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Counting what is measured or measuring what counts?

League tables and their impact on higher education institutions in England

Report to HEFCE by the Centre for Higher Education
Research and Information (CHERI), Open University, and
Hobsons Research

Appendix A Research methodologies

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Appendix A: Research methodologies

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Introduction to Appendix A

Appendix A describes the methodologies used in each of the strands of the research. The detailed findings are reported in Appendices C, D and E and discussed in the main report. The initial study included a literature review and desk analysis of the published league tables. This was followed by structured interviews with the publishers and compilers of the league tables and, in the case of one of the world rankings, an email questionnaire and correspondence. Concurrent with this, an online survey of all higher education institutions (HEIs) in England was undertaken to investigate the impact of league tables in general on their actions and decision-making. Six case study institutions were selected and structured interviews and focus groups held in each to follow up issues raised by the literature review and online survey. Statistical analyses of the five league tables were undertaken. Finally, a draft version of the final report was discussed with representatives from a number of bodies in the higher education sector to gather feedback on the findings and how they could best be communicated and inform debate.

1. Initial study

1.1 Literature review

The design and implementation of both research strands was informed by a review of the academic and other literature on league tables in order to ensure a full understanding of the issues, perspectives and complexities of rankings and their effects. This included research publications and 'grey' literature, such as reports, conference material, policy documents, theses etc. Published literature was identified through desk research using the following search strategies:

- Online and manual searches for relevant journal articles, abstracts, books, reports;
- Online databases such as Current Educational Research in the UK (CERUK), British Education Index, and Education Resources Information Center (ERIC);
- Websites of institutional specialist research centres, policy bodies and others; and
- Citation searching.

Grey literature was sought largely through website searches.

A full bibliography of literature relating to the research is included as Appendix G, which also includes a list of relevant web sites.

1.2 Desk analysis

Another element of the initial study was a desk analysis of the league tables produced by the compilers of the five national and international rankings in order to establish, *prima facie*, how they had been produced, including the source data used, the methodologies, calculations, weightings and approach to sensitivity analysis, and the assumptions and rationales for these, if made public. This analysis covered a number of years in order to identify any refinements or developments that may have been made by the compilers as they themselves have reviewed their methods and procedures and have responded to feedback from readers.

2. Analyses of the five league tables

2.1 Aims of the research strand

The first strand of the research was to examine the five league tables identified by HEFCE. The Funding Council asked the research team to provide:

...a precise and detailed account of the aims for the league table, the chosen indicators and the source of data for each. Such an account should also include an explanation of what attributes the individual measures are supposed to reflect; why those attributes are desirable; and an explanation of justification of the weightings used to combine the separate measures into a single value used to rank institutions, including consideration of each compiler's approach to sensitivity analysis. In their report, the researchers would be asked to comment on the indicators, source of data, and weightings, noting any reservations about the assumptions made, or the reliability of the data. (HEFCE, *Invitation to Tender*)

We were able to obtain information on some of the topics and issues from our initial desk analysis of the tables, but we were able to explore the methods, sources etc and the rationale for these in more detail at the interviews. The interviews were designed to investigate further the following aspects of the generation of league tables in the five examples selected:

- To identify the sources of data used in compiling the league tables;
- To clarify the methodologies, calculations and weightings employed;
- To evaluate the approach adopted to sensitivity analysis; and
- To explore the assumptions and rationales for each of these aspects.

In addition, we were able to test the internal consistency of these aspects of compilation, in order to establish whether the means of producing the rankings fully justified the findings produced – in other words, whether they were ‘fit for purpose’. For example, we asked whether particular performance indicators were being used for the purposes for which they were originally designed, in order to establish whether they were being misappropriated, and even misinterpreted.

We also explored the narratives that compilers constructed around the tables: how they interpreted their significance, their conclusions and the implications they drew from them. This included whether due consideration was given to any caveats that ought to apply. Comparisons between league tables and their narratives were made, especially where they appeared to differ from, or even contradict with, one another.

2.2 Interviews with the compilers

Six interviews were held with the publishers and compilers of the three national league tables, Mayfield Consultants’ *The Good University Guide* and one of the world rankings (*Times Higher Education Supplement-Quacquarelli Symonds (THES-QS) World University Rankings*), and email correspondence was conducted with members of the Institute of Higher Education, Shanghai Jiao Tong University in China, about the *Academic Ranking of World Universities*.

The interviews and correspondence covered the following topics and issues:

- Aims and purposes
- Methodology – fit for purpose?
- External expertise used
- Other means of ensuring the soundness of the methodology
- Indicators chosen
- Indicators – input, process, output, outcomes and reputation
- Sources and currency of data
- Calculations
- Weightings
- Subject tables
- Impact of variables, correlations between different indicators
- Handling errors and corrections

- Handling incomplete data
- The significance of differences in ranking at different parts of the table
- Grouping institutions
- Development of the table
- Accounting for dramatic changes in position
- Transparency.

2.2.1 Generic interview schedule

The full generic interview schedule used for four of the league tables is included below. We also identified specific questions about particular league tables and their compilation. A customised set of questions was emailed to the Institute of Higher Education at Shanghai Jiao Tong University.

1. How would you describe the aims and purposes of the league table? What does it show? Who is it for?
2. Why do you think the methodology you use for compiling the table is fit for this purpose?
3. What external expertise and advice have you drawn on in improving your methodology?
4. What other means do you use for assuring the quality, validity, reliability etc of your table?
5. How and why have you selected the particular indicators included? Do they measure the qualities or differences in performance that you seek to rank in your table? What range of institutional activities do you cover, and why/why not?
6. What are the most important indicators? Why are they important? Are these given more weighting than others? How much more?
7. Given the higher weighting assigned to some indicators, could it be the case that only a subset of variables determine the ranking of any single institution and that its 'performance' in the remaining indicators does not really influence its position?
8. What are your key sources of data? Do you audit and verify them? How do you handle errors and corrections?
9. Is the dataset complete for every institution? If certain data are missing, how is this treated and how does this affect different institutions' positions in the rankings?
10. How are the data converted into a score? Do you use more than one data source for any (or all) of the indicators? Are the indicators normalised, and why?

11. Do you distinguish input, process and output measures? Does the table show value-added, or just reflect the quality of the inputs? How much emphasis is put on outcomes in your table?
12. What is the significance of the differences in ranking at different positions in the table? (e.g. is the difference in value between the institutions ranked 60th and 90th in one indicator commensurate with this difference in position? Is this difference the same between the institutions ranked, say, 10th and 40th?)
13. Have you considered grouping institutions in categories (e.g. research-intensive universities and teaching-focused institutions), similar to that in the US (using the Carnegie classification system), in order to only compare similar institutions (i.e. like with like)?
14. How current are the data used in compiling the table? How contemporaneous are the data used for different indicators? (e.g. Research Assessment Exercise (RAE) 2001 scores, bibliometrics from different time periods)
15. How has the table developed and changed over time (e.g. data sources and indicators used, weightings, use of normalisation etc)? Do you seek to limit changes to your methodology, in order to maintain consistency between years?
16. What have been the most dramatic shifts in institutional positions from year to year, and can you explain these?
17. In publishing the table, do you think you could be more explicit about:
 - how the table is compiled
 - the sources of the data
 - the way they are used.

2.3 Statistical analyses

Statistical analyses of each of the current versions of the five league tables were undertaken, in order to:

- identify the statistical properties of the indicators being used;
- establish the correlation coefficients among the indicators;
- confirm the derivation of the overall ranking using multiple regression analysis;
- carry out a principal component analysis of the indicators;
- seek the derivation of alternative indicator loadings; and
- explore the relationships among the different league tables.

The detailed results of these analyses are included in Appendix C and summarised in the main report. The multiple regression analyses broadly confirmed the derivation of three of the league tables on the basis of the published values of the relevant indicators.

However, the *Times* and *The Guardian* both warn that it is not possible to replicate the overall scores on the basis of published indicators, and this indeed proved to be the case.

We were asked to consider each compiler's approach to sensitivity analysis. Sensitivity can be considered from two points of view (Chatterjee and Hadi, 1988).¹ First, what would be the consequences of modest fluctuations in an institution's scores on the various indicators? The scatterplots of the total scores obtained by the various institutions against their rankings in each of the league tables show that a slight increase or decrease in scores could lead to a shift of several places in their ranking, particularly for institutions in the middle or lower end of the distribution. Secondly, what would be the consequences of modest changes in the weightings attached to the different indicators? The principal component analyses yielded alternative weightings based on the empirical relationships among the indicators themselves rather than the league table compilers' subjective judgements. Once again, the scatterplots of the total scores obtained by the various institutions against their predicted scores on the principal components show that a slight change in the weightings could lead to a shift of several places in their ranking. Both aspects of sensitivity would be worth exploring in future research.

3. The investigation of the impact of league tables on HEIs in England

3.1 Aims of the research strand

The second research strand aimed to investigate the impact of league tables generally on the actions and decision-making of higher education institutions in England:

...how institutions respond to the league tables and the extent to which there are positive and perverse impacts on institutional behaviour – again with the intention of stimulating informed debate about the impact of league tables. (HEFCE, *Invitation to Tender*)

The Funding Council had originally proposed case study research in six to eight institutions and, in addition, the research team proposed a sector-wide survey in order to increase the representativeness of this strand of the research. The survey was designed to cover similar themes to the case studies and to draw out key issues that could be followed up in the case study institutions.

3.2 The online survey of HEIs

The online survey was designed to collect sector-wide perceptions of higher education league tables and their impact on institutions' actions. The survey was limited to higher education institutions in England, with one response requested per institution.

Respondents were asked to state:

1. The degree to which they agreed with a range of statements about league tables;
2. How important achieving good rankings was to their institution and what areas/factors were influenced by rankings (e.g. student recruitment, reputation, etc);

¹ Chatterjee, S. and Hadi, A.S. (1988) *Sensitivity Analysis in Linear Regression*, New York: Wiley.

3. Who benefits the most from league table publications;
4. What rankings were perceived to be most influential;
5. Whether their institution had made any organisational changes as a result of published rankings;
6. How rankings impacted on various institutional activities and policies;
7. Whether their institution was placed roughly where they would expect it to be; and
8. What elements ideally should be included in rankings.

At the end of the survey, participants had an opportunity to make comments on any issues they did not feel had been covered sufficiently by the survey. Finally, institutions were asked to state their institution type (multi-faculty, specialist, or decline to state) and their mission group or representative body (Russell Group, 1994 Group, University Alliance, Million+ (formerly Campaigning for Mainstream Universities), GuildHE, non-aligned, or decline to state). The questionnaire is included in Appendix D, along with a detailed analysis of the responses.

An email invitation to participate was sent to all heads of institutions in England on 1 October 2007 when the survey went online, providing a unique link for each institution. Respondents were encouraged to consult colleagues where appropriate and to ensure that their response represented an institutional perspective rather than a personal opinion. A reminder was sent mid-way through the survey period followed by a final reminder on 19 October. The deadline for completion of the questionnaire was 22 October.

When the survey closed, a total of 91 responses had been received out of a possible 134 – a response rate of 68%. In accordance with the Market Research Society's code of conduct, all answers were anonymised before being analysed.

All phases of the work were conducted in full adherence to the Data Protection Act 1998.

3.3 The case studies

A representative sample of six case study institutions was selected, and these institutions were approached to establish whether they were prepared to participate in the study. Prior to this, it was important to establish the extent to which confidentiality and anonymity for case study institutions is possible within the Freedom of Information Act 2000. Case studies were selected in order to be representative of:

- institutional type (e.g. pre-1992 university with medical school; pre-1992 university without medical school; post-1992 university; college of higher education; specialist institution of higher education);
- mission type (e.g. research intensive, internationally renowned, research informed, teaching focused, business/community orientated, locally engaged); and
- size (i.e. small, medium, large).

In each instance, a back-up was pre-selected in case any of the initial choices declined the invitation.

Initial conversations with participating case study institutions helped to inform the selection of the key institutional contributors to this strand of the research. Examples included:

- a member of the governing body;
- a member of the senior executive (e.g. principal, pro-vice chancellor etc);
- an individual with responsibility for:
 - supplying data to HEFCE, Higher Education Statistics Agency (HESA) etc
 - schools liaison
 - employer liaison
 - the research office
 - finance
 - planning
 - collaborative partnerships
 - performance reward systems
 - marketing
 - admissions
 - widening participation strategies.

Semi-structured interviews were conducted with the selected key personnel in order to establish:

- the awareness of league tables and their dissemination;
- the level of understanding of how league tables are constructed and how the institution's data contribute to this;
- their use within the institution (e.g. for institutional self-understanding, benchmarking, target-setting etc);
- their impact on institutional planning; and
- their influence on strategic decision-making.

We also conducted small-group discussions with a selection of personnel from individual academic departments in each case study institution, including academics and administrators.

Documents provided by the institution to the research team, such as strategic plans and data analyses, together with published material (e.g. on web sites), were also included in the analysis.

3.3.1 Generic interview schedule for case studies

The generic schedule used in the case study interviews is included below:

1. Is it your perception that it is important for your institution to achieve good rankings and, if so, why? (e.g. boosts student and staff recruitment, enhances institutional reputation, attracts financial resources, impresses employers and other stakeholders, used by governing body as performance indicators, etc)

2. Which league table does your institution regard as most influential for your institution, and why?
3. Have the league tables broadly helped or hindered the institution's development? (e.g. reputation, publicity, attracting students and staff, forming academic partnerships, collaboration, programme development, staff morale etc)
4. Who do you consider is the most significant user of league tables in relation to your own institution? (e.g. prospective students, parents, employers, government, funding bodies, the public etc)
5. Have the league tables influenced your institution's perception of some other HEIs and, if so, how?
6. Can you give examples of how your institution has actively responded to league tables as an organisation? For example:
 - The formal reviewing of the institution's position relative to its peers or competitors, or to previous years' positions (by the head of the institution, governing body, specialist team etc);
 - The setting-up of institutional committees or project teams to consider university actions to improve league table positions;
 - Attention given by committees and boards at different levels of the institution.*Any documentation you can provide will be treated in the strictest confidence.*
7. As a result of the league tables, has your institution taken actions in any of the following areas?
 - Promotion and marketing activities
 - Course offerings and content
 - Facilities
 - Career services
 - Media relations
 - Staff recruitment policies
 - Research
 - Learning and teaching
 - Alumni relations
 - Decisions about how best to submit data (e.g. HESA collections)
 - Key performance indicators or targets.
8. Can you give any examples from your own institution of changes in strategies, policies and priorities, including resource-allocation decisions, which can be directly attributed to the institution's response to the published rankings? For example:
 - The indicators underlying the tables have become an explicit part of target-setting;

- The tables (or, at least, the meaningful measures they contain) have become part of SWOT (strengths, weaknesses, opportunities and threats) analysis and benchmarking processes;
- The performance of other HEIs in the tables is monitored (regionally? nationally? worldwide? e.g. for potential collaborators?);
- Management information tools have been developed, institutional research undertaken etc, in order to improve performance;
- Greater emphasis is placed on data gathering, accuracy and its supply to sector bodies (e.g. HESA, HEFCE, Universities and Colleges Admissions Service (UCAS), QAA (Quality Assurance Agency for Higher Education));
- Improving ranking has become a strategic goal;
- Structural and organisational changes have been made (e.g. a new section has been established, or an individual has been assigned to address indicator improvements and to monitor league table positions);
- Efforts have been made to resolve institutional problems that might affect the institution's position in the league tables.

Again, any documentation you can provide will be treated in the strictest confidence.

Would your institution have done this anyway, regardless of the league tables?

9. Do you think that league tables run with, or against, the grain of formal assessments and requirements of institutions? (e.g. RAE, Institutional Audit (and other kinds of audit) by QAA, Teaching Quality Information (soon to be Unistats, including National Student Survey results), Financial Audit by HEFCE, etc).
10. Do you believe that the league tables have influenced other HEIs in:
 - deciding whether to collaborate with your institution?
 - their willingness to support your institution's membership of academic or professional organisations?
11. Do you believe that league tables have had an impact beyond their original purpose? For example, on:
 - higher education policy generally;
 - the classification of HEIs;
 - the allocation of funding (e.g. research, initiative funding).

4. Sector body consultation

In the final phase of the project we sought to share and discuss the key findings from the research with representatives from selected sector agencies and representative bodies in advance of publication of the report. The aim of these separate meetings was to enable the representatives to reflect on the main findings from the study and offer considered views of their implications for policy and practice. This might also have helped to spread

a consistent message throughout the sector and prompt collective approaches, for example, to agreeing principles or guidelines for ranking institutions and related uses of the data collected in England and, indeed, the UK. We explored the initial findings from both strands of the project with key personnel from:

- 1994 Group
- Association of Heads of University Administration (AHUA)
- Association of University Administrators (AUA)
- GuildHE
- HESA
- Million+
- QAA
- Russell Group
- UCAS
- Universities UK.

The comments of these representatives informed the final draft of the report and were reported to HEFCE, but are not included in the report or appendices.