METHODOLOGY FOR OVERALL AND SUBJECT RANKINGS FOR THE *TIMES HIGHER EDUCATION* WORLD UNIVERSITY RANKINGS 2019

September 2018

Times Higher Education World University Rankings:

The *Times Higher Education* World University Rankings, founded in 2004, aims to provide the definitive list of the world's best universities, evaluated across teaching, research, international outlook, reputation and industry income. *Times Higher Education* (*THE*)'s data is trusted by governments and universities and is a vital resource for students, helping them choose where to study.

Directors' Statement:

*This document (the "Methodology") sets out our end-to-end process for generating the Times Higher Education World University Rankings 2019 (the "Rankings"). As directors and management of Times Higher Education, we state that we have followed our Methodology and correctly applied the "specific procedures" denoted by (i) - (x) (highlighted in **<u>bold underlined italics</u>** throughout this document).*

Signed: ....

Print: ....T.REV.O.R...BARRATT..............

Role: ........C.E.O................

Date: .....19./.09./.2018....

For and on behalf of TES Global Limited

Independent assurance by PricewaterhouseCoopers LLP:

To help demonstrate the integrity of the Rankings, our application of the specific procedures (i) - (x) has been subject to independent assurance by PricewaterhouseCoopers LLP UK ("PwC"). Their independent assurance opinion on our application of specific procedures (i) – (x) is set out on the final page of this document. The specific procedures (i) – (x) relate to:

1) **Data collection and sources**
2) **Criteria for exclusion, inclusion, and data processing**
3) **Calculation, scoring and ranking**
4) **Publication and reporting**

The specific procedures (i) – (x) that have been independently assured by PwC are set out below in the table on page 13.

Important links:
- World University Rankings 2019 general procedures --> https://www.timeshighereducation.com/terms-and-conditions
- World University Rankings 2018 World reputational rankings overview --> https://www.timeshighereducation.com/world-university-rankings/world-reputation-rankings-2018-methodology
- *Times Higher Education* World University Rankings 2019 methodology & PwC opinion (this document) --> https://www.timeshighereducation.com/world-university-rankings/methodology-world-university-rankings-2019

The *Times Higher Education* World University Rankings are the only global performance tables that judge research-intensive universities across all their core missions: teaching, research, research influence, knowledge transfer and international outlook. We use 13 carefully calibrated performance indicators, listed below, to provide the most comprehensive and balanced comparisons, trusted by students, academics, university leaders, industry and governments. The basic methodology for this year's rankings is similar to that employed since the 2011 – 2012 tables, but we made important changes to the underlying data sources notably deriving bibliometrics from Elsevier's Scopus database from 2015 – 2016 onwards.

The 2019 World University Rankings are published in autumn 2018.

The performance indicators are grouped into five areas:

- **Teaching** (the learning environment)
  - Reputation Survey – Teaching
  - Academic Staff-to-Student Ratio
  - Doctorates Awarded / Undergraduate Degrees Awarded
  - Doctorates Awarded / Academic Staff
  - Institutional Income / Academic Staff
- **Research** (volume, income and reputation)
  - Reputation Survey – Research
  - Research Income / Academic Staff
  - Publications / Staff (Academic Staff + Research Staff)
- **Citations** (research influence)
  - Field Weighted Citation Impact
- **International outlook** (staff, students and research)
  - Proportion of International Students
  - Proportion of International Academic Staff
  - International co-authorship (International Publications / Publications Total)
- **Industry income** (knowledge transfer)
  - Research income from industry & commerce / Academic Staff

1) Data collection and sources

- Self-submitted data (Portal)

<u>A named representative from each institution submits and authorises their institutional data for use in the Rankings (i),</u> via THE's designated online portal, with confirmations that they have:

- Provided true and accurate information for their institution for 2016; and
- Understood and complied with the THE terms and conditions --> https://www.timeshighereducation.com/terms-and-conditions;

In global terms, the most complete data available for all institutions has been found to be from 2 years ago, therefore all institutions report 2016 data (defined as the appropriate annual cycle for the client that ends within the calendar year 2016).

<u>Times Higher Education will not self-submit data for an institution without positive confirmation from the named representative of the institution</u> (ii).

<u>Prior to submission of data within the portal, the draft data undergoes automatic validation checks reviewed by the named representative</u> (iii).

- Bibliometrics

Citations data is a score per institution calculated by Elsevier from 2015 (until 2014 it was supplied by Web of Science). Elsevier provide the Field-Weighted Citation Impact (FWCI) score, per subject and overall.

The FWCI score indicates how the number of citations received by an entity's publications compares with the average number of citations received by all other similar publications. 'Similar publications' are understood to be publications in the Scopus database that have the same publication year, type, and discipline, as defined by the Scopus journal classification system.

A FCWI of 1.00 indicates the global average.

In 2016 papers with more than 1,000 authors were excluded due to their disproportionate impact on the citation scores of the small number of universities. Since 2017 these papers have been reincorporated using a fractional counting approach to ensure that all universities where academics are authors of these papers will receive at least 5 per cent of the value of the paper. The institutions with authors that provide the most contributors to the paper receive a proportionately larger contribution.

We also collect the total number of publications overall, plus the total number of publications with international co-authorship per institution, providing they meet our 'sufficient publications' criteria (detailed in section 2a).

- Reputation survey

An annual survey was sent to a sample of academics randomly selected by Elsevier, in which we ask them to nominate the universities that they perceive to be the best for Teaching and/or Research in their field. For the 2017 and 2018 surveys, academics have been asked to nominate up to 15 institutions for Teaching and up to 15 institutions for Research. The 2018 results were combined with the 2017 results for use in the WUR.

The Teaching and Research scores for an institution at the global level were the count of mentions they received in each category, weighted both to reflect the distribution of scholars across the world (using data from UNESCO data.uis.unesco.org) and the distribution of respondents by subject in the survey.

The two Teaching and Research scores relating to the specialist field of the survey respondents were the scores used for the subject tables. Where an institution received no votes, they were allocated a zero score.

- Reference data

THE incorporates reference datasets into its model to convert country-level data provided by institutions via the portal (e.g. research income in a local currency) to a single comparable dataset for all institutions.

The sources of this data are the HMRC monthly datasets: [https://www.gov.uk/government/publications/hmrc-exchange-rates-for-2016-monthly], which provides accurate foreign exchange rates to convert datasets into GBP and then back into their local currency if an institution reports in a foreign currency; and the World Bank Purchase Power Parity ("PPP") dataset [http://data.worldbank.org/indicator/PA.NUS.PPP] which is used to convert the local currency to common-PPP-scaled USD. PPP is used to exemplify the differing currency strengths in each country while allowing for easy cross country comparisons. Where data for a country doesn't exist in the World Bank database, a dataset from the IMF is used [http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weoselgr.aspx].

2) Criteria for exclusion, inclusion, and data processing

a) Criteria
b) Subject ranking criteria
c) Data point adjustments
d) Data processing pre-rankings

2a) Criteria

Institutions must meet seven criteria in order to be included in the Overall Ranking[iv]:

i. **Sufficient publications** – An institution is required to publish more than 1000 papers over the previous 5 years, and more than 150 publications in any single year. Thresholds are also applied per subject for the subject rankings.

ii. **Undergraduate students** – An institution must teach at an undergraduate level, usually indicated by having more than zero undergraduate degrees awarded to be marked as valid. Postgraduate-only institutions are therefore not in the ranking.

iii. **Subject breadth** – An institution must not be focused on a single narrow subject area (more than 80% of their publication output is from one subject area).

iv. **Sufficient data in overall submission** – If an institution has not supplied any "overall" numbers for the ranking year they are excluded from the ranking.

v. **Sufficient overall values** – If more than two of the critical overall values (academic staff, international academic staff, research staff, students, international students, undergraduate degrees awarded, doctorates awarded, institutional income, research income, research income from industry and commerce) are null (either marked by the institution as "unavailable" or "withheld"), the institution is marked as invalid. Null values will cause any metric based on that value to also be null.

vi. **At least one subject submission** – In addition to overall numbers, an institution must supply numbers for at least one applicable subject. If no applicable subjects have been reported, the institution is marked as invalid.

vii. **Not featured in custom exclusions list** – Institutions that have requested not to participate in the ranking or that are not eligible for other institution-specific reasons have been excluded.

2b) Subject ranking criteria

Publication eligibility criteria – For the eleven subject tables, there is an additional threshold within the subject:

For the subjects that generate a high volume of publications:
- At least 500 papers over 2013 – 2017 for clinical, preclinical & health, engineering & technology, computer science, life sciences, physical sciences;

For the subjects with lower volumes of publications:
- At least 250 papers over 2013 – 2017 for arts & humanities
- At least 200 papers over 2013 – 2017 in in the social sciences and the arts & humanities
- At least 150 papers in psychology
- At least 100 papers in law and education

Subject	Papers for 5 years (2013-2017)
Overall	1000 (150 per year)
Arts & Humanities	250
Clinical, Preclinical & Health	500
Engineering & Technology	500
Computer Science	500
Life Sciences	500
Physical Sciences	500
Business & Economics	200
Social Sciences	200
Psychology	150
Law	100
Education	100

Staff eligibility criteria – we also expect an institution to either have at least a proportion of its staff in a discipline (4% social sciences, 1% for computer science, psychology, law or education, 5% for other subjects), or clear an absolute number of staff threshold.

Subject	Proportion of staff	Absolute number of staff in a given subject
Arts & Humanities	5%	50
Clinical, Preclinical & Health	5%	50
Engineering & Technology	4%	40
Computer Science	1%	20
Life Sciences	5%	50
Physical Sciences	5%	50
Business & Economics	5%	50
Social Sciences	4%	40
Psychology	1%	20
Law	1%	20
Education	1%	20

2c) Data adjustments

After the deadline of the submission of data via the Portal by institutions, ***management review and approve all institution submissions data for appropriateness and accuracy, based on prior year values and gaps within datasets*** [v] as described below.

On the occasions where an institution does not provide a data point which would result in the inability to generate a metric, the missing metric may be calculated by imputing the value as the higher of:

- The average of the two lowest metric scores for an institution, or
- The minimum score awarded across the whole population for that metric

2d) Data processing pre-rankings

Data provided by institutions for financial information is converted into USD using international PPP exchange rates [vi] (provided by the World Bank), for use in the Rankings calculations.

Institution-level bibliometric (Scopus and/or SciVal) and reputation survey data obtained from Elsevier is mapped to THE institution data via THE's institution ID [vii].

3) Calculation, scoring and ranking

a) Distribution analysis and re-weighting
b) Subject ranking differentiation

3a) Distribution analysis and re-weighting

There are 13 indicators, each combined into 5 categories, or "pillars" which are weighted according to relative importance.

Once the final population of institutions and indicators has been prepared, the Rankings are generated by weighting the indicators [viii] according to the following percentage breakdowns:

1. Teaching (the learning environment): 30%

- Reputation survey: 15%
  The Academic Reputation Survey (run annually) that underpins this category was carried out from January to March 2018. It examined the perceived prestige of institutions in teaching. The 2018 data are combined with the results of the 2017 survey. The responses were statistically representative of the global academy's geographical and subject mix.
- Academic Staff-to-student ratio: 4.5%
- Doctorates awarded-to-bachelor' degrees awarded ratio: 2.25%
  Universities that awarded fewer than 100 undergraduate degrees are not included in the calculation of the metric distribution, but are scored against it.
- Doctorates awarded-to-academic staff ratio: 6%
  As well as giving a sense of how committed an institution is to nurturing the next generation of academics, a high proportion of postgraduate research students also suggests the provision of teaching at the highest level that is thus attractive to graduates and effective at developing them. This indicator is normalised to take account of an institution's unique subject mix, reflecting that the volume of doctoral awards varies by discipline.
- Institutional income: 2.25%
  This measure of income is scaled against staff numbers and normalised for purchasing-power parity. It indicates an institution's general status and gives a broad sense of the infrastructure and facilities available to students and staff.

2. Research (volume, income and reputation): 30%

- Reputation survey: 18%
  The most prominent indicator in this category looks at an institution's reputation for research excellence among its peers, based on the responses to our annual Academic Reputation Survey combining 2017 and 2018 data.
- Research income: 6%
  Research income is scaled against academic staff numbers and adjusted for purchasing-power parity (PPP). This is a controversial indicator because it can be influenced by national policy and economic circumstances. Income is crucial to the development of world-class research, and because much of it is subject to competition and judged by peer review, our experts suggested that it was a valid measure. This indicator is normalised to take account of each institution's distinct subject profile, reflecting the fact that research grants in science subjects are often bigger than those awarded for the highest-quality social science, arts and humanities research.
- Research productivity: 6%
  We count the number of papers published in the academic journals indexed by Elsevier's Scopus database per scholar, scaled for institutional size and normalised for subject. This gives a sense of the institution's ability to get papers published in quality peer-reviewed journals.
  Introduced in the 2018 rankings, we devised a method to give credit for cross-subject research that results in papers being published in subjects where a university has no staff. For subjects where there are papers, but not staff we will reassign the papers to subjects where there are staff.

We will do this proportionally according to the number of staff in populated subjects, and according to the median publications per staff for populated subjects. We will have a maximum threshold of the proportion of papers that we are willing to reassign (10% of the total of papers).

3. Citations (research influence): 30%

Our research influence indicator looks at universities' role in spreading new knowledge and ideas.

We examine research influence by capturing the number of times a university's published work is cited by scholars globally. This year, our bibliometric data supplier Elsevier examined 67.9 million citations to 14.1 million journal articles, article reviews, conference proceedings, book chapters and books published over five years. The data includes more than 25,000 academic journals indexed by Elsevier's Scopus database and all indexed publications between 2013 and 2017. Citations to these publications made in the six years from 2013 to 2018 are also collected.

The citations help to show us how much each university is contributing to the sum of human knowledge: they tell us whose research has stood out, has been picked up and built on by other scholars and, most importantly, has been shared around the global scholarly community to expand the boundaries of our understanding, irrespective of discipline.

The data is normalised to reflect variations in citation volume between different subject areas. This means that institutions with high levels of research activity in subjects with traditionally high citation counts do not gain an unfair advantage.

We have blended equal measures of a country-adjusted and non-country-adjusted raw measure of citations scores.

In 2015-16, we excluded papers with more than 1,000 authors because they were having a disproportionate impact on the citation scores of a small number of universities. Since the 2016-17 rankings, we have designed a method for reincorporating these papers. Working with Elsevier, we have developed a new fractional counting approach that ensures that all universities where academics are authors of these papers will receive at least 5 per cent of the value of the paper, and where those that provide the most contributors to the paper receive a proportionately larger contribution.

4. International outlook (staff, students, research): 7.5%

- Proportion of international students: 2.5%
- Proportion of international staff: 2.5%
    The ability of an institution to attract undergraduates, postgraduates and faculty from all over the planet is key to its success on the world stage.
- International collaboration: 2.5%
    In the third international indicator, we calculate the proportion of an institution's total research journal publications that have at least one international co-author and reward higher volumes. This indicator is normalised to account for an institution's subject mix and uses the same five-year window as the "Citations: research influence" category.

5. Industry income (knowledge transfer): 2.5%

An institution's ability to help industry with innovations, inventions and consultancy has become a core mission of the contemporary global academy. This category seeks to capture such knowledge-transfer activity by looking at how much research income an institution earns from industry (adjusted for PPP), scaled against the number of academic staff it employs.

The category suggests the extent to which businesses are willing to pay for research and an institution's ability to attract funding in the commercial marketplace – useful indicators of institutional quality.

3b) Subject ranking differentiation

N.B. The subject rankings are not subject to PwC assurance. The below information is provided for information purposes only.

The subject tables employ the same range of 13 performance indicators used in the overall World University Rankings, brought together with scores provided under the same five pillars:

- Teaching (the learning environment);
- Research (volume, income and reputation);
- Citations (research influence);
- International outlook (staff, students, research); and
- Industry Income.

However, within the subject rankings, the overall methodology is carefully recalibrated by subject, with the weightings changed to best suit the individual fields. In particular, those given to the research indicators have been altered to fit more closely the research culture in each subject, reflecting different publication habits: in the arts and humanities, for instance, where the range of outputs extends well beyond peer-reviewed journals, we give less weight to paper citations.

Accordingly, the weight given to "citations: research influence" is halved from 30% in the overall rankings to just 15% for the arts and humanities. More weight is given to other research indicators, including the Academic Reputation Survey. For social sciences and law, where there is also less faith in the strength of citations alone as an indicator of research excellence, the measure's weighting is reduced to 25%. It is also reduced for education, engineering & technology and computer sciences to 27.5%.

By the same token, in those subjects where the vast majority of research outputs come through journal articles and where there are high levels of confidence in the strength of citations data, we have increased the weighting given to the research influence (up to 35% for the physical, life sciences, psychology and for the clinical, pre-clinical and health tables).

	Indicator	Overall	A&H	Social	Bus & Eco	Clinical	Life	Phys	E&T	Comp Sci	Psycho	Law	Educ
C1	Citations	30.00%	15.00%	25.00%	25.00%	35.00%	35.00%	35.00%	27.50%	27.50%	35.00%	25.00%	27.50%
E1	Industry Income/Staff	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	5.00%	5.00%	2.50%	2.50%	2.50%
T1	Teaching Reputation	15.00%	25.30%	21.10%	21.10%	17.90%	17.90%	17.90%	19.50%	19.50%	17.90%	21.00%	20.00%
T2	Student to Staff Ratio	4.50%	3.80%	3.30%	3.30%	2.80%	2.80%	2.80%	3.00%	3.00%	2.80%	4.50%	4.50%
T3	PhD/Bachelors	2.25%	1.80%	1.60%	0.00%	1.40%	1.40%	1.40%	1.50%	1.50%	1.40%	0.00%	0.00%
T4	PhD/Staff	6.00%	4.60%	4.80%	4.90%	4.00%	4.00%	4.00%	4.50%	4.50%	4.00%	4.90%	6.00%
T5	Income/Staff	2.25%	1.90%	1.60%	1.60%	1.40%	1.40%	1.40%	1.50%	1.50%	1.40%	2.30%	2.20%
R1	Research Reputation	18.00%	30.00%	22.80%	22.80%	19.30%	19.30%	19.30%	21.00%	21.00%	19.30%	21.00%	20.00%
R2	Research Income/Staff	6.00%	3.80%	4.90%	4.90%	4.10%	4.10%	4.10%	4.50%	4.50%	4.10%	4.90%	4.90%
R3	Papers/Staff	6.00%	3.80%	4.90%	4.90%	4.10%	4.10%	4.10%	4.50%	4.50%	4.10%	4.90%	4.90%
I1	International Students	2.50%	2.50%	2.50%	3.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	3.00%	2.50%
I2	International Staff	2.50%	2.50%	2.50%	3.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	3.00%	2.50%
I3	International Co-authorship	2.50%	2.50%	2.50%	3.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	3.00%	2.50%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

4) Publication and reporting

a) Review of ranking outputs
b) Sign off by management

4a) Review of ranking outputs

Getting to the final result

Moving from a series of specific data points to indicators, and finally to a total score for an institution, requires us to match values that represent fundamentally different data. To do this we use a standardisation approach for each indicator, and then combine the indicators in the proportions indicated below.

The standardisation approach we use is based on the distribution of data within a particular indicator, where we calculate a cumulative probability function, and evaluate where a particular institution's indicator sits within that function. A cumulative probability score of X in essence tells us that an institution with random values for that indicator would fall below that score X per cent of the time.

For all indicators except the Academic Reputation Survey, we calculate the cumulative probability function using a version of Z-scoring. The distribution of the data in the Academic Reputation Survey requires us to use an exponential component.

Once the individual indicators have been created for each institution, the results are combined into the overall rankings according to their relative weightings – these are the Overall Rankings.

Once indicators and pillars have been calculated for each subject and overall, the results are used to calculate the Overall Rankings[ix]:

4b) Sign off by management

The Rankings calculations are reviewed by the editorial team, with comparisons in performance of institutions made to previous years. The Rankings are formally signed off by management prior to being uploaded to the website.

The specific procedures for the Overall Rankings are located on the *Times Higher Education* website at:
 https://www.timeshighereducation.com/world-university-rankings/methodology-world-university-rankings-2019

The Overall Rankings are accurately reported on the THE website. [x]

Specific procedures subject to independent assurance by PwC

Rule number	Methodology section	Rule description
(i)	Data collection and sources	A named representative from each institution submits and authorises their institutional data for use in the Rankings.
(ii)	Data collection and sources	Times Higher Education will not self-submit data for an institution without positive confirmation from the named representative of the institution.
(iii)	Data collection and sources	Prior to submission of data within the portal, the draft data undergoes automatic validation checks reviewed by the named representative.
(iv)	Criteria for exclusion, inclusion and data processing	Institutions must meet seven criteria in order to be included in the Rankings.
(v)	Criteria for exclusion, inclusion and data processing	Management review and approve all institution submissions data for appropriateness and accuracy, based on prior year values and gaps within datasets.
(vi)	Criteria for exclusion, inclusion and data processing	Data provided by institutions for financial information is converted into USD using international PPP exchange rates.
(vii)	Criteria for exclusion, inclusion and data processing	Institution-level bibliometric (Scopus and/or SciVal) and reputation survey data obtained from Elsevier is mapped to THE institution data via THE's institution ID.
(viii)	Calculation, scoring and ranking	Once the final population of institutions and indicators has been prepared, the Rankings are generated by weighting the indicators.
(ix)	Publication and reporting	Once indicators and pillars have been calculated for each subject and overall, the results are used to calculate the Overall Rankings.
(x)	Publication and reporting	The Overall Rankings are accurately reported on the THE website.

Appendix 1: Top 20 institutions in the Overall Rankings from the *Times Higher Education* 2019 World University Rankings.

Institution Name	Country	WUR 2019 Rank Label	WUR 20118 Rank Label	Overall Score	Teaching Score	Research Score	Citations Score	Industry Income Score	International Outlook Score
University of Oxford	United Kingdom	1	1	96.0	91.8	99.5	99.1	67.0	96.3
University of Cambridge	United Kingdom	2	2	94.8	92.1	98.8	97.1	52.9	94.3
Stanford University	United States	3	=3	94.7	93.6	96.8	99.9	64.6	79.3
Massachusetts Institute of Technology	United States	4	5	94.2	91.9	92.7	99.9	87.6	89.0
California Institute of Technology	United States	5	=3	94.1	94.5	97.2	99.2	88.2	62.3
Harvard University	United States	6	6	93.6	90.1	98.4	99.6	48.7	79.7
Princeton University	United States	7	7	92.3	89.9	93.6	99.4	57.3	80.1
Yale University	United States	8	12	91.3	91.6	93.5	97.8	51.5	68.3
Imperial College London	United Kingdom	9	8	90.3	85.8	87.7	97.8	67.3	97.1
University of Chicago	United States	10	9	90.2	90.2	90.1	99.0	41.4	70.9
ETH Zurich	Switzerland	11	=10	89.3	83.3	91.4	93.8	56.1	98.2
Johns Hopkins University	United States	=12	13	89.0	81.9	90.5	98.5	95.5	71.9
University of Pennsylvania	United States	=12	=10	89.0	87.4	89.2	98.4	70.3	63.6
UCL	United Kingdom	14	16	87.8	79.1	90.1	95.9	42.4	95.8
University of California, Berkeley	United States	15	18	87.7	78.7	92.3	99.7	49.3	69.8
Columbia University	United States	16	14	87.2	85.4	83.1	98.8	44.8	79.0
University of California, Los Angeles	United States	17	15	86.4	82.6	87.9	97.8	49.4	62.1
Duke University	United States	18	17	85.4	84.1	78.8	98.2	100.0	61.0
Cornell University	United States	19	19	85.1	79.7	85.4	97.4	36.9	71.8
University of Michigan	United States	20	21	84.1	80.0	85.9	96.0	45.9	58.0

![pwc logo]

Independent assurance report to the directors of TES Global Limited for the Times Higher Education World University Rankings 2019

This report is produced in accordance with the terms of our contract dated 27 November 2017 for the purpose of reporting to the directors of TES Global Limited on our independent limited assurance engagement over the specific procedures (i) – (x) in production and reporting of the universities ranked 1-200 for the Times Higher Education World University Rankings 2019 (the "Rankings"), outlined on page 13 of the methodology.

Our conclusion

Based on the results of our work, nothing has come to our attention that causes us to believe that the specific procedures (i) – (x) outlined by TES Global Limited management are not fairly stated in all material respects.

This conclusion is to be read in the context of what is stated below.

Scope of our work

We have performed a limited assurance engagement over the procedures set out in the table on page 13 ('THE's procedures') within the Times Higher Education World University Rankings 2019 methodology (the 'Methodology'), which outlines THE's production and reporting of the Rankings.

Our work has been performed in accordance with the agreement between us dated 27 November 2017.

Professional standards applied and level of assurance

We performed our limited assurance engagement over THE's procedures in accordance with International Standard on Assurance Engagements 3000 (Revised) *Assurance Engagements other than Audits and Reviews of Historical Financial Information* issued by the International Auditing and Assurance Standards Board.

Our independence and quality control

We complied with the Institute of Chartered Accountants in England and Wales (ICAEW) Code of Ethics, which includes independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

We apply International Standard on Quality Control (UK) 1 and accordingly maintain a comprehensive system of quality control including documented policies and standards regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Inherent limitations

Our assurance procedures are limited to assessing the application of specific procedures (i) – (x) and are subject to the following inherent limitations:

- Reliance has been placed on data obtained from third parties. These data sets include:
  - Bibliometric data for Universities provided by Elsevier (part of RELX Group);
  - Reputational survey response data provided by Elsevier (part of RELX Group);
  - PPP currency conversion figures for 2016 provided by the World Bank and International Monetary Fund; and
  - Foreign exchange currency conversion rates for 2016 provided by HMRC.
- Our responsibility is to assess the Directors' Statement that management has followed specific procedures (i) – (x) of the Methodology, not to comment on the resulting rankings.

Work performed

Our limited assurance procedures primarily comprised:

- Examining the Methodology and specific procedures (i) – (x) and assessing any key assumptions and limitations
- Obtaining an understanding of the third party surveys and data
- Assessment of adherence to specific procedures (i) – (x) for:
  o Data collection and sources;
  o Criteria for exclusion, inclusion and data processing;
  o Calculation, scoring and ranking; and
  o Publication and reporting.
- Confirming accurate reporting of Universities in the Overall Rankings on the Times Higher Education website. The top 20 Universities have been reproduced in Appendix 1.
- Enquiries of relevant management.

A limited assurance engagement is substantially less in scope than a reasonable assurance engagement under ISAE 3000 and involves less detailed testing.

Directors' responsibilities

The directors of TES Global Limited are responsible for:

- establishing an appropriate Methodology and specific procedures for producing the Rankings and reporting the results on THE's website;
- designing, implementing and monitoring policies, activities, processes and controls to comply with the procedures;
- their Methodology, including the application of the procedures set out on page 13;
- supporting the Directors' Statement with sufficient evidence, including documentation; and
- the maintenance and integrity of THE's website.

Our responsibilities

We are responsible for:

- planning and performing the engagement to obtain evidence to support our assurance conclusion;
- forming an independent conclusion, based on the procedures we have performed and the evidence we have obtained, on the Directors' Statement over their application of the procedures on page 13; and
- reporting our conclusions to the directors of TES Global.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

Intended users and purpose

This report is prepared for, and only for, the directors of TES Global Limited, and solely for the purpose of reporting to them on their statement that they have fairly stated the specific procedures (i) – (x) of the Methodology and no other purpose. We do not, in giving our opinion, accept or assume responsibility (legal or otherwise) or accept liability for, or in connection with, any other purpose for which our report including the opinion may be used, or to any other person to whom our report is shown or into whose hands it may come, and no other persons shall be entitled to rely on our opinion.

We permit the disclosure of our report, in full only and in the company of the Methodology, to enable the directors to demonstrate that they have discharged their governance responsibilities by commissioning an independent assurance report over procedures (i) – (x) of the Methodology, without assuming or accepting any responsibility or liability to any third parties on our part. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the directors of TES Global Limited for our work or this report save where terms are expressly agreed and with our prior consent in writing.

PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
Chartered Accountants
London, UK
19 September 2018