

# Indicator book

2018

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**Mapping; Like with like**

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## **Institutional Ranking**

# Teaching and Learning

## Bachelor graduation rate

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Teaching and Learning  |
| Definition      | The percentage of new entrants that successfully completed their bachelor programme.   |
| Rationale       | The graduation rate shows how well the university's programmes are organised and reflects the effectiveness of its teaching.   |
| Data source     | Institution questionnaire  |
| Data elements   | Number of bachelor degrees awarded in period T (2014, 2015, 2016)Number of new entrants in bachelor programmes (in period T-x, x being the standard length of bachelor programmes in years). |
| Time reference  | Average 2014-2016  |
| Grouping method | Standard (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{graduates } ba_{t-i}}{\sum_{i=0}^2 \text{new entrants } ba_{t-x-i}} * 100$   |
|                 | <i>t=standard reference year (2016) x=standard length of bachelor programme</i>  |

# Teaching and Learning

## Masters graduation rate

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Teaching and Learning  |
| Definition      | The percentage of new entrants that successfully completed their master programme.   |
| Rationale       | The graduation rate shows how well the university's programmes are organised and reflects the effectiveness of its teaching.   |
| Data source     | Institution questionnaire  |
| Data elements   | Number of master degrees awarded in period T (2014, 2015, 2016)Number of new entrants in master programmes (in period T-x, x being the standard length of master programmes in years). |
| Time reference  | Average 2014-2016  |
| Grouping method | Standard (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{graduates } ma_{t-i}}{\sum_{i=0}^2 \text{new entrants } ma_{t-x-i}} * 100$   |
|                 | <i>t=standard reference year (2016) x=standard length of master programme</i>  |



# Teaching and Learning

## Graduating on time (bachelors)

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Teaching and Learning  |
| Definition      | The percentage of graduates that graduated within the time expected (normative time) for their bachelor programme.             |
| Rationale       | The time to degree reflects how well the university's programmes are organised and shows the effectiveness of its teaching.    |
| Data source     | Institution questionnaire  |
| Data elements   | Number of graduates that graduated within the time expected for their bachelor programme<br>Number of bachelor degrees awarded |
| Time reference  | Average 2014-2016  |
| Grouping method | Standard (median and 25% bandwidth)  |
| Formula         | $\sum_{i=0}^2 \frac{\text{graduates ba within normative time}_{t-i}}{\text{ba degrees awarded}_{t-i}} * 100$                   |
|                 | <i>t=standard reference year (2016)</i>  |

# Teaching and Learning

## Graduating on time (masters)

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Teaching and Learning   |
| Definition      | The percentage of graduates that graduated within the time expected (normative time) for their masters programme.               |
| Rationale       | The time to degree reflects how well the university's programmes are organised and shows the effectiveness of its teaching.     |
| Data source     | Institution questionnaire   |
| Data elements   | Number of graduates that graduated within the time expected for their master programme.<br><br>Number of master degrees awarded |
| Time reference  | Average 2014-2016   |
| Grouping method | Standard (median and 20% bandwidth)   |
| Formula         | $\sum_{i=0}^2 \frac{\text{graduates master within normative time}_{t-i}}{\text{master degrees awarded}_{t-i}} * 100$            |
|                 | <i>t=standard reference year (2016)</i>   |

## Citation rate

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Research   |
| Definition      | The average number of times the university's research publications (over the period 2012-2016) are cited in other research; adjusted (normalized) at the global level to take into account differences in publication years and to allow for differences in citation customs across academic fields. |
| Rationale       | Indicator of the scientific impact of research outputs within international scientific communities. The measure takes into account differences in citation customs across academic fields ('normalisation').   |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | Mean Normalised Citation Rate  |
| Time reference  | period 2012-2016   |
| Grouping method | Standard (median and 25% bandwidth)  |
| Formula         |  |

## Research publications (absolute numbers)

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Research  |
| Definition      | The number of university's research publications (indexed in the Web of Science Core Collections database), where at least one author is affiliated to the source university or higher education institution. |
| Rationale       | The number of publications in academic journals is a measure of the institution's research activity and its capability in producing research publications at the international level.                         |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection   |
| Data elements   | number of research publications   |
| Time reference  | period 2012-2016  |
| Grouping method |   |
| Formula         |   |

## Research publications (size-normalised)

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Research  |
| Definition      | The number of research publications (indexed in the Web of Science database), where at least one author is affiliated to the university (relative to the number of students).   |
| Rationale       | The number of publications in academic journals is a measure of the institution's research activity and its capability in producing research publications at the international level. Correcting for the size of the institution (approximated by student enrol |
| Data source     | CWTS/Web of Science<br>external sources (IAU database; internet)  |
| Data elements   | number of research publications<br>number of students enrolled  |
| Time reference  | period 2012-2016  |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         | $\frac{\text{totalnumber of researchpublications}_{2012-2016}}{\text{totalnumber of students enrolled}_{2015}}$   |

## External research income

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Research   |
| Definition      | Revenue for research that is not part of a core (or base) grant received from the government. Includes research grants from national and international funding agencies, research councils, research foundations, charities and other non-profit organizations. Measured in € 1,000s, using Purchasing Power Parities (PPP). Expressed per fte academic staff. |
| Rationale       | The indicator expresses the institution's success in attracting grants in national and international competitive, peer reviewed programmes. This reflects the quality of an institution's research.  |
| Data source     | institution questionnaire  |
| Data elements   | Revenue for research that is not part of a core (or base) grant received from the government.<br>PPP (GDP) in euros  |
| Time reference  | Average 2014-2016  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{research revenues from external sources}_{t-i} / \text{PPP (GDP) in } \text{€}_{t-i} * 1000}{\sum_{i=0}^2 \text{fte academic staff}_{t-i}}$  |
|                 | <i>t=2016</i>  |

## Art related output

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Research   |
| Definition      | The number of scholarly outputs in the creative and performing arts, relative to the full-time equivalent (fte) number of academic staff.  |
| Rationale       | This measure recognises outputs other than research publications and reflects all tangible research-based outputs such as musical compositions, designs, artifacts, software, et cetera. |
| Data source     | Institution questionnaire  |
| Data elements   | Number of art related outputs (concerts, exhibitions, artefacts, media productions) academic staff (fte)   |
| Time reference  | Average 2014-2016  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{art related outputs}_{t-i}}{\sum_{i=0}^2 \text{fte academic staff}_{t-i}}$   |
|                 | <i>t=standard reference year (2016)</i>  |

## Top cited publications

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Research   |
| Definition      | The proportion of the university's research publications that, compared to other publications in the same field and in the same year, belong to the top 10% most frequently cited worldwide.                               |
| Rationale       | This is a measure of international research excellence. Departments with well over 10% of their publications in the top percentile of frequently cited articles worldwide are among the top research institutes worldwide. |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | The number of publications of a university that, compared with other publications in the same field and in the same year, belong to the top 10% most frequently cited.<br>total publication output                         |
| Time reference  | Publications: period 2012-2015; citations until 3rd quarter 2016   |
| Grouping method | Standard (median and 25% bandwidth)  |
| Formula         | $\frac{\text{score on topcitedpublications}}{\text{totalpublication output}} * 100$  |



## Interdisciplinary publications

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Research   |
| Definition      | Extent to which reference lists of university's publications reflect cited publications in journals from different scientific disciplines.   |
| Rationale       | The more a publication refers to publications belonging to different fields of science and the larger the distance between these fields, the higher the degree of interdisciplinarity. Given that the frontiers of research are often at the edge of discipline  |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | Interdisciplinary scientific publication output<br>Total publication output  |
| Time reference  | period 2012-2016   |
| Grouping method | Standard (median and 25% bandwidth)  |
| Formula         | <p>interdisciplinarity score of individual publication : <math>I^{pub} = \frac{1}{m^2} \sum_i^j d_{ij}</math></p> <p>interdisciplinarity score of an institution : <math>I^{inst} = \left( \frac{1}{n} \sum_k \#(I_k^{pub} \geq I_{threshold}^{pub}) \right) * 100</math></p> <p><i>m=number of references in the publication to other WoS-indexed publications; dij=distance between the field of reference i and the field of reference j;</i><br/> <i>n=number of publications of the institution</i><br/> <i>I pub;k=interdisciplinarity score of publication k;</i><br/> <i>I p</i></p> |

## Post-doc positions

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Research   |
| Definition      | The number of post-doc positions relative to the number of academic staff (headcount).   |
| Rationale       | As post doc positions are often externally (and competitively) funded, an institution with more post-doc positions is more likely to have a higher research quality. |
| Data source     | Institution questionnaire  |
| Data elements   | Post doc positions (headcount)<br>Academic staff (headcount)   |
| Time reference  | Average 2014-2016  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{postdoc positions}_{t-i}}{\sum_{i=0}^2 \text{fte academic staff}_{t-i}} * 100$   |
|                 | <i>t=2016</i>  |

## Professional publications

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Research  |
| Definition      | The number of professional publications per fte academic staff. Professional publications are all publications published in journals, books, and other media 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". |
| Rationale       | Professional publications are all publications published in journals, books, and other media that are addressed to a professional audience and that can be traced bibliographically. These publications are not peer reviewed as in the category "academic publ   |
| Data source     | institution questionnaire   |
| Data elements   | Number of professional publications; fte academic staff   |
| Time reference  | Average 2014-2016   |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         | $\frac{\sum_{i=0}^2 \text{professional publications}_{t-i}}{\sum_{i=0}^2 \text{fte academic staff}_{t-i}} * 1000$   |
|                 | <i>t=2016</i>   |

## Strategic research partnerships

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Research   |
| Definition      | The number of strategic partnerships per fte academic staff. A strategic partnership is a formal alliance between the higher education institution (or part of it) and one or more external organizations with which a long-term agreement is reached for sharing of physical and/or intellectual resources in the achievement of defined common goals. The focus lies here on agreements referring to research and knowledge exchange activities. |
| Rationale       | A HEI that finds most of its partners for research activities in the region is most likely to be engaged in the region.  |
| Data source     | institution questionnaire  |
| Data elements   | number of strategic research partnerships; fte academic staff  |
| Time reference  | average 2014-2016  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{strategicresearchpartnerships}_{t-i}}{\sum_{i=0}^2 \text{fteacademicstaff}_{t-i}} * 100$   |
|                 | <i>t=2016</i>  |

# Knowledge Transfer

## Co-publications with industrial partners

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Knowledge Transfer  |
| Definition      | The percentage of the university's research publications that list an author affiliate with an address referring to a for-profit business enterprises or private sector R&D unit (excludes for-profit hospitals and education organisations). |
| Rationale       | The more research is carried out with external partners the more likely it is that knowledge transfer takes place between academia and business.  |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection   |
| Data elements   | The number of all the university's research publications that list an author affiliate with an address that refers to a business enterprise or a private sector R&D unit.<br>Total publication output   |
| Time reference  | period 2012-2016  |
| Grouping method | Standard (median and 25% bandwidth)   |
| Formula         | $\frac{\text{score on co – publications with industry}}{\text{total publication output}} * 100$   |

# Knowledge Transfer

## Income from private sources

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Knowledge Transfer  |
| Definition      | Research revenues and knowledge transfer revenues from private sources (incl. not-for profit organisations), excluding tuition fees. Measured in €1,000s using Purchasing Power Parities. Expressed per fte academic staff.                                   |
| Rationale       | The degree to which research is funded by external, private organisations reflects aspects of its research quality - most notably its success in attracting funding and research contracts from end-user sources.   |
| Data source     | Institution questionnaire   |
| Data elements   | Revenues of research related contracts and services, consultancies and other project funds from industry/private business; research related revenues from charities, private foundations, trusts and other non-profit organisations; revenues from licensing. |
| Time reference  | Average 2014-2016   |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         | $\frac{\sum_{i=0}^2 \text{revenues from private source}_{t-i} / \text{PPP (GDP) in } \text{€}_{t-i} * 1000}{\sum_{i=0}^2 \text{fte academic staff}_{t-i}}$  |
|                 | <i>t=2016</i>   |

# Knowledge Transfer

## Patents awarded (absolute numbers)

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Knowledge Transfer   |
| Definition      | The number of patents assigned to (inventors working in) the university (over the period 2002-2011).   |
| Rationale       | The number of patents is an established measure of technology transfer as it indicates the degree to which discoveries and inventions made in academic institutions may be transferred to economic actors for further industrial / commercial development. |
| Data source     | CWTS/PATSTAT database  |
| Data elements   | counts on the level of patent families   |
| Time reference  | period 2005-2014   |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         |  |

# Knowledge Transfer

## Patents awarded (size-normalised)

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Knowledge Transfer  |
| Definition      | The number of patents assigned to (inventors working in) the university over the period 2005-2014 (per 1,000 students).   |
| Rationale       | The number of patents is an established measure of technology transfer as it indicates the degree to which discoveries and inventions made in academic institutions may be transferred to economic actors for further industrial / commercial development. Corr |
| Data source     | CWTS/PATSTAT database   |
| Data elements   | The number of patents assigned to (inventors working in) the institution<br>Total number of students enrolled   |
| Time reference  | period 2005-2014  |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         | $\frac{\text{number of patents assigned to the institution}_{2004-2013}}{\text{total number of students enrolled}_{2015}} * 100$  |



## Industry co-patents

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Knowledge Transfer   |
| Definition      | The percentage of the number of patents assigned to (inventors working in ) the university over the period 2002-2011, which were co-applied with at least 1 applicant from the industry.   |
| Rationale       | If the university applies for a patent with a private firm this reflects that it shares its knowledge with external partners and shows the extent to which it is willing to share its technological inventions for further commercial development. |
| Data source     | CWTS/PATSTAT database  |
| Data elements   | Patents<br>Co-patents with industry  |
| Time reference  | period 2005-2014   |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\text{number of co – patents with industry}_{2005-2014}}{\text{number of patents}_{2005-2014}} * 100$   |

# Knowledge Transfer

## Spin-offs

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Knowledge Transfer  |
| Definition      | The number of spin-offs (i.e. firms established on the basis of a formal knowledge transfer arrangement between the institution and the firm) recently created by the institution (per 1000 fte academic staff) |
| Rationale       | A new firm that is based on knowledge created in a university signals a successful case of knowledge transfer from academia to industry.  |
| Data source     | Institution questionnaire   |
| Data elements   | Start-up firms<br>Academic staff (fte)  |
| Time reference  | Average 2014-2016   |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         | $\frac{\sum_{i=0}^2 \text{new start - up firms}_{t-i}}{\sum_{i=0}^2 \text{fte academic staff}_{t-i}} * 1000$  |
|                 | $t=2016$  |

## Publications cited in patents

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Knowledge Transfer  |
| Definition      | The percentage of the university's research publications that were mentioned in the reference list of at least one international patent (as included in the PATSTAT database).                      |
| Rationale       | This indicator reflects the technological relevance of scientific research at the university, in the sense that it explicitly contributed, in some way, to the development of patented technologies |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection   |
| Data elements   | Research publications<br>Publications cited in patents  |
| Time reference  | period 2005-2014  |
| Grouping method | Standard (median and 25% bandwidth)   |
| Formula         | $\frac{\text{score on publications cited in patents}_{2005-2014}}{\text{total publication output}_{2005-2014}} * 100$   |

# Knowledge Transfer

## Income from continuous professional development

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Knowledge Transfer   |
| Definition      | The percentage of the university's total revenues that is generated from activities delivering Continuous Professional Development courses and training.   |
| Rationale       | When a university is very active in providing continuing education courses to companies and private individuals it transfers knowledge to its environment. |
| Data source     | Institution questionnaire  |
| Data elements   | Total income<br>Income from CPD  |
| Time reference  | Average 2014-2016  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{income from CPD}_{t-i}}{\sum_{i=0}^2 \text{total income}_{t-i}} * 100$   |
|                 | $t=2016$   |

## Graduate Companies

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Knowledge Transfer  |
| Definition      | The number of companies newly founded by graduates per 1000 graduates   |
| Rationale       | The number of companies newly founded by graduates refers to any company that graduates of the higher education institution have founded. Any type of registered company (for profit/not for profit; small/large; manufacturing/service/consultancy) may be rep |
| Data source     | institution questionnaire   |
| Data elements   | number of graduate companies; total number of graduates   |
| Time reference  | average 2014-2016   |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         | $\frac{\sum_{i=0}^2 \text{compagnies newly founded by graduates}_{t-i}}{\sum_{i=0}^2 \text{total number of graduates}_{t-i}} * 1000$  |
|                 | <i>t=2016</i>   |

# International Orientation

## Foreign language bachelor programmes

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | International Orientation  |
| Definition      | The percentage of bachelor programmes that are offered in a foreign language.  |
| Rationale       | Offering degree programmes in a foreign language signals the commitment of the university to welcome foreign students and to prepare its students for working in an international environment. |
| Data source     | Institution questionnaire  |
| Data elements   | Bachelor programmes in foreign language<br>Bachelor programmes   |
| Time reference  | Latest year available  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\text{bachelor programmes offered in foreign language}_t}{\text{number of bachelor programmes offered}_t} * 100$  |
|                 | <i>t=2016</i>  |

# International Orientation

## Foreign language master programmes

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | International Orientation   |
| Definition      | The percentage of masters programmes that are offered in a foreign language.  |
| Rationale       | Offering masters programmes in a foreign language testifies the commitment of the university to welcome foreign students and to prepare its students for working in an international environment. |
| Data source     | Institution questionnaire   |
| Data elements   | Master programmes in foreign language<br>Master programmes offered  |
| Time reference  | Latest year available   |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         | $\frac{\text{master programmes offered in foreign language}_t}{\text{number of master programmes offered}_t} * 100$   |
|                 | <i>t=2016</i>   |

## Student mobility

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | International Orientation   |
| Definition      | A composite of international incoming exchange students, outgoing exchange students and students in international joint degree programmes.  |
| Rationale       | Having an international student body and offering students the opportunity to do part of their degree abroad signals the international orientation of the university.   |
| Data source     | Institution questionnaire   |
| Data elements   | Incoming students; Students sent out in international exchange programmes; students in joint degree programmes<br>Total enrolment   |
| Time reference  | Average 2014-2016   |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         | <p><i>This indicator consists of three subindicators: % incoming exchange students, % exchange students sent out and % of students in international joint degree programmes.</i></p> <p><i>Since the ranges of scores on these indicators differ the scores are normalised (z-scores). The composite indicator value is calculated as the mean of the normalised scores on the three subindicators. If a score on one or two subindicators is missing, the score is based on two or one subindicator.</i></p> <p><i>The resulting composite indicator has a range between -0,8 and 5,3. To create a score that is between 0 and 1 the scores are rescaled. For this rescaling the formula <math>(x_i - \min) / (\max - \min)</math> is used</i></p> |



# International Orientation

## International academic staff

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | International Orientation  |
| Definition      | The percentage of academic staff (on a headcount basis) with foreign citizenship.  |
| Rationale       | Having an international academic staff reflects the international orientation of the university and its attractiveness as an employer for foreign academics.             |
| Data source     | Institution questionnaire  |
| Data elements   | Academic staff (headcount; excluding doctorate candidates counted as staff)<br>International academic staff (headcount; excluding doctorate candidates counted as staff) |
| Time reference  | Average 2014-2016  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{academic staff with foreign nationality (headcount)}_{t-i}}{\sum_{i=0}^2 \text{academic staff (headcount)}_{t-i}} * 100$<br>$t=2016$           |

# International Orientation

## International joint publications

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | International Orientation   |
| Definition      | The percentage of the university's research publications that list at least one affiliate author's address located in another country.      |
| Rationale       | The number of international joint publications reflects the degree to which a university's research is connected to international networks. |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection   |
| Data elements   | International joint research publications<br>Research publications  |
| Time reference  | period 2011-2014  |
| Grouping method | Standard (median and 25% bandwidth)   |
| Formula         | $\frac{\text{score on international co – publications}_{2011-2014}}{\text{total publication output}_{2011-2014}} * 100$                     |
|                 |   |
|                 |   |

# International Orientation

## International doctorate degrees

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | International Orientation  |
| Definition      | The percentage of doctorate degrees that are awarded to international doctorate candidates.  |
| Rationale       | The number of doctorate degrees awarded to international candidates reflects the international orientation of an institution   |
| Data source     | Institution questionnaire  |
| Data elements   | Doctorate degrees awarded to international candidates<br>Doctorate degrees awarded   |
| Time reference  | Average 2014-2016  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{doctorate degrees to candidates with foreign nationality (headcount)}_{t-i}}{\sum_{i=0}^2 \text{doctorate degrees awarded (headcount)}_{t-i}} * 100$ |
|                 | <i>t=2016</i>  |

# Regional Engagement

## Bachelor graduates working in the region

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Regional Engagement  |
| Definition      | The percentage of bachelor graduates who found their first job (after graduation) in the region where the university is located.                                   |
| Rationale       | If a relatively large number of an institution's graduates is working in the region this reflects strong linkages between the university and its regional partners |
| Data source     | Institution questionnaire  |
| Data elements   | Proportion (or range) indicated.   |
| Time reference  | Latest year available  |
| Grouping method | categorised question   |
| Formula         |  |
|                 |  |
|                 |  |

# Regional Engagement

## Master graduates working in the region

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Regional Engagement  |
| Definition      | The percentage of masters graduates who found their first job (after graduation) in the region where the university is located.                                    |
| Rationale       | If a relatively large number of an institution's graduates is working in the region this reflects strong linkages between the university and its regional partners |
| Data source     | Institution questionnaire  |
| Data elements   | Proportion (or range) indicated.   |
| Time reference  | Latest year available  |
| Grouping method | categorised question   |
| Formula         |  |
|                 |  |
|                 |  |

# Regional Engagement

## Student internships in the region

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Regional Engagement  |
| Definition      | Out of all the university's students who did an internship, the percentage where the internship was with a company or organisation located in the region.  |
| Rationale       | Internships of students in regional enterprises are a means to build co-operations with regional partners and connect students to the local labour market. |
| Data source     | Institution questionnaire  |
| Data elements   | Internships in regional/local enterprises<br>Internships   |
| Time reference  | Average 2014-2016  |
| Grouping method | Standard (median and 20% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{students in internships in the region}_{t-i}}{\sum_{i=0}^2 \text{students in internships}_{t-i}} * 100$                          |
|                 | <i>t=2016</i>  |

# Regional Engagement

## Regional joint publications

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Regional Engagement  |
| Definition      | The percentage of the university's research publications that list at least one co-author with an affiliate address located in the same spatial region (within a distance of 50 km). |
| Rationale       | Co-publications with authors located elsewhere in the institution's geographical region are a reflection of regional linkages between the university and regional partners.          |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | Number of research publications that list at least one affiliate address of co-authors in the same 'region' (50 km range)<br>Total publication output                                |
| Time reference  | period 2011-2014   |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\text{score on regional co – publications}_{2011-2014}}{\text{total publication output}_{2011-2014}}$   |

# Regional Engagement

## Income from regional sources

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Regional Engagement   |
| Definition      | The proportion of external research revenues - apart from government or local authority core/recurrent grants – that comes from regional sources (i.e. industry, private organisations, charities). |
| Rationale       | A high proportion of income from regional/local sources indicates a more intense relationship between the university and the region   |
| Data source     | Institution questionnaire   |
| Data elements   | percentage indicated  |
| Time reference  | Average 2014-2016   |
| Grouping method | Log normalised (median and 25% bandwidth)   |
| Formula         |   |



# Regional engagement

## Strategic research partnerships in the region

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Regional engagement   |
| Definition      | The number of strategic research partnerships with partners in the region as a percentage of the total number of strategic research partnerships  |
| Rationale       | strategic partnerships with a focus on research indicate the commitment of HEI and its environment to engage in research collaboration. This collaboration is likely to be focused on applied research activities. Academic staff as the denominator is an adequate |
| Data source     | institution questionnaire   |
| Data elements   | number of strategic research partnerships;<br>number of strategic research partnerships with business in the region; number of strategic research partnerships with civic organisations in the region   |
| Time reference  | average 2014-2016   |
| Grouping method | Standard (median and 25% bandwidth)   |
| Formula         | $\frac{\sum_{i=0}^2 \text{strategic research partnerships}_{t-i}}{\sum_{i=0}^2 \text{strategic research partnerships in the region}_{t-i}} * 100$   |
|                 | <i>t=2016</i>   |

# Teaching and Learning (descriptive)

## Relative BA graduate unemployment

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Teaching and Learning (descriptive)  |
| Definition      | The percentage of bachelor graduates unemployment 18 months after graduation.  |
| Rationale       | Although dependant on regional economic situation and labour market this indicator confers some indication of the employability of graduates |
| Data source     | Institution questionnaire  |
| Data elements   |  |
| Time reference  | Latest year available  |
| Grouping method | categorised question   |
| Formula         |  |
|                 |  |

# Teaching and Learning (descriptive)

## Relative MA graduate unemployment

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Teaching and Learning (descriptive)  |
| Definition      | The percentage of master graduates unemployment 18 months after graduation.  |
| Rationale       | Although dependant on regional economic situation and labour market this indicator confers some indication of the employability of graduates |
| Data source     | institution questionnaire  |
| Data elements   |  |
| Time reference  | Latest year available  |
| Grouping method | categorised question   |
| Formula         |  |
|                 |  |

# Teaching and Learning (descriptive)

## Graduation rate long first degree

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Teaching and Learning (descriptive)  |
| Definition      | The percentage of new entrants that successfully completed their long first degree programme.  |
| Rationale       | The graduation rate shows how well the university's programmes are organised and reflects the effectiveness of its teaching.   |
| Data source     | institution questionnaire  |
| Data elements   | Number of long first degrees awarded in period T (2011, 2012, 2013) Number of new entrants in long first degree programmes (in period T-x, x being the standard length of long first programmes in years). |
| Time reference  | Average 2014-2016  |
| Grouping method | Standard (median and 25% bandwidth)  |
| Formula         | $\frac{\sum_{i=0}^2 \text{graduates long first}_{t-i}}{\sum_{i=0}^2 \text{new entrants long first}_{t-x-i}} * 100$   |
|                 | <i>t=2016; x=standard period of study</i>  |

# Teaching and Learning (descriptive)

## Graduating on time (long first degree)

|                 |   |
|-----------------|---|
| Level           | institutional   |
| Dimension       | Teaching and Learning (descriptive)   |
| Definition      | The percentage of graduates that graduated within the time expected (normative time) for their long first degree programme.   |
| Rationale       | The time to degree reflects how well the university's programmes are organised and shows the effectiveness of its teaching.   |
| Data source     | institution questionnaire   |
| Data elements   |   |
| Time reference  | Average 2014-2016   |
| Grouping method | Standard (median and 25% bandwidth)   |
| Formula         | $\frac{\sum_{i=0}^2 \text{graduates long first degree programmes within normative time}_{t-i}}{\sum_{i=0}^2 \text{graduates long first degree programmes}_{t-i}} * 100$ |
|                 | <i>t=2016</i>   |

# Teaching and Learning (descriptive)

## Relative graduate unemployment long first degree

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Teaching and Learning (descriptive)  |
| Definition      | The percentage of long first degree programme graduates unemployment 18 months after graduation.   |
| Rationale       | Although dependant on regional economic situation and labour market this indicator confers some indication of the employability of graduates |
| Data source     | institution questionnaire  |
| Data elements   |  |
| Time reference  | Latest year available  |
| Grouping method | Categorised question   |
| Formula         |  |
|                 |  |

# Research (descriptive)

## Publication output

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | Research (descriptive)   |
| Definition      | Number of all research publications included in the institution's publications databases, where at least one author is affiliated to the institution (per fte academic staff)  |
| Rationale       | The number of publications is seen as an important indicator for the involvement in research. The indicator adds to the citation based indicator as it allows for journals not covered in the citation databases (discipline and language related) |
| Data source     | institution questionnaire  |
| Data elements   |  |
| Time reference  | Average 2014-2016  |
| Grouping method |  |
| Formula         | $\frac{\sum_{i=0}^2 \text{research publications}_{t-i}}{\sum_{i=0}^2 \text{fte academic staff}_{t-i}} * 100$<br>$t=2016$   |

# International Orientation (descriptive)

## Foreign language long first degree programmes

|                 |  |
|-----------------|--|
| Level           | institutional  |
| Dimension       | International Orientation (descriptive)  |
| Definition      | The percentage of long first degree programmes that are offered in a foreign language.   |
| Rationale       | Offering degree programmes in a foreign language signals the commitment of the university to welcome foreign students and to prepare its students for working in an international environment. |
| Data source     | institution questionnaire  |
| Data elements   |  |
| Time reference  | Latest year available  |
| Grouping method | Log normalised (median and 25% bandwidth)  |
| Formula         | $\frac{\text{long first degree programmes offered in foreign language}_t}{\text{long first degree programmes offered}_t} * 100$  |
|                 | <i>t=2016</i>  |



## Subject Ranking

## Student-staff ratio

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | The number of students (headcount) per member of the academic staff (fte). Staff solely involved in research is excluded.  |
| Rationale       | Indicator for the (expected) intensity of mentoring/tutoring and of contact between students and teachers.   |
| Data source     | Department questionnaire   |
| Data elements   | Number of students (head count); Number of academic staff (fte); Staff solely involved in research and patient care (medicine) are excluded.   |
| Time reference  | 2016 subjects: 2014; 2017 subjects: 2015; 2018 subjects: 2016  |
| Grouping method | All subjects: log-normalised   |
| Formula         | $\frac{\text{students major} + (\text{students minor} * 0.5)}{\text{academic staff (fte)} - \text{academic staff involved in reseach only (fte)}}$ <p><i>Fte academic staff involved in patient care only (medicine) and involved in research only are excluded.</i></p> |

## Graduating on time (bachelors)

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | The percentage of graduates that graduated within the time expected (normative time) for their bachelor programme.   |
| Rationale       | The time to degree reflects how well the university's programmes are organised and shows the effectiveness of its teaching.                                |
| Data source     | Department questionnaire   |
| Data elements   | Number of BA graduates within the standard period; total number of BA graduates.   |
| Time reference  | 2016 subjects: 2012-2014; 2017 subjects: 2013-2015; 2018 subjects: 2014-2016   |
| Grouping method | All subjects: standard; except civil engineering: log-normalised   |
| Formula         | $\frac{\sum_{i=0}^2 \text{graduates bachelor within normative time}_{t-i}}{\sum_{i=0}^2 \text{bachelor degrees awarded}_{t-i}} * 100$ <p><i>t=2016</i></p> |

## Graduating on time (masters)

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | The percentage of graduates that graduated within the time expected (normative time) for their master programme.                                       |
| Rationale       | The time to degree reflects how well the university's programmes are organised and shows the effectiveness of its teaching.                            |
| Data source     | Department questionnaire   |
| Data elements   | Number of MA graduates within the standard period; total number of MA graduates.   |
| Time reference  | 2016 subjects: 2012-2014; 2017 subjects: 2013-2015; 2018 subjects: 2014-2016   |
| Grouping method | All subjects: standard   |
| Formula         | $\frac{\sum_{i=0}^2 \text{graduates master within normative time}_{t-i}}{\sum_{i=0}^2 \text{master degrees awarded}_{t-i}} * 100$ <p><i>t=2016</i></p> |

## Academic staff with doctorates

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | The percentage of academic staff holding a doctorate (PhD or equivalent).  |
| Rationale       | Highly qualified academic staff is a pre-condition for high quality education. In an international perspective it can be measured and compared by reference to the percentage of staff which holds a PhD (or equivalent degree). |
| Data source     | Department questionnaire   |
| Data elements   | Academic staff (head count). Academic staff (head count) with a completed PhD (or equivalent); doctoral candidates counted as staff are excluded.  |
| Time reference  | 2016 subjects: 2014; 2017 subjects: 2015; 2018 subjects: 2016  |
| Grouping method | All subjects: standard; chemistry: log-normalised  |
| Formula         | $\frac{\text{academic staff with completed doctorate degree (head counts)}}{\text{academic staff (head counts)-doctoral candidates counted as staff (head counts)}} * 100$   |





## Gender balance

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | Probability of female and male students to complete a PhD in relation to their percentage among students. We divide the probability score of women by the score of men. To normalise the scale, we apply a log normalisation resulting in a score of 0 in case of perfect balance. |
| Rationale       | This indicator measures gender balance in the transition from students to PhD graduates.   |
| Data source     | Department questionnaire   |
| Data elements   | Male and female students; male and female PhD graduates  |
| Time reference  | 2017 subjects: 2014-2016   |
| Grouping method | Deviation from a perfect balance (score 0)   |
| Formula         | $\frac{\sum_{i=0}^2 \text{PhD graduates female}_{t-i} / \sum_{i=0}^2 \text{Students female}_{t-i}}{\sum_{i=0}^2 \text{PhD graduates male}_{t-i} / \sum_{i=0}^2 \text{Students male}_{t-i}}$  |



## Innovative forms of assessment

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | The percentage of examinations (in medical doctor training programmes) which use innovative forms of assessment (assessment of practical work by faculty and structured clinical cases). |
| Rationale       | This indicator measures the share of forms of assessments of students in medical examinations which are more interactive and focus on medical qualifications and competencies.           |
| Data source     | Department questionnaire   |
| Data elements   | Percentage of method faculty/resident rating; percentage of methods objective structured clinical examination (OSCE).  |
| Time reference  | 2016   |
| Grouping method | Medicine: log-normalised; dentistry: standard  |
| Formula         | <b>% faculty rating + % objective structured clinical examination</b>  |

# Teaching and Learning

## Hospital beds available for teaching

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Teaching and Learning   |
| Definition      | The number of beds available for teaching in university hospital and affiliated hospitals per 100 students.                               |
| Rationale       | For clinical teaching access to patients is important for learning with high practical relevance.   |
| Data source     | Department questionnaire  |
| Data elements   | Number of beds in university hospitals; number of beds in affiliated hospitals; number of students in medical doctor training programmes. |
| Time reference  | 2016  |
| Grouping method | Medicine: log-normalised  |
| Formula         | $\frac{\text{beds university hospital} + (0.5 * \text{beds affiliated hospital})}{\text{number of students} / 100}$                       |

## Overall learning experience

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Teaching and Learning   |
| Definition      | An assessment of the quality of the overall learning experience, based on a survey of the students. |
| Rationale       | This indicator reflects the student views on their overall teaching experience.                     |
| Data source     | Student survey  |
| Data elements   | Single-item indicator concerning the overall learning experience                                    |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017           |
| Grouping method | Confidence interval procedure   |
| Formula         | $\bar{X} = \frac{1}{N} X_{\text{overall learning experience}}$                                      |

## Quality of courses & teaching

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Teaching and Learning   |
| Definition      | An assessment of the quality of teaching provision, based on a student satisfaction survey.   |
| Rationale       | The quality of courses and teaching is a crucial element of the quality of degree programmes.   |
| Data source     | Student survey  |
| Data elements   | Breadth of teaching offerings, the quality of basic courses, didactic quality of teaching, interdisciplinary elements, options to choose elective courses, laboratory courses (engineering only). |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017   |
| Grouping method | Confidence interval procedure   |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^5 X_i$  |

## Organisation of program

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | An assessment of the organisation of the programme, based on a student satisfaction survey.  |
| Rationale       | Student views on the organisation of their degree programme indicates their assessment of basic issues of the organisation of teaching and the degree programme.   |
| Data source     | Student survey   |
| Data elements   | Transparency of entrance requirements/admission regulations, access to classes, average class size, completeness of courses offered compared to the study guide, transparency of the examination system. |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017  |
| Grouping method | Confidence interval procedure  |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^5 X_i$   |

# Teaching and Learning

## Contact with teachers

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | An assessment of the feedback given by teachers, based on a student satisfaction survey.   |
| Rationale       | Close contacts to teachers is a crucial criteria of quality for many students.   |
| Data source     | Student survey   |
| Data elements   | Commitment of teaching staff to students, availability of teachers/professors, informal advice and coaching, feedback on homework, assignments and examinations. |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017  |
| Grouping method | Confidence interval procedure  |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^5 X_i$   |

## Inclusion of work/practical experience

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Teaching and Learning   |
| Definition      | An assessment of the inclusion of work experience and of elements related to work practice, based on a student satisfaction survey.                           |
| Rationale       | The inclusion of work experience and practical elements is an important element to promote the employability of graduates.                                    |
| Data source     | Student survey  |
| Data elements   | Opportunities of including a practical work period/an internship, information about relevant professional fields, number of courses related to practice/work. |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017   |
| Grouping method | Confidence interval procedure   |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^3 X_i$  |

## Library facilities

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Teaching and Learning   |
| Definition      | An assessment of the quality of library services for students, based on a student satisfaction survey.  |
| Rationale       | In many subjects the library is an important resource for students to have access to the knowledge of the subject.  |
| Data source     | Student survey  |
| Data elements   | Availability of literature needed for your work, access to on-stock books and academic journals, access to electronic journals, user support, availability of study/reading places, open hours. |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017   |
| Grouping method | Confidence interval procedure   |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^6 X_i$  |



# Teaching and Learning

## IT provision

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | Student assessment of the quality of IT services for students, based on a student satisfaction survey.       |
| Rationale       | The IT provision marks a major aspect of facilities for teaching and learning.                               |
| Data source     | Student survey   |
| Data elements   | Hardware and software available, maintenance of the computers, user support, number of available work places |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017                    |
| Grouping method | Confidence interval procedure  |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^3 X_i$   |

## Room facilities

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Teaching and Learning   |
| Definition      | An assessment of lecture halls and seminar rooms, based on a student satisfaction survey.   |
| Rationale       | The quality of the buildings is an important element of a good learning experience. This indicator measures how well rooms are maintained and how well they are equipped. |
| Data source     | Student survey  |
| Data elements   | Maintenance, technical facilities, number of places available with regard to class size.  |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017   |
| Grouping method | Confidence interval procedure   |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^3 X_i$  |

## Inclusion of practical experience/clerkships (medicine)

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | The integration of practical experience with patient contact into the study programme, based on a student satisfaction survey.   |
| Rationale       | The inclusion of practical elements is an important element to enhance the employability of students.  |
| Data source     | Student survey   |
| Data elements   | Several items including information about relevant professional fields, insights into the work life, number of courses related to practice/work, quality of project learning and other practical elements, opportunities of including a practical work period. |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017  |
| Grouping method | Confidence interval procedure  |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^3 X_i$   |

## Bedside teaching (medicine)

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | An assessment of bedside teaching concerning mentoring, suitability of rooms and variety of diagnostic techniques applied, based on a student satisfaction survey. |
| Rationale       | The support in and monitoring of bedside teaching by academic staff is an important factor for the quality of medical doctors education.                           |
| Data source     | Student survey   |
| Data elements   | Bed side teaching  |
| Time reference  | Sample of medicine students enrolled in 2017   |
| Grouping method | Confidence interval procedure  |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^3 X_i$   |

## Laboratory facilities

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Teaching and Learning   |
| Definition      | An assessment of the quality of laboratories available to students, based on a student satisfaction survey. This indicator solely applies to science and technology subjects. |
| Rationale       | The laboratory facilities are very important for teaching and learning in the natural sciences.   |
| Data source     | Student survey  |
| Data elements   | Maintenance of laboratories, technical facilities, number of places available.  |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017   |
| Grouping method | Confidence interval procedure   |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^3 X_i$  |

# Teaching and Learning

## Linking clinical/preclinical teaching (medicine)

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Teaching and Learning  |
| Definition      | The integration of pre-clinical/theoretical and clinical courses, based on a student satisfaction survey.          |
| Rationale       | Linking theoretical /pre-clinical and clinical courses is an important element of a good medical doctor education. |
| Data source     | Student survey   |
| Data elements   |  |
| Time reference  | Sample of medicine students enrolled in 2017   |
| Grouping method | Confidence interval procedure  |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^3 X_i$   |

## Skills Labs (medicine)

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Teaching and Learning   |
| Definition      | An assessment of the skills labs and training centers concerning maintenance, accessibility, technical facilities and mentoring, based on a student satisfaction. |
| Rationale       | The access to skills labs is an important factor of modern teaching facilities in medicine.   |
| Data source     | Student survey  |
| Data elements   | Skills labs   |
| Time reference  | Sample of medicine students enrolled in 2017  |
| Grouping method | Confidence interval procedure   |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^3 X_i$  |

## External research income

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Research   |
| Definition      | Research revenue that is not part of a core (or base) grant received from the government. Includes research grants from national and international funding agencies, research councils, research foundations, charities and other non-profit organisations. Measured in €1,000s using Purchasing Power Parities (PPP). Expressed per fte academic staff.                   |
| Rationale       | The indicator expresses the department's success in attracting grants in national and international competitive, peer reviewed programmes. This reflects the quality of its research.  |
| Data source     | Department questionnaire   |
| Data elements   | Research income from national and international funding agencies, research councils, research foundations, charities and other non-profit organisations. Full time equivalent (fte) number of academic staff; doctoral candidates (fte) counted as staff are ex  |
| Time reference  | 2016 subjects: 2012-2014; 2017 subjects: 2013-2015; 2018 subjects: 2014-2016   |
| Grouping method | All subjects: log-normalised   |
| Formula         | $\frac{\sum_{i=0}^2 \text{externalresearchincome}_{t-i} - \sum_{i=0}^2 \text{externalresearchincome from professorships}_{t-i}}{\sum_{i=0}^2 (\text{fte academic staff} - \text{fte doctoral candidates counted as academic staff})_{t-i}} * 100$ <p><i>t=2016; normalised by PPP (GDP) in €. Medicine: fte patient care only is also excluded in the denominator.</i></p> |



## Doctorate productivity

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Research  |
| Definition      | The number of doctorate degrees, relative to the number of academic staff (fte).  |
| Rationale       | The number of doctorate degrees may be seen as an expression of the research activity of a higher education institution. The doctorate thesis is a significant research publication.  |
| Data source     | Department questionnaire  |
| Data elements   | Number of doctorate degrees awarded; full time equivalent (fte) number of academic staff.   |
| Time reference  | 2016 subjects: 2012-2014; 2017 subjects: 2013-2015; 2018 subjects: 2014-2016  |
| Grouping method | All subjects: log-normalised  |
| Formula         | $\frac{\sum_{i=0}^2 \text{doctorate degrees awarded}_{t-i}}{\sum_{i=0}^2 (\text{fte academic staff} - \text{fte doctoral candidates counted as academic staff})_{t-i}}$ <p><i>t=2016; Medicine: fte academic staff involved in patient care only is also excluded</i></p> |

## Research publications (absolute numbers)

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Research   |
| Definition      | The number of department's research publications indexed in the Web of Science Core Collection database, where at least one author is affiliated to the source university or higher education institution. |
| Rationale       | The number of publications in academic journals is a measure of the institution's research activity and its capability in producing research publications at the international level.                      |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | Number of research publications indexed in Thomson Reuters data base   |
| Time reference  | period 2012-2016   |
| Grouping method | All subjects: log-normalised   |
| Formula         |  |

## Citation rate

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Research   |
| Definition      | The average number of times the university's research publications are cited in other research; adjusted (normalized) at the global level to take into account differences in publication years and to allow for differences in citation customs across academic fields. |
| Rationale       | Indicator of the scientific impact of research outputs within international scientific communities. The measure takes into account differences in citation customs across academic fields ('normalisation').   |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | Mean normalised citation rate  |
| Time reference  | Publications: period 2013 - 2016; citations until 4th quarter of 2016  |
| Grouping method | All subjects: standard   |
| Formula         |  |

## Top-cited publications

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Research   |
| Definition      | The proportion of the department's research publications that, compared to other publications in the same field and in the same year, belong to the top 10% most frequently cited worldwide.                               |
| Rationale       | This is a measure of international research excellence. Departments with well over 10% of their publications in the top percentile of frequently cited articles worldwide are among the top research institutes worldwide. |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | The number of publications of a university that, compared with other publications in the same field and in the same year, belong to the top 10% most frequently cited total publication output                             |
| Time reference  | Publications: period 2013 - 2016; citations until 4th quarter of 2016  |
| Grouping method | All subjects: standard   |
| Formula         | $\frac{\text{score on top cited publications}}{\text{total publication output}} * 100$   |

## Interdisciplinary publications

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Research  |
| Definition      | Extent to which reference lists of university's publications reflect cited publications in journals from different scientific disciplines.  |
| Rationale       | The more a publication refers to publications belonging to different fields of science and the larger the distance between these fields, the higher the degree of interdisciplinarity. Given that the frontiers of research are often at the edge of discipline   |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection   |
| Data elements   | Interdisciplinary scientific publication output; total publication output   |
| Time reference  | period 2012- 2016   |
| Grouping method | All subjects: standard; social work: log-normalised   |
| Formula         | <p>interdisciplinarity score of individual publication: <math>i^{pub} = \frac{1}{m^2} \sum_i^j d_{ij}</math></p> <p>interdisciplinarity score of an institution: <math>i^{inst} = \left( \frac{1}{n} \sum_k \#(i_k^{pub} \geq i_k^{pub\ threshold}) \right) * 100</math></p> <p><i>m=number of references in the publication to other WoS-indexed publications; dij=distance between the field of reference i and the field of reference j;n=number of publications of the institution; i<sup>pub</sup>;k=interdisciplinarity score of publication k; i<sup>p</sup></i></p> |

## Research orientation of teaching

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Research  |
| Definition      | The degree to which the education is informed by research in the field (based on a survey of students in the programme).  |
| Rationale       | The degree to which education is informed by research reflects the innovative character of the teaching in the programme.   |
| Data source     | Student survey  |
| Data elements   | Introduction to methods of scientific work; inspiration for own critical reflection on the subject; inclusion of central and innovative research results; training of scientific thinking in general. |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017   |
| Grouping method | Confidence interval procedure   |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^4 X_i$  |

# Knowledge Transfer

## Income from private sources

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Knowledge Transfer   |
| Definition      | Research revenues and knowledge transfer revenues from private sources (incl. not-for profit organisations), excluding tuition fees.   |
| Rationale       | The degree to which research is funded by external, private organisations reflects aspects of a department's research quality - most notably its success in attracting funding and research contracts from end-user sources. |
| Data source     | Department questionnaire   |
| Data elements   | Research income from industry/ private business; total external research income  |
| Time reference  | 2016 subjects: 2012-2014; 2017 subjects: 2013-2015; 2018 subjects: 2014-2016   |
| Grouping method | All subjects: log-normalised; social work: standard  |
| Formula         | $\frac{\sum_{i=0}^2 \text{income from private business}_{t-i}}{\sum_{i=0}^2 \text{total third party funds}_{t-i}} * 100$   |

## Co-publications with industrial partners

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Knowledge Transfer   |
| Definition      | The percentage of a department's research publications that list an author affiliate with an address that refers to a for-profit business enterprise or private sector R&D unit (excludes for-profit hospitals and education organisations). |
| Rationale       | The more research is carried out with external partners, the more likely it is that knowledge transfer takes place between academia and business.  |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | Co-publications with industrial partners; total publication output   |
| Time reference  | period 2012 - 2016   |
| Grouping method | 2016/2017 subjects standard; mathematics, chemistry: log-normalised; 2018 subjects: log-   |
| Formula         | $\frac{\text{score on co-publications with industry} * 100}{\text{total publication output}}$  |



## Publications cited in patents

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Knowledge Transfer  |
| Definition      | The percentage of the department's research publications that were cited in the reference list of at least one international patent (as included in the PATSTAT database).                          |
| Rationale       | This indicator reflects the technological relevance of the department's scientific research, in the sense that it explicitly contributed, in some way, to the development of patented technologies. |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection; CWTS/PATSTAT database  |
| Data elements   | Publications cited in patents; research publications  |
| Time reference  | period 2006-2015  |
| Grouping method | All subjects: standard; mathematics, psychology: log-normalised   |
| Formula         | $\frac{\text{score on publications cited in patents}_{2006-2015}}{\text{total publication output}_{2006-2015}} * 100$   |





## Opportunities to study abroad

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | International Orientation  |
| Definition      | An assessment of the opportunities for studying abroad, based on a survey of the students.   |
| Rationale       | Students judgments about their possibilities and the support by their university to arrange a study period or an internship abroad.  |
| Data source     | Student survey   |
| Data elements   | Attractiveness of the exchange programme/partner universities, support and advice for studying abroad, financial support, recognition of the results obtained during the study abroad period (e.g. Credits). |
| Time reference  | Sample of students enrolled in the year of survey; e.g. for 2018 subjects: survey in 2017  |
| Grouping method | Confidence interval procedure  |
| Formula         | $\bar{X} = \frac{1}{N} \sum_{i=1}^4 X_i$   |

## International doctorates

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | International Orientation   |
| Definition      | The percentage of doctorate degrees that are awarded to international doctorate candidates.   |
| Rationale       | The number of doctoral degrees awarded to international candidates reflects the international orientation of an institution.  |
| Data source     | Department questionnaire  |
| Data elements   | Number of doctorates awarded to international doctoral candidates; total number of PhD degrees awarded.   |
| Time reference  | 2016 subjects: 2012-2014; 2017 subjects: 2013-2015; 2018 subjects: 2014-2016  |
| Grouping method | All subjects: log-normalised; nursing: standard   |
| Formula         | $\frac{\sum_{i=0}^2 \text{doctorate degrees awarded to candidates with foreign nationality}_{t-i}}{\sum_{i=0}^2 \text{total number of doctorate degrees awarded}_{t-i}} * 100$ <p><i>t=2016</i></p> |

# International Orientation

## International joint publications

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | International Orientation   |
| Definition      | The percentage of the department's research publications that list at least one affiliate author's address in another country.              |
| Rationale       | The number of international joint publications reflects the degree to which a university's research is connected to international networks. |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection   |
| Data elements   | International joint research publications; research publications  |
| Time reference  | period 2012 - 2016  |
| Grouping method | All subjects: standard; social work, sociology, nursing: log-normalised   |
| Formula         | $\frac{\text{score on international co-publications}_{2012-2016} * 100}{\text{total publication output}_{2012-2016}}$                       |

# International Orientation

## International research grants

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | International Orientation   |
| Definition      | The proportion of external research revenue – including public and private funding organisations and businesses – that comes from other countries.                        |
| Rationale       | The existence of research projects that are funded by foreign and international sources is an indicator of the international orientation of research activities.          |
| Data source     | Department questionnaire  |
| Data elements   | Research revenues from international sources (public and private funding organisations and enterprises from abroad); total external research income.                      |
| Time reference  | 2016 subjects: 2012-2014; 2017 subjects: 2013-2015; 2018 subjects: 2014-2016  |
| Grouping method | All subjects: log-normalised; Political science, sociology: standard  |
| Formula         | $\frac{\sum_{i=0}^2 \text{external research funds from international sources}_{t-i}}{\sum_{i=0}^2 \text{total external research funds}_{t-i}} * 100$ <p><i>t=2016</i></p> |

## Student internships in the region

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Regional Engagement  |
| Definition      | Out of the students who did an internship, the percentage where the internship was with a company or organisation located in the region.                   |
| Rationale       | Internships of students in regional enterprises are a means to build co-operations with regional partners and connect students to the local labour market. |
| Data source     | Department questionnaire   |
| Data elements   | Number of students who did an internship in the region; total number of students who did an internship.  |
| Time reference  | 2016 subjects: 2012-2014; 2017 subjects: 2013 - 2015; 2018 subjects: 2014 -2016.   |
| Grouping method | All subjects: standard; civil engineering, business studies, economics, chemical engineering,  |
| Formula         | $\frac{\sum_{i=0}^2 \text{students in internships in the region}_{t-i}}{\sum_{i=0}^2 \text{students in internships}_{t-i}} * 100$ <p><i>t=2016</i></p>     |



# Regional Engagement

## Regional joint publications

|                 |  |
|-----------------|--|
| Level           | Department   |
| Dimension       | Regional Engagement  |
| Definition      | The percentage of department's research publications that list at least one co-author with an affiliate address in the same spatial region (within a distance of 50 km from the university). |
| Rationale       | Co-publications with authors located elsewhere in the region are a reflection of regional linkages between the university and regional partners.   |
| Data source     | CWTS/Thomson Reuters - Web of Science Core Collection  |
| Data elements   | Number of research publications that list at least one affiliate address of co-authors in the same region (50 km range); total number of academic publications                               |
| Time reference  | period 2012-2016   |
| Grouping method | 2016 subjects, mechanical and electrical engineering: standard; other 2017 subjects: log-n   |
| Formula         | $\frac{\text{score on regional co-publications}_{2012-2016}}{\text{total publication output}_{2012-2016}} * 100$   |

## Community service learning

|                 |   |
|-----------------|---|
| Level           | Department  |
| Dimension       | Regional Engagement   |
| Definition      | The percentage of credits given in service-learning activities, in relation to total number of credits. Service-learning involves students in community service activities and applies the experience to personal and academic development. This indicator is used only in social work. |
| Rationale       | Service-learning involves students in community service activities and applies the experience to personal and academic development. Service-learning takes place outside the HEI.   |
| Data source     | Department questionnaire  |
| Data elements   | Credits for service-learning; duration of programme (60 credits per year)   |
| Time reference  | 2016  |
| Grouping method | Only social work: log-normalised  |
| Formula         | $\frac{\text{Number of credit points obtainable for service learning} * 100}{\text{Total credit points required for degree}^*}$ <p><i>* 180 CP for a Bachelor degree and 120 CP for a Master degree</i></p>   |

# Mapping

# Teaching and Learning

## Expenditure on teaching

|                |  |
|----------------|--|
| Dimension      | Teaching and Learning  |
| Definition     | Percentage of total institutional expenditure dedicated to teaching activities   |
| Rationale      | This indicator highlights the priority given to teaching activities, in relation to research and knowledge exchange  |
| Data source    | institution questionnaire  |
| Data elements  | percentages of expenditure on teaching provided  |
| Time reference | 2014-2016  |
| Formula        | $\frac{\sum_{i=0}^2 \text{percentage of expenditure on teaching activities}_{t-i}}{3}$ <p><i>t=2016; Percentage is corrected for expenditure on other activities: these expenditures are distributed over teaching, research and knowledge transfer. If more than 50% is spent on other activities, the indicator is not calculated.</i></p> |
| Categories     | low; medium; high  |

# Teaching and Learning

## Graduate students

|                |  |
|----------------|--|
| Dimension      | Teaching and Learning  |
| Definition     | The number of higher degrees (master and PhD) awarded as a percentage of total number of degrees awarded                                   |
| Rationale      | The indicator characterises an institution regarding its focus on graduate versus undergraduate teaching and education                     |
| Data source    | institution questionnaire; external sources (ETER, institutional website)  |
| Data elements  | The number of higher degrees (master and doctorate) awarded.<br>Total number of degrees awarded  |
| Time reference | 2014-2016  |
| Formula        | $\frac{\sum_{i=0}^2 \text{number of higher degrees awarded}_{t-i}}{\sum_{i=0}^2 \text{total number of degrees awarded}_{t-i}}$<br>$t=2016$ |
| Categories     | none; low; medium; high  |

# Teaching and Learning

## Scope

|                |  |
|----------------|--|
| Dimension      | Teaching and Learning  |
| Definition     | The number of broad educational subject fields (ISCED97) in which students have graduated in the latest year   |
| Rationale      | Scope is seen as an indication of the disciplinary diversity of a HEI. A specialised activity profile is likely to lead to a different performance profile than a broad or comprehensive activity profile. |
| Data source    | institution questionnaire  |
| Data elements  |  |
| Time reference | Latest year available  |
| Formula        |  |
| Categories     | specialised (1, 2 or 3 fields); broad (4, 5 or 6); comprehensive (7, 8, 9 or 10)   |

# Teaching and Learning

## Level of study

|                |  |
|----------------|--|
| Dimension      | Teaching and Learning  |
| Definition     | The degree levels at which the institution awards degrees  |
| Rationale      | The highest level of degree programmes offered is one of the indicators of research intensiveness of the activity profile of a HEI. Doctorate granting HEIs are more likely to be research active as bachelor granting HEIs. |
| Data source    | institution questionnaire; external sources (institutional websites)   |
| Data elements  |  |
| Time reference | Latest year available  |
| Formula        |  |
| Categories     | bachelor; master; doctorate  |

# Teaching and Learning

## Specialised in

|                |   |
|----------------|---|
| Dimension      | Teaching and Learning   |
| Definition     | The broad subject field in which more than 50% of graduates graduated in.   |
| Rationale      | This indicator allows for selecting specialised HEIs on their dominant subject field  |
| Data source    | institution questionnaire; ETER   |
| Data elements  | graduates per broad educational subject field (ISCED 2011)  |
| Time reference | 2014-2016   |
| Formula        | $\frac{\text{number of graduates in field } x}{\text{total number of graduates}}$<br><br><i>field x=broad subject field</i> |
| Categories     |   |



## Expenditure on research

|                |  |
|----------------|--|
| Dimension      | Research   |
| Definition     | The percentage of expenditure allocated to research activities   |
| Rationale      | This indicator highlights the priority given to research activities, in relation to teaching and knowledge exchange  |
| Data source    | institution questionnaire  |
| Data elements  |  |
| Time reference | 2014-2016  |
| Formula        | $\frac{\sum_{i=0}^2 \text{percentage of expenditure on research activities}_{t-i}}{3}$ <p><i>t=2016; Percentage is corrected for expenditure on other activities: these expenditures are distributed over teaching, research and knowledge transfer. If more than 50% is spent on other activities, the indicator is not calculated.</i></p> |
| Categories     | none; low; medium; high  |

# Knowledge Transfer

## Income from private sources

|                |  |
|----------------|--|
| Dimension      | Knowledge Transfer   |
| Definition     | The total amount of external research income and income from knowledge transfer from private sources as a percentage of total income of institution  |
| Rationale      | The amount of income from third parties (external research and knowledge exchange income) signals knowledge exchange between academia and business, contract research complements patent indicators    |
| Data source    | institution questionnaire  |
| Data elements  | revenues from tuition fees<br>revenues from CPD<br>revenues from private research contracts<br>revenues from licensing, royalties or copyrights  |
| Time reference | 2014-2016  |
| Formula        | $\frac{\sum_{i=0}^2 \text{revenues from (tuition + private research contracts + CPD + licensing, royalties and copyrights)}_{t-i}}{\sum_{i=0}^2 \text{total income}_{t-i}} * 100$ <p><i>t=2016</i></p> |
| Categories     | none; low; medium; high  |

# Regional Engagement

## New entrants from the region

|                |   |
|----------------|---|
| Dimension      | Regional Engagement   |
| Definition     | The percentage of new entrants to bachelor programmes coming from the region in which the institution is located        |
| Rationale      | The percentage of new entrants from the region reflect one aspect of the embeddedness of the institution in the region. |
| Data source    | institution questionnaire   |
| Data elements  | Percentage or range provided  |
| Time reference | Latest year available   |
| Formula        |   |
| Categories     | none; low; lower medium; upper medium; high   |

# General

## Size of institution

|                |   |
|----------------|---|
| Dimension      | General   |
| Definition     | The size of the institution in terms of the number of students enrolled   |
| Rationale      | Size is seen as an important characteristic describing the institution, from both the student perspective and the institution perspective |
| Data source    | institution questionnaire; external sources (ETER, IPEDS, institutional websites)   |
| Data elements  | Degree seeking students enrolled  |
| Time reference | 2014-2016   |
| Formula        | $\frac{\sum_{i=0}^2 \text{degree students enrolled}_{t-i}}{3}$<br><br>$t=2016$  |
| Categories     | small; midsize; large; very large   |

# General

## Legal status

|                |  |
|----------------|--|
| Dimension      | General  |
| Definition     | The public/private character of the institution  |
| Rationale      | legal status is a crude indicator of the dependency of a HEI on revenues from private sources. |
| Data source    | Institution questionnaire  |
| Data elements  | Choice of:<br>(1) public;<br>(2) private;<br>(3) private government-dependent                  |
| Time reference | Latest year available  |
| Formula        |  |
| Categories     | public; private; government dependent private  |

# General

## Fouding year

|                |   |
|----------------|---|
| Dimension      | General   |
| Definition     | The founding year of the oldest part of the institution                                 |
| Rationale      | Age/ year of foundation proves to be correlated to a number of performance indicators.  |
| Data source    | institution questionnaire   |
| Data elements  | year of foundation<br>year of foundation of oldest part (in case of merged institution) |
| Time reference |   |
| Formula        |   |
| Categories     | pre 1870; 1870-1945; 1945-1980; post 1980   |

## Female students bachelor

|                |   |
|----------------|---|
| Dimension      | General   |
| Definition     | The number of female students enrolled in bachelor programmes as a percentage of total enrolment in bachelor programmes |
| Rationale      | The gender aspect in bachelor enrolment is seen as an aspect of the social dimension of a HEI and its programmes.       |
| Data source    | external datasources, like ETER and IPEDS   |
| Data elements  |   |
| Time reference | latest year available   |
| Formula        | $\frac{\text{number of female bachelor students enrolled}}{\text{total number of bachelor students enrolled}} * 100$    |
| Categories     |   |

## Female students master

|                |   |
|----------------|---|
| Dimension      | General   |
| Definition     | The number of female students enrolled in master programmes as a percentage of total enrolment in master programmes |
| Rationale      | The gender aspect in master enrolment is seen as an aspect of the social dimension of a HEI and its programmes.     |
| Data source    | external sources, like ETER and IPEDS   |
| Data elements  |   |
| Time reference | latest year available   |
| Formula        | $\frac{\text{number of female master students enrolled}}{\text{total number of master students enrolled}} * 100$    |
| Categories     |   |



## Female academic staff

|                |  |
|----------------|--|
| Dimension      | General  |
| Definition     | The number of female academic staff as a percentage of total number of academic staff                                |
| Rationale      | The gender aspect in academic staff is seen as an aspect of the social dimension of a HEI and its programmes.        |
| Data source    | external sources like ETER and IPEDS   |
| Data elements  |  |
| Time reference | latest year available  |
| Formula        | $\frac{\text{number of female academic staff (headcount)}}{\text{total number of academic staff (headcount)}} * 100$ |
| Categories     |  |

# General

## Female professors

|                |   |
|----------------|---|
| Dimension      | General   |
| Definition     | The number of female professors as a percentage of total number of professors   |
| Rationale      | The gender aspect in the number of professors is seen as an aspect of the social dimension of a HEI and its programmes. |
| Data source    | external sources, like ETER and IPEDS   |
| Data elements  |   |
| Time reference | latest year available   |
| Formula        | $\frac{\text{number of female professors (headcount)}}{\text{total number of professors (headcount)}} * 100$            |
| Categories     |   |