combined with licensing information to better capture exchange and use of patented knowledge (especially because only university-assigned patents are considered).

The annual income from licensing[35] agreements (as a share of total income).

- Pro: Licensing, along with spin-offs, is a valuable method of exploiting the IP that is generated from HEIs.[36] License agreements means that licensor intends to use the patented invention (or software) for further development. Furthermore, the licensing of technology and IP to an organisation can also lead to other downstream knowledge transfer activities such as consultancy, collaborative research, or the formation of a spin-out/joint venture. Indicator is often used (e.g. in AUTM, HE-BCI, EGKTM).
- Con: Ideally, the number of license agreements might also be interesting for combining with license revenues to get an indication of the volume of licensing. HEIs that are not doing research in natural sciences/engineering/medical sciences will hardly be covered.

The number of license agreements (as a percentage of the number of patents).

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gives an inventor the right for a limited period to stop others from making, using or selling the invention without the permission of the inventor.

[34] Please note: This is patents *granted* by the patent office, meaning that the invention has become the property of the inventor, which - like any form of property or business asset - can be bought, sold, rented or hired. Patent *applications* filed concern inventions that still will have to receive the status of granted patent. Patent Applications are included in U-Map to signal another dimension of a HEI's involvement in knowledge exchange.

[35] Licensing is defined as: A formal agreement that allows the transfer of technology between two parties, where the owner of the technology (licensor) permits the other party (licensee) to share the rights to use the technology, without fear of a claim of intellectual property infringement brought by the licensor.

[36] Giuri P. et al. (2007) Inventors and invention processes in Europe: Results from the PatVal-EU survey. *Research Policy*, Vol. 36, pp. 1107-1127.

- Pro: Licensing is a relevant and frequently used indicator for knowledge transfer (in AUTM, HE-BCI surveys and core indicator in EGKTM study). Combined with license income (see above) and patenting (below) indicator shows potential versus actual exploitation of inventions. In itself, however, the number of licences is seen as more robust than the measurement of income.
- Con: Licensing is not a condition sine qua non for commercialization.

Joint research contracts with private sector

- Pro: The budget (or number) of joint research projects with private enterprises is an indicator for (applied) R&D activities. Such activities are particularly directed towards knowledge and technology transfer.
- Con: Budgets are depending on a number of systemic features, including national differences in wealth/prices, technology intensiveness. A financial indicator only refers to the size of projects, not its impact in terms of knowledge transfer. Looking at the number of joint projects only disregards the volume of projects.

Number of spin-offs (over the last three years, relative to academic staff)

- Pro: The formation of companies that have been spun-out from HEIs (measured over a three year period) is an essential mechanism of the knowledge transfer activities[37], particularly with regards to IP exploitation. The EGKTM regards Spin-offs as a core indicator. Data available from secondary sources.
- Con: The definition of spin-offs can differ depending on whether its source was higher education or business-oriented. Clear definition and demarcation criteria will need to be specified and applied. A suggested definition is: "start up firms, that are dependent on the use of knowledge and intellectual property that was created or developed at the parent university. Merely financial (equity) participations do not qualify. Indicator does not reveal the market value of spin-offs (at flotation) or the Exit value (i.e. at trade sale or buy-out), let alone the survival rate. Overlap with the U-Map exercise, where spin-offs describe an institution's involvement in knowledge exchange. The indicator is discipline-specific, but the fact that this indicator is only used in the field-based ranking will mitigate that problem.

Knowledge transfer field-based ranking	Relevance	Concept/construct validity	Face validity	Robustness/ reliability	Availability	CHERPA rating
University-industry joint publications	▲	▲	▼	▲	▲	A
Academic staff with work experience outside HE	▲	▲	▼	■	■	A
Joint research contracts with private sector	▲	▲	▼	■	▲	A
Co-patenting	▼	▲	▼	▲	▲	B

[37] Di Gregorio, D., & Shane, S. (2003). Why do some universities generate more start-ups than others? Research Policy 32(2): 209–227.

Annual income from licensing						B
Number of license agreements						B
Number of spin-offs						B
Patents awarded						C

University-industry joint publications: Number of research publications that list an author affiliate address referring to a business enterprise or a private sector R&D unit, relative to fte academic staff
Academic staff with work experience outside HE: Percentage of academic staff with work experience outside higher education within the last ten years
Joint research contracts with private sector: Budget (or number) of joint research projects with private enterprises per FTE academic staff:
Patents awarded: The number of patents awarded to the university related to number of academic staff
Co-patenting: Percentage of university patents for which at least one co-applicant is a firm, as a proportion of all patents
Annual income from licensing: The annual income from licensing agreements as a percentage of total income
Number of license agreements: The number of licence agreements as a percentage of the number of patents
Number of spin-offs: Number of spin-offs created over the last three years per academic staff (fte)

2.5 International orientation

Internationalization is a widely discussed and complex phenomenon in higher education. The rise of globalisation and Europeanisation have put growing pressure on higher education institutions to respond to these trends and develop an international orientation in their activities.

Internationalisation activities can be categorised in three types:

- Activities to develop and promote international mobility of students and staff
- Activities to develop and enhance international cooperation
- Activities to develop and increase international competition

The rationales that drive these activities are divers[38]. They comprise a.o.,

- The enhancement of the student preparedness by training for the international labour market and cultural awareness.
- curriculum and quality enhancement
- enhancement of institutional profile and reputation
- enhancement of the research and knowledge production. This rationale can be specified as the enhancement of academic quality, as in the position in academic networks and international partnerships (Enequist, 2005).

In the literature (Brandenburg 2007, Enequist 2005, Nuffic 2010, IAU 2005) many indicators have been identified, most of which refer to inputs, resources and processes. The outcomes and impacts of internationalisation activities are not very well covered by existing internationalisation indicators.

For many of the indicators data are available in the institutional databases. Hardly any of such data can be found in national databases.

2.5.1 Focused institutional ranking

At the institutional level there is a focus on international cooperation and international competition activities.

Size of international office. Indicates the commitment of the HEI to internationalisation.

- Pro: information of this indicator is readily available (at the institutional level)
- Con: Stakeholders consider this indicator not very important. The validity is questionable as the size of the international office as a facilitating service is a very distant proxy for the level of activity in the three areas of activity mentioned above.

[38] IAU (2005) Global Survey Report, Internationalization of Higher Education: New Directions, New Challenges, Paris

Educational programmes in a foreign language. Signals the commitment to international orientation in teaching and learning. It testifies the commitment to welcome foreign students and prepare students for future international activities.

- Pro: the availability of the data is good (at the institutional level) and stakeholders consider this indicator as an important indicator. It is used quite frequently and it addresses some of the rationales (student preparedness and curriculum quality)
- Con: It is sensitive to the relative 'size' of the national language. Dutch institutions will score different from British institutions because of that.

International academic staff. A high percentage of international staff flags a strong international orientation.

- Pro It is considered to be relevant by stakeholders and it covers to some extent the staff mobility aspect. Availability does not seem to be a problem.
- Con: Nationality is not the most precise way of measuring the international orientation

Joint degree programmes. The integration of international learning experiences is a central element of the internationalization of teaching & learning.

- Pro Data are available and the indicator is considered to be relevant. It addresses cooperation activities.
- Con: The indicator is not that often used.

International doctorate graduation rate. This indicator shows how international oriented an institution is in producing doctorate degrees holders.

- Pro: It addresses the quality enhancement rationale and the international orientation in the organisation of the doctorate education process.
- Con: It is not often used and stakeholders are not interested in the indicator. There are some doubts on the availability of data on this indicator: experts indicated that they are available in institutional databases, but some institutions indicated that data are not available.

International graduate employment rate .This indicates the student preparedness on the international labour market.

- Pro: This is the only indicator on student preparedness.
- Con: data are not readily available. There are no clear international standards for measuring the indicator, stakeholders think the indicator is not important.

International joint research publications. Indicator of successful international research cooperation across the border of countries.

- Pro: The indicator is the only indicator addressing research activities in this dimension. The indicator addresses the cooperation activities. Data are available in international data bases
- Con. There is a bias towards certain disciplines and languages when using the existing databases on publications.

International partnerships. The number of international academic networks a HEI participates in indicates the international embeddedness of the HEI.

- Pro The indicator addresses the cooperation activities.
- Con: There is no clear internationally accepted way of counting partnerships, Stakeholders think this indicator is not that relevant.

International orientation Focused institutional ranking	**Relevance**	**Concept/construct validity**	**Face validity**	**Robustness/ reliability**	**Availability**	**CHERPA rating**
Educational programs in foreign language	▲	□	□	□	▲	A
Number of joint degree programs	▲	▲	□	□	▲	A
International joint research publications	▲	▲	□	▲	▲	A
International academic staff	▲	□	□	□	□	B
International Doctorate Graduation rate	▼	□	▼	□	□	B
International partnerships	▼	▲	□	▼	▼	C
International Graduate Employment rate	□	▲	▼	▼	▼	C
Size of international office	▼	▼	▼	□	▲	C

Educational programs in foreign language: The number of programmes offered in a foreign language as a percentage of the total number of programmes offered
Number of joint degree programs: The number of students in joint degree programmes with foreign university (incl. integrated period at foreign university) as a percentage of total enrolment
International joint research publications: Relative number research publications that list one or more author affiliate addresses in another country relative to research staff
International academic staff: Foreign academic staff members (headcount) as % of total number of academic staff members (headcount). Foreign academic staff is academic staff with a foreign nationality, employed by the institution or working on an exchange base
International Doctorate Graduation rate: The number of doctorate degrees awarded to students with a foreign nationality, as a percentage of the total number of doctorate degrees awarded
International partnerships: The number of international networks a HEI participates in as a percentage of the number of academic staff (fte)
International Graduate Employment rate: The number of graduates employed abroad or in an international organization as a percentage of the total number of graduates employed.
Size of international office: The number of fte staff working at the international office as a percentage of total enrolment

2.5.2 Field based ranking

International academic staff. The international character /climate of a faculty is affected by the existing international staff /teachers.

- Pro It is considered to be relevant by stakeholders and it covers to some extent the staff mobility aspect.
- Con: Nationality is not the most precise way of measuring the international orientation

Joint international research publications. Indicator of successful international research cooperation across the border of countries, showing international involvement and visibility.

- Pro: The indicator is the only indicator addressing research activities in this dimension. The indicator addresses the cooperation activities. Data are available in international data bases
- Con. There is a bias towards certain disciplines and languages when using the existing databases on publications.

Joint international projects. The number of research projects done in co-operation with foreign partners is a good indicator of the international orientation of research activities, showing international involvement and visibility.

- Pro: A good indicator of the position in international networks and cooperation.
- Con: the indicator is not very often used.

International research grants. The existence of research projects that are funded by foreign and international sources are a good indicator of the international orientation of research activities.

- Pro: it addresses research activities. It is a proxy of the international reputation and quality of research activities. Data are available.
- Con: Stakeholders consider this indicator neither relevant nor important.

The enhancement of curriculum enhancement is more reflected in the following indicators:

Percentage international students. 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.

- Pro: addresses the international competitiveness, data are available; stakeholders consider the indicator to be important.
- Con: the indicator may be sensitive to the region where the HEI is located in (border regions will have more international students than other regions). There are also some questions regarding the availability of data on the nationality (of the student of the diploma).

Incoming and outgoing students. International exchange of students is an important indicator of the international "atmosphere" of a faculty/department. The own students of a university should have the experience of going a broad (outgoing); and vice versa students from abroad should come to a university (incoming).

- Pro: addresses student mobility and curriculum quality; data are available
- Con: the indicator focuses on participation in formalised exchange programs, and therefore neglects the free-movers. The ratio between program-mobility and free-movers may differ per country.

Student satisfaction regarding the opportunities to go abroad. Students' judgments about their possibilities to arrange a semester or an internship abroad.

- Pro: addresses the mobility aspect; data are available (student survey).
- Con: not often used

Internationalisation of programmes. The integration of international learning experiences is a central element of the internationalization of teaching & learning.

- Pro: addresses the quality of the curriculum.
- Con: not very often used.

Two indicators are geared towards indicating the enhancement of student preparedness.

International doctorate graduation rate. This indicator shows how international oriented an institution is in producing doctorate degrees holders.

- Pro: It addresses the quality enhancement rationale and the international orientation in the organisation of the doctorate education process.
- Con: It is not often used and stakeholders are not interested in the indicator.

International graduate employment rate. This indicates the student preparedness on the international labour market.

- Pro: This is the only indicator on student preparedness .
- Con: data are not readily available. There are no clear international standards for measuring the indicator, stakeholders think the indicator is not important.

International orientation Field based ranking	Relevance	Concept/con-struct validity	Face validity	Robustness/ re-liability	Availability	CHERPA rating
Percentage of international students	▢	▲	▢	▢	▲	A
Incoming and outgoing students	▲	▲	▢	▢	▲	A
Student satisfaction: Opportunities for a stay abroad	▢	▢	▼	▢	▲	A
Internationalisation of programmes	▲	▲	▼	▢	▢	A
International academic staff	▲	▢	▢	▢	▢	B
Joint international publications	▲	▢	▼	▲	▲	B
International research grants	▼	▢	▢	▢	▲	B
International graduate employment rate	▼	▲	▼	▼	▼	C
International Doctorate Graduation rate	▲	▢	▼	▢	▢	C
Joint international projects	▲	▢	▼	▢	▢	C

Percentage of international students: The number of degree seeking students with a foreign diploma on entrance as % of total enrolment in degree programs.
Incoming and outgoing students: Incoming students as a percentage of total number of students and The number of students sent out abroad as a percentage of total number of students enrolled
Student satisfaction: Opportunities for a stay abroad: Index made up of several items: The attractiveness of the university's exchange programmes, the attractiveness of the partner universities, the sufficiency of the number of exchange places; support and guidance in preparing the stay abroad; financial support (scholarships, exemption from

study fees); the transfer of credits from exchange university; the integration of the stay abroad into studies (no time loss caused by stay abroad) and the support in finding internships abroad)
Internationalisation of programmes: Index made up of several issues: existence of joint programmes with foreign universities and student exchange (prevalence, duration
International academic staff: Percentage of international academic staff in total number of (regular) academic staff
Joint international publications: Relative number research publications that list one or more author affiliate addresses in another country relative to academic staff
International research grants: Research grants attained by foreign and international funding bodies as a percentage of total income
International graduate employment rate: The number of graduates employed abroad or in an international organization as a percentage of the total number of graduates employed
International Doctorate Graduation rate: The number of doctorate degrees awarded to students with a foreign nationality, as a percentage of the total number of doctorate degrees awarded
Joint international projects: The number of research projects done in co-operation with foreign partners as a percentage of total number of research projects

2.6 Regional engagement

The region has become an important entity in the processes of economic and social development and innovation. Gaps between regions regarding these processes are growing and regions that have skilled people and the infrastructure for innovation have a competitive advantage (Ischinger et al. 2009).

Higher education institutions may play an important role in the process of creating the conditions for the region to succeed. Creating and expanding this role in the region has become for many public policymakers at the national and regional level, as well as for institutional policymakers an objective. How well a HEI in engaged in the region is increasingly considered to be part of the mission of higher education institutions. How important this element is in the institutional mission will differ for each institution.

Regional engagement is part of the broader concept of 'third mission' In the European project on third mission ranking (Montesinos 2008)), third mission consists of three dimensions: a social dimension, an enterprising dimension and an innovative dimension. The latter two dimensions are covered in the U-Multirank dimension 'Knowledge transfer'. Indicators for the social dimension of the third mission comprise indicators on international mobility (that are covered in the U-Multirank dimension International orientation) and a very limited number of indicators on the regional engagement.

Activities and indicators on regional and community engagement can be categorized in three groups: outreach, partnerships and curricular engagement [39]. Outreach focuses on the application and provision of institutional resources for regional and community use, benefitting both university and region and community. Partnerships focus on collaborative interactions with the region/community and related scholarship for the mutual beneficial exchange, exploration, discovery, and application of knowledge, information, and resources. Curricular engagement refers to teaching, learning and scholarship that engage faculty, students, and region/community in mutual beneficial and respectful collaboration.

The distinction between enabling indicators and performance indicators can also be found in the literature on regional and community engagement. Most attention is paid to the enablers, or 'foundations for engagement' as they are called. These indicators address the way the HEI organizes its engagement activities. These indicators are based on checklists assessing the extent to which regional engagement is part of the institutional mission and integrated in the routine and procedures of the institution. Do the reward and promotion schemes of the insti-

[39] : http://classifications.carnegiefoundation.org/details/community_engagement.php

tution acknowledge regional engagement activities? Are there visible structures that function to assist with region-based teaching and learning? Is there adequate funding available for establishing and deepening region based activities? Are there courses that have a regional component (like service-learning courses? Are there mutual beneficial, sustained partnerships with regional community partners? These are typical items on such checklists (Furco et al, 2009; Hollander et al, 2001). The problem with these checklists is that the information is not readily available. Institutional or external assessors need to collect the information, which makes the robustness and reliability of the results in an international comparative setting highly questionable.

The second type of indicators (the performance oriented ones), captures the relative size of the interaction. How much does the institution draw on regional resources (students, staff, funding) and how much does the region draw on the resources provided by the HEI (graduates and facilities) are the leading questions.

What needs to be clear is what constitutes a region. The starting point is the existing list of regions in the Nomenclature of Territorial Units for Statistics (NUTS) classification developed and used by the European Union[40]. The focus is on the NUTS 2 level. For non European countries a different region classification will be used. Staring point here is the lower level (Territorial level 3) of the OECD classification of its member states, which is composed of micro-regions[41]. As it is with most standard lists: they work fine in most cases, but there are always cases where a different definition is more appropriate. In this feasibility study, HEIs may specify a different region and the reasons why they think a deviation from the standard is appropriate.

Below we discuss indicators on regional engagement. The focus will be on indicators of the second type. The problems regarding availability, robustness and reliability are so severe that these indicators are not taken in consideration further on. Data on regional engagement indicators are in general not available from national databases.

2.6.1 Focused institutional ranking

Income from regional/local sources . If a relatively large part of the income originates from regional and local sources, the higher education institution is seen as being more connected and engaged with regional/local society.

- Pro: It covers the extent to which the HEI draws on the financial resources of the region. Stakeholders are in favor of this indicator, both in terms of relevance and to a lesser extent the overall importance.
- Con. The indicator is sensitive to the way the public funding of HEIs is organized. In some countries the regions are the main public funding bodies, whereas in other countries the national government has that role. There are some doubts regarding the availability of clear breakdowns of income by geographical source.

Student internships in local/regional enterprises. Student internships open up communication channels between HEI and regional/local enterprises, that facilitate further regional engagement. It covers the curricular engagement aspect of the dimension.

- Pro: It covers an aspect of the dimension that is not covered by other indicators. Stakeholders think this indicator is very important.

[40] http://epp.eurostat.ec.europa.eu/portal/page/portal/region_cities/regional_statistics/nuts_classification

[41] http://www.oecd.org/document/62/0,3343,en_2649_34413_36878718_1_1_1_1,00.html

- Con: Data are not readily available. Due to the fact that there is no clear internationally accepted definition of what a student internship is reliability of the indicator is questionable. Pretesting revealed that the scores on this indicator depend on the discipline, which makes it less relevant at the institutional level. The indicator is hardly ever used.

Graduates working in the region. A high proportion of graduates working in the region indicates a close relation between the higher education institution and the region.

- Pro: It refers to the most important resource the HEI provides to the region and is frequently used in benchmarking and ranking projects. Stakeholders are in favor of this indicator, both in terms of relevance and the overall importance.
- Con: Only few countries have proper data bases on the destination of their higher education graduates. Pretesters indicated that there are hardly any data available that meet the definition.

Research Contracts with Regional Business. Firms in a region may benefit from the presence of a HEI through several channels. Outsourcing research activities is one of them. Consultancy or research contracts with the HEI are reflections of such activities.

- Pro: The validity of the indicator and the relevance as assessed by the stakeholders.
- Con: There are some doubts on how well records of contracts are kept . The indicator is relatively new.

Co-patents with Regional Firms. Co-patents with regional firms are in most cases the result of cooperative research activities, hence an exchange of knowledge with business in the region. These exchanges likely benefit regional firms.

- Pro. The indicator uses existing international data bases on patents.
- Con. The indicator is not often used and stakeholders are not in favor of it.

Regional Economic Impact of University. Assessing what the HEI 'does' for the region (in economic terms) is seen as most relevant (but also as very problematic due to severe data constraints).

- Pro: The high conceptual validity and the stakeholder preference for the indicator.
- Con: The assessment of this indicator requires massive data sets that are not readily available in most cases. The indicator is not very often used (for the previous reason).

Regional joint research publications. Indicator of successful 'local' research cooperation with partners located in the same geographical regions.

- Pro. The indicator is based on existing data bases on scientific publications.
- Con. Professional publications, that may be of high importance in the regional context, are not included in this indicator.

Regional engagement focused institutional ranking	Relevance	Concept/con-struct validity	Face validity	Robustness/ reliability	Availability	CHERPA rating
Income from regional/local sources	▲	□	□	□	▲	A
Student internships in local/regional enterprises	□	▲	▼	▼	▼	B
Research Contracts with Regional Business	▲	□	▼	▼	□	B
Regional joint research publications	▼	□	▼	▲	▲	B
Graduates working in the region	▲	▲	▼	▼	▼	B
Regional Economic Impact of University	▲	▲	▼	▼	▼	C
Co-patents with Regional Firms	▼	□	▼	▲	▲	C

Income from regional/local sources: institutional income from local regional authorities, local/regional charities and local/regional contracts as a percentage of total institutional income
Student internships in local/regional enterprises: The number of student internships in regional enterprises as a percentage of total enrolment (with defined minimum of weeks and/or credits)
Research Contracts with Regional Business: The number of research projects with regional firms, as a proportion of the total number of collaborative research projects
Regional joint research publications: Number of research publications that list one or more author affiliate addresses in the same NUTS2 or NUTS3 region, relative to fte academic staff
Graduates working in the region: The number of graduates working in the region, as a percentage of all graduates employed
Regional Economic Impact of University: Number of jobs generated by the university, as a percentage of the fte staff of the university
Co-patents with Regional Firms: The number of patents with a regional firm as co-applicant, as a proportion of the total number of patents co-owned with at least one firm.

2.6.2 Field based ranking

Regional participation in Continuing education. The participation of people from the region in continuing education programmes is an aspect of regional engagement of the university. It indicates how much the HEI draws on the regional resources (students) as well as how much the region draws on the resources of the HEI (training of the labourforce).

- Pro. Stakeholders this indicator is very relevant and important. The indicator covers an aspect of curricular engagement.
- Con. Data are not readily available. Due to the fact that there is no clear internationally accepted definition of what a student internship is reliability of the indicator is questionable. The indicator is hardly ever used.

Summerschool/ courses for secondary education students. The degree to which HEIS offer summer schools and courses for secondary education students show their engagement in the region, as participants of such courses/schools are supposed to come from the region mainly.

- Pro. Addresses outreach activities. Stakeholders consider this indicator important.
- Con. The limited availability of data. Due to the lack of international accepted definitions, reliability may be questioned.

Financial support by regional enterprises. Financial involvement of regional/local enterprises is a good indicator of the strength of the links between HEIs and their regional/local economic environment.

- Pro. Stakeholders think this indicator is relevant.
- Con. The availability of data is questionable. The indicator is not used very often.

Student internships in local/regional enterprises. student internships open up communication channels between HEI and regional/local enterprises, that facilitate further regional engagement. It covers the curricular engagement aspect of the dimension.

- Pro. It covers an aspect of the dimension that is not covered by other indicators. It shows a two-way exchange of resources: students gaining valuable work experience and business to get new insights and new recruitment channels. Stakeholders think this indicator is very important.
- Con. Data are not readily available. Due to the fact that there is no clear internationally accepted definition of what a student internship is reliability of the indicator is questionable. The indicator is hardly ever used.

Joint R&D projects with regional/local enterprises. Firms in a region may benefit from the presence of a HEI through several channels. Outsourcing research activities is one of them. Consultancy or research contracts with the HEI are reflections of such activities.

- Pro. the relevance as assessed by the stakeholders.
- Con. There are some doubts on how well records of contracts are kept. The indicator is relatively new.

Public lectures for external audience. Public lectures open to an external, mostly local audience, are a way to intensify contacts to the local community.

- Pro. The indicator addresses outreach activities.
- Con. Stakeholders do not think this indicator is relevant nor important.

Regional intake. A high percentage of new entrants from the region can be seen as the result of the high visibility of the regional active HEI. It may also be a result of the engagement with regional secondary schools. It is an indicator of the regional vs national vs international orientation of the HEI.

- Pro: Stakeholders think this indicator highly important.
- Con. The indicator is hardly used. The indicator may be sensitive to difference between rural and urban regions.

Graduates working in the region. A high proportion of graduates working in the region indicates a close relation between the higher education institution and the region.

- Pro: It refers to the most important resource the HEI provides to the region. Stakeholders are in favor of this indicator, terms of overall importance.
- Con. Not all countries have proper data bases on the destination of their higher education graduates. Stakeholders think the relevance is limited.

Degree theses in co-operation with regional enterprises. Degree thesis in cooperation with local enterprises which deal with issues and problems of practical relevance, are a means to build co-operations and an indicator of regional knowledge transfer.

- Pro: The indicator addresses curricular engagement.
- Con: The indicator is hardly ever used.

Regional engagement field based ranking	**Relevance**	**Concept/con-struct validity**	**Face validity**	**Robustness/ reliability**	**Availability**	**CHERPA rating**
Regional intake	▲	■	▼	■	■	A
Graduates working in the region	▼	▲	■	■	▼	A
Regional participation in Continuing education	▲	■	▼	▼	▼	B
Student internships in local/regional enterprises	▲	■	▼	▼	■	B
Degree theses in co-operation with regional enter-prises	■	■	▼	■	■	B
Public lectures for external audience	▼	■	▼	■	■	C
Summerschool/ courses for secondary education students	▼	▼	▼	▼	■	C
Financial support by regional enterprises	▲	■	▼	▼	▼	C
Joint R&D projects with regional/local enterprises	▲	▼	▼	▼	▼	C

Regional intake: The number of first year bachelor students from the region as a percentage of total number of first year students in bachelor programmes
Graduates working in the region: The number of graduates working in the region, as a percentage of all graduates employed 1
Regional participation in Continuing education: Number of regional participants (coming from NUTS3 region where HEI is located) as percentage of total number of population in NUTS3 region aged 25+
Student internships in local/regional enterprises: Number of internships of students in regional enterprises (as percentage of total students (with defined minimum of weeks and/or credits)
Public lectures for external audience: Number of public lectures for an external audience per fte academic staff
Degree theses in co-operation with regional enterprises: Number of degree theses in co-operation with regional enterprises as a percentage of total number of degree theses awarded; by level of program
Summerschool/ courses for secondary education students: Number of participants in schools/courses for secondary school students as a percentage of total enrolment
Financial support by regional enterprises: Income from regional enterprises as a percentage of regional/local income
Joint R&D projects with regional/local enterprises: The number of R&D projects in co-operation with regional enterprises per academic staff (fte)

3 Preparation for the pilot study

3.1 Creating the group of pilot institutions

A major task of work package 4 was the selection of pilot institutions for the feasibility study. The selection of the 150 pilot institutions (as specified in the project outline) needed to be informed by two major criteria: including a group of institutions that reflects as much institutional diversity as possible; and making sure that the sample was regionally and nationally balanced. In addition we needed to ensure sufficient overlap between the institutional ranking and the field-based rankings in business and engineering.

U-Map – the European classification of higher education institutions – was designed to make diversity within European higher education more transparent. After five years of research, development, piloting and extensive stakeholder consultation U-Map includes six dimensions of diversity in terms of which institutions will be classified and grouped:

- Teaching and learning profile (level and orientation of degrees; range of subjects offered)
- Student profile(size; mature, part-time and distance learning students)
- Research involvement (including basic – applied orientation)
- Involvement in knowledge exchange (start-ups; patents; cultural activities)
- International orientation (foreign staff and students; outgoing exchange programmes
- Regional engagement (students from region; graduates in the region; regional income)

In an ideal situation we would have selected the group of institutions based on their institutional profiles within U-Map. Unfortunately at this stage of its development U-Map includes only 60 provisional institutional profiles and these are all from universities and colleges in Europe.

The important question of the composition of the set of pilot institutions in terms of institutional diversity was also discussed with the Advisory Board in February and June. This project is a feasibility study and not the first version of the "real" U-Multirank ranking. What is important is to demonstrate our logic of ranking within comparable institutions by using U-Map as a mechanism to group institutions with similar profiles. This is why we need a sufficient diversity of institutions within the sample - but in a feasibility study we can not attempt to be representative of the full diversity of all the higher education systems in the world – particularly as there is no adequate description of this diversity against which to draw such a representative sample. In selecting institutions in each country - within the broad framework given in the project outline and including more countries than originally envisaged - we have included different institutional types and universities with different profiles in order to ensure a sufficient level of horizontal diversity for the purposes of the feasibility study. We do not claim or need to have a full representative sample since our aim is limited to testing the new ranking tool in a pilot situation.

3.1.1 Regional distribution

A basic framework for the regional and national distribution of the pilot institution was included in the call for tender for the project. This included the mix of European and Non-European institutions as well as the stipulation that all EU member states should be included (the number of institutions from each EU country varying by the size of the country). At the third meeting of the Advisory Board in February 2010 the project team proposed to extend the international coverage of the feasibility study by including a limited selection of African, Asian, Middle Eastern and Latin American institutions not originally envisaged in the project outline.

3.1.2 Selection procedure

Potential pilot institutions were identified in a number of ways:

- Some universities applied through the U-Multirank web-site to participate in the feasibility study. Their broad profiles were checked as far as is possible against the U-Map dimensions listed above.
- In most countries "national correspondents" (a network created by the research team) were asked to suggest institutions that would reflect the diversity of higher education institutions in their country. Clearly this is easier to do in large countries where we planned to include six or more institutions (see the table that follows) than in small countries where only one or two institutions could be included. For the latter countries the research team looked at institutional diversity across the group of small countries.
- Some international networks of institutions (e.g. LERU) expressed an interest to be involved in the project and suggested institutions to participate in the pilot study.
- Our field-based partner organisations (FEANI, EFMD) were consulted with regard to the field based rankings.
- The 60 institutions that participated in the pilot study on the European classification of higher education institutions (U-Map) were also included as potential participants.

These procedures resulted in a list of 268 potential pilot institutions. In 20 countries the number of institutions significantly exceeded the target number set by the research team for those countries. In these cases a selection of institutions was made to give the closest possible fit to the desired mix of profiles and institutional diversity as outlined above. The overall position is now as follows: we have invited 216 institutions drawn from 49 countries to participate in the U-Multirank pilot (this allows for a quarter of the institutions to decline to participate) and we have a reserve list of 52 institutions from 20 countries which we will draw from in cases where this is needed to meet our national targets and/or achieve the desired mix in terms of institutional diversity. The table below compares the regional and national distribution of the 216 institutions with the targets discussed with the Advisory Board in February. It also indicates the distribution of the 122 institutions who had confirmed their participation by 1 November 2010.

Region and Country	Initial proposal (after February 2010 Advisory Board) for number of institutions	Institutions in the final pilot selection of 216 institutions (July 2010)	Participating institutions as at November 2010
I. EU 27 (population in millions)			
Austria (8m)	2	2	3
Belgium (10m)	3	3	3
Bulgaria (8 m)	2	3	1
Cyprus (1m)	1	1	0
Czech Republic (10m)	3	4	3
Denmark (5m)	2	5	4
Estonia (1m)	1	2	1
Finland (5m)	2	3	1
France (64m)	6*	9	5
Germany (84m)	6*	9	3
Greece (11m)	3	4	2
Hungary (10m)	3	4	0
Ireland (4m)	1	1	5
Italy (60m)	6*	8	7
Latvia (2m)	1	1	0
Lithuania (3m)	1	2	2
Luxembourg (0.5m)	1	1	1
Malta (0.4m)	1	1	0
Netherlands (16m)	3	7	4
Poland (38m)	6*	12	6
Portugal (10m)	3	3	4
Romania (21m)	3	5	5
Slovakia (5m)	2	1	1
Slovenia (2m)	1	2	1
Spain (46m)	6*	7	2
Sweden (9m)	2	3	2
United Kingdom	6*	8	4
Total EU *(* specified in project outline)*	**77**	**102**	**70**
II. Europe – Non EU			
Russia	5	4	1
Switzerland		6	4
Turkey		6	2
Norway		4	4
Liechtenstein		1	0
Iceland		1	1
Croatia			1
III. Outside Europe			
US	19	24	4
Canada	6	6	3
Japan	5	9	1
China	10	11	0

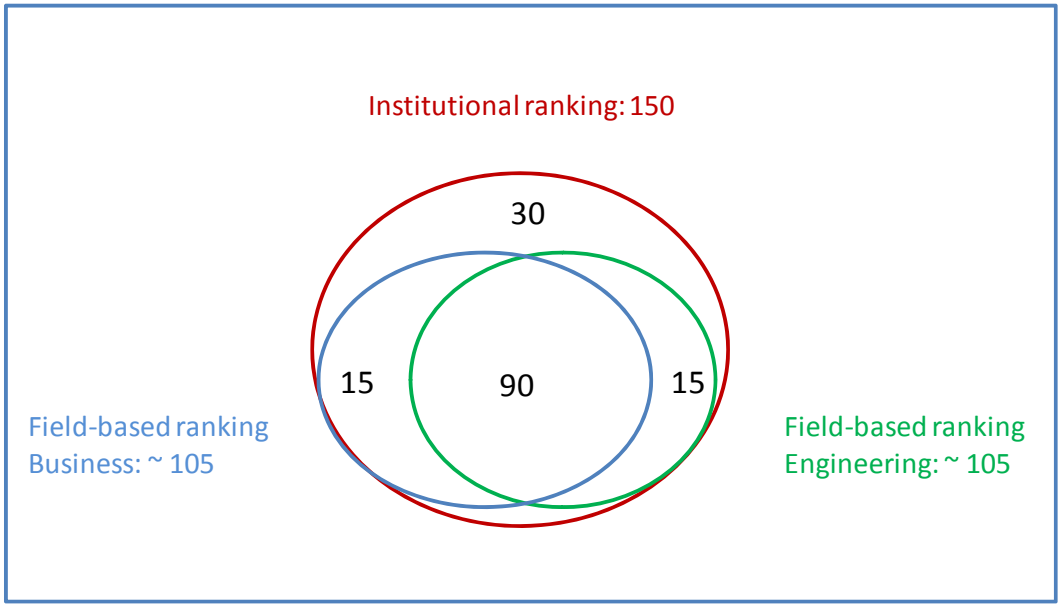
India	5	7	4
Other Asia	5	2	5
Australia	3	8	6
Latin America	5	3	
- Mexico			1
- Colombia			1
South Africa	5	5	3
Other Africa		3	3
Israel	5	2	1
Saudi Arabia		4	3
Other Middle East		1	4
Total	**150**	**216**	**122**

3.1.3 *Profiles and institutional types*

We are confident that the group of 216 institutions has sufficient institutional diversity for the purpose of the pilot study. While we will only be able to demonstrate this fully when the pilot institutions have completed the U-Map instrument and we are able to generate their institutional profiles, the group includes large and small institutions; comprehensive and specialised institutions; leading research universities and institutions focusing primarily on Bachelor-level education; internationally, nationally and regionally oriented institutions; universities, universities of applied sciences, colleges and non-university research organisations etc.

3.1.4 *Field- based rankings*

We wanted the sample of institutions to have a high degree of overlap between the institutional ranking and the field based ranking for logistical reasons as the field-based rankings include contextual data on the institutions themselves. Hence all institutions participating in one of the field-based rankings are also included in the institutional ranking. At the same time we aimed for some degree of flexibility so that the institutional ranking would be able to cover a higher degree of institutional diversity, by including specialised institutions (in fields other than business and engineering). Our initial plan is set out in the figure below:



In terms of participation in the field based rankings, if all 216 institutions were to agree to participate in the relevant field based rankings then the pilot project would include around 150 institutions participating in the business ranking and around 140 in the engineering ranking. In terms of our initial plan this means that we have achieved the expected level of overlap across the two fields but have a smaller group (27 of the 216 compared to 30 of 150) of specialised institutions in fields other than business and engineering in the selection than anticipated - in part because these do not exist in many countries.

3.2 Current situation

As of 1 November 2010 the overall situation is as follows: 122 institutions have confirmed their participation (see the table above and Appendix 2); 5 have declined to participate; 7 have asked questions concerning their potential participation but have yet to decide.

The research team is now in the process of approaching as many as possible of the non-responding institutions via national contact persons or others in our networks. We are giving high priority to those countries where the number of confirmed institutions is way below the target number for the pilot group (USA, China, Japan, Spain, UK, and Poland).

Particularly in China and the USA we faced difficulties to recruit institutions. As for China our national experts explained that universities are reluctant to participate in rankings. This is because first the national ministry of education is not in favor of ranking systems but has their own systems and second because universities cannot estimate the effects/outcomes of participation. In other words universities fear to be placed in an unfavorable position when participating in the pilot study. The U-Multirank team tries to solve this problem by communicating that the results of participation will not be made public. As for the USA the U-Multirank projects is perceived as being strongly European-focused. Therefore many institutions are reluctant to participate.

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Appendix 1. Assessment of data availability

The assessment of availability of data is based on two sources. For European countries the primary source was the EUMIDA project. The EUMIDA project seeks to develop the foundations of a coherent data infrastructure (and database) at the level of individual higher education institutions for the entire European Union, plus Norway and Switzerland, as additional case studies. For the countries that are not in the European Higher Education Area (but are in the initial group of countries selected for the pilot) an on-line consultation of national experts was set up.

1. The expert consultation

National experts were consulted for six non-European countries and questioned about data availability. Experts from six countries[42] responded. Table 1 shows that the Teaching and Learning dimension scores best in terms of data availability – both from national and institutional databases. The dimensions Research and Knowledge Transfer have far less data available on the national level, but this is compensated by the data available at the level of the institution. The same holds, to a lesser extent, for the dimension Internationalization, where only few data are available in national databases. The Regional Orientation dimension is the most problematic in terms of data availability. Here, data will have to be collected from the level of the individual institution.

Table 1: Availability of U-Multirank data elements in countries' national databases according to experts in 6 countries (Argentina/AR, Australia/AU, Canada/CA, Saudi Arabia/SA, South Africa/ZA, United States/US)

Dimension	U-Multirank data element	Countries where data element is available in national databases	Countries where data element is available in institutional database
Teaching and learning	expenditure on teaching	AR, US, ZA	AR, AU, SA, ZA
	time to degree	AR, CA, US, ZA	AR, AU, CA, SA, ZA
	graduation rate	AR, CA, US, ZA	AR, AU, SA, ZA
	relative rate of graduate unemployment	AU, CA, US	
	relative graduate earnings	AU, ZA	ZA
Research	expenditure on research	AR, AU, ZA	AR, AU, SA, US, ZA
	number of post-doc positions		CA, US, ZA
		AR	AU, AR, CA, SA, US
	presence of clear promotion		

[42] Argentina, Australia, Canada, Saudi Arabia, South Africa and the US

	schemes		
	research publication output	AR, AU, US	AR, AU, SA, US, ZA
	within country joint publication output	AU	AR, ZA
	international prizes and scholarships won		AR, CA, ZA
Knowledge transfer	Size of TTO		AU, CA, SA, ZA
	Incentives for knowledge exchange	AR	AR, AU, CA, SA
	chairs co-funded by industry		AR, AU, CA, SA, ZA
	CPD courses offered		AU, CA, SA, ZA
	university-industry joint research publications	AR	
	number of spin-offs	AU	CA, US
	cultural awards	AR	CA, US
	third party funding	AU, US	CA, US, ZA
	license income		CA, US, ZA
	license agreements	AU	AR, CA, ZA
	co-patents		CA, ZA
	patents	AR	AR, CA, US, ZA
Internationalisation	size of international office		AR, CA, US, ZA
	educational programs in English	ZA	AR, AU, CA, SA, ZA
	international academic staff	ZA, US	AR, AU, CA, SA, US, ZA
	joint degree programmes	AR	AR, AU, CA, US
	international doctorate graduation rate	US	AR, CA, SA, US
	international partnerships	AR	AR, CA, ZA
	international graduate employment rate		CA
Regional orientation	income from regional sources		AU, CA, SA, ZA
	student internships in local/regional		AU, SA, US, ZA
	graduates working in the region		US
	research contracts with regional business		AR, CA, ZA
	co-patents with regional firms	ZA	CA, ZA

	regional impact		AU, SA, US
	regional participation in continuing education		AR, CA, ZA

Source: Based on U-Multirank expert survey

Looking at the individual indicators, we conclude that International Graduate Graduation Rate scores worst (5 out of six countries reported no information available). Co-patents with regional business scored 4 out of 6. The list of indicators for which half of the countries have no data comprises: International partnerships, Co-patents, License agreements, Regional impact, Regional participation in continuing education; Research contracts with regional business, International prizes and scholarships won, and Number of post-doc positions.

If we look at indicators for which data are available in national databases, it appears that for the Teaching and Learning indicators, data are available in many countries. Graduation rate and Time to degree score 4 out of six, and Expenditure on teaching and Relative rate of graduate unemployment score 3 out of 6. The weak indicator in the Teaching and Learning dimension is Relative graduate earnings. In the Research dimension, Expenditure on research and Research publication output score relatively high (3 out of 6). For the other indicators, information is for only one or two countries available in national databases.

Our experts state that if information is available in national databases, it is in all cases relatively easy to obtain the data. According to the national experts, a lot of data can be found in institutional databases. Staff-related data can be found in almost all countries in such databases. What is more difficult to find in institutional databases is information on graduate employment and earnings conditions.

If information is only available from institutional databases, there is a risk that different institutions may use different definitions. This risk is smaller if the data are simultaneously available from institutional and national databases. Even if there is information available in databases (be it national, institutional, or other), it is not always easy to obtain that information. This is the case for most indicators in the dimension Regional Engagement. The same holds for the Number of post-doc positions.

From the experts' comments we learn that some definitions need revision (like CPD and 'Presence of clear promotion schemes'). It is furthermore clear that the breakdown of expenditure by type of activity is seen as a tricky point, where data provided may not be completely comparable across institutions and countries.

Availability according to EUMIDA

Like the U-Multirank project, the EUMIDA project (see http://www.eumida.org) collects data on individual higher education institutions (HEIs). The EUMIDA project is meant to test whether a data collection effort can be undertaken by EUROSTAT in the foreseeable future. It is a *feasibility study* to establish a university register/census. The EUMIDA project is now in its final stages and has demonstrated that a regular data collection by national statistical authorities *is* feasible across (almost) all member states, albeit for a limited number of indicators – mostly of an input (instead of output-) type. While the EUMIDA project is not an instrument to support a ranking on several dimensions, it has been very helpful for the U-Multirank project in providing information on the availability of data on individual institutions.

The U-Multirank project team has agreed with the EUMIDA project team to share information on issues such as definitions of data elements and data sources and it was agreed (with the approval of a representative of Commission involved in both projects) that the preliminary outcomes of EUMIDA (which has a shorter deadline than U-Multirank) would be made available to the U-Multirank project (subject to the usual confidentiality arrangements). Bothe project teams are aware of the value of a close collaboration, given the overlap between the two projects – which have different goals, but share a great deal of data (indicators) on individual higher education institutions from multiple countries.

EUMIDA covers twenty-nine countries (the 27 EU member states plus two additional countries: Switzerland, Norway). The EUMIDA project investigates the data covered in *national* databases, in as far these databases are held/maintained by national statistical institutes, ministries, or other organizations with a public mission (e.g. funding councils, rectors' conferences, evaluation agencies, etc). Therefore, its main sources of information are the national statistical bureaus, because these agencies will have to collect, or at least coordinate, any future data collection exercises in the future.

The EUMIDA project collects data in order to investigate the feasibility for the building of two data collections:

1. Core set of data covering *all* higher/tertiary education institutions in the country
2. Extended set of data covering only the *research active* higher education institutions.

In the EUMIDA project, the definition for *research-active* HEIs is quite broad. Criteria for inclusion are the following:

- The existence of an official research mandate.
- The existence of research units institutionally recognized (for example on the institution's website).
- The inclusion in the R&D statistics (availability of R&D expenditure data), as a sign of institutionalized research activity.
- Awarding doctorates or other ISCED 6 degrees.
- Consideration of research in an institution's strategic objectives and plans.
- Regular funding for research projects either from public agencies or from private companies.

Institutions fulfilling at least three of these criteria are regarded as research active. This implies that many Universities of Applied Sciences are regarded as research active – even in case these institutions do not have the right to award PhDs.

The *core set of data* in EUMIDA is intended to sketch a rough picture of each HEI. The data elements included in the *core set* of data are:

1. name
2. region of location
3. having regional campuses
4. year of foundation
5. legal status / control (i.e. public, private, or government-dependent private)
6. highest degree delivered
7. number of enrolled students (ISCED 5)

8. number of doctorates awarded (ISCED 6)
9. existence of a university hospital
10. research mandate (i.e. being research-active)
11. being a distance education institution
12. specialisation (i.e. educational fields covered)

The EUMIDA core set covers far less data elements compared to the extended set. The following categories are part of the *extended data collection*:

1. Expenditures (total; personnel; non-personnel; capital, R&D expenditures)
2. Revenues (core funding; third party funding; fees)
3. Personnel (Total academic and non-academic staff; Non-academic staff; Total academic staff including foreigners; foreign academic staff)
4. Number of academic personnel by field of science (FTE)
5. Number of students ISCED 5 (headcount) broken down into: National students; International students
6. Number of students enrolled at level ISCED 5 by educational field (headcount)
7. Number of students ISCED 6 (headcount) broken down into: number of national students ISCED 6; Number of international students ISCED 6
8. Number of students ISCED 6 by educational field (headcount)
9. Total number of degrees awarded (Diploma; Bachelor, Master, …); Degrees awarded to national students (broken down by type of degree); Degrees awarded to international students (broken down by type of degree)
10. Degrees by field of education (broken down by type of degree)
11. Scientific publications (and classification used for this)
12. Number of patent applications filed by HEI
13. Patent applications filed by HEI staff
14. Number of spin-off companies

In addition, for the extended data set the EUMIDA project also investigates some more detailed data:

15. Total funding (revenues) from the private sector
16. Funding (revenues) from the private sector for R&D
17. Data on careers and employability

From this list of data elements it will be clear that there is a great deal of overlap between EUMIDA and U-Multirank in terms of data elements, but the overlap lies mainly in the area of data related to the inputs (or activities) of HE institutions. A great deal of this input-related information is used in the construction of the indicators in U-Multirank. The EUMIDA data elements are overlapping even more with those of the U-MAP project, since U-Map aims to build *activity profiles* for individual HE institutions whereas U-Multirank constructs performance profiles. The synergies between U-Multirank, U-Map and EUMIDA can therefore be used to shed some light on data availability for the areas of overlap between EUMIDA and U-Map.

Some of the preliminary findings of EUMIDA are the following:[43]

- Data availability for the core set of data is not considered problematic in most countries. This does however not imply that data on all indicators suggested is readily available in most countries since there are some confidentiality issues and issues of methodology and perimeter of the population/sample.

[43] Source: *EUMIDA Deliverable D2 – Review of Relevant Studies* (dated 20 February 2010 and submitted to the Commission on March 1, 2010.) Please note: we are quoting from a project that officially has not finished yet.

- For the extended set of EUMIDA variables the findings for data availability were largely positive. That set originally excluded output indicators on patents, and to be more complete, an investigation was made in the EUMIDA project to see whether data are available on patents and technology transfer. As expected, this showed that availability was more problematic. An exception is data on graduates, which seems to be more readily available, although data on graduate careers and employability are sketchy. Some data on scientific publications is available for most countries. This points to the conclusion that output-related data is less widely available compared to input-related data items. The role of national statistical institutes is quite limited here, and across countries, the underlying methodology is not yet consistent to allow for comparability of data.

- When data is not available (such as for university income and expenditures), it is not so much legal confidentiality issues that stand in the way, but more so reluctance on the part of the Ministry for political reasons, or concerns due to the fact that data on individual institutions had never been published before. In due time, these problems can most likely be overcome though.

- What was also made clear is that there is very little data on private HEIs in the national databases.

- For data not publicly available, an option may be to ask higher education institutions individually to get permission to publish individual data is not deemed realistic by national experts.

Table 2 below (third column) indicates which U-Multirank indicators are covered in EUMIDA and whether data on these indicators is available in national databases (statistical offices, ministries, rectors' associations, etc.). The above list of EUMIDA data elements also shows that EUMIDA primarily focuses on the Teaching & Learning and Research dimensions, with some indicators in the Knowledge Transfer dimension and institutional characteristics added. Since EUMIDA never had the intention to cover all dimensions of university activity (or performance), it is only natural that dimensions such as Internationalisation and Regional Orientation are less prominent in the project.

As far as the dimension of Knowledge Transfer is concerned, the EUMIDA project concludes that national regimes of university patenting differ considerably across countries. This implies that preconditions for the collection of data on patents vary considerably. EUMIDA concludes that data on patents are available in a number of countries only. In many countries, however, no data on university patents is systematically collected. No international manual for the collection of university patents exists. Hence all activities follow national classifications and requirements. This raises doubts about the comparability of data.

- The availability of data on other indicators of technology transfer activities resembles the situation for patents. Only for some countries data is available, and if it is available, then frequently only for a restricted set of HEIs. National statistical offices do not play a role in collecting this data. If data is available, it is provided mostly by public agencies, universities themselves, or based on specific research efforts.

- EUMIDA also concludes that the availability of data on employability of graduates and graduate careers is also problematic. A systematic collection of data only takes place in a few European countries (e.g. Finland, Ireland, Netherlands, Norway, Sweden, Switzerland, UK). Data collection follows national standards and these differ considerably concerning time frame and variables considered. Hence, even when data is available, comparability has to be questioned.

Finally, it is worth mentioning that apart from the insight that EUMIDA has given into data availability issues, the U-Multirank (and U-Map) projects can profit in another way from its outcomes. Since EUMIDA is investigating (and perhaps, later on leading to) a university census, it can be used to show (say, gauge) the composition and structural characteristics of the (European) U-Multirank sample against the universe of European higher education institutions. In short, there is a potential for synergies between U-Multirank, U-Map and EUMIDA on areas such as definitions, data availability and giving insight into the diversity of higher education institutions worldwide

Table 2: Availability of U-Multirank data elements in European national databases according to EUMIDA

Dimension	U-Multirank data element	Data element is included in EUMIDA collection (Yes/No)	Countries where data element is available in national databases
Teaching and learning	expenditure on teaching	N	
	time to degree	N	
	graduation rate	N	
	relative rate of graduate unemployment	Y	CZ, FI, NO, SK, ES
	relative graduate earnings	Y	FI, NO, ES
Research	expenditure on research	Y	AT*, BE, CY, CZ*, DK, EE, FI, GR*, HU, IT, LV*, LT*, LU, MT*, NO, PL*, RO*, SI*, ES, SE, CH, UK
	number of post-doc positions	N	
	presence of clear promotion schemes	N	
	research publication output	Y	AT, BE-FL, CY, CZ, DK, FI, FR, DE, GR, HU, IE, IT, LV, LT, LU, NO, NL, PL, PT*, RO*, SK, SI, ES, SE*, CH, UK
	within country joint publication output	N	
	international prizes and scholarships won	N	
Knowledge transfer	Size of TTO	N	
	Incentives for knowledge exchange	N	
	chairs co-funded by industry	N	
	CPD courses offered	N	
	university-industry joint research publications	N	

	number of spin-offs	Y	BE-FL, FR*, GR, IT (p), PT (p), ES
	cultural awards	N	
	third party funding	Y (different definition)	CY, CZ, DE, IT, NL, NO, PL, PT, ES, CH
	license income	N	
	license agreements	N	
	co-patents	N	
	patents	Y	AT, BE-FL, CZ, EE*, FI, FR*, GR, HU, IE*, IT, LU, MT*, NO, NL (p), PL*, SI, ES, UK
Internationalisation	size of international office	N	
	educational programs in English	N	
	international academic staff	N	
	joint degree programmes	N	
	international doctorate graduation rate	N	
	international partnerships	N	
	international graduate employment rate	N	
Regional orientation	income from regional sources	N	
	student internships in local/regional	N	
	graduates working in the region	N	
	research contracts with regional business	N	
	co-patents with regional firms	N	
	regional impact	N	
	regional participation in continuing education	N	

Source: Based on EUMIDA Deliverable D2

* indicates: there are confidentiality issues (e.g. national statistical offices may not be prepared to make data public without consulting individual HEIs)

(p) indicates: data are only partially available (e.g. only for public HEIs, or only for (some) research universities)

The list of EUMIDA countries with abbreviations: Austria (AT), Belgium (BE), [Belgium-Flanders community (BE-FL)], Bulgaria (BG), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI) France (FR), Germany (DE), Greece (GR), Hungary (HU), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LV), Luxembourg (LU), Malta (MT), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), United Kingdom (UK).

3. Consistency between IPEDS and U-Multirank indicators

Table 3: Comparisons of definitions in the IPEDS and U-Multirank data systems

Indicator	IPEDS Indicator and Definition	U-Multirank Definition
Average time to degree	Normal time to completion The amount of time necessary for a student to complete all requirements for a degree or certificate according to the institution's catalog. This is typically 4 years (8 semesters or trimesters, or 12 quarters, excluding summer terms) for a bachelor's degree in a standard term-based institution; 2 years (4 semesters or trimesters, or 6 quarters, excluding summer terms) for an associate's degree in a standard term-based institution; and the various scheduled times for certificate programs.	Average time to degree as a percentage of the official length of the program; by type of program
Community engagement	Public service: A functional expense category that includes expenses for activities established primarily to provide noninstructional services beneficial to individuals and groups external to the institution. Examples are conferences, institutes, general advisory service, reference bureaus, and similar services provided to particular sectors of the community. This function includes expenses for community services, cooperative extension services, and public broadcasting services. Also includes information technology expenses related to the public service activities if the institution separately budgets and expenses information technology resources (otherwise these expenses are included in academic support). Institutions include actual or allocated costs for operation and maintenance of plant, interest, and depreciation.	to be determined
Continous professional development courses	Continuing professional education: Programs and courses designed specifically for individuals who have completed a degree in a professional field (such as law, medicine, dentistry, education, or social work) to obtain additional training in their particular field of study.	Number of CPD courses offered per academic staff (fte).
External research income	Business type activities: Activities for which fees are charged to external parties for goods or services. GASB Statement 34 specifies the reporting format to be used by this type of governmental entity.	Level of funding attracted by researchers and universities from contracts with external sources, including competitive grants and research income from government, industry, business and community organisations, as a percentage of total income.

Foreign degree seeking students	Out-of-state student A student who is not a legal resident of the state in which he/she attends school.	The number of degree seeking students with a foreign diploma on entrance as % of total enrolment in degree programs.
Graduation rate	Graduation rate The rate required for disclosure and/or reporting purposes under Student Right-to-Know Act. This rate is calculated as the total number of completers within 150% of normal time divided by the revised adjusted cohort. Completer A student who receives a degree, diploma, certificate, or other formal award. In order to be considered a completer, the degree/award must actually be conferred. Completers within 150% of normal time Students who completed their program within 150% of the normal (or expected) time for completion.	The percentage of a cohort that graduated after x years after entering the programme
Importance of local/regional income sources	Local government grants and contracts (revenues): Revenues from local government agencies that are for training programs and similar activities for which amounts are received or expenditures are reimbursable under the terms of a local government grant or contract. Local grants: Local monies awarded to the institution under local government student aid programs . Local grants (revenues): A sum of money or property bestowed on a postsecondary institution by a local government. These amounts can be treated as an allowance, an agency transaction, or as a student aid expense in the institution's General Purpose Financial Statements (GPFS) and are reported differently depending on their treatment. Generally, however, private institutions report these grants as allowances when applied to the student's account and as local grant revenues when received.	Income from regional/local sources as a percentage of total income
Income from copyrighted products	Intangible assets: Assets consisting of nonmaterial rights and benefits of an institution, such as patents, copyrights, trademarks and goodwill.	Income from copyrights of products for which the institution holds the copyright

Income from privately funded research contracts	Private grants and contracts (Revenues) Revenues from private (non-governmental) entities that are for specific research projects, other types of programs, or for general institutional operations (if not government appropriations). Examples are research projects, training programs, and similar activities for which amounts are received or expenses are reimbursable under the terms of a grant or contract, including amounts to cover both direct and indirect expenses. Grants and contracts (revenues): Revenues from governmental agencies and nongovernmental parties that are for specific research projects, other types of programs , or for general institutional operations (if not government appropriations). Examples are research projects, training programs, student financial assistance, and similar activities for which amounts are received or expenses are reimbursable under the terms of a grant or contract, including amounts to cover both direct and indirect expenses. Includes Pell Grants and reimbursement for costs of administering federal financial aid programs. Grants and contracts should be classified to identify the governmental level - federal, state, or local - funding the grant or contract to the institution; grants and contracts from other sources are classified as nongovernmental grants and contracts. GASB institutions are required to classify in financial reports such grants and contracts as either operating or nonoperating. Independent operations (revenues): Revenues associated with operations independent of or unrelated to the primary missions of the institution (i.e., instruction, research, public service) although they may contribute indirectly to the enhancement of these programs. Generally includes only those revenues associated with major federally funded research and development centers. Net profit (or loss) from operations owned and managed as investments of the institution's endowment funds is excluded.	Financial volume of privately funded research contracts as a percentage of total revenues. Privately funded includes non-profit research funds

Income from regional sources	Local government grants and contracts (revenues) Revenues from local government agencies that are for training programs and similar activities for which amounts are received or expenditures are reimbursable under the terms of a local government grant or contract. Local grants Local monies awarded to the institution under local government student aid programs . Endowment assets: Gross investments of endowment funds, term endowment funds, and funds functioning as endowment for the institution and any of its foundations and other affiliated organizations. Endowment funds: Funds whose principal is nonexpendable (true endowment) and that are intended to be invested to provide earnings for institutional use. Also includes term endowments and funds functioning as endowment. Endowment income Endowment income includes: (1) the unrestricted income of endowment and similar funds; (2) restricted income of endowment and similar funds to the extent expended for current operating purposes, and (3) income from funds held in trust by others under irrevocable trusts. Excludes capital gains or losses unless the institution has adopted a spending formula by which it expends not only the yield but also a prudent portion of the appreciation of the principal. Does not include gains spent for current operations, which are treated as transfers.	institutional income from local regional authorities, local/regional charities and local/regional contracts as a percentage of total institutional income
Incoming and outgoing students		Incoming and outgoing students as a percentage of total number of students
Incoming students in European and other international exchange programs	Study abroad: Arrangement by which a student completes part of the college program studying in another country. Can be at a campus abroad or through a cooperative agreement with some other U.S. college or an institution of another country.	The number of incoming students in international exchange programmes, as a percentage of total enrolment
Student internships in regional enterprises	Employment services for current students: Activities intended to assist students in obtaining part-time employment as a means of defraying part of the cost of their education.	Number of internships of students in regional enterprises (as percentage of total students (with defined minimum of weeks and/or credits)

Student-staff ratio	Student-to-faculty ratio:The ratio of FTE students to FTE instructional staff, i.e., students divided by staff. Students enrolled in "stand-alone" graduate or professional programs and instructional staff teaching in these programs are excluded from both full-time and part-time counts. "Stand-alone" graduate or professional programs are those programs such as medicine, law, veterinary, dentistry, social work, or public health, in which faculty teach virtually only graduate-level students (also referred to as "independent" programs). Each FTE value is equal to the number of full-time students/staff plus 1/3 the number of part-time students/staff.	Number of (fte) students per fte academic staff
Summerschools/ courses for secondary education students	Summer session: A summer session is shorter than a regular session and is not considered part of the academic year. It is not the third term of an institution operating on a trimester system or the fourth term of an institution operating on a quarter calendar system. The institution may have two or more sessions occurring in the summer months. Some schools, such as vocational and beauty schools, have year-round classes with no separate summer session.	Number of participants in schools/courses for secondary school students as a percentage of total enrolment

Appendix 2: U-Multirank participating institutions

Université d'Oran Es sénia	Algeria
Université Mentouri, Constantine	Algeria
University of Melbourne	Australia
Royal Melbourne Institute of Technology	Australia
Bond University	Australia
University of South Australia	Australia
University of Technology Sydney	Australia
Griffith University	Australia
FH Vorarlberg University of Applied Science	Austria
Technical University Vienna	Austria
University of Graz	Austria
Royal Military Academy (KMS-ERM)	Belgium
Royal Conservatory, University College of Antwerp	Belgium
University libre de Bruxelles	Belgium
Technical University Sofia	Bulgaria
International Institute for Water & Environmental Engineering	Burkina Faso
University of Toronto	Canada
University of British Columbia	Canada
University of Alberta	Canada
Universidad El Bosque	Colombia
University of Rijeka	Croatia
Brno Technical University	Czech Republic

Technical University Ostrava	Czech Republic
Charles University	Czech Republic
Aarhus University	Denmark
University of Southern Denmark	Denmark
Aalborg University	Denmark
VIA University College	Denmark
Tallin Technical University	Estonia
Aalto University	Finland
Université Pierre et Marie Curie Paris (UPMC)	France
Université de Haute-Alsace	France
Paris Dauphine University	France
University Victor Segalen Bordeaux 2	France
INSA Toulouse	France
University of Applied Science Reutlingen	Germany
University of Applied Science for Business Berlin	Germany
University of Applied Science Osnabrück	Germany
Patras Technological Institute	Greece
Aristotle University of Thessaloniki	Greece
The Chinese University of Hong Kong	Hong Kong
University of Iceland	Iceland
Manipal University	India
Indian Institute of Information Technology	India
Kalinga Institute of Industrial Technology	India
VIT University	India
Syiah Kuala University	Indonesia

University College Dublin	Ireland
Institute of Technology Tallaght, Dublin	Ireland
Galway-Mayo Institute of Technology	Ireland
Cork Institute of Technology	Ireland
Institute of Technology Sligo	Ireland
Tel Aviv University	Israel
University La Sapienza Rome	Italy
Scuola Superiore die Studi Avanza die Trieste SISSA	Italy
University of Milan	Italy
University Cassino	Italy
University of Padova	Italy
Bocconi University Milano	Italy
University of Bologna	Italy
Tokyo University	Japan
Moi University	Kenya
University Saint Joseph	Lebanon
Vilnius University	Lithuania
Vilnius College of Higher Education	Lithuania
University of Luxembourg	Luxembourg
University Sains	Malaysia
University of Guadalajara	Mexico
University of Tangier	Morocco
University Utrecht	Netherlands
Maastricht University	Netherlands
Radboud University Nijmegen	Netherlands

Wageningen University	Netherlands
Oslo University College	Norway
Vestfold University College	Norway
NTNU	Norway
University of Bergen	Norway
University of the East	Philippines
Warsaw School of Social Science and Humanities	Poland
Kielce University of Technology	Poland
University of Silesia	Poland
Technical University Lodz	Poland
Agricultural University Krakow	Poland
Jagiellonian University	Poland
University of Lisbon	Portugal
Porto University	Portugal
Polytechnic Institute of Leiria	Portugal
New University of Lisbon	Portugal
Lucian Blaga University of Sibiu	Romania
Alexandru Ioan Cuza University of Iaşi	Romania
Babes Bolyai University	Romania
Politechnica University of Timişoara	Romania
Romanian-American University	Romania
State University – Higher School of Economics	Russia
King Saud University	Saudi Arabia
King Fahd University of Petroleum and Minerals	Saudi Arabia
King Abdulaziz University	Saudi Arabia

Slovak University of Technology	Slovakia
University of Maribor	Slovenia
Nelson Mandela Metropolitan University	South Africa
University of Venda	South Africa
University of Cape Town	South Africa
Autonomous University Barcelona	Spain
University Carlos III de Madrid	Spain
University of Malmo	Sweden
Lund University	Sweden
Ecole Polytechnique Federale de Lausanne	Switzerland
Swiss Federal Institute of Technology Zürich (ETH)	Switzerland
University St. Gallen	Switzerland
University of Geneva	Switzerland
National Cheng Kung University	Taiwan
Sfax University	Tunisia
Sabanci University	Turkey
Bilkent University	Turkey
University of Coventry	UK
University of Nottingham	UK
University of Glasgow	UK
University of Newcastle	UK
University of Wisconsin-Madison	USA
Bentley University	USA
Roosevelt University	USA
Olin College	USA

Appendix 3: Letter to the Presidents of pilot institutions

Head
Title
Institution
City
Country

A multi-dimensional global ranking of universities

Dear

We are writing to you on behalf of the CHERPA Network to invite your institution to participate in a pilot project to design and test a multi-dimensional global university ranking.

About the project

U-Multirank is an international project to design and test the feasibility of a multi-dimensional global university ranking. This feasibility study is funded by the European Commission (DG EAC) and carried out by the CHERPA Network[44] in association with the European Federation of National Engineering Associations (FEANI) and the European Foundation for Management Development (EFMD). It was inspired by a concern that existing international university rankings may have a negative effect on diversity within the higher education sector by encouraging universities to engage in a costly race for short-term prestige and to aspire to a single model of a successful university irrespective of their mission and profile.

The U-Multirank project aims to develop a ranking that respects the multi-dimensional and heterogeneous nature of the world's universities. It will not only focus on research but analyse five different dimensions of university performance:

- Teaching and learning
- Research
- Knowledge transfer
- Regional engagement
- Internationalisation

Over the two year life of the project the research team will design and select appropriate indicators, develop data collection instruments, and apply the ranking to 150 pilot institu-

tions in over 40 countries. Universities will be compared and ranked according to their institutional profiles.

The U-Multirank approach is based on a number of important principles:

User-driven: The nature of a university ranking should be determined by its purpose and by the needs of its potential users.

Multi-dimensional: The importance of different dimensions and indicators varies among different user groups; a university ranking should not produce a consolidated score but should treat different dimensions separately.

Field-specific and institutional rankings: Performance may vary considerably across disciplines within one university; an effective ranking should also offer field specific information.

Diversity: Ranking should respect the diversity of higher education institutions and compare only institutions with a similar profile.

Performance-orientation: Ranking should focus primarily on achieved performance and not on inputs, reputation or descriptive characteristics.

Context: An international ranking must take into account the linguistic, cultural, economic and historical contexts of different higher education systems.

The selection of pilot institutions

Our brief from the European Commission is to test the feasibility of the multi-dimensional ranking on an initial group of 150 institutions drawn from Europe and beyond. In most cases institutions will be active in one or both of the fields of (mechanical and electrical) engineering and business that were identified as the pilot disciplines for the field-based rankings. Institutions have also been chosen to ensure that the diversity of institutions in participating countries is represented as far as is possible in the initial pilot group.

We have used a number of mechanisms to establish the pilot group of institutions: some institutions participated in the project to design a European classification of higher education institutions (U-Map. See www.u-map.eu) and wish to continue participating in the ranking project; others volunteered through the project web-site; our professional partners (FEANI & EFMD) made suggestions; organisations representing different groups of universities have made proposals; and our network of "national correspondents" all over the world were also asked to advise us. The U-Multirank Research team then made an initial selection of 150 institutions which we believe has an adequate coverage in terms of countries, the two chosen fields and institutional diversity. Your institution is one of those selected and we very much hope that you will agree to participate.

What does participation in the pilot project entail?

First, the 150 institutions will be asked to complete an on-line questionnaire to enable us to develop an institutional profile for each institution using the dimensions and indicators developed for the European classification of higher educational institutions (U-Map).
Second, institutions will then be asked in another on-line questionnaire to provide information on the indicators selected to measure the five dimensions of the multi-dimensional *institutional* ranking.
Third, those institutions active in the fields of engineering and/or business will be asked to complete on-line questionnaires to gather the information on the indicators selected to measure the dimensions of the multi-dimensional *field-based* rankings.
Finally, institutions will also be asked to arrange for students studying in these fields to complete an on-line student survey.
In addition to the data collection we will ask for your feedback on the feasibility of the whole process of data collection and the calculation of the ranking outcomes.

What are the benefits of participating in the pilot project?

The 150 institutions participating in the pilot project will have full access to the institutional profiles, the focused institutional rankings and the field-based rankings produced in the pilot project. This provides a unique opportunity to compare and benchmark your institution with 150 other institutions from over 40 countries. While it will be public knowledge which 150 institutions participated in the project, U-Multirank will not make the outcomes of the pilot rankings public and all participating institutions will be asked to sign an undertaking not to make public the results of any institution other than their own – either directly or indirectly. The objective of the pilot study is to test the feasibility of the instrument, not to publish a ranking.

Participation in the pilot project also provides your institution with the opportunity to help shape the final selection of dimensions and indicators for the multi-dimensional ranking which we hope will be institutionalised after the completion of this feasibility study. The views of participating institutions will be a crucial part of our final report and recommendations.

The next steps

If your institution agrees to participate in the pilot study please send an email confirming your participation as well as the name and address of your nominated contact person for U-Multirank to our co-ordinator Jon File (j.m.file@utwente.nl). We will then liaise with your contact person to take the process forward. Please state in which of the pilot rankings your institution will participate (institutional ranking, business, mechanical engineering, electrical engineering).

If you have any questions not covered above please do not hesitate to contact Jon File. Further information on the design of the ranking and its dimensions and indicators can also be found on the U-Multirank web-site (www.u-multirank.eu).

We look forward to working with you in this challenging but important project

Prof. Dr. Frans van Vught (CHEPS) and Prof. Dr. Frank Ziegele (CHE)
U-Multirank Project leaders

Contact person:

Jon File
Director: Development and Consultancy
CHEPS (Center for Higher Education Policy Studies)
University of Twente
The Netherlands
j.m.file@utwente.nl

[1] **The CHERPA Network**

CHEPS (Netherlands) is a research institute at the University of Twente that specialises in higher education and science policy. CHEPS was the lead partner in the project that developed a European classification of higher education institutions (*U-Map*).

CHE (Germany) is a private non-profit organisation founded by the Bertelsmann Foundation and the German Rectors Conference (HRK). Since 1998 it has published the *CHE Ranking*: a field-based, multi-dimensional, interactive ranking of German universities.

CWTS (Netherlands) is a research institute at Leiden University specialising in the development of bibliometric indicators for the assessment of research performance. It compiles the *Leiden Ranking* and the *University-Industry Research Cooperation Scoreboard*.

INCENTIM (Belgium) is a part of the Faculty of Business and Economics of the Catholic University of Leuven. It specialises in innovation management, science and technology policy studies and knowledge intensive entrepreneurship.

OST (France) is a research group dedicated to the design and production of R&D indicators. OST publishes a biannual report *Science & Technology – Indicators*. It produces scoreboards for most French higher education and research institutions for strategic positioning and performance monitoring.

Appendix 4: Email after confirmation

Dear colleague

Thank you for agreeing to participate in this challenging project.

At the moment we have 122 institutions from 50 countries participating in the project. For your information an updated list of the participating institutions is available on our web-site. (http://www.u-multirank.eu)

Data for U-Multirank will be gathered from three on-line questionnaires/surveys, the U-Map instrument and international databases of bibliometric and patent data.

- The U-Map instrument gathers information on the profile of the institution
- The institutional questionnaire focuses on the characteristics and performance of the institution as a whole.
- The departmental questionnaire focuses on the characteristics and performance of the department. (Electrical engineering, mechanical engineering, business)
- The student survey gathers student views on the institution, department and programme.
-

The deadline for completion of all 4 surveys is 20 December.

To start work on the surveys you need first to complete a simple contact form to ensure that we have the correct information (including the name for your institution that you would like us to use in the project) and that we know which field-based rankings you would like to participate in.

This form can be found at: http://www.u-multirank.eu/contact-form2.doc/

Once you have completed this form we will email you your user name and password so that you are able to log-in to the on-line instruments.

If you have any questions please email our project team at: info@u-multirank.eu

We are maintaining a FAQ section on both the U-Multirank and U-Map web-sites.

With our thanks and best wishes

The U-Multirank team

Twitter: http://twitter.com/UMultirank

Facebook: http://www.facebook.com/pages/U-Multirank/142826629097074

Appendix 5: Email containing technical details for data collection

Dear colleague,

Thank you once again for agreeing to participate in this challenging project. Now the data collection for the pilot study is going to start.

Your institution is going to participate in the institutional ranking and in the field based ranking. Data for U-Multirank will be gathered from online-questionnaires on the institutional level, online-questionnaires on the field level and a survey among the students of the relevant fields. In addition, data from international databases of bibliometric and patent data will be analysed.

Both the institutional and the field-based questionnaire are ready to start.

1. The **institutional questionnaire** focuses on the characteristics and performance of the institution as a whole.
   The questionnaire can be found here:
   http://www.u-multirank.eu/questionnaire/signin.shtml

   To log in please enter your e-mail-address and this password:
   E-mail address:
   Password:

2. The **departmental questionnaire** focuses on the characteristics and performance of the departments in the pilot fields. The first part of the questionnaire refers to the faculty/department/unit which is responsible for the programmes in that field; the second part refers to individual degree programmes.
   The programmes that you want to include in the ranking can be inserted into the questionnaire by yourself. They will appear in the following questions automatically.

   The questionnaires can be found here:
   www.che-befragung.de/u-multirank

   To log in, please enter the password which will direct you to the questionnaire for the specific field:

Field	Participation	Password
Business/Management	Yes	
Mechanical engineering	Yes	
Electrical engineering	No	

Please complete both institutional and departmental questionnaires until 20. December 2010.

3. The **student survey** will gather student views on the institution, department and programme. The student survey has to be organised only in the fields in which your university is going to participate. The survey will start in *Mid November*.

   To prepare to survey we already want to give you some basic information about the organisation of the survey. The survey will *include*

   - Bachelor/Undergraduate students (from their 2nd year of study): max. 300 students per field
   - Master /Graduate students (but not PhD students): max 200 students per field

   If there are less students then the max numbers mentioned please include all students.

   The invitations to the students can be sent either by e-mail **or** by mail – according to the address situation in your university. We will send you

   a) a Word-file including 500 letters in case you want to contact your students by mail and

   b) a draft letter and 500 passwords (Excel file) to produce a serial mail

   It is important that you use only *one* channel to contact the students!

   The materials for the student survey will be sent to you next week – together with a more detailed description about the procedure.

If you have any questions please email our project team at: info@u-multirank.eu

We will maintain a FAQ section on the U-Map and U-Multirank web-sites.

With our thanks and best wishes

The U-Multirank team

Appendix 6: Glossary

Glossary

(12.11.10)

Part 1: Institutional and Departmental Questionnaire

A	
Academic staff	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 students or non-doctoral students working as teaching/research assistants.

Academic staff with foreign nationality	The number of academic staff with foreign nationality, employed by the institution or working on an exchange basis. A member of the academic staff is considered to be foreign in case s/he does not have the nationality of the country where the institution is located. Data are measured in headcounts.
Actual average time to degree in years	The time that the students at the particular university need in average (arithmetic mean) to finish their studies. Independent from the standard/norm duration of study.
Art related output	The volume of all relevant scholarly outputs in the creative arts. This includes major art works, exhibition catalogues, musical compositions, designs, media productions, and other tangible artefacts and outputs.
B	
Bachelor degree programs	Bachelor degrees are first degrees awarded usually after three or four years of study completed successfully at colleges, polytechnics, higher vocational education, or universities. Bachelor's degree recipients can either enter the labour force or pursue their education in graduate (Master's or, sometimes Ph.D.) or (in the US) first-professional (law, medicine, dentistry) degree programmes.
Bachelor degree programs in a foreign language	Total number of bachelor or other first degree programmes that are offered completely in a language, differing from your national language.
Business field	The field includes: General business and management, International business/ management and specialised sub-fields as (e.g. Marketing, logistics, controlling, banking, Commerce/Trading etc.). Not included is economics within all subfields.
C	
Character of the institution	An institution can be public, private-independent, or private-government dependent.
Copyrighted products	Copyrighted products are manuscripts, designs, software, and goods of an artistic or literary nature protected by copyright law. Copyright is a right to prevent copying of original literary, artistic and musical works, and computer software. "Original" means that the work is the creation of its author, not being copied from any other work. The copyrights protect the creator's right to be appropriately acknowledged for their work and give creators a means of controlling how their protected work is exploited, thereby ensuring that they are properly rewarded for their creative endeavours.
Courses in other fields	Courses in other disciplines than those who form the core of a programme, e.g. philosophy or business in engineering programmes.

Continuous Professional Development (CPD)	CPD is the training 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 programs, some of which have an option of accreditation. This job-related continuing education and training refers to all organised, systematic education and training activities in which people take part in order to obtain knowledge and/or learn new skills for a current or a future job, to increase earnings, to improve job and/or career opportunities in a current or another field and generally to improve their opportunities for advancement and promotion. CPD activity is not part of a Higher Education Institution's regular teaching activities supported through the institution's general grants and tuition fees paid by students enrolled in degree programs.
Collaborative research projects	Research projects where a researcher from the HEI in question collaborates with a partner (or multiple partners) employed in another organisation (higher education institution, business, non-profit organisation, government agency). This only refers to research (or creative arts/cultural) projects where a dedicated project budget was made available by a third party to (partly) cover the project costs.
D	
Degree seeking students with a foreign nationality	Number of degree seeking students with a foreign nationality. This characteristic refers to the country of citizenship criterion. Students are non-citizens students if they do not have the citizenship of the country where the institution is located. Normally citizenship corresponds to the nationality of the passport which the student holds or would hold. Students on internships should be excluded.
Degree seeking students with a foreign qualifying diploma	The number of degree seeking students who received access to the higher education program on the basis of a qualification awarded abroad.
Degrees awarded with regional enterprises	Number of degree theses written in co-operation with regional enterprises.
Direct basic government funding for research	This category includes all amounts received as direct government funding ('core funding') by the institution through acts of a legislative body (i.e. ministry or national funding agency), except for competitive grants and contracts. The adjective "basic" or "core" means *recurrent* funding that is normally awarded each year. In many universities, the direct basic funding for research is part of the general institutional funds that the institution receives as an integrated amount (i.e. a 'block grant', or 'lump sum') for its education, research and other services. In that case, an estimate is to be provided for the part devoted (directly and indirectly) to research. The remaining parts then go under other categories, such as education. Any funding for the service function of academic hospitals (i.e. patient care) should be excluded.

Direct basic government funding for teaching	Direct basic government funding for teaching refers to the funds that support the basic educational services of the institution. We include competitive funding, project funding, negotiated funding and subsidies provided by public authorities for teaching-related activities (e.g. for innovation of teaching practice, inclusion of disadvantaged groups). It therefore excludes: (1) Funds provided specifically for research projects; (2) Payments for services purchased or contracted by private organisations; (3) Fees and subsidies received for ancillary services, such as student lodging and meals. Comment: In many universities, the direct basic funding for teaching is part of the general institutional funds that the institution receives as an integrated amount (i.e. a 'block grant', or 'lump sum') for its education, research and other services. In that case, an estimate is to be provided for the part devoted (directly and indirectly) to education. The remaining parts then go under other categories, such as research. Funding for teaching hospitals (sometimes referred to as academic hospitals or university hospitals) is excluded from educational revenues, particularly all funding for patient care and other general expenses of academic hospitals, even if such expenses are paid by the education authorities. However, funding for teaching hospitals that it is directly and specifically related to the training of medical personnel is included.
Doctoral students	Students pursuing a doctorate (PhD, or Doctor of Philosophy), either as a student enrolled in a PhD programme offered by a PhD awarding institution, or as a member of an institution's staff (having been appointed as a research trainee) with the explicit goal of completing a PhD thesis (doctoral dissertation). Doctoral students may also be referred to as PhD candidates. This is in line with the European Commission policy advocating all PhD candidates to be no longer considered as students (with grants) but as early stage researchers.
Doctoral students counted as staff	The number of doctoral students (PhD candidates) appointed as a member of academic staff (measured in fte). In some systems, doctoral students are not counted as students, but as academic staff. In others, they are receiving a salary and are included in personnel statistics. To obtain comparable data on academic staff and student numbers, those doctoral students need to be identified.
Doctorate degrees awarded	The number of doctorate degrees awarded in the reference year to persons having successfully completed a tertiary education programme that leads directly to the award of the Ph.D. research qualification (Doctor of Philosophy). A doctorate requires, for successful completion, the submission of a thesis or dissertation of publishable quality that is the product of original research and represents a significant contribution to knowledge. The doctorate is not solely based on course-work.
E	
E-mail address of official contact person	E-mail address of the official contact person.
Engineering fields	Included are: Mechanical and industrial engineering (Not material sciences) and electrical engineering.
Expenditure	The total expenditure of the institution, including current expenditure and capital expenditure. Total expenditures include expenditures for educational services, research, knowledge transfer and other services.

Expenditure on knowledge exchange	The total amount of financial resources spent on the institution's knowledge transfer activity. Knowledge transfer, or knowledge exchange, includes research commercialization, activities organized within the framework of continuing professional development (CPD), the institution's regional engagement and other activities aimed at disseminating the knowledge and expertise of the institution to business, the public sector, cultural and community partners, and other societal entities. As such, knowledge transfer is broader and more encompassing than technology transfer. *Please indicate the percentage (estimated) of the institution's total expenditure dedicated to the knowledge transfer activity.*
Expenditure on other activities	The total amount of financial resources spent on activities other than teaching, research and knowledge transfer. This includes expenditures related to debt service and ancillary services. Preferably, this category should be as small as possible, since most activities of the institution will directly or indirectly be related to teaching, research and knowledge transfer.
Expenditure on research	The total amount of financial resources spent on research activities, including expenditure on R&D at academic hospitals and including expenditure on services indirectly related to research (e.g. management and organization of research, administration, capital expenditure), but excluding the academic hospitals' expenditure on patient care and other non-research-related general expenditure. All expenditure on research is included, regardless of whether the research is funded from general institutional funds or through separate grants or contracts from public or private sponsors. This includes all research institutes and experimental stations operating under the direct control of, or administered by, or associated with, the higher education institution. Some institutions are engaged in teaching as well as research. This makes it difficult to single out research-related expenditure. In this case we only request an estimate of the share of research in total expenditure.
Expenditure on teaching	The total amount of financial resources spent on teaching/instruction activities, including instruction in teaching hospitals and including expenditure on services indirectly related to instruction (e.g. educational services, curriculum development, administration, capital expenditure), but excluding the teaching hospitals' expenditure on patient care and other non-education related general expenditure. Some institutions are engaged in teaching as well as research. This makes it difficult to single out teaching-related expenditure. In this case we only request an estimate of the share of teaching in total expenditure.
External research grants	Grants from external sources that are only dedicated to research (e.g. from foundations, EU, business. Excluded are basic funding from government; money for consultant projects or services.
F	

Foreign nationality	This characteristic refers to the country of citizenship criterion. Students or staff are non-citizens students or staff if they do not have the citizenship of the country where the institution is located. Normally citizenship corresponds to the nationality of the passport which the student or staff member holds.
G	
General studies	Courses as an additional offer to the students and that are not related to a subject. This includes soft skills, language courses, IT courses etc.
Graduate employment	The number of graduates employed abroad or in an international organisation 18 months after graduation. In a number of countries existing surveys on graduate employment use a different time span between graduation and surveying. In those cases the time span used needs to be specified.
Graduates	Graduates are those who successfully complete an educational programme during the reference calendar year. The requirement to demonstrate that the student has acquired the expected skills and knowledge of someone at the level of education of the programme completed can be accomplished through either: (1) passing a final, curriculum-based examination or series of examinations; or (2) accumulating the specified number of study credits throughout the programme; or (3) a formal assessment of the skills/knowledge acquired by the student during the programme (where no formal examinations exist). In all cases, a successful outcome should result in certification which is recognised within the educational system and the labour market. Graduates refer to head-counts – the individual is only counted once per reference year, even if he or she has obtained multiple qualifications in multiple fields within a category of qualification. Graduations should be based on the calendar year.
Graduates working in the region 18 months after graduation	Percentage of the institution's graduates working (i.e. having paid employment or being self-employed) in the region, 18 months after their graduation. Crucial here is the definition of 'region'. Often used definitions are the NUTS2 regions, or the regions as described in the IRE network. Please specify what region you used for this item. For listings of regions, see: http://ec.europa.eu/enterprise/ire/Innovating-regions/www.innovating-regions.org/index.html or http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction .If otherwise unavailable, data may be reported on a different time span after graduation (e.g. two years after graduation). In this case, please indicate alternative time scopes in the comments section. In a number of countries existing surveys on graduate employment use a different time span between graduation and surveying. In those cases the time span used needs to be specified.

Graduation rate (Bachelor, Master)	The total number of students receiving a degree (in the reference year) within 150% of the normal ('stipulated') time expected for completing all requirements for the degree, divided by the size of the student cohort that entered the program x years ago, where x is 150% of the stipulated time to degree.
Guest professors/visiting professors	Professors from abroad coming for a limited time to the university who are engaged in teaching. Also incoming professors.
H	
Hospital (University Hospital)	A hospital closely associated with the medical school or faculty of a university with the following missions: (1) serving as a practical educational site for medical students and physicians; (2) carrying out research in the medical sciences; (3) providing patient care.
I	
Income	Total revenues (in Euros) of the institution in the calendar year. The total consists of: (1) the direct public expenditures allocated to the institution; (2) Fees from households and students; (3) Direct expenditures of other private entities (other than households) to the institution; (4) Direct foreign payments to the institution. Income data should be provided in Euros. The exchange rate to the national currency is provided by the U-Multirank team.
Income from copyrighted products	Income received by the institution from copyrighted products for which the institution holds the copyright (see also: Copyrighted products).
Income from European research programs	Income received from research funds administered by the European Commission, or – on its behalf - one of its bodies. The largest European research program is the Framework program (FP7), but there are also other research programs administered by the European Union that allocate funds to higher education institutions, such as European Structural funds. Please note: Funds awarded by the European Research Council (ERC) are included in the category "Research Councils". Institutions outside Europe, or the European Union normally do not qualify for this funding and, consequently, will not report any funds here.
Income from licensing agreements	The annual income from licensing agreements. Licensing is defined as: A formal agreement that allows the transfer of technology between two parties, where the owner of the technology (licensor) permits the other party (licensee) to share the rights to use the technology, without fear of a claim of intellectual property infringement brought by the licensor. The income generated from licences is an indication of both the impact and success of an institution's knowledge transfer (or: its transfer of intellectual property rights; IP).

Income from other (i.e. non-European) international competitive research programs	This category includes revenues received from public bodies and agencies outside of the country in which the institution operates - as long as these revenues are for specific research projects and not awarded in the context of a European research program (see item “European research programs’). If the funds are administered by a research council from abroad, they should go under the heading “research councils”.
Income from other sources (donations, other fees, etc.)	Income from charitable donations, interest, fees paid to institutions for ancillary services (e.g. student lodging), rents paid by private organizations; and earnings from private endowment funds.
Income from privately funded knowledge transfer 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.
Income from privately funded research contracts	All research income that is based on contracts that are not part of funding flows originating from governments (national, international, federal, regional) or other public organizations (e.g. Research Councils) is part of this category. Privately funded research includes research contracts and consultancies carried out for private (for-profit and not-for-profit) organizations, such as industry, medical charities, and private foundations – from the country itself or from abroad. Please note: donations and revenues from licensing and copyrighted products do not belong to this category and should be included in one of the categories for “Other activities”.
Income from Research councils	Revenues from government agencies and other public bodies, awarded competitively for specific research projects carried out by the institution. This includes research projects funded through grants and contracts by research councils, ministries and other government agencies. Such grants and contracts are normally awarded after a peer review of research proposals submitted by (teams of) academics. Funds provided by the ERC are also included. Revenues from research councils such the French ANR, the NSF in the USA, or the Dutch NWO/SKO/KNAW should also go under this heading. In the German context, DFG would qualify as a Research Council. Research-related project based funding (e.g. the Dutch RAAK subsidies) has to be included in this category as well.
Income from tuition fees from students in degree programs	The income from tuition fees refers to the net tuition fee income, excluding the tuition fees the institution has to transfer to the government. Fees paid for ancillary services, lodging, meals, health services, and fees paid for other welfare services furnished to students by the educational institutions should be excluded here (and should be included in ‘other income’).
Incoming students in international exchange programs	The number of students who come from abroad to the institution within the framework of an international exchange program. Examples: Erasmus, Leonardo.
Interdisciplinary programs	Number of programmes involving at least two traditional disciplines.
International degree students	Students that got their university entrance qualification abroad and who are coming to the university to study their whole programme at this

	university
International doctorate graduation rate	The number of doctorate degrees awarded to students with a foreign nationality, as a percentage of the total number of doctorate degrees awarded.
International exchange students	Students that got their university entrance qualification abroad and are coming to the university to study only a limited time (either in an organised exchange programme or self-organised) at this university without aiming at graduating at the university.
International graduate employment rate	The number of graduates employed abroad or in an international organization as a percentage of the total number of graduates employed
International networks	The number of international networks a higher education institution participates in.
International office (size)	The number of dedicated staff working at the international office or some other unit responsible for international affairs of the higher education institution.
International PhD students	International PhD students are defined as students that got their university entrance diploma abroad.
International prizes and scholarships won	Prizes, medals, awards and scholarships won by the HEI's employees for research work and in (inter-) national cultural competitions. This excludes scholarships awarded by research councils for carrying out research projects, but includes awards granted by academies of science. It excludes military honours, state decorations, knighthoods, patriotic medals and prizes for sports and entertainment. For a (non-complete) list of prizes and awards, see: http://www.wordiq.com/definition/List_of_prizes,_medals,_and_awards and http://en.wikipedia.org/wiki/List_of_prizes,_medals,_and_awards
J	
Joint program	A joint or double degree program is a program set up in close cooperation between two or more partners. Successful conclusion of the program leads to diploma's of both the home institute and the partner institute(s).
K	
Knowledge transfer	Knowledge transfer is the process by which the knowledge, expertise and intellectually linked assets of higher education institutions are constructively applied beyond higher education for the wider benefit of the economy and society, through two-way engagement with business, the public sector, cultural and community partners. Knowledge transfer is a broader and more encompassing concept than *technology*

	transfer.
L	
Legal status of the institution	The official legal status of the institution (in national language).
Licensing	Licensing is defined as: A formal agreement that allows the transfer of technology between two parties, where the owner of the technology (licensor) permits the other party (licensee) to share the rights to use the technology, without fear of a claim of intellectual property infringement brought by the licensor. The income generated from licences is an indication of both the impact and success of an institution's knowledge transfer.
Local/regional enterprise	An enterprise is according to the OECD, an institutional unit in its capacity as a producer of goods and services; an enterprise may be a corporation, a quasi- corporation, a non-profit institution, or an unincorporated enterprise. A regional/local enterprise is one that is located in the region of the higher education institution.
M	
Master degree programs	Master degrees are higher degrees, obtained after a period of typically one to two years of study following upon a bachelor's degree. Master's programmes prepare students for occupations which require the application of scientific knowledge and methods.
Master programs in a foreign language	Total number of master programmes offered completely in a language, differing from your national language.
N	
Name of institution	The institution's name that will appear in the U-Multirank ranking. This may be the official name as stipulated in legal registry or founding act, or the institution's name in a different (e.g. English) language.
Name of official contact person	The name of the person who will act as the contact person for the institution and the U-Multirank team in the data collection and the verification of data.

Number of research projects within regional firms	Total number of research projects with partners from the region (NUTS2).
Number of licence agreements	The average number of licence agreements signed by the HEI over the last three years.
Number of professional publications	A count of all publications published in journals/books/proceedings that are addressed to a professional audience and that can be traced bibliographically. These publications are not peer reviewed as in the category “Academic publications”.
Number of new patent applications	The number of new patent applications filed by the institution (or one of its researchers/departments) with a patent office. A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. A patent gives an inventor the right for a limited period to stop others from making, using or selling the invention without the permission of the inventor.
Number of patents awarded to HEI or its employees	See patent.
Number of peer reviewed academic publications	A count of peer reviewed publications of the institution. This includes PhD dissertations and books. Peer review (also known as refereeing) is a process of subjecting an author's scholarly work, research, or ideas to the scrutiny of others who are experts in the same field, before a paper describing this work is published in a journal, book or conference proceedings.
Number of peer reviewed professional research outputs	The number of research outputs other than peer-reviewed publications and professional publications. These outputs may be found through bibliographical searches and have been documented officially. This category includes exhibition catalogues, musical compositions, designs, and other artefacts that underwent a process of peer review.
O	
Outgoing professors	Professors of the faculty that spent a period at a foreign HEI as a guest/visiting professor.
Outgoing students in international exchange programs	The number of an institution’s students that study abroad for at least three months in the reference year in the context of an international exchange program.

Ownership of the buildings of the institution	The extent to which the institution is the prime responsible actor for maintaining and investing in its infrastructure. This is to provide important contextual information for interpreting expenditure data. If the majority of the buildings are owned by the institution (e.g. in contrast to the government owning the buildings), this will have implications for its investment (fixed capital formation) and debt servicing. The extent to which the buildings are owned by the institution should be indicated in the three answer categories: (1) owned by the institution; (2) mainly by the institution, some by others; (3) mainly by others. In case of (2) and (3), please specify what types of costs are paid directly by external bodies.
P	
Patent	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 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.
Performance appraisal system	A performance appraisal system is a method by which the job performance of an employee working in a higher education institution is evaluated (generally in terms of quality and quantity) against some set of performance criteria. The appraisal is typically carried out by the employee's supervisor (dean, chair, department head). The outcome of the appraisal is normally used to judge an employee's suitability for promotion or further training.
Position of official contact person	The position of the official contact person in his/her institution
Post doc (postdoctoral research fellow)	Academics holding a temporal research appointment to carry out academic or scholarly research. The position is available only for those who have completed their doctoral studies. Postdoctoral research may be funded through an appointment with a salary or an appointment with a stipend or sponsorship award.
Private government-dependent Institution (private institution)	A government-dependent private institution is an institution that receives more than 50 per cent of its core funding from government agencies, or one whose staff is overwhelmingly paid by a government agency.
Private- independent Institution (private institution)	An independent private institution is an institution that receives less than 50 per cent of its core funding from government agencies and whose teaching personnel are not paid by a government agency. See: http://www.oecd.org/dataoecd/45/17/33692376.pdf

Private Institution	An institution is classified as private if it is controlled and managed by a non-governmental organisation (e.g. a Church, a Trade Union or a business enterprise), or its Governing Board consists mostly of members not selected by a public agency. Private institutions may be further classified as government-dependent private or independent private institutions.
Professors with work experience	Professors who gained professional experience outside higher education in private or public enterprises/business.
Public Institution	An institution is classified as public if it is controlled and managed directly by a public education authority/agency; directly by a government agency; or a governing body (Council, Committee etc.) most of whose members are either appointed by a public authority or elected by public franchise.
R	
Region	There is no official definition of a region. Often used definitions are the NUTS2 regions and the regions as described in the IRE network. Please specify what region you used in this item. For listings of regions see http://ec.europa.eu/enterprise/ire/Innovating-regions/www.innovating-regions.org/index.html or http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction . From the perspective of a higher education institution, the region would extend to the places where full-time students would be able to commute from when attending the institution's programme.
Research	Research is the wide range of activities that support original, innovative and creative work in the whole range of academic, professional and technological fields, including the humanities, and traditional, performing, and other creative arts.
Research Councils	Publicly-funded agencies responsible for co-coordinating and funding particular areas of research (basic, applied and strategic research) and postgraduate research training. Decisions by research councils are predominantly made by researchers, independently from Government (both national and supranational government – e.g. European).
Research performance	Information on various aspects related to the quantity and quality of an institution's (or department's) research activity and research outcomes. Performance is reflected in measures of inputs, outputs, outcomes, and impacts of research.
Regional/ local enterprise	An enterprise is according to the OECD, an institutional unit in its capacity as a producer of goods and services; an enterprise may be a corporation, a quasi- corporation, a non-profit institution, or an unincorporated enterprise. A regional/local enterprise is one that is located in the region of the higher education institution.

S	
Start-up firm	A newly formed company that is the result of a licensing deal or a transfer of technology process involving the higher education institution. Start-ups (or spin-offs) are set up to exploit technology/intellectual property (IP) that has originated from within the HEI and has obtained the IP from the parent HEI.
Staff on the payroll of the institution	The extent to which an institution's staff carries out teaching and research duties on behalf of the institution while receiving a salary from a third party. If (a large amount of) staff is (or is not) on the payroll of a ministry or regional government, this should be indicated.
Standard period of study in years	Also norm duration of study. Official Duration of the study programme as specified in the examination rules.
Student internships in local enterprises	A student who is undergoing a period of supervised practical training in an enterprise located in the institution's region and where the training is related to the student's study programme.
Student numbers (total students enrolled)	The number of students enrolled refers to the number of individuals (head count) that are enrolled within the reference period and not necessarily to the number of registrations. Each student enrolled is counted only once. We consider all students registered at the reporting institution who follow courses that lead to the award of a qualification(s) (degree seeking students), excluding those registered as studying wholly abroad. Data should reflect the number of students enrolled at the beginning of the academic year. Preferably, the end (or near-end) of the first month of the school / academic year should be chosen. If the enrolment of students is not stable at the beginning of the academic year, a count at a later point may be preferable. Included are students studying for Associate degrees (short first cycle), Bachelor degrees (first cycle), Master degrees, students in pre-Bologna degree programs (second cycle), as well as doctoral students and other third cycle students.
Students sent out in international exchange programs	The number of students going abroad to another higher education institution within the framework of an international exchange program (like Erasmus).
T	
Technology transfer	Technology transfer is about the transfer of intellectual property resulting from scientific research to business. Technology transfer includes the creation of licensing agreements or joint ventures, partnerships, or spin-out companies to develop new technology and bring it to market, typically by dedicated technology transfer offices in HEIs.

Technology Transfer Office (TTO)	A dedicated unit in a higher education institution (HEI) that is set up with the aim to liaise the institution with industry and assist its personnel in the commercialisation of research results. TTOs provide services in terms of assessing inventions, patenting, licensing intellectual property rights (IP), developing and funding spin-offs and other start-ups, and approaching firms for contract based arrangements.
W	
Website/URL of institution	The website/URL of the (main campus of the) institution
Y	
Year of foundation of current institution	This is the year the institution got its current shape and legal status. Since many higher education institutions underwent significant changes during their history, the identification of the foundation year may be difficult in a number of cases. The following criteria should be used: - (1) name; (2) location; (3) legal status; (4)- activities as prescribed in the institutional mandate (for example law or statute). If at least two characteristics were modified in some year, this year should be considered as the foundation year. Otherwise the foundation year is the year the current institution came into existence. If the institution is the result of a merger between two or more institutions that existed before, the year that the oldest precursor of the institution was founded needs to be mentioned (in an answer to a separate question).

Part 2: Student Questionnaire

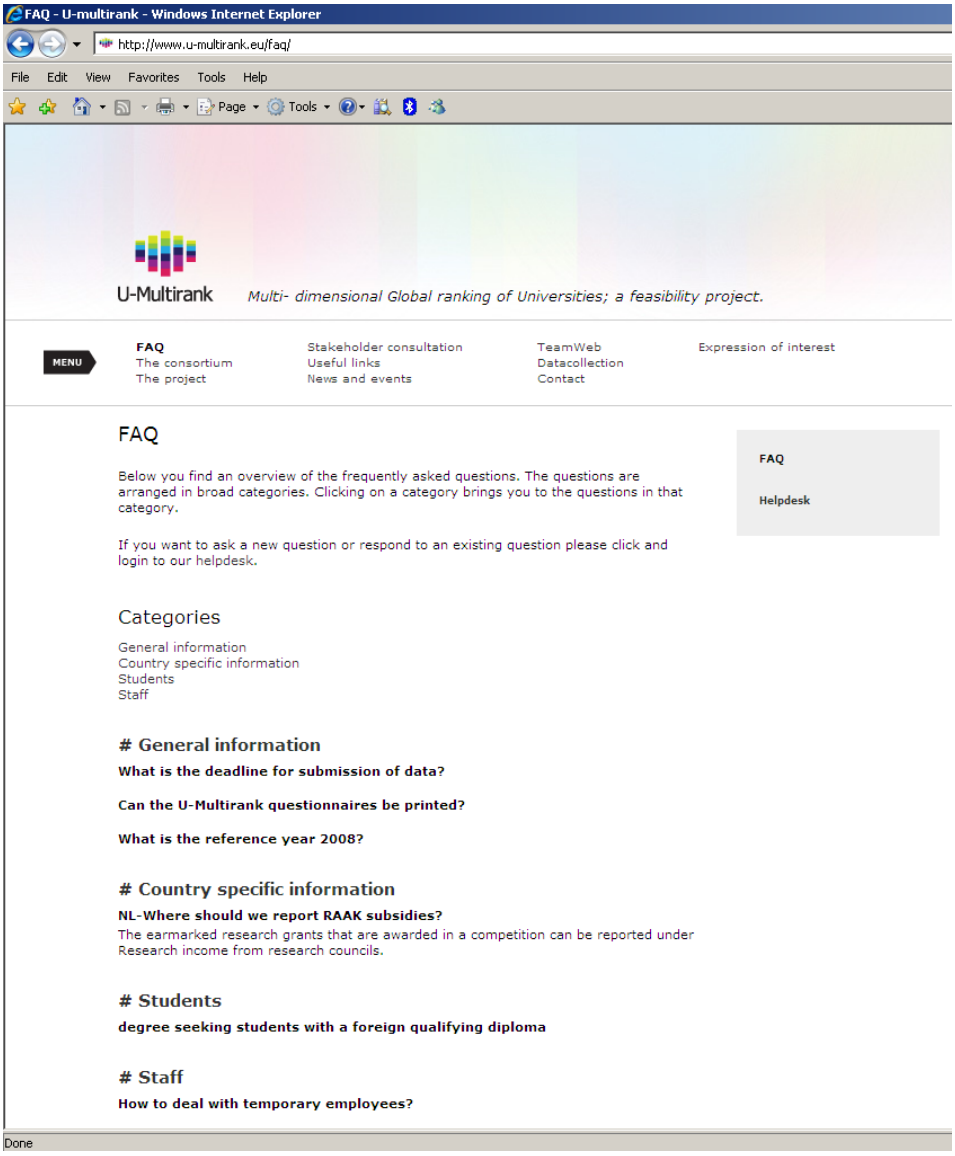
C	
Contact among students	Students assess the social climate and the co-operation with and contacts to other students; Index made up of a number of items, on a six-point scale (I fully agree – I do not agree at all)
Costs of accomodation	Average monthly rent paid by students incl. running costs (heating, electricity etc.).
Course content	Students assess amongst other things the variety of courses/classes offered, the didactical quality of teaching, the interdisciplinary, training in empirical methods and relevance of the range of courses, etc.; Index made up of a number of items, on a six-point scale (I fully agree – I do not agree at all)

E	
E-Learning	Students assses some elements of e-learning: Materials for downloading, electronic interaction with teachers and e-learning classes. Index made up of a number of items on a six-point scale (I fully agree – I do not agree at all)
I	
IT-infrastructure	Students give an assessment of hardware and software equipment for the PC-places, maintenance and care of the computers, user support, availability of workstations; Index made up of a number of items, on a six-point scale (I fully agree – I do not agree at all)
L	
Library	Students assess the quality of the library by a number of items: the availability of the required literature, the stock of books and specialist publications, user support, electronic services, the possibility of literature research; Index made up of a number of items, on a six-point scale (I fully agree – I do not agree at all)
O	
Overall study situation	The overall teaching and study situation is assessed by students on a six-point scale (Very good – very bad)
P	
Practical orientation and work experience	Students indicate the practical orientation of their study programme. Index made up of a number of items, e.g. information about occupational fields, project learning or support in finding internships. Six-point scale (I fully agree – I do not agree at all).
R	
Research orientation of	Judgement of the students on the degree of research orientation of teaching in their programme on a six-point scale (I fully agree – I do not

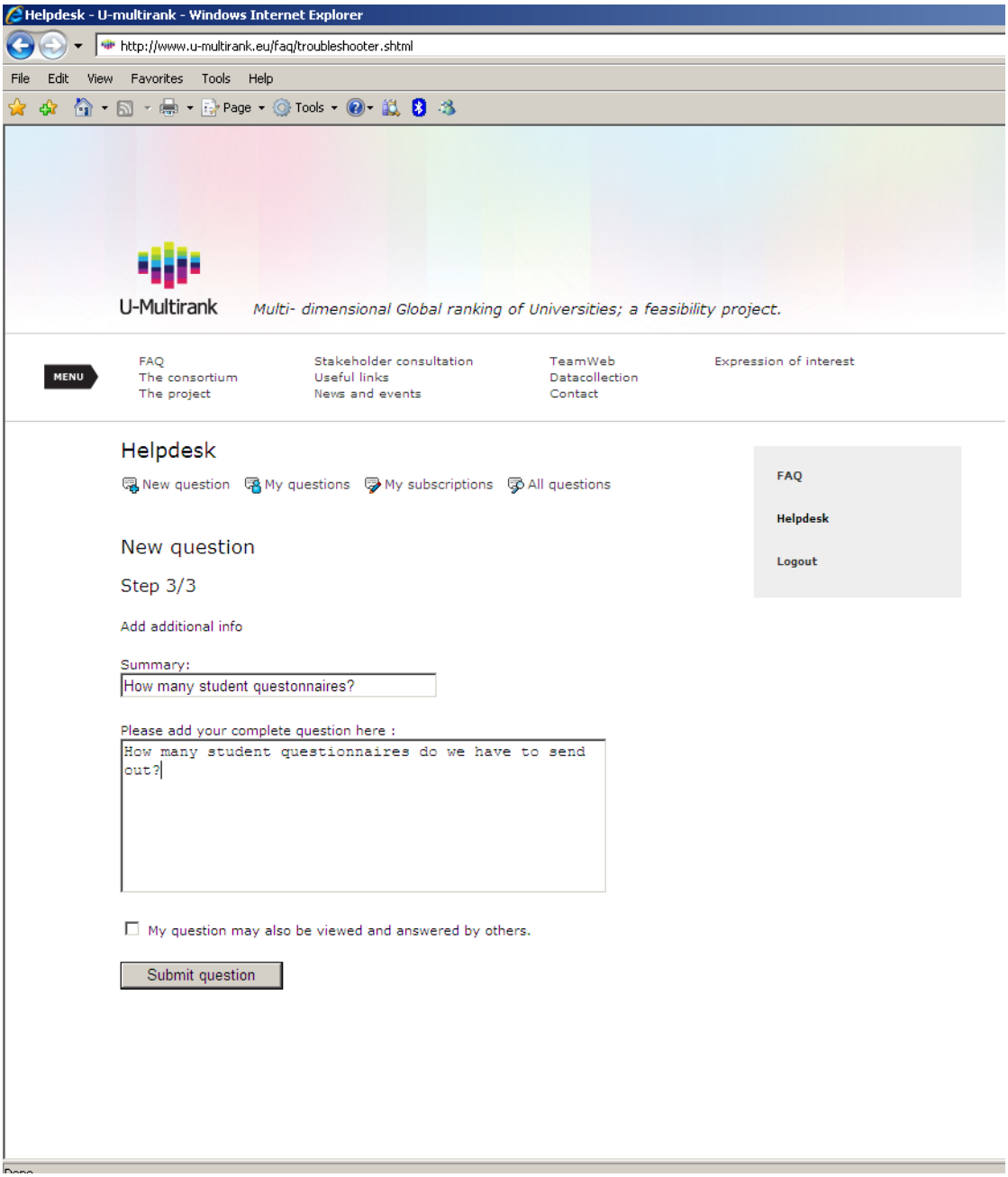
teaching	agree at all).
Rooms	Students give an assessment on the state/maintenance of the lecture halls and seminar rooms, their technical equipment and the number of places available; Index made up of a number of items, on a six-point scale (I fully agree – I do not agree at all)
S	
Services available	Students indicate the offered services at the university like accommodation services, student funding services or international offices.
Study organisation	Students give their view on the co-ordination of the courses offered, the congruence of teaching and examinations, their access to compulsory classes; Index made up of a number of items, on a six-point scale (I fully agree – I do not agree at all)
Support by teachers	Students give an assessment of, inter alia: accessibility of teachers, advice, feedback on homework etc.; Index made up of a number of items, on a six-point scale (I fully agree – I do not agree at all)
Support for stays abroad	Students assess the opportunities that their university offers to go abroad, including the attractiveness of partner institutions, the support and guidance in preparing the stay abroad, the integration of the stay abroad into studies. Six-point scale (I fully agree – I do not agree at all)
T	
Teaching evaluation	Students rated their involvement in teaching evaluation: the participation of students in this process and the implementation of results; on a six-point scale (I fully agree – I do not agree at all). The evaluation of courses and lectures is seen as a student-centered instrument for improving the quality of teaching.
W	
Web site	Students give an assessment of the information provided by the university on the university website. This includes e.g. accessibility, quality and quantity of information and – for non – English universities the translation into English. Six-point scale(I fully agree – I do not agree at all)

Appendix 7: Frequently asked Questions (FAQ)

In the frequently asked questions section of the U-Multirank website (www.u-multirank.eu/faq), visitors get an overview of the most frequently asked questions as well as the answers to them provided by the U-Multirank team. The questions are categorised by theme. Country specific questions are in a separate category.



Visitors may also pose new questions. To use this option, visitors need to register.



Appendix 8: Questionnaires

Welcome to the U-Multirank institutional questionnaire

The questionnaire consists of eight sections. To go to a section, click on edit. You may save the information entered and resume later. When all information in a section is provided and saved, the status bar will be all green. When all sections are completed you can submit the information (see ninth section). For each question an explanation or comment is available by moving the cursor over the question mark. Further explanation is also provided in the glossary.

The default reference year is 2008 (calendar year 2008 or academic year 2008-2009).
For comparability reasons this is the preferred reference year. If data are not available for that year a different year may be specified, although this may cause in some cases an error as data that are used to calculate an indicator have to refer to the same year.

	General Information			
1	Name & Contact			
	Name of institution	text	Please specify the name you want to appear in the U-Multirank classification. This may be your official name as stipulated in legal registry or founding act, or your name in a different language.	This information will be used to identify your institution
	Name of the official contact person	text	The name of the person who will act as the contact person for the institution and the U- Multirank team in the data collection and the verification of data.	This information will be used for contacting the institution.
	Position of official contact person	text	Please specify the position of the official contact person in the institution	
	E-mail address of official contact person	text		This information will be used for contacting the institution.
	Website of the institution	text	Please specify the official website address of the institution.	
2	Public/private and age			
	What is the legal status of your institution?	text	Please specify the official legal status of the institution (in national language). For more detailed information see the glossary.	The legal status will be used as a context variable.

	How would you characterize your institution?	○ public	An institution is classified as **public** if it is controlled and managed: - Directly by a public education authority or agency or, - Either by a government agency directly or by a governing body (Council, Committee etc.), most of whose members are either appointed by a public authority or elected by public franchise. http://www.oecd.org/dataoecd/45/17/33692376.pdf	The public/ private character will be used as a context variable.
		○ private	An institution is classified as **private** if: - It is controlled and managed by a non-governmental organization (e.g. a Church, a Trade Union or a business enterprise), or - Its Governing Board consists mostly of members not selected by a public agency.	
		○ government dependent private	A **government-dependent private** institution is a private institution that receives more than 50 per cent of its core funding from government agencies, or one whose staff is overwhelmingly paid by a government agency.	
	When was the institution in its current constitution founded?	text	Please specify the year the current institution was founded	The age of the institution is used as a context variable
	If the institution comprises merged institutions, when was the oldest part founded?	text	Please specify the year the oldest part of the institution was founded.	The age of the institution is used as a context variable
3	University Hospitals			

	Does the institution comprise or is it affiliated to a university hospital?		Data should include all information on university hospitals related to teaching and research activities. Information related to patient care should not be included. If different information is included, please specify in the 'comments'-section.	
		○ Yes, comprises a university hospital		
		○ Yes, is affiliated to a university hospital		
		○ No		
	Does the information provided in this questionnaire comprise data on university hospitals?	○ Yes		
		○ No		
4	comments	text		

	Students			
	All information refers to headcount data over the academic year 2008-2009. If information refers to a			

	different period please specify the reference year and add a comment in the ‘comments’-section. If information is not available please fill in NA and comment in the 'comments'-section			
1	Student numbers			
	Total number of students enrolled	text	Please specify the headcount number of degree seeking students, including all levels of programs.	This information is used to determine the student profile.
	Total number of doctoral students	text	Please specify the headcount number of doctoral students.	
	Are doctoral students counted as students or staff?	○ Student	In some systems doctoral students are not counted as students but as academic staff. To obtain comparable data on academic staff and student numbers, those doctoral students need to be identified.	
		○ Staff		
	Total number of student internships in local enterprise	text	Please specify the number of student internships in local enterprises started in the reference year	This information is used determined the student profile.
	Degree seeking students with a foreign qualifying diploma	text	Number of degree seeking students who got access to the program based on a qualification awarded abroad	This information is used to determine the international orientation.
	Degree seeking students with a foreign nationality		Number of degree seeking students with a foreign nationality.	This information is used to determine the international orientation.

		text		
	Number of incoming students in international exchange programs	text	Number of students who come from abroad to the higher education institution for a period of at least three months within the framework of a subsidized exchange program.	This information is used to determine the international orientation.
	Number of students sent out in international exchange programs	text	The number of students going abroad to another higher education institution for a period of at least three months within the framework of a subsidized exchange program.	This information is used to determine the international orientation
	Number of students in (international) joint programmes	text	A joint or double degree program is a program set up in close cooperation between two or more partners. Successful conclusion of the program leads to diploma's of both the home institute and the partner institute(s).	
2	comments	text		

	Programme information			
	All information refers to headcount data over the academic year 2008-2009. If information refers to a different period please specify the reference year and add a comment in the 'comments'-section. If information is not available please fill in NA and comment in the 'comments'-section			
1	Programmes offered			

	Total number of bachelor degree programmes offered	text	Please specify the total number of bachelor programmes offered.	
	Number of bachelor programmes offered in a foreign language	text	Please specify the number of programmes offered in a foreign language only.	
	Total number of master degree programmes offered	text	Please specify the total number of master programmes offered.	
	Number of master programmes offered in a foreign language	text	Please specify the number of programmes offered in a foreign language only.	
	Number of CPD courses offered	text	Please specify the number of continuous professional development courses offered. For further information see the glossary.	
	Number of interdisciplinary programmes offered	text	Please specify the number of bachelor and master programmes that involve at least two traditional disciplines.	
2	comments	text		

	Graduates			
	All information refers to headcount data over the academic year 2008-2009. If information refers to a different period please specify the reference year			

	and add a comment in the ‘comments’-section. If information is not available please fill in NA and comment in the 'comments'-section			
1	Graduates			
	Total number of degrees awarded		Please specify the number of degrees awarded in the reference year. Included are Associate degrees (short first cycle), Bachelor degrees (first cycle), Master degrees, as well as pre-Bologna degrees (second cycle), as well as PhDs and other third cycle degrees.	
	Degree theses awarded in co operation with regional enterprises		Please specify the number of degree theses awarded in co-operation with regional enterprises in the reference year.	
	doctorate degrees awarded		Please specify the number of doctorate degrees awarded in the reference year	
	Doctorate degrees awarded to foreign students		Please specify the number of doctorate degrees awarded to students with a foreign nationality in the reference year	
	Average time to degree for bachelor students		Please specify the average time to degree for bachelor students (in months) over the last three years.	
	Average time to degree for master students		Please specify the average time to degree for master students (in months) over the last three years	
	Bachelor graduation rate		Please specify the percentage of a cohort of bachelor students who graduated within five years after entering the programme	

	Master graduation rate		Please specify the percentage of a cohort of master students who graduated within three years after entering the programme	
	International doctorate graduation rate		Please specify the number of doctorate degrees awarded to students with a foreign nationality, as a percentage of the total number of doctorate degrees awarded.	
	Graduate employment	%	Please specify the total number of graduates employed 18 months after graduation. If data refer to a different time span between graduation and data collection please specify in 'comments'.	
	Graduate earnings; bachelor	€	The monthly earnings of bachelor graduates 18 months after graduation. An exchange rate table can be found at www.u-multirank.eu/exchangerate.doc	
	Graduate earnings; master	€	The monthly earnings of master graduates 18 months after graduation. An exchange rate table can be found at www.u-multirank.eu/exchangerate.doc If data refer to a different times pan between graduation and data collection please specify in 'comments'.	
	Percentage of graduates working in the region 1,5 years after graduation	%	Please specify the number of graduates from 18 months ago, who work in the region, as a percentage of the total number of graduates from 18 months ago. This question refers to all levels combined. If data refer to a different time span between graduation and data collection please specify in 'comments'.	
	region used	text	What a region is is not always clear. Often used definitions are the NUTS2 regions and the regions as described in the IRE network. Please specify what region you used in this item. For listings of regions see http://www.innovating-regions.org/network/whoswho/regions_search.cfm or http://ec.europa.eu/eurostat/ramon/nuts/codelist_en.cfm?list	

			=nuts.	
	if no exact data are available please indicate what percentage range applies.	○ less than 1%	Please tick the range you think applies to your institution.	
		○ between 1 and 5%		
		○ between 5 and 10%		
		○ more than 10%		
2	comments	text		

	Staff			
	All information refers to data for the year 2008. If information on this period is not available please specify the reference year to which the data provided refer to and add a comment in the 'comments'-section. If information is not available please fill in NA and comment in the 'comments'-section.			

1	Staff			
	number of academic staff (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.	
	number of post doc positions		The number of persons (headcount) holding a temporary post-doc position	
	number of academic staff with foreign nationality		The number of academic staff (headcount) with a foreign nationality	
	number of doctoral students with foreign nationality, counted as academic staff		The number of doctoral students (headcount) counted as academic staff)	
	number of fte staff working in international office		The number of employees working in international offices, in fte	
	number of employees (FTE) working in Technology Transfer Office		The number of employees working in technology transfer offices, in fte	
	presence of technology transfer activities as part of the performance appraisal system	○ Yes	Does the performance appraisal scheme include criteria related to technology transfer activity?	

		○ No		
	presence of research performance as part of the performance appraisal system	○ Yes	Does the performance appraisal scheme include criteria related to research output performance?	
		○ No		
2	Comments	text		

	Income			
	All information refers to Euros. To convert data in different currencies to euro's, you may use the exchange rates specified in www.u-multirank.eu/exchangerate.doc If information is not available please fill in NA and comment in the 'comments'-section.			
1	Income			
	Total income	x1000 Euros	Please specify the amount in 1,000 Euros	
	Please specify a breakdown of total income by activity related source			
2	Income from Teaching			
	Direct government funding for teaching	x1000 Euros	Please specify the amount in 1,000 Euros. This information refers to the government funding of teaching activities. Project based funding related to teaching activities (including innovation of teaching practice, inclusion of deprived groups) should be included. Funding for teaching hospitals (sometimes referred to as academic hospitals or university hospitals) is excluded from educational revenues, particularly all funding for patient care and other general expenses of academic hospitals, even if such expenses are paid by the education authorities. However, funding for teaching hospitals that it is directly and specifically related to the training of medical personnel, is included.	
	Tuition fees from students in degree programmes		Please specify the amount in 1,000 Euros. The income from tuition fees refers to the net tuition fee income, excluding the tuition fees the institution has to transfer	

		x1000 Euros	to the government. Fees paid for ancillary services lodging, meals, health services, and fees paid for other welfare services furnished to students by the educational institutions) should be excluded here (and should be included in 'other income').	
	courses organised within the framework of continuing professional development	x1000 Euros	Please specify the amount in 1,000 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 programs, some of which have an option of accreditation. This job-related continuing education and training refers to all organised, systematic education and training activities in which people take part in order to obtain knowledge and/or learn new skills for a current or a future job, to increase earnings, to improve job and/or career opportunities in a current or another field and generally to improve their opportunities for advancement and promotion. CPD activity is not part of the regular teaching activities supported through the institution's general grants and tuition fees paid by students enrolled in degree programs.	
3	Income from Research			
	Direct basic government funding for research	x1000 Euros	Please specify the amount in 1,000 Euros. This category includes all amounts received as direct government funding ('core funding') by the institution through acts of a legislative body (i.e. ministry or national funding agency), except for competitive grants and contracts. The adjective "basic" or "core" means recurrent funding that is normally awarded each year.	

			In many universities, the direct basic funding for research is part of the general institutional funds that the institution receives as an integrated amount (i.e. a 'block grant', or 'lump sum') for its education, research and other services. In that case, an estimate is to be provided for the part devoted (directly and indirectly) to research. The remaining parts then go under other categories, such as education. Any funding for the service function of academic hospitals should be excluded.	
	European research programmes	x1000 Euros	Please specify the amount in 1,000 Euros. This category includes research funds administered by the European Commission, or – on its behalf - one of its bodies. The largest European research program is the Framework program (FP7), but there are also other research programs administered by the European Union that allocate funds to higher education institutions, such as European Structural funds. Please note: Funds awarded by the European Research Council (ERC) are included in the category "Research Councils" (below). Institutions outside Europe, or the European Union normally do not qualify for this funding and, consequently, will not report any funds here.	
	Other international competitive research programmes	x1000 Euros	Please specify the amount in 1,000 Euros. This category includes revenues received from public bodies and agencies outside of the country in which the institution operates - as long as these revenues are for specific research projects and not awarded in the context of a European research program (see item "European research programs'). If the funds are administered by a research council from abroad, they should go under the heading "research councils" (below).	
	Research councils		Please specify the amount in 1,000 Euros. Revenues from government agencies and other public bodies,	

	licensing agreements	x1000 Euros	Please specify the amount in 1,000 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 your institution has received as licensor of the patents it holds.	
	privately funded knowledge transfer contracts	x1000 Euros	Please specify the amount in 1,000 Euros. Income from competitive or non-competitive public research funding is to be excluded here.	
	copyrighted products	x1000 Euros	Please specify the amount in 1,000 Euros. Income from copyrighted products for which the institution holds the copyright. Copyrighted products are manuscripts, designs, software, and goods of an artistic or literary nature protected by copyright law. Copyright is a right to prevent copying of original literary, artistic and musical works, and computer software. "Original" means that the work is the creation of its author, not being copied from any other work. The copyrights protect the creator's right to be appropriately acknowledged for their work and give the creator a means of controlling how their protected work is exploited, thereby ensuring that they are properly rewarded for their creative endeavors.	
	Income from other sources	x1000 Euros	Please specify the amount in 1,000 Euros. Income from charitable donations, interest, fees paid to institutions for ancillary services, rents paid by private organisations; and earnings from private endowment funds.	
5	Comments	text		

	Expenditure			
	All information refers to Euros. To convert data in different currencies to euro's, you may use the exchange rates specified in www.u multirank.eu/exchangerate.doc If information is not available please fill in NA and comment in the 'comments'			
1	Expenditure			
	Total expenditure	x1000 Euros	Please specify the total amount in 1,000 Euros spent in the reference year. The total expenditure of the institution, including current expenditure and capital expenditure. Total expenditures include expenditures for educational services, research, knowledge transfer and other services.	
	Breakdown by costcenter:		Please indicate what percentage of expenditure is dedicated to the activity mentioned	
	teaching	%	Expenditure on teaching activities, CPD activities excluded. Expenditure on management and organization of teaching is to be included. Some institutions are engaged in teaching as well as research. This makes it difficult to single out teaching-related expenditure. In this case we only request an estimate of the share of teaching in the total activity.	
	Research	%	Expenditure on management and organization of research is to be included. Some institutions are engaged in teaching as well as research. This makes it difficult to single out research-related expenditure. In this case we only request an estimate of the share of research in the total activity.	
	Knowledge transfer		Knowledge transfer, or knowledge exchange, includes research commercialization, activities organized within	

		%	the framework of continuing professional development (CPD), the institution's regional engagement and other activities aimed at disseminating the knowledge and expertise of the institution to business, the public sector, cultural and community partners, and other societal entities. As such, knowledge transfer is broader and more encompassing than technology transfer. *Please indicate the percentage (estimated) of the institution's total expenditure dedicated to the knowledge transfer activity.*	
	Other	%		
	The breakdown is based on estimates	○ Yes		
		○ No		
2	Coverage			
	Are all staff on the pay roll of the institution?	○ Yes	This question seeks to capture the extent to which an institution's staff carries out teaching and research duties on behalf of the institution while receiving a salary from a third party. If (a large amount of) staff is on the payroll of a ministry or regional government, this should be indicated.	
		○ No		
	Are all buildings owned by the institution?	○ Yes	This question seeks to clarify the extent to which the institution is the prime responsible actor for maintaining and investing in its infrastructure. The answer to this question provides important contextual information for	

			interpreting expenditure data.	
		○ No		
3	Comments			

	Research and knowledge transfer			
	All information refers to the year 2008. If information refers to a different period please specify the reference year and add a comment in the ‘comments’-section. If information is not available please fill in NA and comment in the 'comments'-section			
1	Research and knowledge transfer			
	Number of peer reviewed academic publications		A count of peer reviewed academic publications of the institution. This includes PhD dissertations and books. Peer review (also known as refereeing) is a process of subjecting an author's scholarly work, research, or ideas to the scrutiny of others who are experts in the same field, before a paper describing this work is published in a journal, book or conference proceedings.	

	Number of professional publications		A count of all publications published in journals/books/proceedings that are addressed to a professional audience and that can be traced bibliographically. These publications are not peer reviewed as in the category academic publications.	
	Number of international networks the institution participates in actively		The number of international networks a HEI participates in.	
	The number of international prizes and scholarships won for research work		The number of international prizes and scholarships won for research work	
	Total number of collaborative research projects		Total number of research projects with partners from outside the higher education institution	
	The number of research projects with regional firms		Total number of research projects with partners from the region (NUTS2 or NUTS3)	
	The number of licence agreements		The average number of license agreements signed over the last three years	
	The number of patents awarded to the higher education institution or its employees		The number of patents awarded to the higher education institution or its employees	
	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 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.	
	Number of cultural awards and prices won		Number of cultural awards and prizes won	

	Art related output		Count of all relevant research-based tangible outputs	
	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.	
2	Comments	text		

Welcome to the student survey of the U-Multirank project!

Your opinion is important.

U-Multirank project which is undertaken by the CHERPA network is going to develop a concept and test the feasibility of a multi-dimensional global university ranking. One of the major aims of such a ranking will be to give information to students helping them to make an informed choice on their university/higher education institution on an international scale.

Students' judgements on their own institution and programme play an important role in informing prospective students. Therefore we ask for your opinion on several aspects on the conditions and quality of your studies as well as on some aspects of your student life like cost of living or accommodation.

The survey will not be used in a published ranking as U-Multirank is only a feasibility study! Your answers will help to design future international rankings. Your own institution will get a comparison of the results from their own students to the other average of the participating institutions. So your answers will help your university to enhance the quality of programmes. – Please give a fair and honest evaluation of your institution.

Taking part in the survey is optional and anonymous. The password for the questionnaire is derived randomly; there is no connection to your person. The necessary information for accessing the questionnaire was distributed by your university. Data is used only for the U-Multirank project.

Filling in the questionnaire will take about twenty minutes time.

Thank you very much!

Gero Federkeil
gero.federkeil@che-ranking.de
Isabel Roessler
isabel.roessler@che-ranking.de

Please insert your password here:

Login

4%

At which Higher Education Institution (HEI) are you currently enrolled?

Please select the country of your universiy/higher education institution first!

--- Please select ---

- --- Please select ---
- Algeria
- Argentina
- Australia
- Austria
- Belgium
- Bulgaria
- Burkina Faso
- Canada
- China
- Cyprus
- Czech Republic
- Denmark
- Egypt
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary

Next

Please select the institution you are currently enrolled.

--Please select --

In which field/subject are you currently enrolled?

If more than one of the subjects listed apply, please mark your major subject. Please stick to that field througout the whole questionnaire.

- ◯ Business / Management
- ◯ Mechanical / industrial engineering
- ◯ Electrical engineering
- ◯ Other:

Please indicate the degree you are seeking in your current programme in that field.

If more than one of the degrees listed apply, please mark one degree and stick to that degree throughout the whole questionnaire.

- ◯ Bachelor
- ◯ Master
- ◯ Short national first degree (up to 3 years)
- ◯ Long national first degree (more than 3 years)
- ◯ Other postgraduate programme

What is the exact name of the programme in which you are currently enrolled?

Name of programme:

All in all, how would you evaluate your entire education experience at this institution?

Very good					Very bad	not applicable
○	○	○	○	○	○	○

How would you evaluate the course delivery / teaching in your programme?

	I fully agree					I do not agree at all	not applicable
Courses							
There is a wide range of courses offering a view on different theories, methods and topics	○	○	○	○	○	○	○
The courses / modules follow a coherent integrated whole	○	○	○	○	○	○	○
Teaching stimulates a deeper reflection of my field of study	○	○	○	○	○	○	○
Teaching staff are qualified and are good at explaining things	○	○	○	○	○	○	○
Teaching refers to international developments in my field (literature, research)	○	○	○	○	○	○	○
Courses offer useful links to other fields / disciplines	○	○	○	○	○	○	○
Learning materials made available on my course have enhanced my learning	○	○	○	○	○	○	○
Training in empirical methods / statistics is good	○	○	○	○	○	○	○

How would you evaluate the research orientation of your programme?

	I fully agree					I do not agree at all	not applicable
Leading edge research is presented in lectures and courses	○	○	○	○	○	○	○
The programme offers opportunities to participate in research projects	○	○	○	○	○	○	○
Relevant research methods of the field are taught	○	○	○	○	○	○	○
Introductory classes/courses to academic research and writing have been helpful	○	○	○	○	○	○	○

How would you evaluate the following situation:
In a term you want to take five courses; due to organisational reasons (overlapping times, not enough places), you get a place in three out of those 5.
In this situation I would be ...

very satisfied				very dissatisfied	I don't know
○	○	○	○	○	○

How would you evaluate the organisation of the programme and of examinations?

	I fully agree					I do not agree at all	not applicable
Entrance requirements/admission regulations were made transparent	○	○	○	○	○	○	○
The programme is organised in a way that allows to graduate within the norm time	○	○	○	○	○	○	○
I have a good access to classes (no waiting lists, no overlaps in time)	○	○	○	○	○	○	○
Average class size is not too big for effective learning	○	○	○	○	○	○	○
The offered courses are - compared to the study guide - complete	○	○	○	○	○	○	○
Examinations are related to the course content taught	○	○	○	○	○	○	○
The examination system (e.g. criteria, procedures) is transparent	○	○	○	○	○	○	○
I receive regular and prompt feedback on my work by teachers	○	○	○	○	○	○	○

How would you evaluate the practical orientation of your programme?

	I fully agree					I do not agree at all	not applicable
I feel well informed about about relevant occupational fields	○	○	○	○	○	○	○
Practical elements are sufficiently included in the study programme	○	○	○	○	○	○	○
The number of courses related to practice is sufficient	○	○	○	○	○	○	○
Project learning and other practical elements have a high quality	○	○	○	○	○	○	○

How would you evaluate the inclusion of work experience into your programme (e.g. internships)?
If you cannot answer these questions, e.g.because you did not do an internship, please mark "not applicable".

	I fully agree					I do not agree at all	not applicable
The opportunities of including a practical work period/an internship are sufficient	○	○	○	○	○	○	○
I received appropriate support by the university in finding a place for an internship/work placement	○	○	○	○	○	○	○
The placement/internship was well integrated into the programme (contents, competencies)	○	○	○	○	○	○	○
I received sufficient supervision on my placement/internship by teachers from my university	○	○	○	○	○	○	○

How much time per week (during term) do you usually spend with personal communication with teaching staff outside course?
Average numer of contact hours to teaching staff per week:

_____ hours/week

How would you evaluate the quality of advice by teaching staff in your programme?

	I fully agree					I do not agree at all	not applicable
I am in close contact with teachers/ professors (e.g. during office hours, via e-mail)	○	○	○	○	○	○	○
Good advice by teachers is available when I need it	○	○	○	○	○	○	○
I receive sufficient feedback on my work (e.g. on homework, presentations, exams)	○	○	○	○	○	○	○
I receive sufficient supervision in laboratory tutorials /IT-tutorials	○	○	○	○	○	○	○
I receive sufficient support during individual study time (e.g. through self-learning platforms)	○	○	○	○	○	○	○

Please give your opinion about the evaluation of teaching and learning in your programme.

Course evaluations	I fully agree					I do not agree at all	not applicable
Course evaluations by students regularly take place (coverage, regularity)	○	○	○	○	○	○	○
Course evaluations include relevant aspects	○	○	○	○	○	○	○
I feel well informed about evaluation outcomes	○	○	○	○	○	○	○
My experience is that the results from evaluations are addressed	○	○	○	○	○	○	○
Students are sufficiently included in large scale evaluations (e.g. self-reports, peer reviews, commissions)	○	○	○	○	○	○	○

Have you already studied abroad?

- ○ Yes, I already studied abroad during my current programme, exchange programme (e.g. ERASMUS)
- ○ Yes, I already studied abroad during my current programme, self-organised
- ○ No, I have not yet studied abroad

How would you evaluate the opportunities and support of your university for studying abroad?

	I fully agree					I do not agree at all	not applicable
The foreign partner institutions of my university are attractive	○	○	○	○	○	○	○
There are enough places available for a stay abroad	○	○	○	○	○	○	○
I received sufficient support and advice to study abroad	○	○	○	○	○	○	○
There is sufficient financial support for studying abroad	○	○	○	○	○	○	○
The recognition of the results obtained (credits) abroad in my home university was easy	○	○	○	○	○	○	○
The study abroad was well integrated in my home programme	○	○	○	○	○	○	○

How would you evaluate the rooms at your university?

	I fully agree					I do not agree at all	not applicable
Lecture halls / seminar rooms							
...are in good physical condition	○	○	○	○	○	○	○
...the number of places is sufficient with regard to class size	○	○	○	○	○	○	○
...technical facilities are up-to-date	○	○	○	○	○	○	○
In General the buildings/architecture of my university							
... create a stimulating athmosphere	○	○	○	○	○	○	○

How would you evaluate this library?

You are trying to lend three books in your library; only two are available and only one of the missing three is available by interlibrary loan.

very good				very bad	I don't know
○	○	○	○	○	○

Please give your opinion about the library (libraries) available at your university.

	I fully agree					I do not agree at all	not applicable
Literature necessary for my studies is available when I need it	○	○	○	○	○	○	○
There is a large on-site stock of non-electronic literature (books, journals, ...)	○	○	○	○	○	○	○
Relevant electronic journals are available and easily accessible	○	○	○	○	○	○	○
I can use many facilities to search for literature (e.g. online catalogues, DVD)	○	○	○	○	○	○	○
The library offers access to relevant data bases in my field	○	○	○	○	○	○	○
User services and support are available and competent	○	○	○	○	○	○	○
Online-user services like ordering and reserving books are organized well	○	○	○	○	○	○	○
There are enough quiet study areas/places	○	○	○	○	○	○	○
Hours of operation are satisfactory	○	○	○	○	○	○	○

How would you evaluate the IT facilities for students?

	I fully agree					I do not agree at all	not applicable
The availability of internet access for students on campus is adequate	○	○	○	○	○	○	○
The availability and the speed of Wi-Fi on campus is satisfactory	○	○	○	○	○	○	○
The hardware equipment of computers is modern and satisfactory	○	○	○	○	○	○	○
The availability of printing facilities is adequate	○	○	○	○	○	○	○
Relevant/necessary software is installed on computers that can be used by students	○	○	○	○	○	○	○
Maintenance of the computers is good	○	○	○	○	○	○	○
Electronic administration of student accounts is effective (registration, exam results...)	○	○	○	○	○	○	○
User support is available and professional	○	○	○	○	○	○	○

Please give your opinion about the information provided by your university on the university website

	I fully agree					I do not agree at all	not applicable
Overall website of university							
Accessibility, quality and quantity of information is sufficient	○	○	○	○	○	○	○
For non-English universities: an adequate translation into English is available	○	○	○	○	○	○	○
Website of the study programme							
I find sufficient information on organisational issues of my programme	○	○	○	○	○	○	○
Information on lectures/seminars is available and up-to-date (time schedules, literature lists, etc.)	○	○	○	○	○	○	○
For non-English universities: an adequate translation into English is available	○	○	○	○	○	○	○

On your campus WI-Fi / Wireless internet connection for students is available

- ○ not at all
- ○ only in some roooms / some buidlings
- ○ in all class rooms

As far as electronic learning elements are offered in your study, how would you evaluate the following services?

	I fully agree					I do not agree at all	not applicable
Electronic materials/scripts							
A high number of courses in my study programme offer online materials	○	○	○	○	○	○	○
The materials are of high quality	○	○	○	○	○	○	○
Possibility for online communication (e.g. chats, interactive study materials)							
A high number of teachers in my study programme offer this	○	○	○	○	○	○	○
Those tools are of high quality	○	○	○	○	○	○	○
Self learning tools							
...are available and easy to access	○	○	○	○	○	○	○
...are helpful to my learning	○	○	○	○	○	○	○

Please quantify the (typical) weekly time you spend for learning in class and for self-learning (incl. preparation, reading)
Please give the hours per week

Learning in class (e.g. courses and lectures)	
Self-learning	

How would you evaluate the social climate and the environment at your university?

	I fully agree					I do not agree at all	not applicable
The contacts/relation to other students stimulates working and learning together	○	○	○	○	○	○	○
There is a good relationship between students and teachers	○	○	○	○	○	○	○
There is a positive attitude towards students in town/city	○	○	○	○	○	○	○
Security is satisfactory on campus and in town/city	○	○	○	○	○	○	○

Please give your opinion about the services at your university.

	I fully agree					I do not agree at all	not applicable
General Student Information services offer good advice and services	○	○	○	○	○	○	○
Accommodation services offer good advice and services	○	○	○	○	○	○	○
Student funding office/services offer good advice and services	○	○	○	○	○	○	○
Career services offer good advice and services	○	○	○	○	○	○	○
International Office offers good advice and services	○	○	○	○	○	○	○
Student groups / organisations / associations are active and helpful	○	○	○	○	○	○	○
For international students: Special services for international students offer good advice and services	○	○	○	○	○	○	○

What is your accomocation during this term?

- ◯ Student residence, on campus
- ◯ Student residence, not on campus
- ◯ Private accomodation, living alone
- ◯ Private accomodation, living with friends
- ◯ Private accomodation, living with partner
- ◯ Living with parents
- ◯ Other

Are you satisfied with your housing situation in terms of...

	yes	no	not applicable
...quality/standard	◯	◯	◯
...costs	◯	◯	◯
...security	◯	◯	◯

How big is your house or room (square metres)?
In case you share an apartment, please tell us the size of the whole appartment.

Square metres

How much do you pay on average for rent, including gas, water and electricity?
In case you share an apartment, please tell us the total costs for the whole appartmentent (incl. gas, water and electricity etc.).

Costs

Currency

What is the distance between your regular accomodation during term and your campus?

- ◯ I am living on campus
- ◯ Distance (one way in kilometres):

How relevant are the follwoing issues for your overall opinion on the quality of your university and your learning experience.
(We want to know which informnation is most relevant for prospective students who are one of the main target groups of the ranking developed by U-Multirank.)

	very relevant					not relevant	not applicable
Quality and delivery of courses	○	○	○	○	○	○	○
Organisation of programme and examination	○	○	○	○	○	○	○
Research orientation of your programme	○	○	○	○	○	○	○
Pracitcal orientation of prgramme	○	○	○	○	○	○	○
Inclusion of work experience	○	○	○	○	○	○	○
Coaching/support by teaching staff	○	○	○	○	○	○	○
Evaluation of teaching and learning	○	○	○	○	○	○	○
Support for studying abroad	○	○	○	○	○	○	○
Rooms	○	○	○	○	○	○	○
Libraries	○	○	○	○	○	○	○
IT facilities	○	○	○	○	○	○	○
Website of the university and the study programme	○	○	○	○	○	○	○
E-Learning instruments	○	○	○	○	○	○	○
Social climate at the university	○	○	○	○	○	○	○
Student services	○	○	○	○	○	○	○
Accomodation	○	○	○	○	○	○	○
other:							
	○	○	○	○	○	○	○

Finally, we would like to ask for some personal information :

What is your age?

[ ] years

Gender

- ◯ Female
- ◯ Male

Year of first enrolment in current programme

--- Please select ---

Have you been enrolled at another Higher Education Institution previous to your studies at your current Institution?

- ◯ No
- ◯ Yes
  In which year did you change to your current institution? Year: [ ]

Do you study full-time, part-time or are you inactive at this moment?

- ◯ I am a full-time student
- ◯ I am a part-time student, but I am enrolled in a programme that is designed for full-time students
- ◯ I am a part-time student and I am enrolled in a programme that is designed for part-time students
- ◯ I am formally enrolled but not studying actively

Was your current institution your first choice?

- ◯ Yes
- ◯ No

How do you finance your study and costs of living?
Please fill in the approximate share (in %) of each category!

Job in my university, approx. %	
Job outside university, approx. %	
Scholarship / bursaries, approx. %	
Repayable loan, approx. %	
Parents, partner, relatives, approx. %	
Savings, approx. %	
Other sources, approx. %	

If you were educated in other countries than that of your actual residence, please indicate:

Country in which you acquired your higher education entrance qualification

--- Please select ---

Comments on the questionnaire

We appreciate your comments on the comprehensibility of the questions. How well did you understand them? How clear are they formulated?

How relevant are the questions to your learning experience and to the situation in your country?

General remarks (e.g. relevant issues that are missing, technical issues)

Finally, we would like to ask you some questions about the process of organising the student survey at your institution.

How did you obtain the password letter?

- ○ The invitation came by postal mail
- ○ The invitation came by e-mail
- ○ The invitation was given to me during a lecture / seminar
- ○ The invitation was distributed on campus
- ○ Other:

Who informed you about the upcoming student survey?
(Multiple answers are possible)

- ☐ I was notified only through the invitation letter
- ☐ My university/institution sent me an additional letter / e-mail message
- ☐ Our professors / teachers informed us during class
- ☐ The student union informed me about the survey
- ☐ I read a notice on the webpage / on a bill-board of my instiitution
- ☐ Other:

If you have obtained additional information or instructions about this survey, you can describe it here briefly.

U-Multirank

100%

Thank you very much for sharing your views.

Further information about the project is available on the project website:

www.u-multirank.eu

In case of any questions please contact:

Gero Federkeil
gero.federkeil@che-ranking.de

Isabel Roessler
isabel.roessler@che-ranking.de

print version

Institution/University: Hochschule u07 [alt]
Faculty/Department/Unit:
Field: Business

U-Multirank Feasibility Study

Questionnaire for faculties / departments

Field: Business

A) Overview

1 Please give the **full name and address** of the **unit responsible for organising Business**.	
Name of university:	
Faculty/department:	
Institute or other body, if applicable:	
Street:	
Postal code, town / city:	
Country:	- please select -
Website:	
Telephone:	
Comments:	
Comments U-Multirank:	

Please name a contact person who would be available to respond to possible **queries** about this questionnaire:	
Contact person:	
Position / Unit:	
Phone:	
E-mail:	

Part 1: Details about the department

B) Staff and PhD

The question(s) of this page has been forwarded to start@markuslueck.de for editing.

Editor:	Date of editing: (please use: dd.mm.yyyy)

2 Please give the numbers of **academic staff in Business** (professors and other academic staff; full-time equivalent) employed in your department for the years **2007 to 2009**.

Staff (filled posts)	**Full-time equivalent academics in Business**			
	2007 31/12	**2008** 31/12	**2009** 31/12	**2009:** thereof with completed PhD
Professors*				
Other Academic staff**				
Comments:				
Comments U-Multirank:				

* according to national higher education legislation
** involved in teaching and/or research; holding at least a first degree, excluding PhD students

3 Please give the head count of professors in **Business** in the academic year 2009/10.

	Number of professors (head count)	**thereof:**	
		female	**hired from abroad* (last 5 years)**
Number			
Comments:			
Comments U-Multirank:			

* irrespective of citizenship

4	Please state the extent of the contribution **international visiting/guest professors** made to teaching in **Business** in the academic year 2009/10 with lectures offering credit points (at least 2 credits, no single lectures/talks). Please also state for these lectures the number of possible credits for their lectures/courses.		
		Academic year 2009/10	
		Number of guest/visiting professors	**Total number of credits**
	International visiting professors giving lectures in your department in **Business** (at least 2 credits)		
	Comments:		
	Comments U-Multirank:		

5	Please state the extent to which professors of your department contributed to teaching in **Business** at foreign HEIs in the academic year 2009/10 with lectures offering credit points (at least 2 credits, no single lectures/talks). Please also state for these lectures the number of possible credits for their lectures/courses.		
		Academic year 2009/10	
		Number of outgoing professors	**Total number of credits**
	Professors in the department Business offering lectures **abroad** (at least 2 credits)		
	Comments:		
	Comments U-Multirank:		

6 Please indicate the number of **professors with work experience** outside higher education (business, administration,...) after 2004.	
	Number (head count)
Professors with work experience outside HE	
Comments:	
Comments U-Multirank:	

Editor:	Date of editing: (please use: dd.mm.yyyy)

7 Please indicate the number of **PhDs** completed in **Business** in the period indicated with the principal examiner coming from your department.

Academic year*		**2007/08**	**2008/09**	**2009/10**
Number of completed PhDs	**Total number**			
	... by women			
	... by international students**			
	... in co-operation with enterprises/business			
Comments:				
Comments U-Multirank:				

* If not available for academic years: alternatively for calendar years 2007, 2008 and 2009.
** Definition: with first degree obtained abroad

8 Please give the **number** of post-doc positions in **Business** in the academic year 2009/10.

	Number of post-doc positions in academic year 2009/2010	**thereof:**	
		female	**international***
Numbers			
Comments:			
Comments U-Multirank:			

* Definition: with at least one degree obtained abroad

C) Funding

Editor: Date of editing: (please use: dd.mm.yyyy)

Please estimate the amount of **external research funds** (research promotion and/or contract research) spent by your department in **Business** in the last three years (2007, 2008, 2009).

Please do **NOT** state the total amounts spent on the relevant research projects but **ONLY** the **funds SPENT in the relevant year.**

Example: For a project that started in 2006 and was completed in 2009 only the amounts spent from 2007 to 2009 are to be listed in the following table.

For joint projects with other departments/other institutions please give only the amount spent by your department!

9

N.B. Funding for basic equipment are to be **excluded** from your calculations.

Please choose the currency in which you'll give the information:

Currency

Third party funds	**2007 in 1.000 € / US-$**	**2008 in 1.000 € / US-$**	**2009 in 1.000 € / US-$**
From national science foundations			
From national government authorities (national or federal)			
From national foundations			
From industry/private business			
From regional/local sources			
From international/foreign institutions			
From other sources			
Total			
Thereof **third party funding for services rendered** (e.g. material testing)			
Thereof **third party funding of professorships**			
Comments:			
Comments U-Multirank:			

Explanation: Third party funds are only those for which you have to apply regularly, submitting fresh applications as part of an assessment process.

Editor:	Date of editing: (please use: dd.mm.yyyy)

10 License agreements/income: Please give the number of license agreements and the income raised from licenses in **Business**.

Licenses	**2007**	**2008**	**2009**
No. of license agreements			
License income (amount) (Currency as in question 9)			
Comments:			
Comments U-Multirank:			

11 Please indicate if there are **joint R&D projects with local enterprises.**

Joint R&D projects with local enterprises	**No. of projects**	
	Volume (Currency as in question 9)	
Comments:		
Comments U-Multirank:		

Editor:	Date of editing: (please use: dd.mm.yyyy)

12 Please give the **total** number of students enrolled in your department in **Business at present*.**

	Main subject / major in field	**Second subject / minor in field**
Total number of students in Business at the department		
No. of female students		
No. of international students (degree students)**		
No. of international students (exchange students)**		
Comments:		
Comments U-Multirank:		

* Preferably data for academic year 2009/10, otherwise 2008/09 (please indicate)
** Students who got their entry qualification for higher education abroad

13 Please give the **total** number of students enrolled in your department in **Business at present (academic year 2009/10) by degrees.**

Students enrolled in	**Main subject / major in Business**	**Second subject / minor in Business**
Bachelor / undergraduate programmes		
Master / graduate programmes		
PhD programmes		
Other degree programmes		
Comments:		
Comments U-Multirank:		

14 Please indicate how many students in **Business** made **internships** (minimum 4 weeks) in **local** enterprises within the past academic years			
	2007/2008	**2008/2009**	**2009/2010**
Student internships in local enterprises			
Comments:			
Comments U-Multirank:			

15 Please state the number of **degree theses** in cooperation with local enterprises for the period 2007/2008 to 2009/2010.			
	Bachelor / Undergraduate	**Master / Graduate**	**PhD**
Degree theses in cooperation with local enterprises			
Comments:			
Comments U-Multirank:			

16	Does your department offer **continuing education programmes / professional development programmes** in **Business**? Yes ○ No ○ If yes, how many participants / students joined one of those programmes within the past three academic years?

	2007/2008	**2008/2009**	**2009/2010**
Participants in total			
Thereof regional participants*			
Comments:			
Comments U-Multirank:			

* City, surrounding administrative districts

17	Does you department offer **summer schools / courses for secondary education students in Business?** Yes ○ No ○ If yes, how many participants joined the summer schools / courses within the past three academic years?

	2007/2008	**2008/2009**	**2009/2010**
Summer schools			
Courses for secondary education students			
Comments:			
Comments U-Multirank:			

18 Is the department accredited?		
Status of accreditation of department	Has the department or single programme been evaluated by an external agency?	**Only for Business Studies:** The programme is accredited by...
☐ yes, accredited internationally ☐ yes, accredited nationally ☐ no	☐ the department is evaluated and given a numeric score ☐ the department is evaluated but without a numeric score ☐ programme(s) are evaluated and given a numeric score ☐ programme(s) are evaluated but without a numeric score ☐ no	☐ AASCB International ☐ EFMD (EQUIS) ☐ AMBA
Comments:		
Comments U-Multirank:		

19	
a)	Please describe the specific **profile** of your institution in **Business** with regard to **teaching & learning** (max. 600 characters) Website:
b)	Please describe the specific **profile** of your institution in **Business** with regard to **research** (max. 600 characters) Website:
Comments U-Multirank:	

Part 2: Details about the individual study programmes

Please fill in those degree programmes in **Business** which should be included into the ranking.

Please include only programmes, which

- **are already running,**
- are offered as a **main subject/major** in **Business in your department**

Please do not include:

20

- Continuous education / CPD programmes
- Distance education programmes
- Special programmes for teacher education
- Programmes in which first year enrolment is not possible any more

Those programmes can be listed below under "other programmes".

Please mark the degrees: BA; BSc, MA, MSc , PhDs or give a short explanation for other degrees.

a) Please add each programme separately by entering the name and clicking on "add this programme". The programmes added will appear then in the questions to follow.

Business (TEST)

b) Other study programmes:	
Comments:	
Comments U-Multirank:	

21 Please give **basic information** about the programmes.			
	Programme offered since (year)	Standard period of study in years	Actual average time to degree in years
Business (TEST)			
Comments:			
Comments U-Multirank:			

22 Please give some information about **interdisciplinary characteristics** of the programmes.			
	Total number of credits of programme	Thereof: free credits for	
		General studies	Courses in other fields
Business (TEST)			
Comments:			
Comments U-Multirank:			

23 Please describe the programmes according to the following **characteristics**: (Multiple answers are possible)				
	Full time presence learning programme	Part time presence learning programme	Distance education programme	Programme combined with employment
Business (TEST)	☐	☐	☐	☐
Comments:				
Comments U-Multirank:				

Editor:	Date of editing: (please use: dd.mm.yyyy)

24 Please give the following information about **students enrolled in the programmes** in the academic year 2009/2010.

	Number of students			
	Total number of students	Students in their 1st year	Female students	International students*
Business (TEST)				
Comments:				
Comments U-Multirank:				

* Only international students holding a university entrance qualification acquired abroad.

25 Please indicate the number of **study places** and, if applicable, give details about any **tuition fees** (Currency as in question 9).

	Restricted admission in academic year 2009/10	If admission is restricted:		Amount of tuition fees per year:	
		Number of study places for 2009/10	Number of applicants 2009/10	domestic* students	foreign students
Business (TEST)	☐ yes				
Comments:					
Comments U-Multirank:					

* EU countries: EU-students/Non-EU students.

26 Please give details of periods of **work experience** integrated in the programmes.

	Periods of work experience during term		Periods of work experience during vacation		Specific, practice-oriented lectures and tutorials	No elements of work experience	other, please give details
	Duration in weeks	Mandatory?	Duration in weeks	Mandatory?	Existing?		
Business (TEST)						☐ yes	

Comments:

Comments U-Multirank:

27	Please describe the **international orientation** of the programmes with regard to the inclusion of study periods abroad (incl. internships abroad).		
	Study period abroad		
	Study period abroad	If mandatory, how long (weeks)?	If available: (max.) number of credits
Business (TEST)			
Comments:			
Comments U-Multirank:			

28 Please indicate if there are **joint study programmes** with foreign partner institutions.			
	Joint / double degree programme with (name of HEIs)		Transferability of credits
	If yes, Partner(s)	No joint / double degree programme	
Business (TEST)		☐ yes	
Comments:			
Comments U-Multirank:			

29 How many students in **Business** in your department earned **credits** for achievements **abroad** (academic year 2009/2010)?		
	Number of students who earned credits for achievement abroad and the three most visited HEI:	
	Number of students	Most frequently visited HEI
Business (TEST)		
Comments:		
Comments U-Multirank:		

30 Please give the number of **exchange students** from foreign universities in the programmes and the names of up to **three HEIs** from which students most frequently come to your university.		
	Number of exchange students from abroad	Most important institutions of exchange: HEI/country (e.g. Oxford University/UK)
	Academic year 2009/10	
Business (TEST)		
Comments:		
Comments U-Multirank:		

31 Please indicate the **share of courses held in a foreign language** by programme. Please give preferably the number of credits, if this is not possible please refer to the percentage of courses (academic year 2009/2010).		
	Number of credits for courses in a foreign language (only mandatory courses)	Or: Percentage of courses in a foreign language
Business (TEST)		
Comments:		
Comments U-Multirank:		

32	**Special features of the study programmes:** In 600 characters max. per study programme, give the special characteristics of the study programmes (foci, areas of particularly intensive study, relevance to research, practical relevance, interdisciplinary orientation, etc.)?
Business (TEST)	
Comments U-Multirank:	

Editor: Date of editing: (please use: dd.mm.yyyy)

33 Please indicate for each programme the **number of graduates**, if any, and the number of those graduating within the norm period of completion.

	No graduates yet	2007/2008 Number of graduates		2008/2009 Number of graduates		2009/2010 Number of graduates	
		Total	Within norm period	Total	Within norm duration	Total	Within norm period
Business (TEST)	☐						

Comments:

Comments U-Multirank:

34 Is there any **information about labour market entrance** of graduates available from national quantitative data/surveys? If yes, please give some details for the most recent data available.

	% of graduates employed with graduate job	Within .... month	Please specify to which period the data refers to	Source of data
Business (TEST)	%			

Comments:

Comments U-Multirank: