Comparative Analysis of University Rankings

Possible Strategies for Universities to Improve their Rankings

History

Eugene Garfield introduced the

Citation Index and Impact Factor

Impact Factor (IF) launched the practice

of evaluating researchers quantitatively

"*This invention of Eugene Garfield, a man who has done enormous harm to true science*": David Colquhoun

Impact Factor

Calculating the Impact Factor

No of article citations in 2014
(to articles published in 2012+2013)
——————————————— = **IF of 2014**
Number of articles published in 2012+2013

Journal received 1500 citations in 2014
(to 350 articles published in 2012 +
400 articles published in 2013)
——————————————— = **IF is 2** (2014)
350 articles published in 2012 +
400 articles published in 2013
in total 750 articles published during 2012+2013

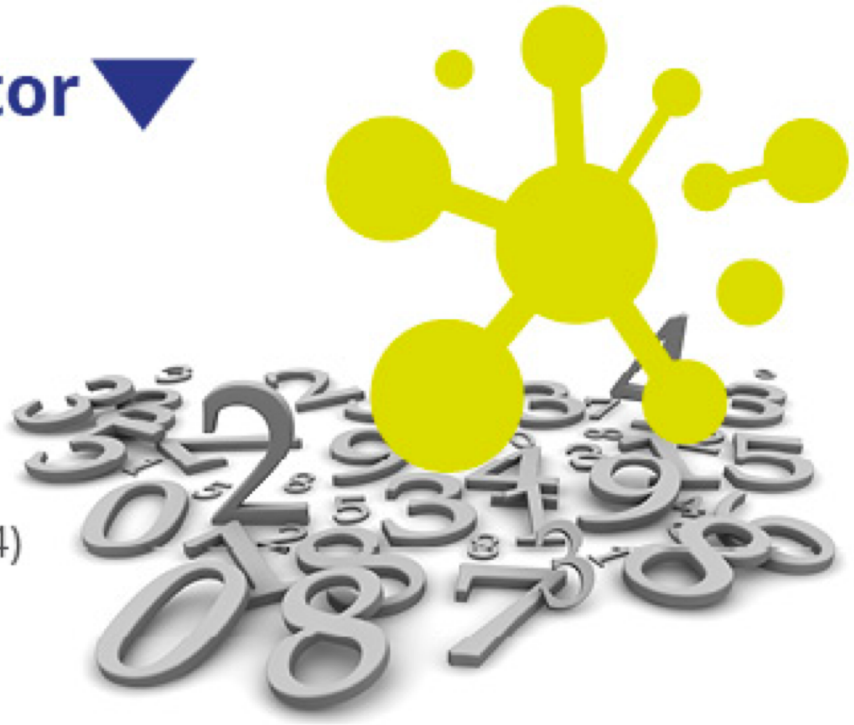


Figure 2: Calculation for five-year impact factor:
One year of citations to five years of articles.

A= citations in 1992 to articles published in 1987-91

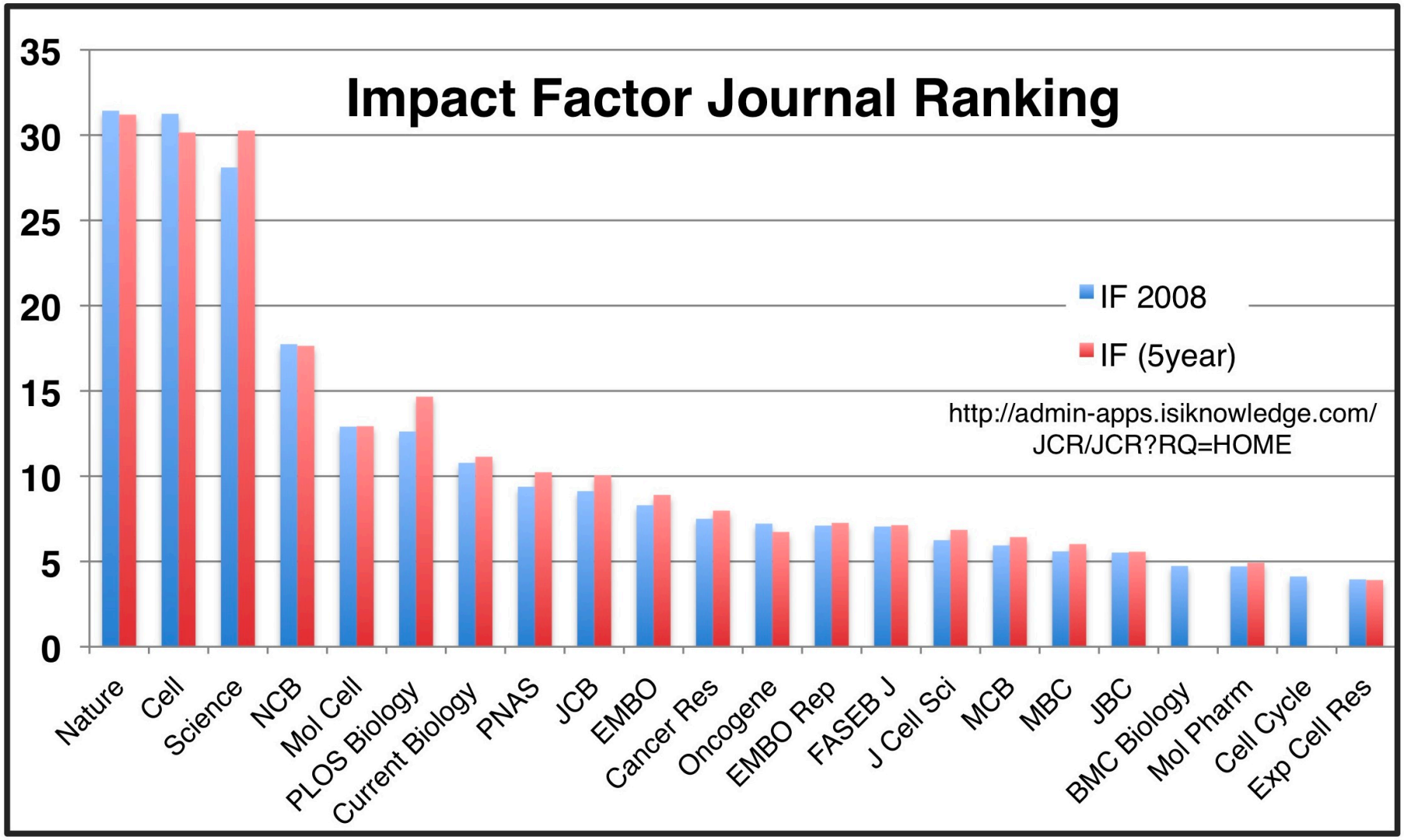
B= articles published in 1987-91

C= A/B = five-year impact factor

Impact Factor

- Example: Nature's impact factor for 2017 is 42
- This means that, on average, papers published in Nature in 2015 and 2016 received roughly 42 citations each in 2017
- 5-year IF is 45: Papers published in Nature during the period 2012-16 received, on the average, 45 citations each in 2017

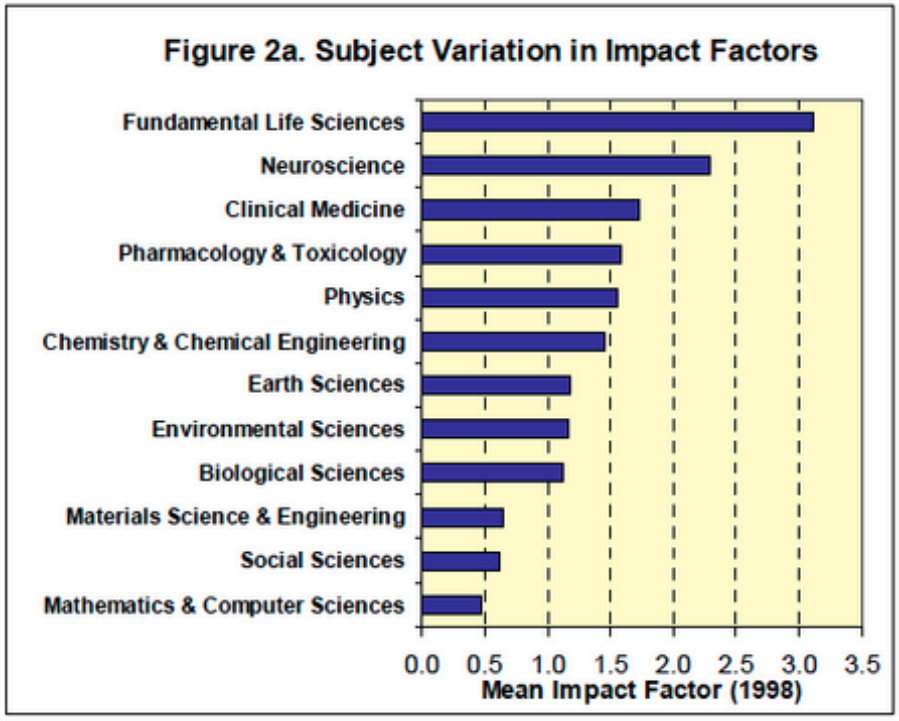
Impact Factor

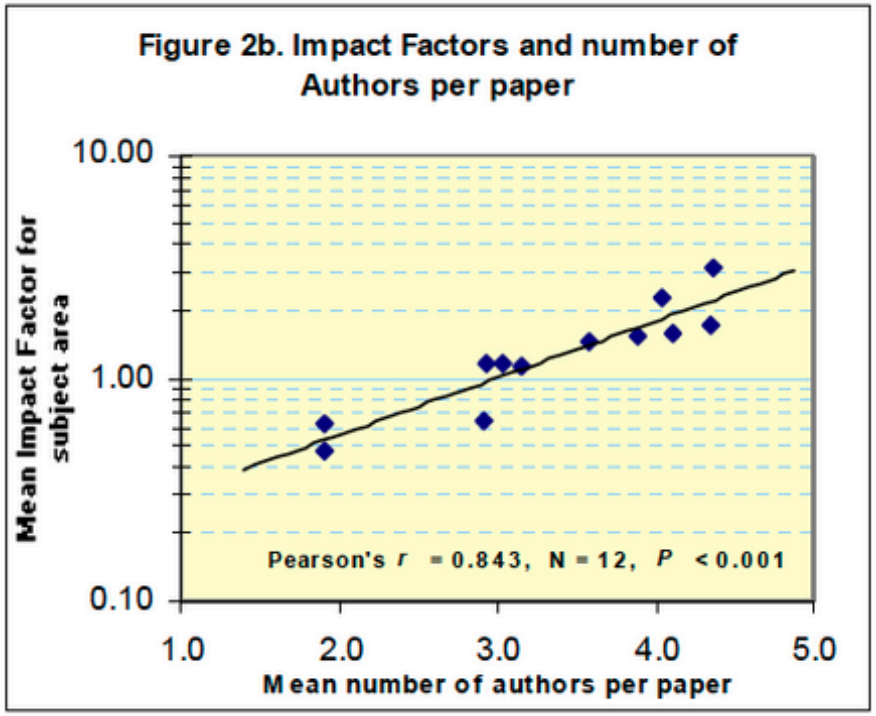


The Rise of Impact Factor

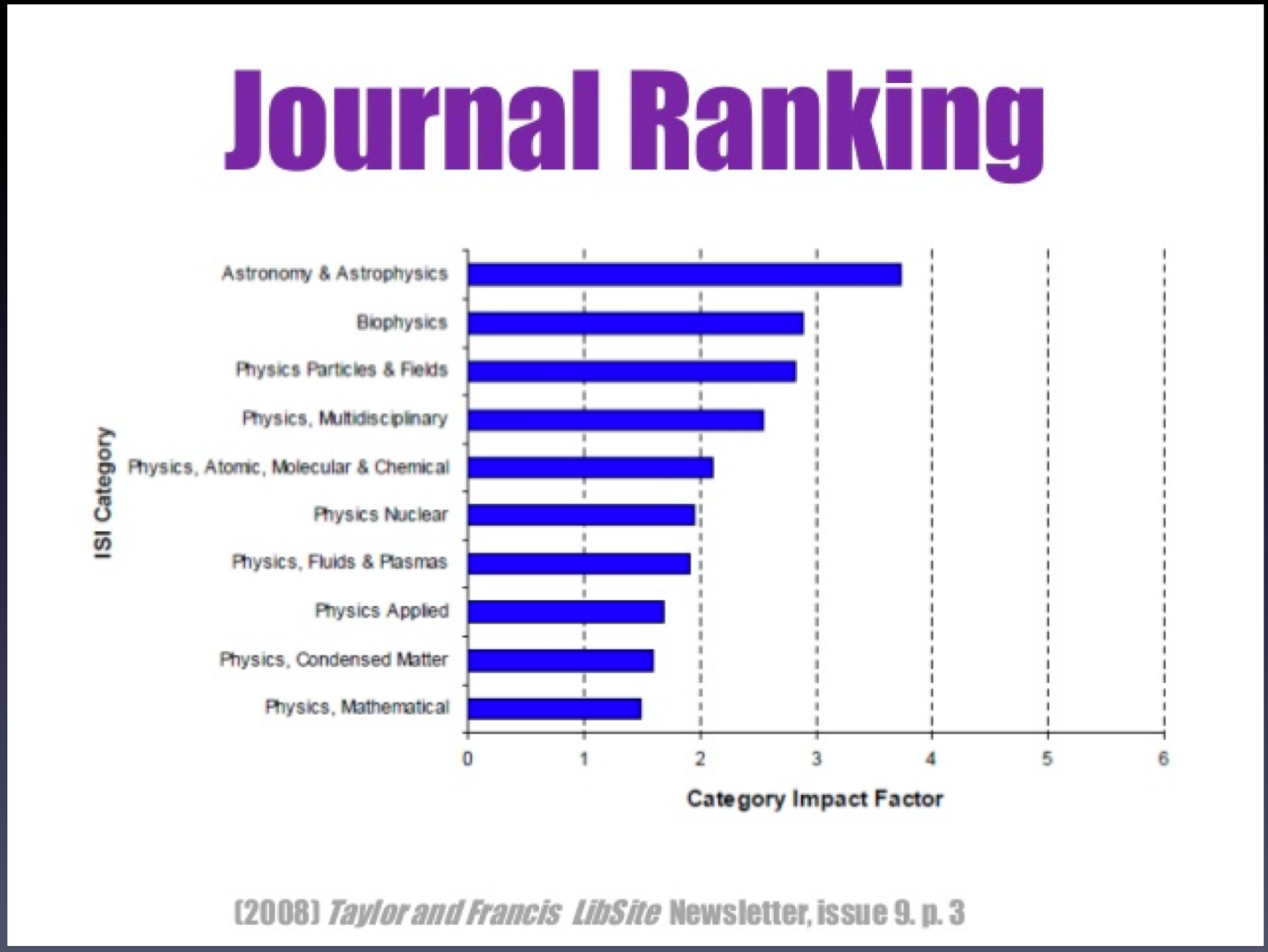
- Impact Factor was designed primarily to aid comparison of journals within particular academic fields
- Higher IF has now become synonymous with greater impact and quality thereby bestowing prestige on a journal
- Consequently, publishing in a high-impact journal has become a surrogate measure of a researcher's quality
- China even offers financial rewards: In 2016 the average reward for publication of a single paper in Nature or Science was $44,000 and the highest payment was $165,000!

Impact Factor: Pitfalls

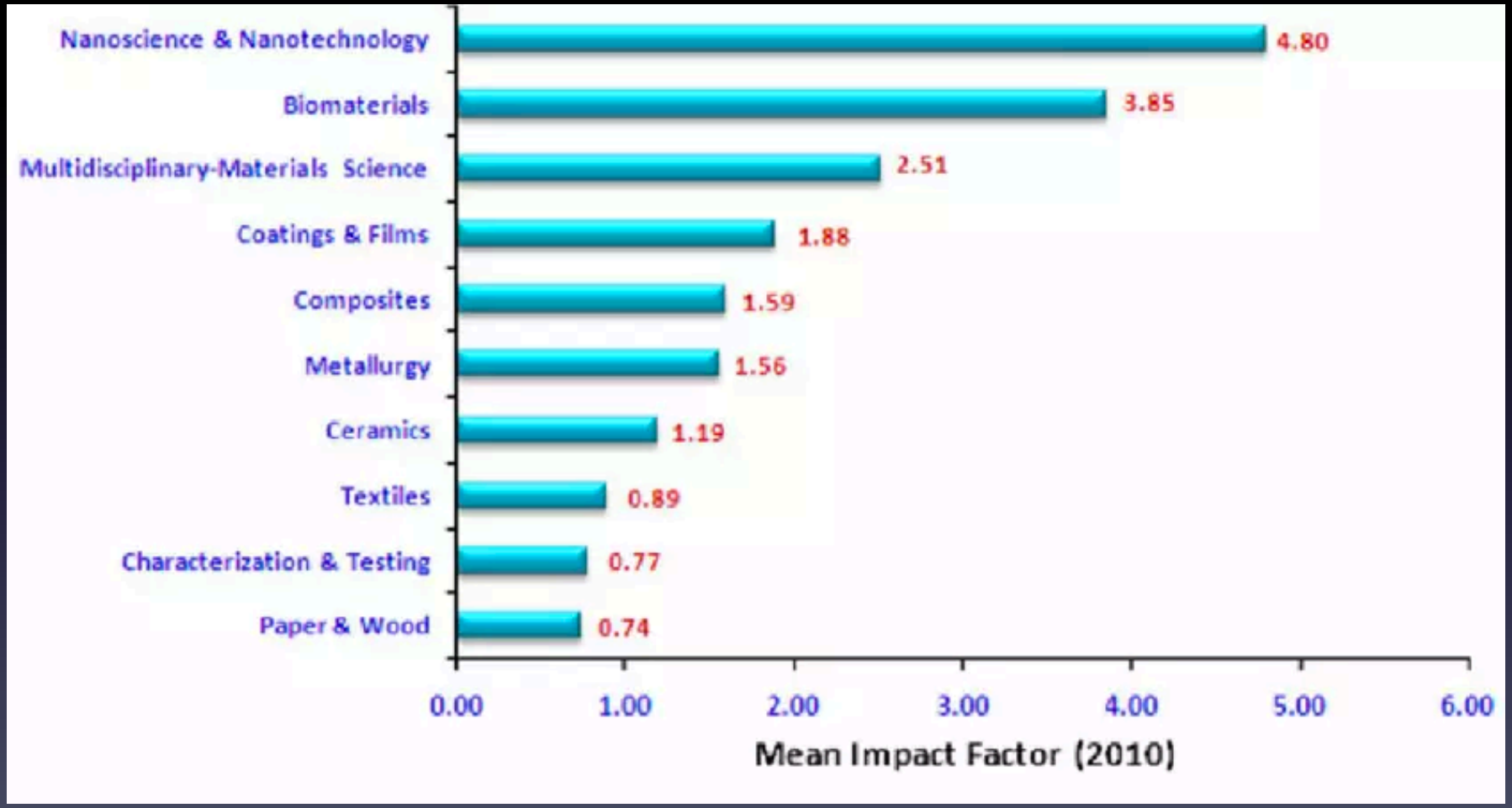




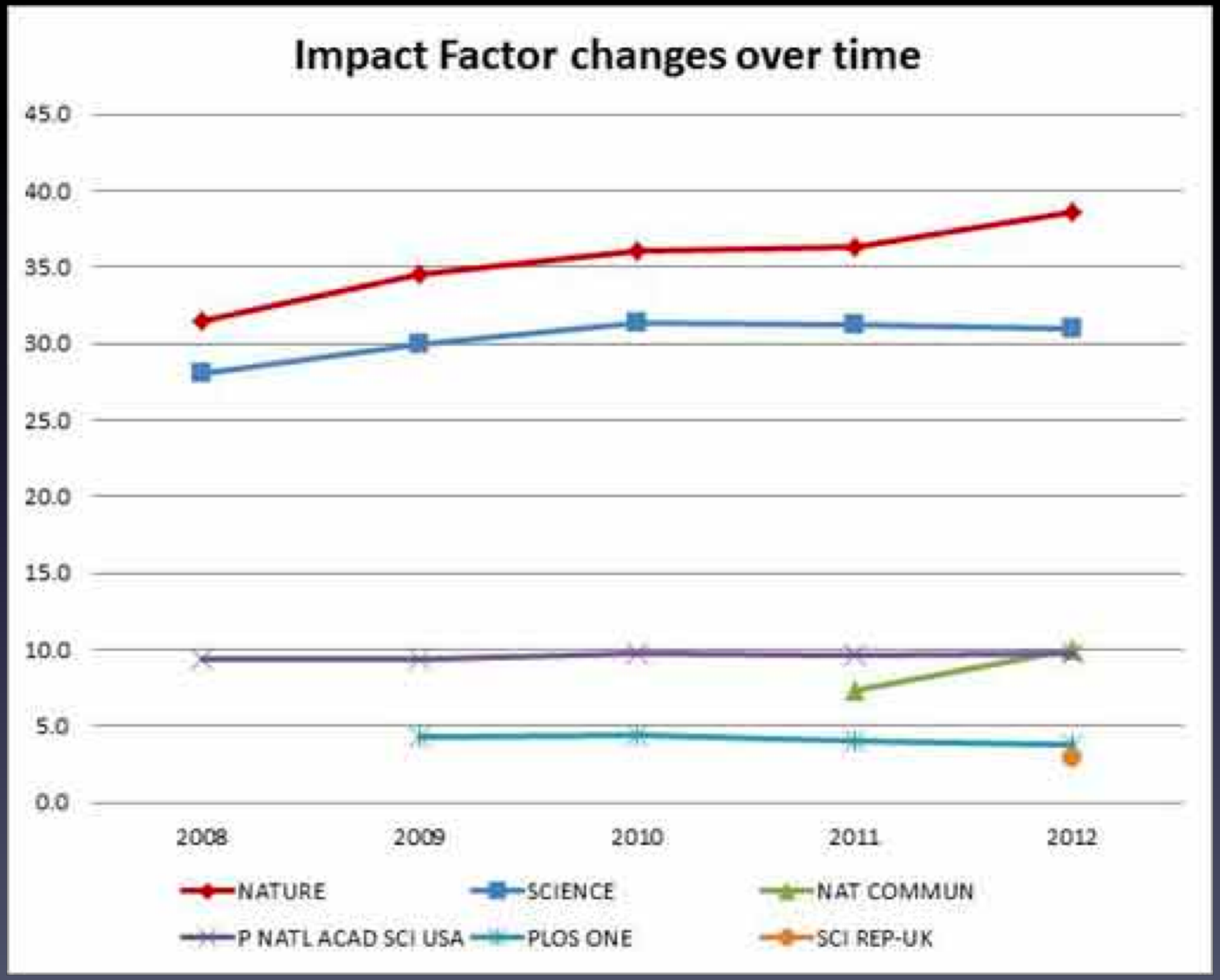
Impact Factor: Pitfalls



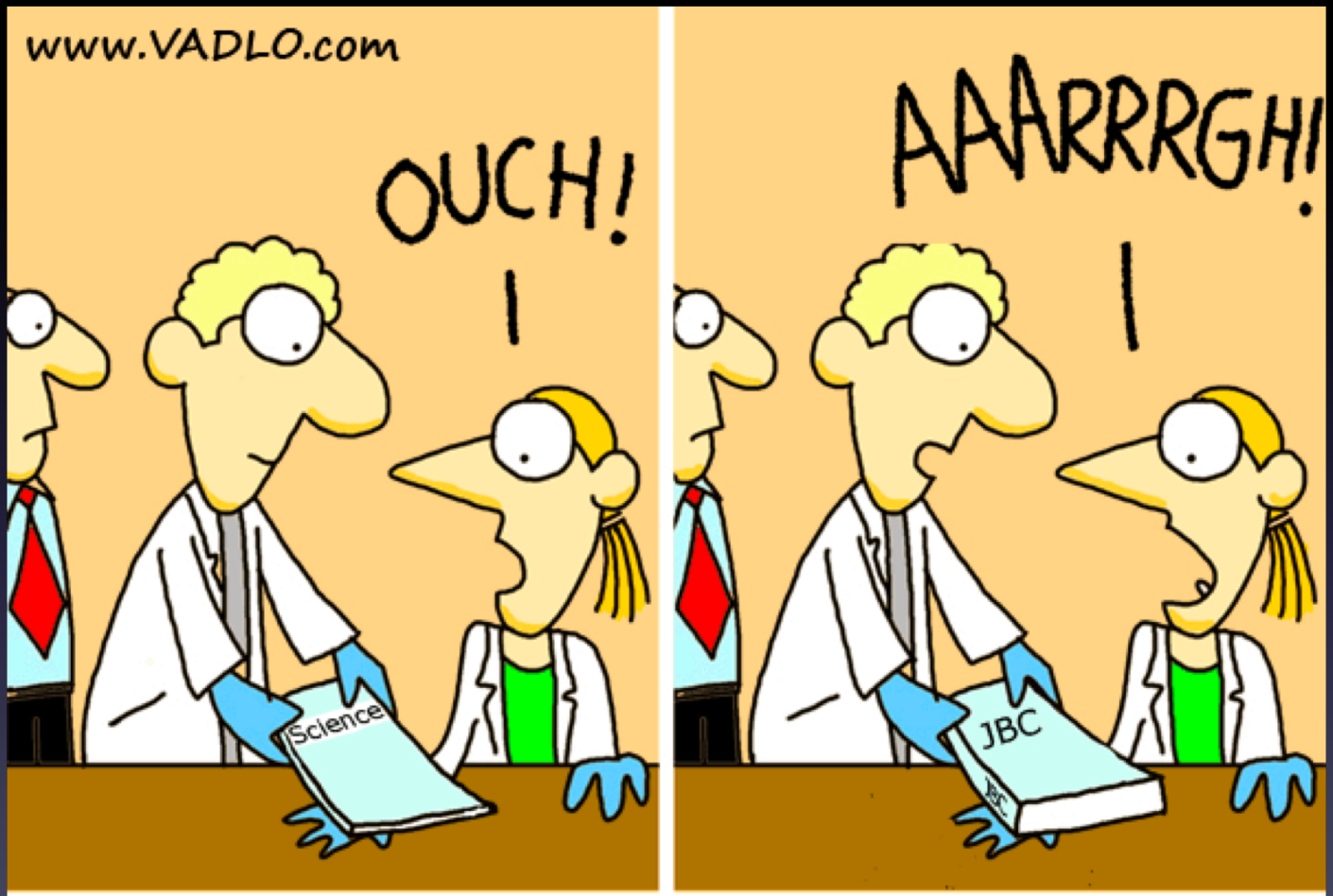
Impact Factor: Pitfalls



Impact Factor: Pitfalls



Impact Factor: Pitfalls



"Issue settled. JBC has it higher!"

Impact Factor: Pitfalls

- Philip Campbell, then editor-in-chief of Nature: "*89% of our (2004) Impact Factor was generated by just 25% of our papers*"
- Hence publication in a high impact journal does not mean that the paper would also also high impact
- Better to look at citations to individual papers
- "*The use of journal impacts in evaluating individuals has its inherent dangers. In an ideal world, evaluators would read each article and make personal judgements*": Eugene Garfield

Impact Factor: Pitfalls

October 27, 2017

Statement by three national academies (Académie des Sciences, Leopoldina and Royal Society) on good practice in the evaluation of researchers and research programmes

"Evaluation requires peer review by acknowledged experts working to the highest ethical standards and focusing on intellectual merits and scientific achievements. Bibliometric data cannot be used as a proxy for expert assessment. Well-founded judgment is essential. Over-emphasis on such metrics may seriously damage scientific creativity and originality. Expert peer review should be treated as a valuable resource."

San Francisco Declaration on Research Assessment (DORA)

General Recommendation:

Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions

DORA …

For Institutions and Funding Agencies:

- Be explicit about the criteria used to reach hiring, tenure, and promotion decisions, clearly highlighting, especially for early-stage investigators, that the scientific content of a paper is much more important than publication metrics or the identity of the journal in which it was published

DORA …

For Institutions and Funding Agencies …

- For the purposes of research assessment, consider the value and impact of all research outputs (including datasets and software) in addition to research publications, and consider a broad range of impact measures including qualitative indicators of research impact, such as influence on policy and practice

DORA …

For Researchers:

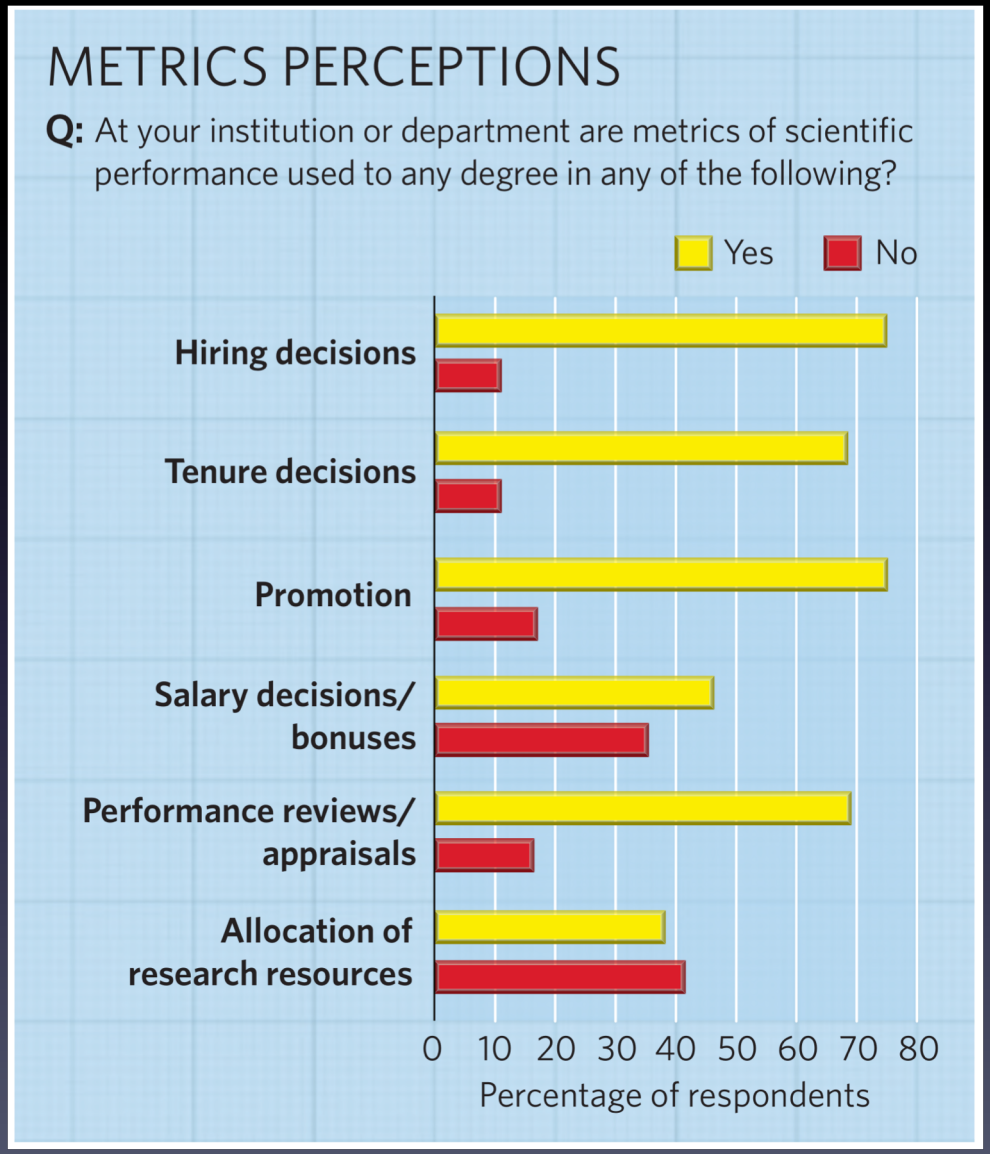
- When involved in committees making decisions about funding, hiring, tenure, or promotion, make assessments based on scientific content rather than publication metrics
- Wherever appropriate, cite primary literature in which observations are first reported rather than reviews in order to give credit where credit is due

DORA …

For Researchers …

- Use a range of article metrics and indicators on personal/supporting statements, as evidence of the impact of individual published articles and other research outputs
- Challenge research assessment practices that rely inappropriately on Journal Impact Factors and promote and teach best practice that focuses on the value and influence of specific research outputs

Impact Factor: Reality



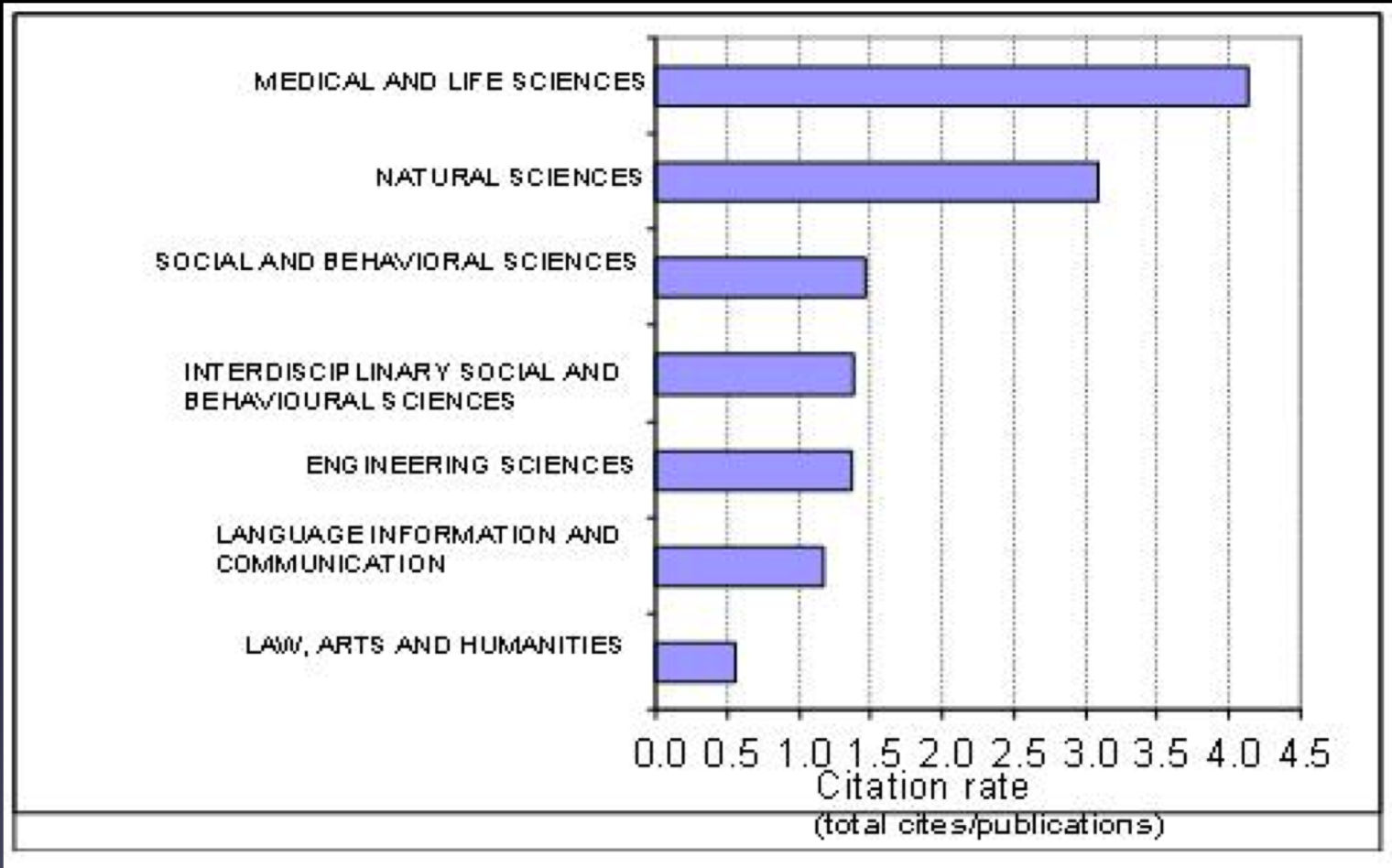
Better Metric: SNIP

- Source Normalized Impact per Paper (SNIP) corrects for differences in citation practices between scientific fields, thereby allowing for more accurate between-field comparisons of citation impact
- 2015 Journal SNIP
  - Nature: 8.1 (IF: 42)
  - Annals of Mathematics: 5.4 (IF: 3)

Better Metric: Citations/paper

- Citations per paper: Divide the number of citations by the number of papers
- Can be computed for researchers, institutions
- Ideally should be computed for each subject area separately

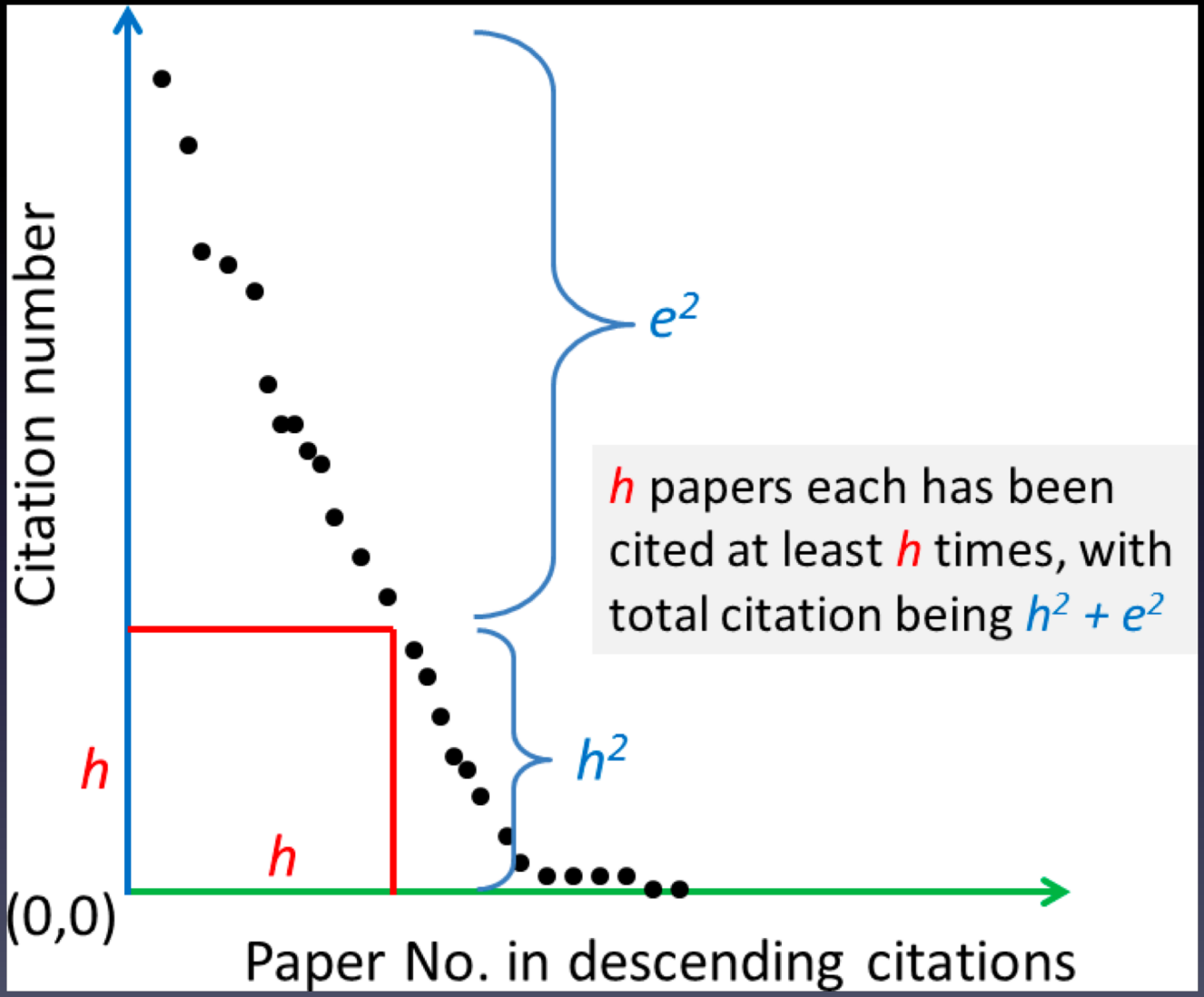
Citations per Paper



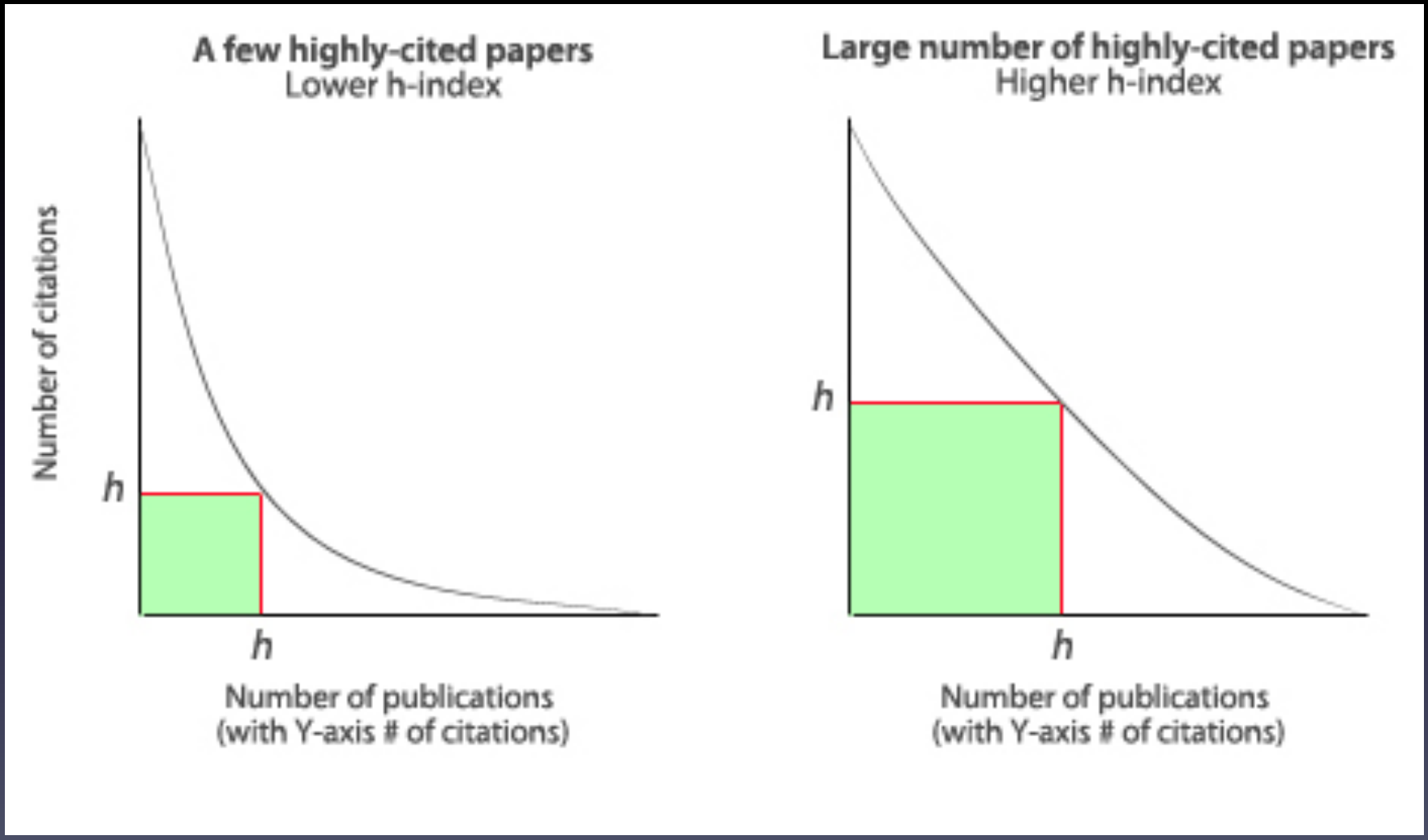
Field Weighted Citation Impact

- **Field weighted citation impact**: Indicates how the number of citations received by an institution's publications compares with the average number of citations received by all other similar publications
  - Similar publications are those publications that have the same publication year, publication type and discipline
  - Uses citations received in the year of publication plus the following 3 years
  - Citation impact = 1: Equal in impact to world average
  - Citation impact = 0.8: 20% less impact than world average
  - Useful to benchmark regardless of differences in size, disciplinary profile, age and publication type composition

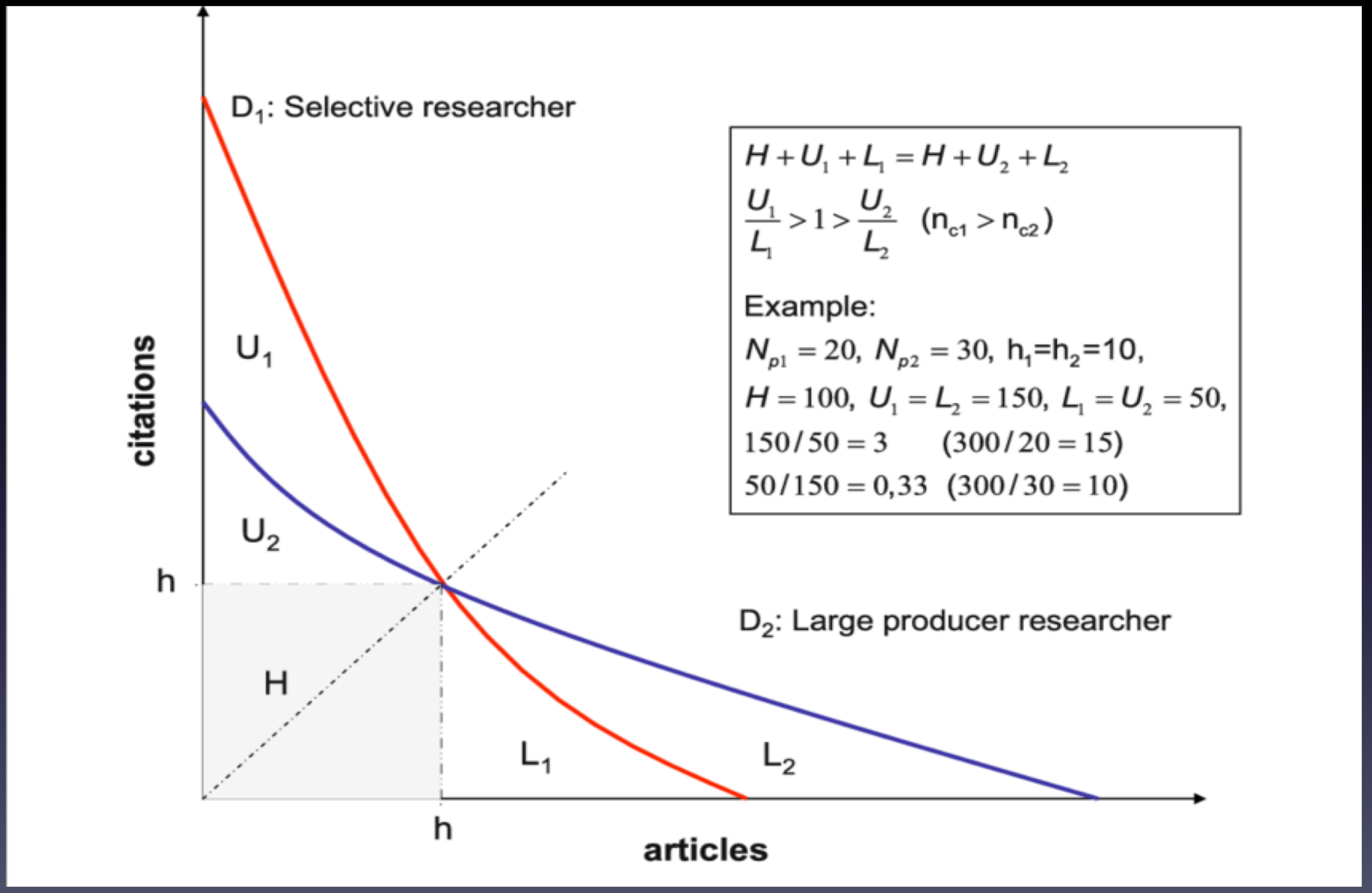
h-index


Citation number
e^2
h papers each has been cited at least h times, with total citation being $h^2 + e^2$
h^2
h
h
(0,0)
Paper No. in descending citations

h-index ...

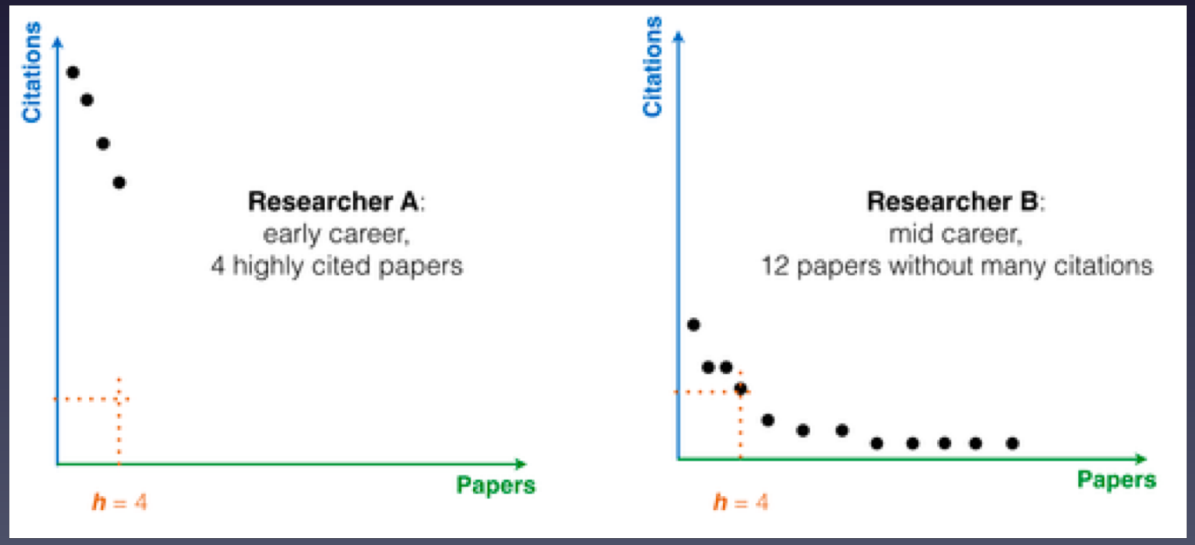

A few highly-cited papers
Lower h-index
Number of citations
h
h
Number of publications
(with Y-axis # of citations)
Large number of highly-cited papers
Higher h-index
h
h
Number of publications
(with Y-axis # of citations)

h-index ...


D1: Selective researcher
$H + U_1 + L_1 = H + U_2 + L_2$
$\frac{U_1}{L_1} > 1 > \frac{U_2}{L_2}$ $(n_{c1} > n_{c2})$
Example:
$N_{p1} = 20,\ N_{p2} = 30,\ h_1 = h_2 = 10,$
$H = 100,\ U_1 = L_2 = 150,\ L_1 = U_2 = 50,$
$150/50 = 3 \quad (300/20 = 15)$
$50/150 = 0{,}33 \quad (300/30 = 10)$
citations
U1
U2
h
H
D2: Large producer researcher
L1
L2
h
articles

h-index does not tell you …

- **The stage of your career:** Two researchers could have the same h-index, but drastically different citation records
  - Although Researcher A's work has been highly cited, his/her h-index is limited to 4



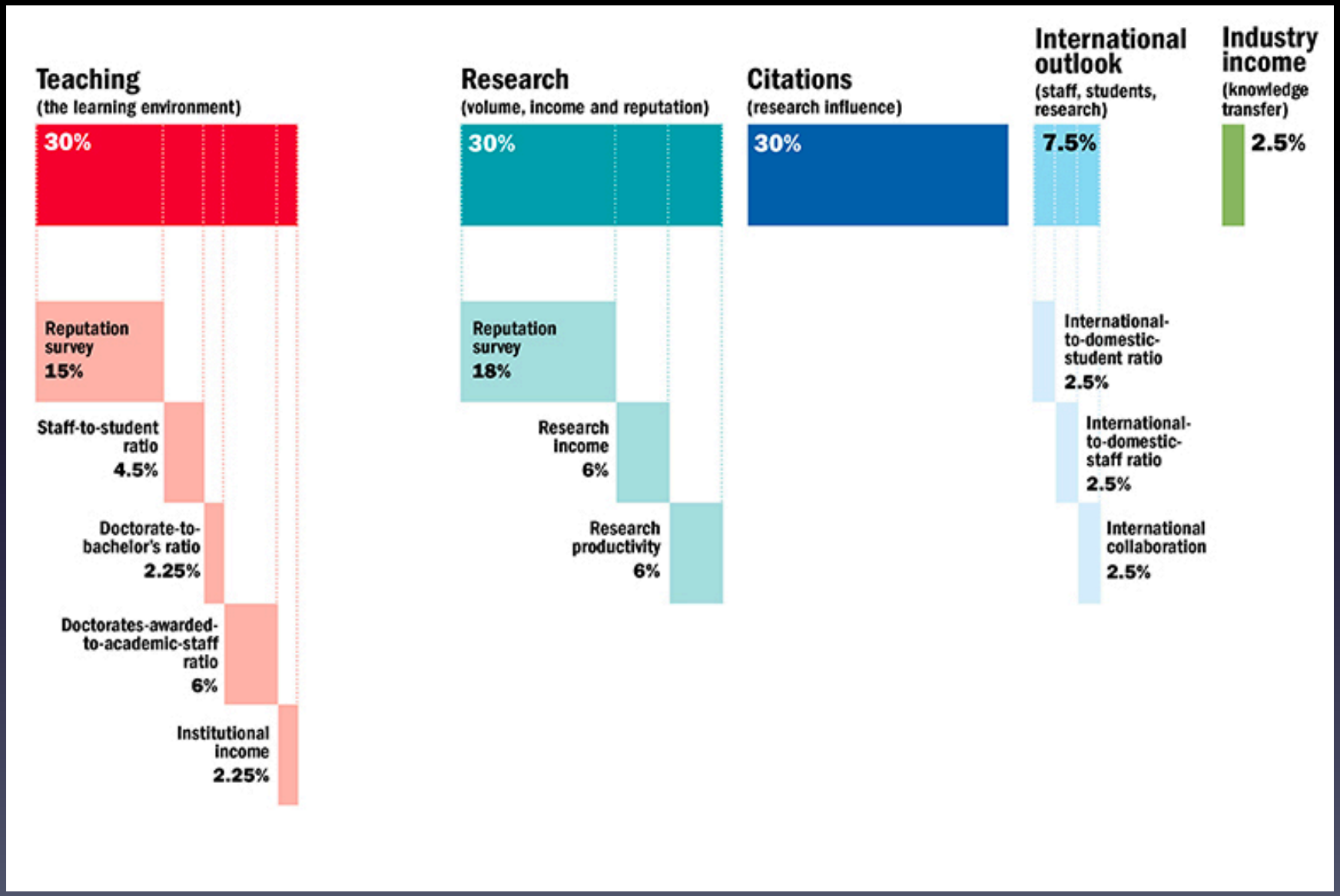
h-index does not tell you …

- **Whether you were first author or fourteenth on that ground-breaking paper:** The h-index only cares whether your name is on the paper or not. This could skew things in favor of big-name researchers who are put on many publications as collaborators
- **Whether citations are due to positive or negative references:** In other words, maybe a paper is getting cited a lot because it is controversial or has since been disproven
- **The impact factors of the journals you have published in:** The h-index doesn't take impact factor into account - rather, it is only concerned with the number of citations to your papers. This is a good thing

University Rankings

- Times Higher Education (THE) Rankings
- QS World University Rankings
- Academic Ranking of World Universities (ARWU)
- National Institutional Ranking Framework (NIRF)
- National Taiwan University (NTU) Rankings
- SCImago Institutions Rankings (SIR)
- Leiden University Rankings

THE Ranking Methodology



THE Ranking Methodology

- Teaching (30%)
- Research (30%)
- Citations (30%)
- International outlook (7.5%)
- Industrial income (2.5%)

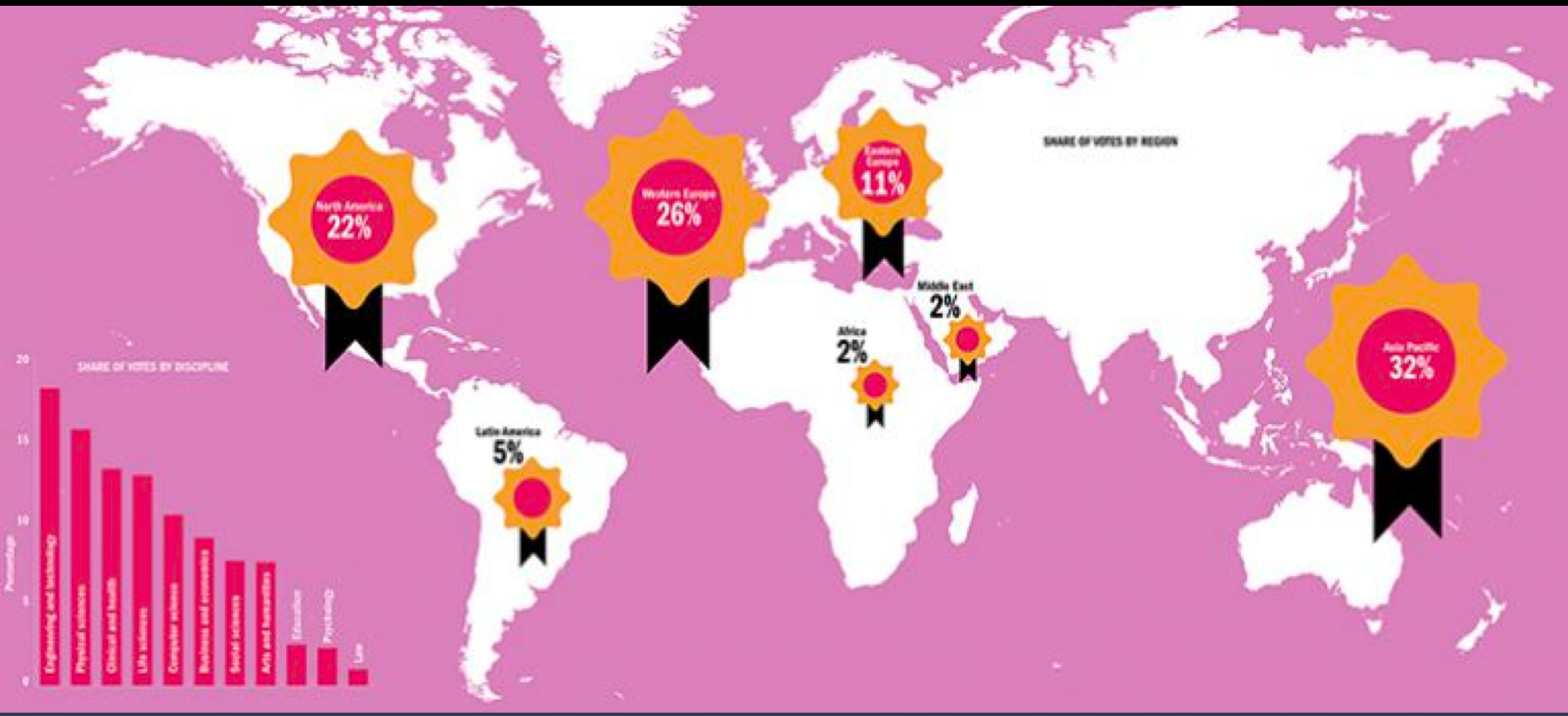
THE: Teaching

- Teaching (30%)
  - Reputational survey (15%)
  - Student to staff ratio (4.5%)
  - Doctorate to Bachelor's ratio (2.25%)
  - No. of Doctorates awarded per faculty member (6%)
  - Institutional income per faculty member (2.25%)

THE: Teaching …

- Reputational survey (15%)
  - The 2018 THE Academic Reputation Survey attracted 10,162 responses from 138 countries
  - The 2018 data are combined with the results of the 2017 survey, giving more than 20,000 responses
  - It examined the perceived prestige of institutions in teaching
  - Each respondent can name at most 15 universities that they believe are the best in teaching (excluding their own university)

Survey: Geographical Distribution



Where countries were over- or under represented, *THE*'s data team weighted the responses to more closely reflect the actual geographical distribution of scholars, based on UN data

Survey: Subject Distribution

Subject	% Respondents
Engineering and Technology	18.1
Physical Sciences	15.6
Clinical and Health	13.2
Life Sciences	12.8
Computer Science	10.4
Business and Economics	9.0
Social Sciences	7.6
Arts and Humanities	7.5

Subjects not equally represented

THE: Teaching …

- Student to staff ratio (4.5%)
- Doctorate to Bachelor's ratio (2.25%)
  - How committed an institution is to nurturing the next generation of academics
- No. of Doctorates awarded per faculty member (6%)
  - This indicator is normalised to take account of a university's unique subject mix (number of doctoral awards varies by discipline)

THE: Teaching …

- Institutional income per faculty member (2.25%)
  - Institutional income is scaled against faculty numbers and normalized for purchasing-power parity (PPP)*
  - It gives a broad sense of the infrastructure and facilities available to students and faculty

* Even a PPP geared towards scientific research ($1 spent on equipment, consumables, AMC equal to Rs. 73; $1 spent on salary is scaled by a factor of 5 etc… gives an overall PPP of 1$ = Rs. 18; same as World Bank PPP)

THE Ranking

- Research (30%)
  - Reputational survey (18%)
  - Research income per faculty member (6%)
  - No. of papers published per faculty normalized for area (6%)

THE Research

- Reputational survey (18%)
  - Measures a university's reputation for research excellence among its peers, based on the responses to the annual Academic Reputation Survey
- Research income per faculty member (6%)
  - Research income is scaled against faculty numbers and adjusted for purchasing-power parity (PPP)
  - Can be influenced by national policy and economic circumstances
  - Normalized by subject since, for example, research grants in science subjects bigger than in social sciences

THE Research

- No. of papers published per faculty normalized for area (6%)
  - Counts the number of publications per scholar (published in the academic journals indexed by Elsevier's Scopus database)
  - Scaled for institutional size
  - Normalized for subject

THE Ranking …

- Citations normalized for subject area (30%)
  - Average number of times a university's published work is cited
  - All indexed publications between 2013 and 2017; citations to these publications made in the six years from 2013 to 2018
  - The data are normalized to reflect variations in citation volume between different subject areas.
  - Equal measures of a country-adjusted and non-country-adjusted raw measure of citations scores are blended
  - Papers with more than 1000 authors are handled separately (minimum 5% of citations to each institution with at least one author; institutions that provide the most cauthors to the paper receive a proportionately larger contribution)

THE Ranking …

- International outlook (7.5%)
  - Ratio of international to domestic students (2.5%)
  - Ratio of international to domestic staff (2.5%)
  - Fraction of papers that have foreign co-author(s) (2.5%)
    - Fraction of a university's total research journal publications that have at least one international co-author
    - Normalized for subject area
- Industrial income (2.5%)
  - Research income an institution earns from industry (adjusted for PPP), scaled against the number of faculty it employs

THE Subject Ranking

SUBJECT RANKINGS METHODOLOGY

Indicator	Total students/ academic staff	PhD awards/ bachelor	PhD/Academic staff	Reputation Survey (teaching)	Institutional income/ Academic staff	Scholarly papers/ Academic Staff	Research income/ Academic Staff	Reputation Survey (research)	Citations: Research impact	Income from industry/ Academic Staff	Ratio of international to domestic staff	International co-authorship	Ratio of international to domestic students
	Teaching: The learning environment					Research: volume, income and reputation			Citations per paper	Industry income: innovation	International outlook		
ARTS & HUMANITIES													
Group weight	37.5					37.5			15	2.5	7.5		
Indicator weight	3.8	1.9	4.7	25.3	1.9	3.8	3.8	30	15	2.5	2.5	2.5	2.5
CLINICAL, PRE-CLINICAL & HEALTH, LIFE SCIENCES & PHYSICAL SCIENCES													
Group weight	27.5					27.5			35	2.5	7.5		
Indicator weight	2.8	1.4	4.1	17.9	1.4	4.1	4.1	19.3	35	2.5	2.5	2.5	2.5
ENGINEERING & TECHNOLOGY													
Group weight	30					30			27.5	5	7.5		
Indicator weight	3	1.5	4.5	19.5	1.5	4.5	4.5	21	27.5	5	2.5	2.5	2.5
SOCIAL SCIENCE													
Group weight	32.5					32.5			25	2.5	7.5		
Indicator weight	3.3	1.6	4.9	21.1	1.6	4.9	4.9	22.8	25	2.5	2.5	2.5	2.5

THE World Rankings (2019)

THE WORLD UNIVERSITY RANKINGS 2019 TOP 10

Rank 2019	Rank 2018	Institution	Country/region
1	1	University of Oxford	United Kingdom
2	2	University of Cambridge	United Kingdom
3	=3	Stanford University	United States
4	5	Massachusetts Institute of Technology	United States
5	=3	California Institute of Technology	United States
6	6	Harvard University	United States
7	7	Princeton University	United States
8	12	Yale University	United States
9	8	Imperial College London	United Kingdom
10	9	University of Chicago	United States

THE WORLD UNIVERSITY RANKINGS

www.thewur.com

#THEunirankings

THE World Rankings (2019)

Rank	Name	Overall	Teaching	Research	Citations	Industry Income	International Outlook
251–300	Indian Institute of Science India	46.4–49.4	56.7	51.4	41.7	50.7	20.2
351–400	Indian Institute of Technology Indore India	41.7–43.9	25.1	20.2	86.5	34.0	18.2
401–500	Indian Institute of Technology Bombay India	37.1–41.6	44.3	33.0	47.0	71.9	19.6
401–500	Indian Institute of Technology Roorkee India	37.1–41.6	34.9	29.6	53.4	82.9	16.2
401–500	JSS Academy of Higher Education and Research India	37.1–41.6	37.1	7.7	80.8	35.1	25.7
501–600	Indian Institute of Technology Delhi India	33.5–37.0	43.3	19.8	48.5	52.6	17.4
501–600	Indian Institute of Technology Kanpur India	33.5–37.0	37.8	24.6	38.0	98.2	19.0
501–600	Indian Institute of Technology Kharagpur India	33.5–37.0	36.6	30.7	43.2	59.9	21.8

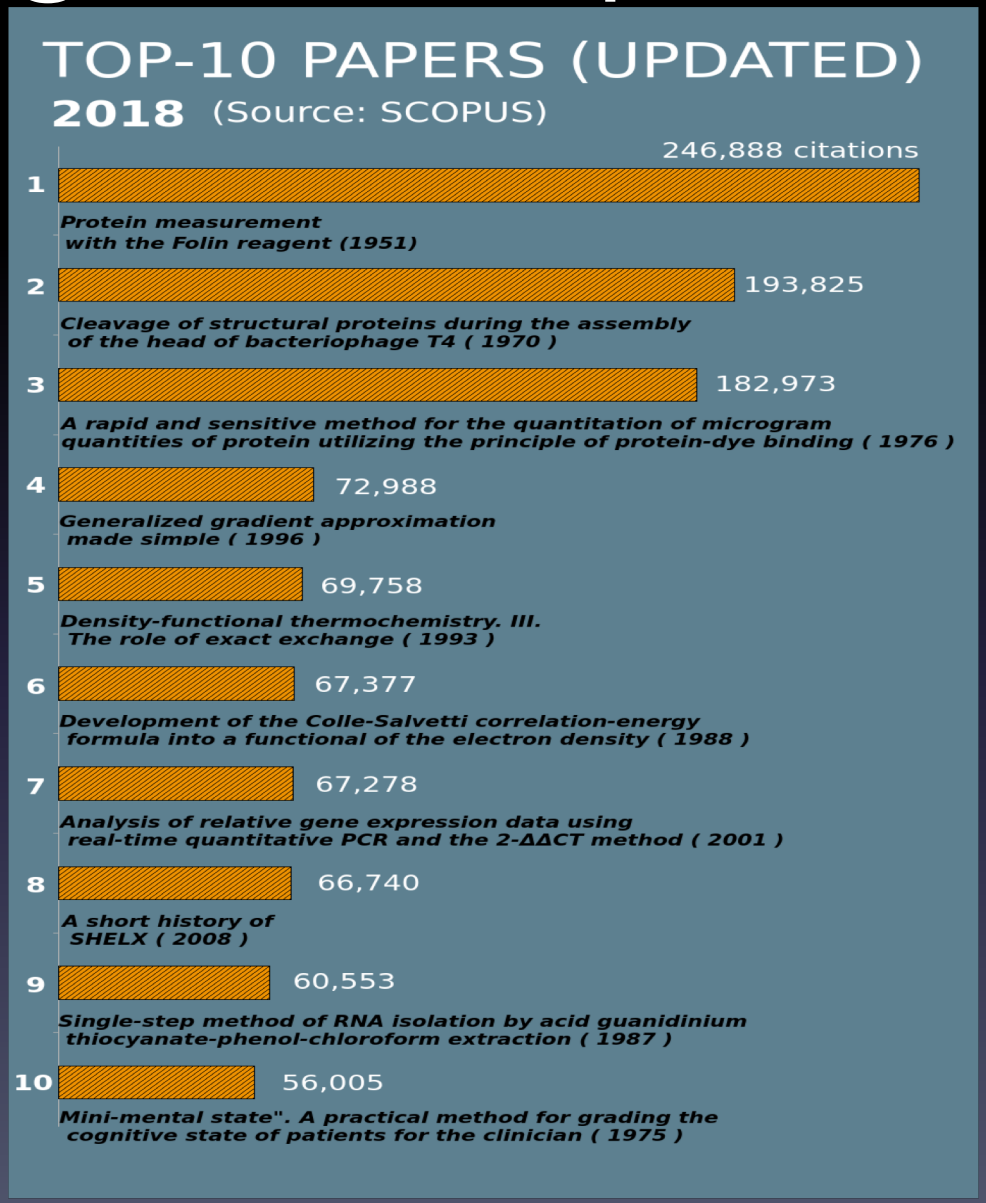
Strategies for Improvement

- Research and Teaching Reputation (36%):
  - Encourage faculty from other Indian institutions to rank each other
  - Actively take part in international conferences (esp. young faculty and students)
  - Actively promote international research collaboration (SPARC)
  - Have a large number of academic visitors (GIAN, VAJRA)
  - Recruit professional staff to publicize research achievements
  - Highlight selected research accomplishments to visiting delegations

Strategies for Improvement …

- Citations (30%):
  - Publish high-impact papers or much larger number of papers
  - Increase faculty strength
  - Appoint "star" faculty
  - Implement a (strict) tenure system
  - Reward performing faculty in terms of research and travel grants
  - Promote international collaborations (leads to increased citations)

Strategies for Improvement ...



Strategies for Improvement …

- International Outlook (7.5%):
  - Appoint foreign faculty members
  - Increase number of foreign students
  - Promote international collaborations
  - Joint supervision of PhD theses with reputed universities
  - Joint degrees with reputed universities abroad

QS World University Rankings

- Academic reputation (40%)
- Faculty to student ratio (20%)
- Citations per faculty (20%)
- Employer reputation (10%)
- Proportion of international faculty (5%)
- Proportion of international students (5%)

QS World University Rankings

- Academic Reputation (40%)
  - The highest weighting of any metric is allotted to an institution's academic reputation score
  - Collates the expert opinions of over 80,000 individuals in the higher education space regarding teaching and research quality at the world's universities
  - World's largest survey of academic opinion

QS World University Rankings

- Faculty to Student Ratio (20%)
  - Teaching quality is typically cited by students as a metric of highest importance but is difficult to quantify
  - Measuring teacher/student ratios is an effective proxy metric for teaching quality
  - It assesses the extent to which institutions are able to provide students with meaningful access to lecturers and tutors
  - A high ratio will reduce the teaching burden on each individual academic

QS World University Rankings

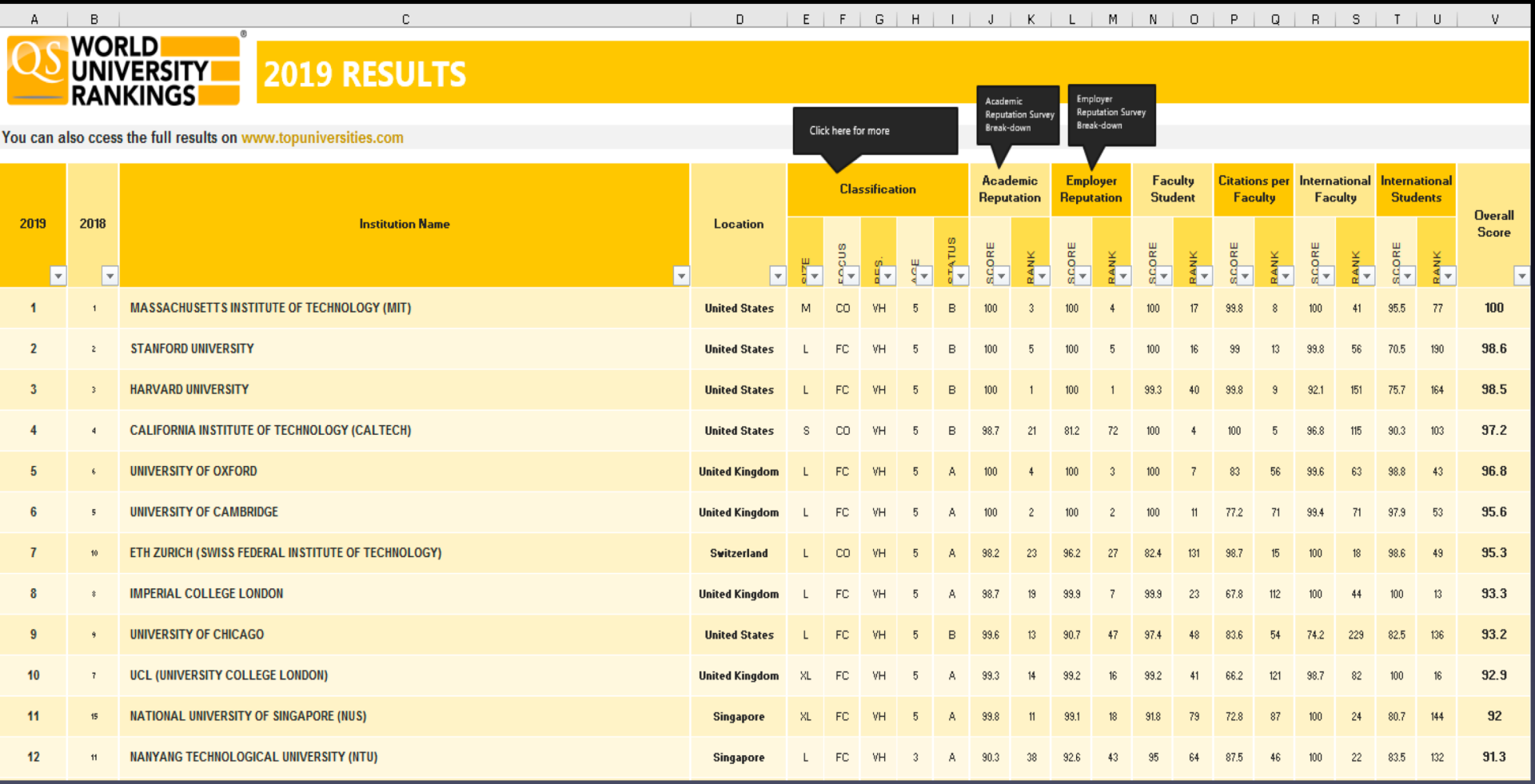
- Citations per Faculty (20%)
  - Divide the total number of citations received by all papers produced by an institution across a five-year period by the number of faculty members at that institution
  - Papers published from 2012 to 2016 were used; citations from 2012-2017
  - Normalized by the subject
  - Is not a good metric if you want to measure impact
  - In subject rankings, citations per paper is used

QS World University Rankings

- Employer Reputation (10%)
  - Based on over 40,000 responses to QS Employer Survey
  - Asks employers to identify those institutions from which they source the most competent, innovative, effective graduates
  - The QS Employer Survey is the world's largest of its kind
- International Faculty and Student Ratio (5+5%)
  - Demonstrates ability to attract faculty and students from across the world
  - High ratio implies institution possesses a strong international brand and has a highly global outlook
  - Presence of international faculty/students provides students and staff with a multinational environment; facilitates exchange of best practices and beliefs

QS World University Rankings (2019)

QS World University Rankings (2019)



QS WORLD UNIVERSITY RANKINGS

2019 RESULTS

You can also ccess the full results on www.topuniversities.com

Click here for more

Academic Reputation Survey Break-down

Employer Reputation Survey Break-down

2019	2018	Institution Name	Location	Classification					Academic Reputation		Employer Reputation		Faculty Student		Citations per Faculty		International Faculty		International Students		Overall Score
				SIZE	FOCUS	RES.	AGE	STATUS	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	
1	1	MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)	United States	M	CO	VH	5	B	100	3	100	4	100	17	99.8	8	100	41	95.5	77	100
2	2	STANFORD UNIVERSITY	United States	L	FC	VH	5	B	100	5	100	5	100	16	99	13	99.8	56	70.5	190	98.6
3	3	HARVARD UNIVERSITY	United States	L	FC	VH	5	B	100	1	100	1	99.3	40	99.8	9	92.1	151	75.7	164	98.5
4	4	CALIFORNIA INSTITUTE OF TECHNOLOGY (CALTECH)	United States	S	CO	VH	5	B	98.7	21	81.2	72	100	4	100	5	96.8	115	90.3	103	97.2
5	6	UNIVERSITY OF OXFORD	United Kingdom	L	FC	VH	5	A	100	4	100	3	100	7	83	56	99.6	63	98.8	43	96.8
6	5	UNIVERSITY OF CAMBRIDGE	United Kingdom	L	FC	VH	5	A	100	2	100	2	100	11	77.2	71	99.4	71	97.9	53	95.6
7	10	ETH ZURICH (SWISS FEDERAL INSTITUTE OF TECHNOLOGY)	Switzerland	L	CO	VH	5	A	98.2	23	96.2	27	82.4	131	98.7	15	100	18	98.6	49	95.3
8	8	IMPERIAL COLLEGE LONDON	United Kingdom	L	FC	VH	5	A	98.7	19	99.9	7	99.9	23	67.8	112	100	44	100	13	93.3
9	9	UNIVERSITY OF CHICAGO	United States	L	FC	VH	5	B	99.6	13	90.7	47	97.4	48	83.6	54	74.2	229	82.5	136	93.2
10	7	UCL (UNIVERSITY COLLEGE LONDON)	United Kingdom	XL	FC	VH	5	A	99.3	14	99.2	16	99.2	41	66.2	121	98.7	82	100	16	92.9
11	15	NATIONAL UNIVERSITY OF SINGAPORE (NUS)	Singapore	XL	FC	VH	5	A	99.8	11	99.1	18	91.8	79	72.8	87	100	24	80.7	144	92
12	11	NANYANG TECHNOLOGICAL UNIVERSITY (NTU)	Singapore	L	FC	VH	3	A	90.3	38	92.6	43	95	64	87.5	46	100	22	83.5	132	91.3

QS World University Rankings (2019)

India Ranking	Name of the Institute/ University	QS World University Ranking 2019
1	Indian Institute of Technology Bombay (IITB)	162
2	Indian Institute of Science	170
3	Indian Institute of Technology Delhi (IITD)	172
4	Indian Institute of Technology Madras (IITM)	264
5	Indian Institute of Technology Kanpur (IITK)	283
6	Indian Institute of Technology Kharagpur (IIT-KGP)	295
7	Indian Institute of Technology Roorkee (IITR)	381
8	Indian Institute of Technology Guwahati (IITG)	472
9	University of Delhi	487
10	University of Hyderabad	591-600

Academic Ranking of World Universities (ARWU)

- Alumni winning Nobel Prizes and Fields Medals (10%)
- Staff winning Nobel Prizes and Fields Medals (20%)
- Highly cited researchers in 21 subject areas (20%)
- Papers in Nature/Science or fraction in top 20% (20%)
- SCI-indexed papers (20%)
- Per capita academic performance (10%)

(Biased towards large institutions; but Caltech is ranked 6th)

Some Myths (ARWU)

- Lack of medical school: Separate rankings for life and medical sciences; several highly ranked schools do not have medical schools
- Absence of Nobel laureates/Fields medalists/Turing Award winners: Indian Institutions do not do much better in recomputed rankings ignoring these criteria

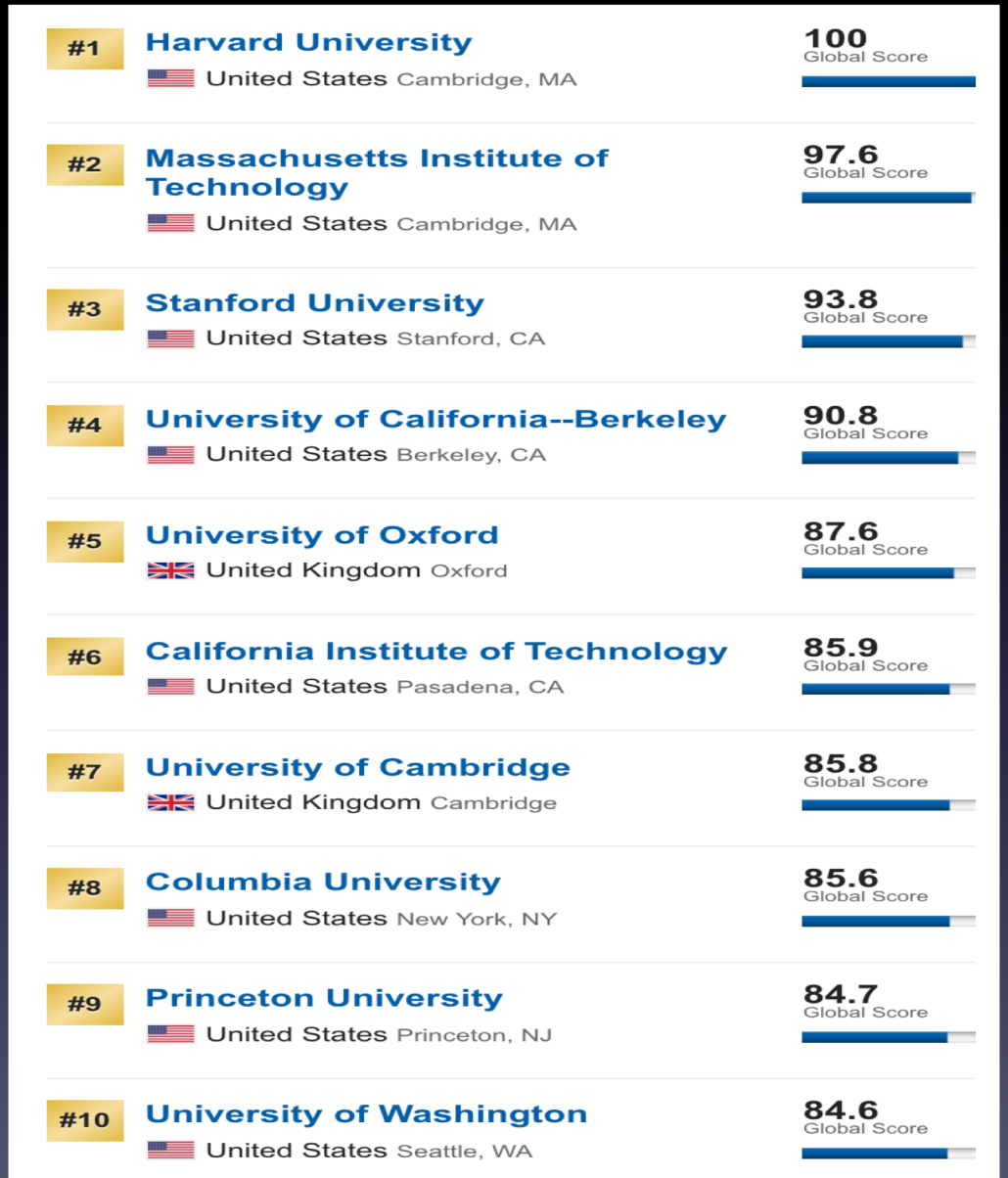
ARWU

World Rank	Institution*	By location: All	National/Regional Rank	Total Score	Score on: HiCi
1	Harvard University		1	100	100
2	Stanford University		2	75.6	76.6
3	University of Cambridge		1	71.8	56.7
4	Massachusetts Institute of Technology (MIT)		3	69.9	52.5
5	University of California, Berkeley		4	68.3	61.3
6	Princeton University		5	61	44.9
7	University of Oxford		2	60	61.3
8	Columbia University		6	58.2	41.8
9	California Institute of Technology		7	57.4	34.5
10	University of Chicago		8	55.5	35.8

US News Best Global Universities

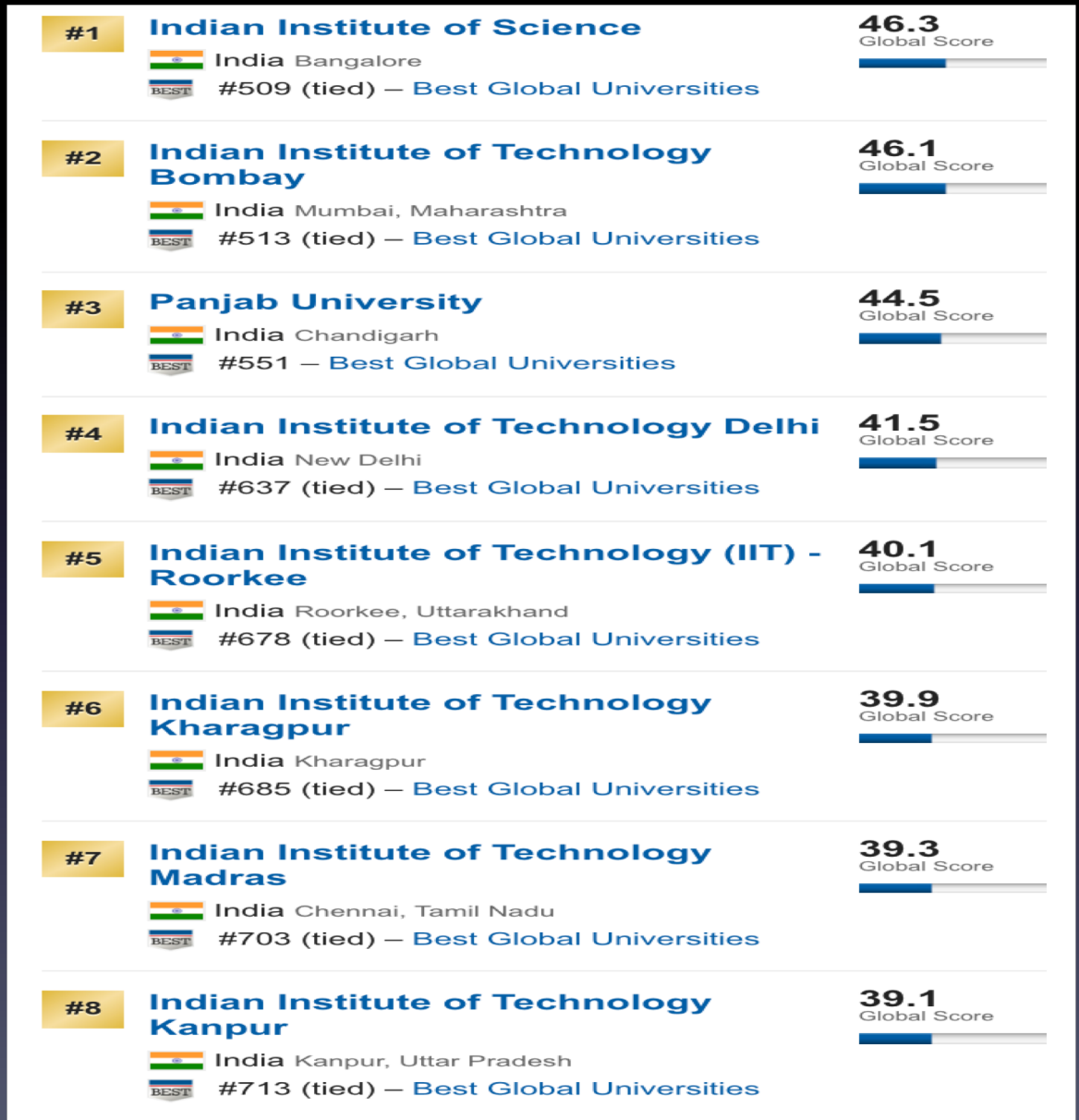
Ranking indicator	Weight
Global research reputation	12.5%
Regional research reputation	12.5%
Publications	10%
Books	2.5%
Conferences	2.5%
Normalized citation impact	10%
Total citations	7.5%
Number of publications that are among the 10 percent most cited	12.5%
Percentage of total publications that are among the 10 percent most cited	10%
International collaboration	5%
Percentage of total publications with international collaboration	5%
Number of highly cited papers that are among the top 1 percent most cited in their respective field	5%
Percentage of total publications that are among the top 1 percent most highly cited papers	5%

US News Best Global Universities



#1	Harvard University United States Cambridge, MA	100 Global Score
#2	Massachusetts Institute of Technology United States Cambridge, MA	97.6 Global Score
#3	Stanford University United States Stanford, CA	93.8 Global Score
#4	University of California--Berkeley United States Berkeley, CA	90.8 Global Score
#5	University of Oxford United Kingdom Oxford	87.6 Global Score
#6	California Institute of Technology United States Pasadena, CA	85.9 Global Score
#7	University of Cambridge United Kingdom Cambridge	85.8 Global Score
#8	Columbia University United States New York, NY	85.6 Global Score
#9	Princeton University United States Princeton, NJ	84.7 Global Score
#10	University of Washington United States Seattle, WA	84.6 Global Score

US News Best Global Universities



#1	**Indian Institute of Science** India Bangalore #509 (tied) — Best Global Universities	46.3 Global Score
#2	**Indian Institute of Technology Bombay** India Mumbai, Maharashtra #513 (tied) — Best Global Universities	46.1 Global Score
#3	**Panjab University** India Chandigarh #551 — Best Global Universities	44.5 Global Score
#4	**Indian Institute of Technology Delhi** India New Delhi #637 (tied) — Best Global Universities	41.5 Global Score
#5	**Indian Institute of Technology (IIT) - Roorkee** India Roorkee, Uttarakhand #678 (tied) — Best Global Universities	40.1 Global Score
#6	**Indian Institute of Technology Kharagpur** India Kharagpur #685 (tied) — Best Global Universities	39.9 Global Score
#7	**Indian Institute of Technology Madras** India Chennai, Tamil Nadu #703 (tied) — Best Global Universities	39.3 Global Score
#8	**Indian Institute of Technology Kanpur** India Kanpur, Uttar Pradesh #713 (tied) — Best Global Universities	39.1 Global Score

National Institutional Ranking Framework (NIRF)

- Teaching, learning and resources (30%)
- Research and professional practice (30%)
- Graduation outcomes (20%)
- Outreach and inclusivity (10%)
- Perception (10%)

National Institutional Ranking Framework (NIRF)

- Teaching, learning and resources (30%) (100 marks)
  - Student Strength including Doctoral Students: 20 marks
  - Faculty-student ratio with emphasis on permanent faculty: 30 marks
  - Combined metric for Faculty with PhD (or equivalent) and Experience: 20 marks
  - Financial Resources and their Utilisation: 30 marks

National Institutional Ranking Framework (NIRF)

- Research and professional practice (30%) (100 marks)
  - Combined metric for Publications: 35 marks
  - Combined metric for Quality of Publications: 35 marks
  - IPR and Patents: Published and Granted: 15 marks
  - Footprint of Projects and Professional Practice: 15 marks
- Graduation outcomes (20%) (100 marks)
  - Metric for University Examinations: 60 marks
  - Metric for Number of Ph.D. Students Graduated: 40 marks

National Institutional Ranking Framework (NIRF)

- Graduation outcomes (20%) (100 marks)
  - Percentage of Students from Other States/Countries: 30 marks
  - Percentage of Women: 30 marks (*50% of students; 20% of faculty*)
  - Economically and Socially Challenged Students: 20 marks
  - Facilities for Physically Challenged Students: 20 marks
- Perception (10%) (100 marks)
  - Peer Perception: Academic Peers and Employers: 100 marks

National Institutional Ranking Framework (NIRF)

Name	City	State	Score	Rank
Indian Institute of Science More Details |	Bengaluru	Karnataka	82.16	1
Indian Institute of Technology Madras More Details |	Chennai	Tamil Nadu	81.39	2
Indian Institute of Technology Bombay More Details |	Mumbai	Maharashtra	79.20	3
Indian Institute of Technology Delhi More Details |	New Delhi	Delhi	73.97	4
Indian Institute of Technology Kharagpur More Details |	Kharagpur	West Bengal	71.39	5
Jawaharlal Nehru University More Details |	New Delhi	Delhi	67.57	6
Indian Institute of Technology Kanpur More Details |	Kanpur	Uttar Pradesh	65.39	7
Indian Institute of Technology Roorkee More Details |	Roorkee	Uttarakhand	64.93	8
Banaras Hindu University More Details |	Varanasi	Uttar Pradesh	63.52	9
Anna University More Details |	Chennai	Tamil Nadu	62.82	10
University of Hyderabad More Details |	Hyderabad	Telangana	60.54	11
Indian Institute of Technology Guwahati More Details |	Guwahati	Assam	60.16	12
Jadavpur University More Details |	Kolkata	West Bengal	59.68	13
University of Delhi More Details |	Delhi	Delhi	58.69	14
Amrita Vishwa Vidyapeetham More Details |	Coimbatore	Tamil Nadu	58.46	15

CSRankings.org

- Computer Scientists often prefer this ranking
- Considers publications only in the top few conferences in CS
- Top conferences are those with the highest "impact factor"
- CVPR, NIPS, ICML, STOC, FOCS etc
- Similar to the journal impact factor
  - Same problems as the journal IF (many papers are not impactful)
  - One study at a top CS conference showed that acceptance/rejection can change substantially if a different set of referees are used

CSRankings.org

#	Institution	Count	Faculty
1	Carnegie Mellon University	17.7	150
2	Massachusetts Institute of Technology	12.2	85
3	Stanford University	11.9	65
4	University of California - Berkeley	11.2	84
5	Univ. of Illinois at Urbana-Champaign	10.0	91
6	University of Michigan	9.8	77
7	University of Washington	9.2	63
8	Cornell University	9.0	76
9	Georgia Institute of Technology	8.4	89
10	Tsinghua University	8.1	115
11	ETH Zurich	7.6	35
12	University of California - San Diego	6.9	53
13	University of Wisconsin - Madison	6.2	49
14	National University of Singapore	6.1	64
15	University of Maryland - College Park	6.0	51
16	Columbia University	5.9	47
17	University of Pennsylvania	5.5	46
17	University of Toronto	5.5	70
19	University of Southern California	5.4	45
20	Northeastern University	5.3	57
20	University of Texas at Austin	5.3	41
22	Princeton University	5.2	51
22	University of California - Los Angeles	5.2	36
24	Technion	5.0	74
25	Purdue University	4.8	54

National Taiwan University Rankings

- Number of articles in the previous 11 years (10%)
- Number of articles in the current year (15%)
- Number of citations in previous 11 years (15%)
- Number of citations in previous 2 years (10%)
- Average number of citations in previous 11 years (10%)
- h-index of last 2 years (10%)

National Taiwan University Rankings

- Number of highly cited papers in the previous 11 years from Essential Science Indicators (15%)
- Number of articles in the current year in high-impact journals (in top 5%) in every subject (15%)
- Reference Ranking:
  - This is obtained by normalizing the scores on the first 4 parameters listed above using the institution's faculty strength

National Taiwan University Rankings

World Rank	University	Country	Score	11 Years Articles	Current Articles	11 Years Citations	Current Citations	Ave. Citations	H-Index	HiCi Papers	Hi-Impact Journal Articles	Ref. Rank
1	Harvard University	United States	97.9	100.0	100.0	100.0	100.0	78.8	100.0	100.0	100.0	1
2	Stanford University	United States	95.5	93.2	94.1	100.0	100.0	75.0	96.0	100.0	100.0	3
3	Johns Hopkins University	United States	95.3	98.8	98.4	100.0	100.0	69.7	86.9	100.0	100.0	4
4	University of Toronto	Canada	94.9	100.0	100.0	100.0	100.0	63.2	86.2	100.0	100.0	6
5	University of Oxford	United Kingdom	94.1	94.1	93.3	100.0	100.0	70.4	86.2	100.0	100.0	8
6	University of Washington, Seattle	United States	93.6	91.5	90.8	100.0	100.0	70.6	87.5	100.0	100.0	5
7	University of Michigan, Ann Arbor	United States	92.8	98.1	96.0	99.7	97.2	65.1	82.0	96.9	98.0	12
8	University of London, University College London	United Kingdom	92.0	87.5	94.3	97.6	100.0	72.1	83.2	93.1	100.0	13
9	Massachusetts Institute of Technology	United States	91.8	80.1	77.9	100.0	98.1	85.7	87.5	100.0	100.0	2
10	University of Cambridge	United Kingdom	90.9	89.2	85.0	96.9	99.5	69.9	85.6	98.4	95.9	16

Methods to Improve Rankings (THE)

- To change a university, you need to change people's incentives
  - To change behaviour, provide new incentives for your staff, and monitor performance from the top
  - University strategy works best if it is a simple list of key priorities

Methods to Improve Rankings (THE)

- To attract the best faculty, you need the best leaders
  - Hire the best scholars you can and put them in positions of power - Pro VC for Research, Dean or Head of Department
  - Other great scholars will then choose to be there
  - A Dean who is a successful scholar feels less threatened by someone "famous" coming in
  - A Dean who is not a good scholar may have limited credibility and power
  - Who would pay any attention to a Dean or Pro VC with few publications telling other faculty members to improve their research output?

Methods to Improve Rankings (THE)

- Control quality through hiring panels
  - The Director/VC should set the quality threshold in the institution and monitor/control the hiring process
  - Ensure that the very best researchers are on hiring committees
  - A hiring panel made up of grade-two researchers is unlikely to want to hire a grade-one researcher
  - Create a committee to advise the Director/VC that polices all hiring, promotion and probation decisions

Methods to Improve Rankings (THE)

- Hire the best faculty
  - Director/VC should create and drive this process, and be available to talk to potential hires personally
  - Don't just advertise; think about who the perfect candidate might be and then go after that person (if available)
  - "Wine and dine" your top prospects

Methods to Improve Rankings (THE)

- Retain the best faculty
  - People on the ground should let the Director/VC know when someone does something commendable
  - Send a congratulatory note
  - Let people know that their contribution has not gone unnoticed
  - Researchers usually receive positive feedback only from colleagues in their field; ensure that the institution also regularly gives such a feedback
  - Know exactly who your outstanding people are, and whether they are happy or not

Methods to Improve Rankings (THE)

- Too much organisational change is not good
  - University strategy is usually initiated and led by the Director/VC
  - But a head may stay in post for only a few years
  - To avoid the institution's strategy flip-flopping each time a new leader arrives, the Governing Board should bear overall responsibility for it
  - If a predecessor has invested university resources and effort, don't waste what has been achieved
  - To be the best in anything requires focus, tenacity and time

Methods to Improve Rankings (THE)

- Incentivise raising research money
  - If you want more research money raised in the university, offer to give something back in return
  - Make this part of promotion decisions
  - Permit the faculty and department to keep a portion of the overheads
  - Enable buying out teaching and administration time

Methods to Improve Rankings (THE)

- Cut the red tape and reduce the number of committees
  - Red tape slows everything down, affects innovation, weakens motivation, reduces research time and, therefore, quality
  - All committees, systems and processes should be assessed
  - If something does not help the core business of research and teaching get rid of it
  - Committee minutes and reports could be cut to a minimum
  - Don’t let your best people waste productive time on administration

Methods to Improve Rankings (THE)

- As a leader, be accessible
  - Have a policy of hearing what others are trying to say
  - Be able to take bad news, too
  - Have a little humility and make others feel good about themselves
  - Be available to students also: eat where they eat; give a seminar or lecture directed at the student body; and let them know who you are
  - If you are the kind of Director/VC who mainly wants to be liked, or likes to compete with your faculty members, don't take the job of leader
  - Many Directors/VCs and senior administrators start to talk in a different language - managerialism. Talk in Plain English

Methods to Improve Rankings (THE)

- Clarify the relationship between administrative and academic staff
  - The core business of a university - research and teaching - does not exist without academics. This should be explained to administration
  - Similarly, the role of administrators is sometimes viewed as "less important" by academics
  - But the relationship between the two is interdependent
  - Better communication and more networking time together could make the world of difference
  - Academic-related administrators, fundraisers and PR staff should dine (in decent facilities) with academics regularly

Methods to Improve Rankings (THE)

- Start to train scholars in management when they are young
  - Potential scholar-leaders need to be trained early in their careers
  - Much management education is viewed as overly long-winded and not tailored to the needs of academics
  - Short, concise, relevant courses should be offered with necessary incentives to researchers throughout their careers - little but relatively often

Methods to Improve Rankings (THE)

- Give staff food for their tummies as well as thought
  - The importance of good food cannot be overestimated
  - How often do we hear the words "we want to encourage interdisciplinarity"?
  - Where are these disciplines supposed to meet each other?
  - Rarely are there good-quality restaurants in Indian universities - places that openly encourage academics to meet with each other (or with academic related staff)

Summary

- Overall rank of Indian Universities is below 250 in most of the rankings
- Key factors: Lack of sufficient citations to our papers and lack of publications in top journals
- Need to choose problems carefully in order to increase impact
- Increase interactions with industry (especially in engineering)
- Actively take part in international conferences (greater visibility)

Summary …

- Actively promote international research collaborations (higher citations)
- Strong post-doc culture (immediate productivity; ability to explore new areas)
- Substantially increase endowment and alumni funding so that these funds can be used to provide flexible support to faculty and students; appoint professional staff in key areas

Summary

- Need to appoint "star" faculty
- Provide joint appointments to international faculty (like China and Singapore)
  - Providing them higher salaries could be a double-edged sword
- Reward productive faculty
- Have a (strict) tenure system
- Provide substantial faculty start up grants

Summary

- Universities can improve reputation rankings in THE and QS through:
  - Cooperation between Indian institutions
  - Sustained PR
  - Outreach
  - Large number of national and international visitors
  - Both organize and participate in international conferences

Summary …

- Have a high-level standing committee that continuously monitors rankings and formulates strategies
- Talk to administrators from other universities: Find out what strategies worked for them
  - NUS, NTU, TU Delft, Melbourne …

Thank you