World University Rankings
How to be Number One

1

We're Number One!

1ST

ASIAN TOP 200 YOUNG
UNIVERSITIES, 2017
(No.2 In the World)

in world young university rankings
**Hong Kong institutions make significant
progress amid strong showing by Asian
schools**

       HKUST and City U place second and seventh

http://www.ust.hk/about-hkust/rankings/
http://www.scmp.com/news/hong-kong/education-community/article/2084977/hkust-and-cityu-place-second-and-seventh-world

Scholarly Communications Seminar
How to be Number One in the Rankings Game

- Brief history of biibliometrics and rankings
- Setting the Stage – The players and providers
- Basic metrics that are used in rankings
- Overview of major rankings and their indicators
- Higher education system rankings and policy implications

How I became an Expert

- Went to library school a block from Institute for Scientific Information-Citations introduced in1961
- Wrote my first article on rankings 30 years ago
- Co-authored a book on international business information over 20 years ago
- Worked closely with faculty on citation matters
- Sat on the Gouzueta Business School (Emory) committee that spent months talking about how to improve the rankings
- As University Librarian at SMU worked closely with university administration, faculty and vendors
- Went to Taiwan ten years ago to be labelled an expert!

Data Providers ⟹ ⟸ Information Users
Where do metrics & rankings fit in?

Government policy and funding initiatives

Institutional Vision, Mission and Goals;
Institutional Benchmarking

Faculty and Institutional accountability

School or Department Requirements – hiring, promotion and tenure

Faculty Productivity – publications and citations

Students- Admissions, nationalities, employability

Sources for Bibliometrics

COMMERCIAL AGGREGATORS

Clarivate Analytics

    Web of Science (WOS) - SCI-e, SSCI, A&HCI; Korean, Russian, Chinese

    Journal Citation Reports (JCR);

    Essential Science Indicators (ESI)

    InCites analytical tools

    Free highly cited researchers

ELSEVIER

Scopus

SciVal analytical tools

Free Journal Metrics CiteScore

SPECIALIZED SITES

Google Scholar

Websites

Repositories

Research Gate

Mendeley

Specialized scholar cites

Altmetrics- Social Media

Plum Analytics

Benchmarking in Incites - Raw Data

Explore InCites Data
Create dynamic tables and graphs based on your needs.

People	Organizations	Regions	Research Areas	Journals, Books,

Name	WOS DOCS	Citations	Category Normailzed Citation Impact	% Docs Cited	% Docs Top 10%	People
HKUST	**10821**	**99862**	**1.74**	**72%**	**18%**	**5496**
City U	13650	107129	1.6	70%	16.6%	5595
HKPoly	14346	101361	1.36	69.80%	14,6%	7451
NTU SG	29949	310431	1.64	68%	17.1%	15782

From Incites 4 September 2017

Overall research performance (2012-2016)   HKUST
Publications   Citations   Authors   Field Weighted Citation Impact

Other (13.6%)
Social Sciences (2.8%)
Medicine (3.2%)
Biochemistry, Genetics and Mo... (4.3%)
Earth and Planetary Sciences (2.8%)
Environmental Science (3.4%)
Engineering (19.5%)
Materials Science (9.7%)
Chemical Engineering (3.8%)
Chemistry (7.7%)
Physics and Astronomy (8.5%)
Mathematics (5.4%)
Computer Science (15.3%)

9
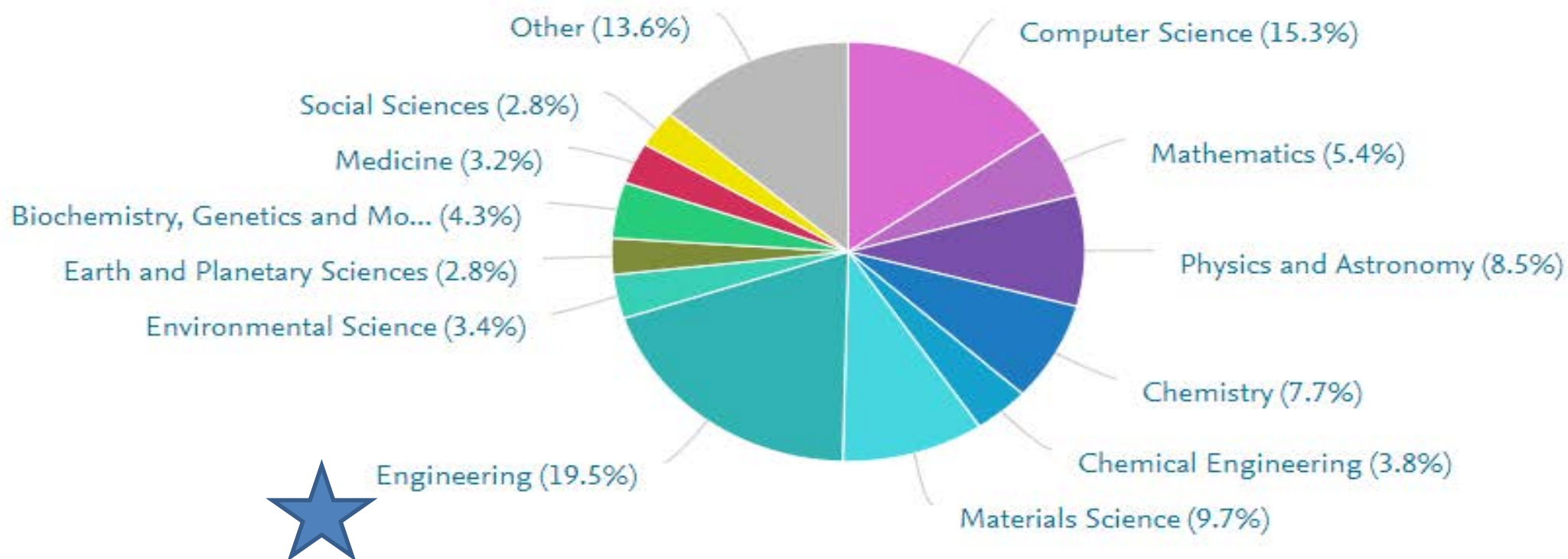
Ranking Organizations

Consultancies & Research Labs		
QS Quacquarelli Symonds (QS or Top Universities)	Mass Market Students	Composite; 1-400 individual
Shanghai Rankings Consultancy ARWU- Academic Ranking of World Universities	Scholarly	Composite 100 individual
Scimago Labs – SIR Institutional Rankings; Google Scholar ; Webometrics	Scholarly, Mass Market	Composites
Publishers		
Times Higher Education (THE World University Rankings	Mass Market Students	Composite 200 individual
U.S. News Best Global Universities	Scholarly	Composite
Nature - Nature Index	Scholarly	No composite
University Affiliates		
Centre for Science & Technology Studies – CWTS Leiden Rankings	Scholarly	No composite
National Taiwan University -Performance rankings of academic papers	Scholarly	Composite
European Commission U-Multirank	Mass Market	No composite

Which should we Believe?
World's Number One

Number 1	Source	# of universities
Oxford	THE World University Ranking	1102
MIT	QS World –Top Universities	1000
Harvard	ARWU – Academic Ranking …	800
Harvard	THE World Reputation	1102
Harvard	U.S. News Best Global Universities	1000
Harvard	NTU-TW Scientific Papers	500
Rockefeller Univ	Leiden % top 10 % publications	903
Ch Academy Sciences	Scimago Institutions Rankings	5250
Harvard	Webometrics – Ranking Web	>20,000

Which should we Believe?
HKUST Rankings

Rank	Source	# of universities
1	**THE Asian top young university**	**200**
30	QS World 2018	1000
40	THE World 2018	1102
66	Leiden % top 10%	903
164	U.S. News Global	1000
198	Webometrics – Ranking Web	>20,000
201-300	ARWU – Academic Ranking …	800
243	Scimago Institutional Rankings	2966
294	NTU-TW Scientific Papers	500
347	Leiden publications	903

Context for HKUST

HKUST's Vision and Mission

VISION

To be a leading university with significant international impact and strong local commitment

Global – To be a world class university at the cutting edge internationally in all targeted fields of pursuit

National – To contribute to the economic and social development of the nation as a leading university in China

Local – To play a key role, in partnership with government, business and industry, in the development o Hong Kong as a knowledge-based society

http://www.ust.hk/about-hkust/hkust-at-a-glance/mission-vision/

Context for HKUST

HKUST's Vision and Mission

MISSION

- To advance learning and knowledge through teaching and research particularly

  - **in science, technology, engineering, management & business studies and**

  - at the postgraduate level and

- To assist the economic and social development of Hong Kong

The Metrics - - Bibliometrics

- Publications (how many, what type)

- Citations (how many, what impact)

- Journal Impact Factors (how "good")
- Collaboration (with whom)

LEVELS
- Institutions (universities, research institutes, hospitals, etic.)
- Countries (aggregate metrics, systems)
- Authors (mapping to publications, institutions and countries)

The measurements
- Totals (number of) – **size dependent**

- Output per faculty **– size independent**

- Percent in top 10%, 1% in subject

- Weighted counts

- **Normalization** - differences among disciplines; among countries

Fractionalized faculty counts (multiple authors)

How to Increase Citations

- Publish more

- Write reviews or articles

- Collaborate more; collaborate with US authors

- Publish in journals indexed in Scopus or WOS

- Post a list of all publications on your web site and in open repositories

- Use a middle initial, include your complete affiliation and be consistent

- Register at sites for identifier numbers

11/10/2017

Publications, Citations and Authors

Institution		Pubs	CR	Cites	AR	Authors
Harvard University	1	140641	1	2388572	1	80040
Stanford University	7	63004	2	1029281	15	34404
University of Toronto	2	81239	3	1007470	6	46826
University of Oxford	10	62538	4	931564	27	29511
Johns Hopkins U	11	61498	5	931237	22	32060
U Paris Saclay Systen	3	76529	10	805390	7	40957
UC London	4	68790	6	890693	19	32922
U de Sao Paulo	5	66056	65	400535	3	54560
Zhejiang University	12	59759	56	431236	4	52980
Peking University	15	56268	28	549194	5	48640

SciVal October 2017; 15 of top 20 in icites from US; 18 from US, UK and Canada

Relationship of Publications to Citations
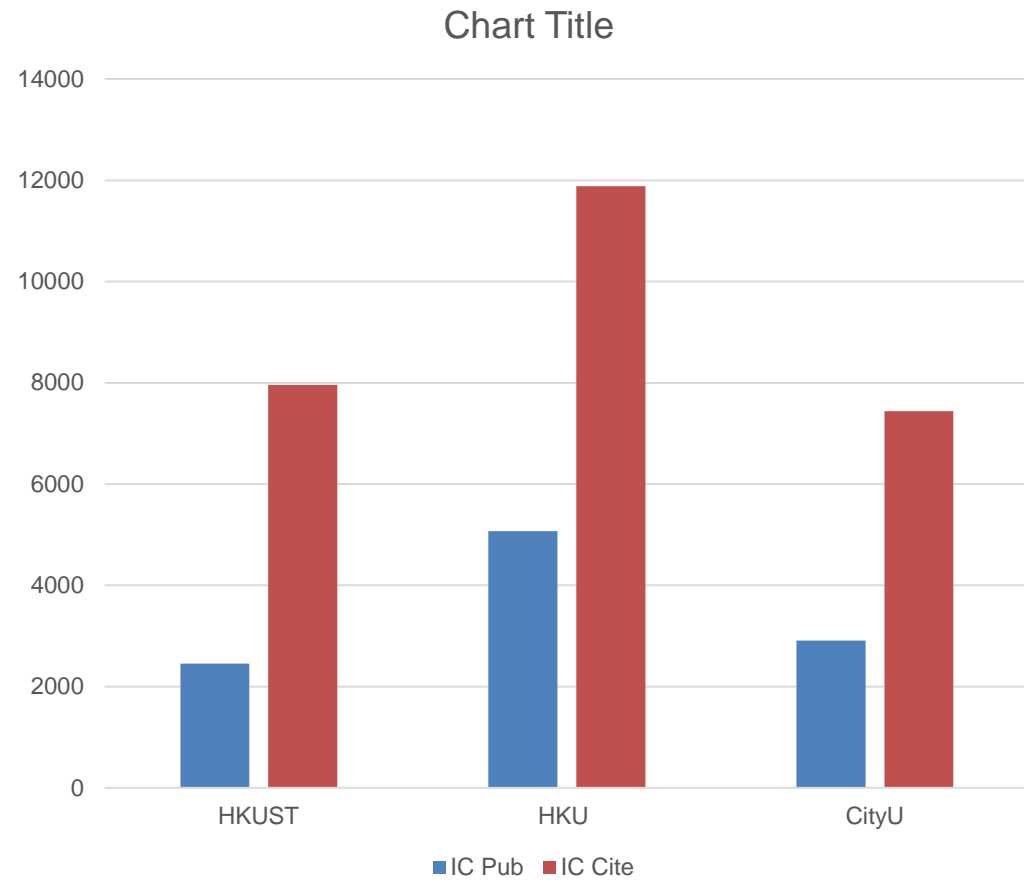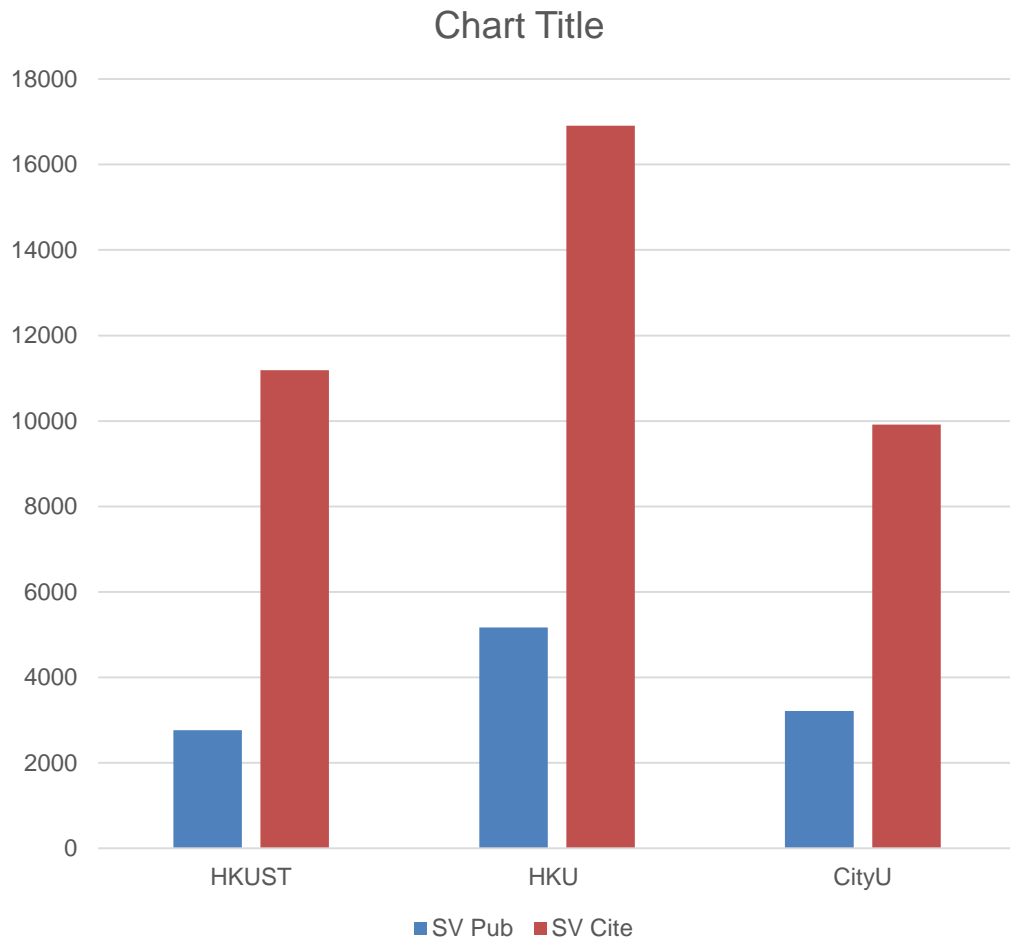
MISCONCEPTION
Citations are THE way to improve rankings

- The Big Three

    QS – papers in Scopus

    THE – teaches undergrads; >= 1000 articles in Scopus;
        more than one core subject area

    ARWU – Articles in Nature, Science, SCI-e and SSCI

- Other rankers

    US NEWS Global – reputation and publications in WOS

    LEIDEN – number of articles in SCI-e, SSCI and **A&HCI**

External Non-bibliometric Indicators

- Surveys (QS, THE, US News)

  - Academic reputation
  - Employer reputation
  - Regional reputation

- Researchers' accomplishments (ARWU)

  - Alumni and staff winning Nobel prize or "Field Medal" [math]

- Web metrics (Webometrics)

  - Number of web pages at a university's domain
  - Number of incoming links

20

Non-bibliometric indicators from institutional data

- Faculty/student ratio – QS (20%), THE (4.5% in Teaching)
- **International faculty – QS, THE**
- **International students – QS, THE**
- **International collaboration** – QS, THE, Leiden, SIR
- Industry Income - QS
- Research income - THE

# RANK	UNIVERSITY	OVERALL SCORE	ACADEMIC REPUTATION	CITATIONS PER FACULTY	EMPLOYER REPUTATION	FACULTY STUDENT	INTERNATIONAL FACULTY	INTERNATIONAL STUDENTS
2018	Uni Search							
1	Massachusetts Institute of Technology (MIT)	100	100	99.9	100	100	100	96.1

2004 (with THE)

2018 – 1000 universities

Based on :All papers in **Scopus**

Citations: All citations in 5-year period / number of faculty, normalized by subject **- 20%**

https://www.topuniversities.com/university-rankings

HKUST in different QS rankings
- World Ranking – 30 / 1000
- **Asia 2018 3/400**
- 50 under 50 2 /250
- Best Student City – HK -11; Singapore 14

Rank and Scoring Distance - QS Asia 2018

Rank	University	Overall Score	Academic Reputation	Employer Reputation	Faculty/Student Ratio	Papers per Faculty
1	NTU	100	99.9	100	99.5	65
2	NUS	99.9	100	100	98.5	61.1
3	HKUST	98.2	99.6	99.2	77.5	82.8
5	HKU	97.4	100	99.8	99.8	58.1
8	City U	96.6	93.4	83.7	96.8	90.9

In World Rankings 50 universities score 100 in ternational faculty

Rank ▲	Name	Overall	Teaching	Research	Citations	Industry Income	International Outlook
1	**University of Oxford** ⚲ United Kingdom Explore	94.3	86.7	99.5	99.1	63.7	95.0

2004 (with QS) -2018

208: 1102 universities

Based on >=1000 articles in **Scopus**

Citations – Number normalized by subject – **30%**

https://www.timeshighereducation.com/world-university-rankings/2018/world ranking#!/page/ 0/length/25/sort_ by/rank/sort_order/asc/cols/scores

HKUST in different THE rankings
- World 2018: 44/ 1102
- Asia 2017: 5/298
- Young universities 2017: 2/200
- World Reputation 2017: 71-80

SAME RANK- SAME SCORE
World Rank 2018

Rank	University	Overall Score	Teaching	Research	Citations	Industy Income	International Outook
27	NYU	79.2	73.7	77.4	96.5	37	53.4
27	Peking U	79.2	83	85.1	74.2	100	53
	Weight		30%	30%	30%	2.50%	7.50%
	# of metrics		5 *	3*	1	1	3

* includes reputation

* Includes reputation   © Ruth A. Pagell - Scholarly Communications Seminar, HKUST

ACADEMIC RANKING OF WORLD UNIVERSITIES — SINCE 2003

World Rank	Institution*	By location All ▼	National Rank	Total Score	Score on Alumni ▼
1	Harvard University	🇺🇸	1	100.0	100.0
2	Stanford University	🇺🇸	2	76.5	44.5

2003-2017
Bibliometrics from **Clarivate Analytics,**
Based on articles in **SCI, SSCI** and Nature
and Science in Web of Science(40%)
Citations: Number highly cited in Essential
Science Indicators **20**%
Nobel prizes and other prizes (30%)
http://www.shanghairanking.com/ARWU2017.html

HKUST 2017: 201-300/800 (same rank since 2003)
Engineering : 31
Computer Science: 39
Economics & business 50
In 2017 ARWU added HK as a location
Added 300 more universities and
Added new subject areas, mainly in Engineering

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Ranking and Scoring Distance - ARWU

World Rank	Institution	National Rank	Total Score	Alumni
1	Harvard	1	100	100
2	Stanford	2	76.5	44.5
3	Cambridge	1	70.9	81.4
4	MIT	3	70.4	68.7
5	UC Berkeley	4	69.1	64.4

http://www.shanghairanking.com/ARWU2017.html

Best Global Universities Rankings

Rankings Search

[Reset search criteria]

Region

Select region

Showing 1-10 of 1000 schools sorted by Global Rank

#1 **Harvard University**

🇺🇸 United States Cambridge, MA

100 Global Score

2014- 2018 – shows current year
From **Clarivate Analytics**, Number
of articles, reviews & notes; bools
and conferences (total 15%)
Citations – numbers and percent –
including top 1% and 10% (total 60%

HKUST   152 /1000
Asia – 14/ 444
Computer Science 21
Engineering 29
Materials Science 22
Economics & Business 41

Time period:	2012–2015 ▼	Type of indicators:	Impact ▼
Field:	All sciences ▼	Indicators:	P, P(top 10%), PP(top 10%) ▼
Region/country:	World ▼	Order by:	P(top 10%) ▼
Min. publication output:	100 ▼	☑ Calculate impact indicators using fractional counting ?	

	University		P	P(top 10%)	PP(top 10%)	
346	China Univ Geosci	🇨🇳	3248	313	9.6%	▬
347	Hong Kong Univ Sci & Technol	🇨🇳	3240	464	14.3%	▬
348	Trinity Coll Dublin	🇮🇪	3232	419	12.9%	▬

2011-2012 to 2017
2017- 903
No composite; 100% bibliometrics

HKUST (HK incl. In China
World publications: 371
Number in top 10% -227
% in top 10% - 68 – size independent

http://www.leidenranking.com/ranking/2017/list

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Scimago Institutions Rankings
All sectors

1 (1)	Chinese Academy of Sciences *	CHN	
2 (2)	Centre National de la Recherche Scientifique *	FRA	
3 (3)	Harvard University	USA	

2009- 2017
2017 5250 institutions incl. 2966 ranked higher ed institutions
Based on publications in **Scopus** (8%)
Various citation metrics: 45%

HKUST
World 2017: 305;
Academic 2017: 243
Highest rank in 2009

http://www.scimagoir.com/rankings.php?year=2011

Webometrics

RANKING WEB OF UNIVERSITIES

21 institutions

ranking	World Rank▲	University	Det.	Presence Rank*	Impact Rank*	Openness Rank*	Excellence Rank*
1	94	University of Hong Kong	››	229	139	103	97
2	139	Chinese University of Hong Kong	››	77	194	159	144
3	198	Hong Kong University of Science & Technology	››	337	257	153	225
4	202	City University of Hong Kong	››	478	371	154	167

- "It should be noted that the aim of the ranking is to promote Open Access, not to classify websites, so your priority should be to involve **everybody** in your organization in the generation and publication of web contents and not on the insane task of monitoring the ranks. " http://webometrics.info/en/Previous_editions

nature INDEX

2016	University	WFC 2015	WFC 2016	AC	Change WFC
147	Hong Kong University of Science and Technology (HKUST), China	76.21	78.97	253	3.6% ⬆
194	The University of Hong Kong (HKU), China	57.6	62.99	296	9.4% ⬆

Annual Index – lists top 500

Search by country for complete list

From *Nature* and *Science*

Not normalized but fractionalized

HKUST – 147 annual

HKU   - 194 annual

5 in top 500

HK with mainland China

Factors Contributing to Rankings
"Time" and Age

Date range of the publications

19 of the top 20 universities in ARWU founded before 1900

Longer time span, better for larger, older world institutions

Better for reputation

Better for non-scientific fields
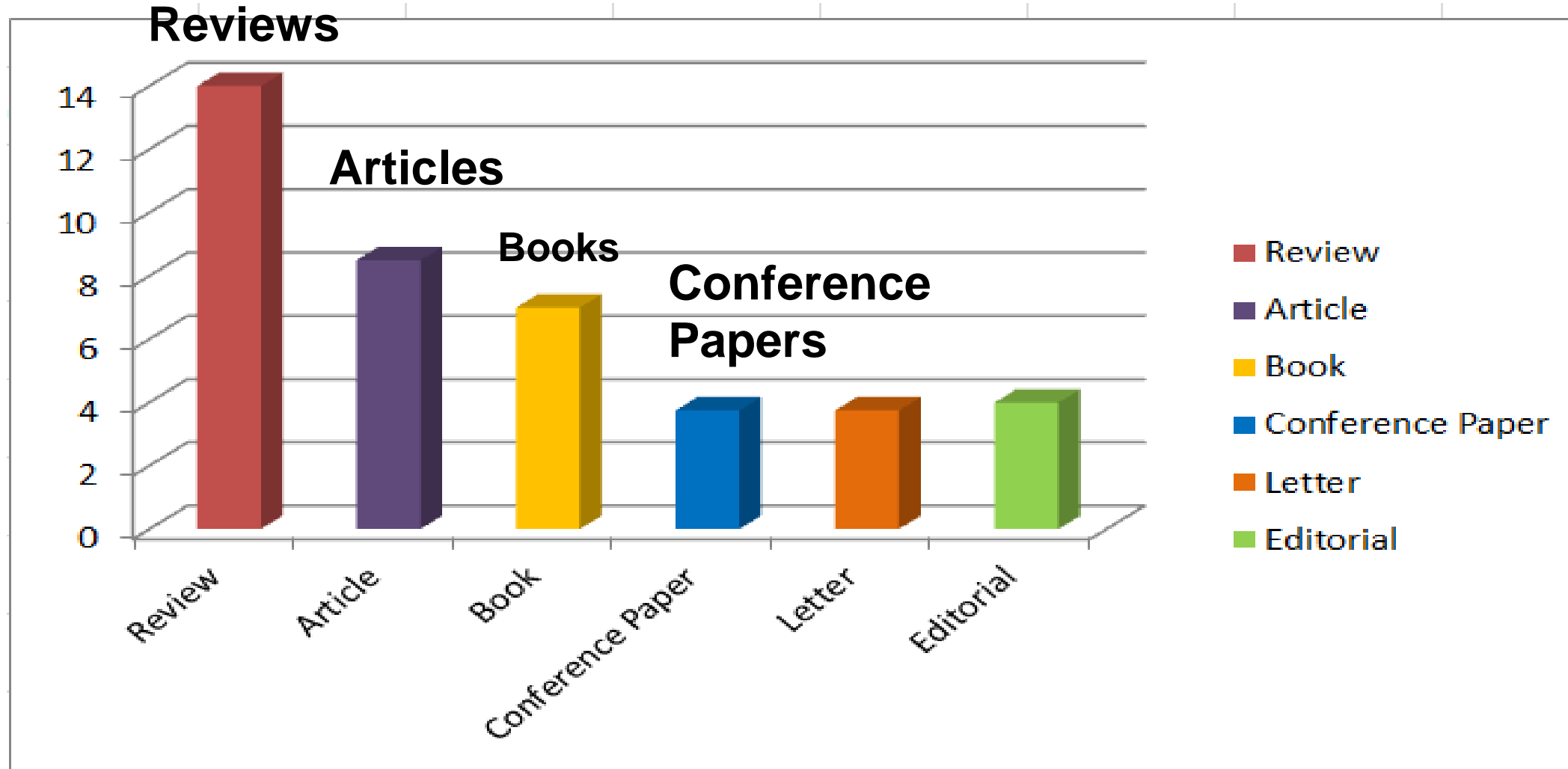
Subject differences in "half life " of citations

Does University Age Count?
http://meta.umultirank.org/fileadmin/downloads/Newsletter/2015/November/Readymade_Rankings_by_University_Age_Story.pdf
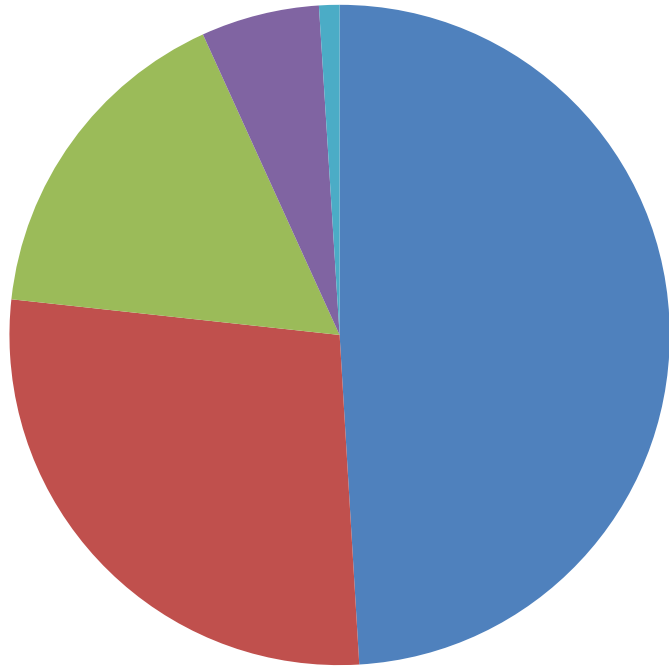
Factors contributing to Rankings
Publication Type

From SciVal Metrics Guidebook Table 3.2.3

Factors Contributing to Rankings
Broad Subject Areas

HKUST

	WORLD	HKUST
Life Science and Medicine	49.1%	
Natural Sciences	27.6%	
Engineering & Technology	16.5%	**48.3%**
Social Sciences	5.8%	
Arts & Humanities	1%	

Data from Scopus

ESI Highly Cited

	Research Fields	Web of Science Documents	Cites ▼	Cites/Paper	Top Papers
1	CLINICAL MEDICINE	2,589,800	32,381,665	12.50	25,493
2	CHEMISTRY	1,631,432	22,773,683	13.96	16,330
3	PHYSICS	1,088,978	11,942,859	10.97	10,784
4	BIOLOGY & BIOCHEMISTRY	701,873	11,367,999	16.20	7,040
5	MOLECULAR BIOLOGY & GENETICS	441,547	10,551,074	23.90	4,435
6	NEUROSCIENCE & BEHAVIOR	492,990	8,693,441	17.63	4,945
7	MATERIALS SCIENCE	750,331	8,552,728	11.40	7,415
8	ENGINEERING	1,152,029	8,007,166	6.95	11,530
9	PLANT & ANIMAL SCIENCE	700,149	6,294,680	8.99	6,980
10	SOCIAL SCIENCES, GENERAL	850,718	5,541,544	6.51	8,496

Limitations of Rankings

- Limited number of institutions
- Fixed time periods
- A composite rank based on pre-set weights
- Annual updates
- A composite rank based on scores but no data
- Individual scores by indicator but no composite rank
- Inclusion by number of articles from fixed sets of publications

- Fixed regional comparisons
- Fixed and limited subject categories
- No downloading
- No customization
- Emphasis on science and technology
- English language bias
- Lack of comparability among rankers

Different definitions of indicators

Different "publications" sources

Different target audiences

Sources for Non-U Data/Rankings

- Incites –Prince of Wales Hospital

- SciVal –Queen Elizabeth Hospital

- Scimago IR – Prince of Wales Hospital

- Webometrics –Hospitals, Business Schools, Research Centers
  Hong Kong: Hospital Authority, HK Institute of Marketing

- Nature – Hong Kong is under China ; need to recognize name

New Metrics

Usage and views from Scopus and Web of Sciene

CiteScore free journal ratings
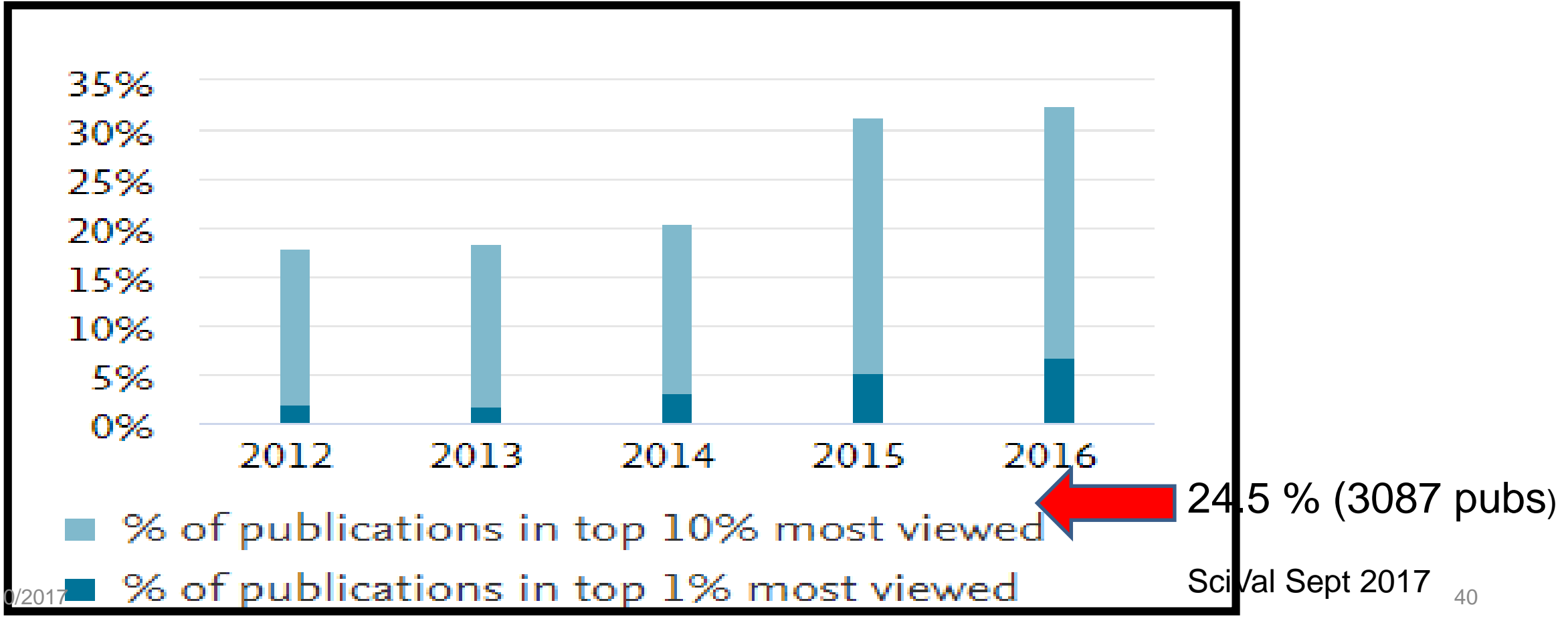
Altmetrics in Nature Index

Plum Analytics – PlumX from Scopus

New Metrics Scopus Top Views
HKUST VIEWED- in top views percentiles

Share of publications at HKUST that are among the most view publications worldwide

24.5 % (3087 pubs)

☐ % of publications in top 10% most viewed

■ % of publications in top 1% most viewed

SciVal Sept 2017

New Metrics – Usage Count - WOS

Analyze Results

1. **Procurement management** using option contracts: random spot price and the portfolio effect

   By: Fu, Qi; Lee, Chung-Yee; Teo, Chung-Piaw
   IIE TRANSACTIONS   Volume: 42   Issue: 11   Pages: 793-811   Article
   Number: PII 927000540   Published: 2010

   Find It Emory   View Abstract

Times Cited: 52
(from Web of Science Core Collection)

Usage Count ^

Last 180 Days: 0

Since 2013:   32

New Metric – CiteScore

	Cite Score	Highest CS Percentile	CS Rank	Cite 2016	Docs 12-15	% cited	SNIP	SJR
Ca-A Cancer for Clinicians	89.23	99%	1/117	11957	134	72%	67.56	39.29
Chemical Review	42.49	99%	1/354	33796	794	97%	10.37	19.28

SNIP: Source Normalized Impact per Paper – field differences from CWTS

SJR: SCImago Journal Rank – can find journals by country

https://journalmetrics.scopus.com/

2017 Annual Tables - Altmetrics

nature INDEX

World scores

AC	FC	WFC
245	82.32	82.19

Subject		AC	FC	WFC
🟦	Physical Sciences	133	41.12	40.98
🟥	Chemistry	115	42.72	42.72

Sub-wavelength InAs quantum dot micro-disk lasers epitaxially grown on exact Si (001) substrates

Journal: *Applied Physics Letters*

Published: 2016-05-30

DOI: 10.1063/1.4952600

Affiliations: 5

Authors: 8

160

See more details

Picked up by **18** news outlets

Blogged by **3**

Tweeted by **8**

On **2** Facebook pages

Mentioned in **3** Google+ posts

24 readers on Mendeley

https://www.natureindex.com/article/10.1063/1.4952600

New Metrics – Plum Analytics in Scopus

Procurement management using option contracts: random spot price and the portfolio effect

Citation data: IIE Transactions, ISSN: 0740-817X, Vol: 42, Issue: 11, Page: 793-811

Scopus Metrics ?

Citation Count	Field-Weighted Citation Impact	Citation Benchmarking
64	**4.52**	96th percentile
Cited by in Scopus		Compared to Engineering articles of same age and document type

USAGE ⌄	10797	CAPTURES ⌄	184	CITATIONS ⌄	64
Abstract Views ⊘	9654	Exports-Saves ⊘	141	Citation Indexes ⊘	64
PDF Views ⊘	882	Readers ⊘	43		
HTML Views ⊘	248				
Link-outs ⊘	13				

May also include mentions and social media : https://plumanalytics.com/

The Geography of Research
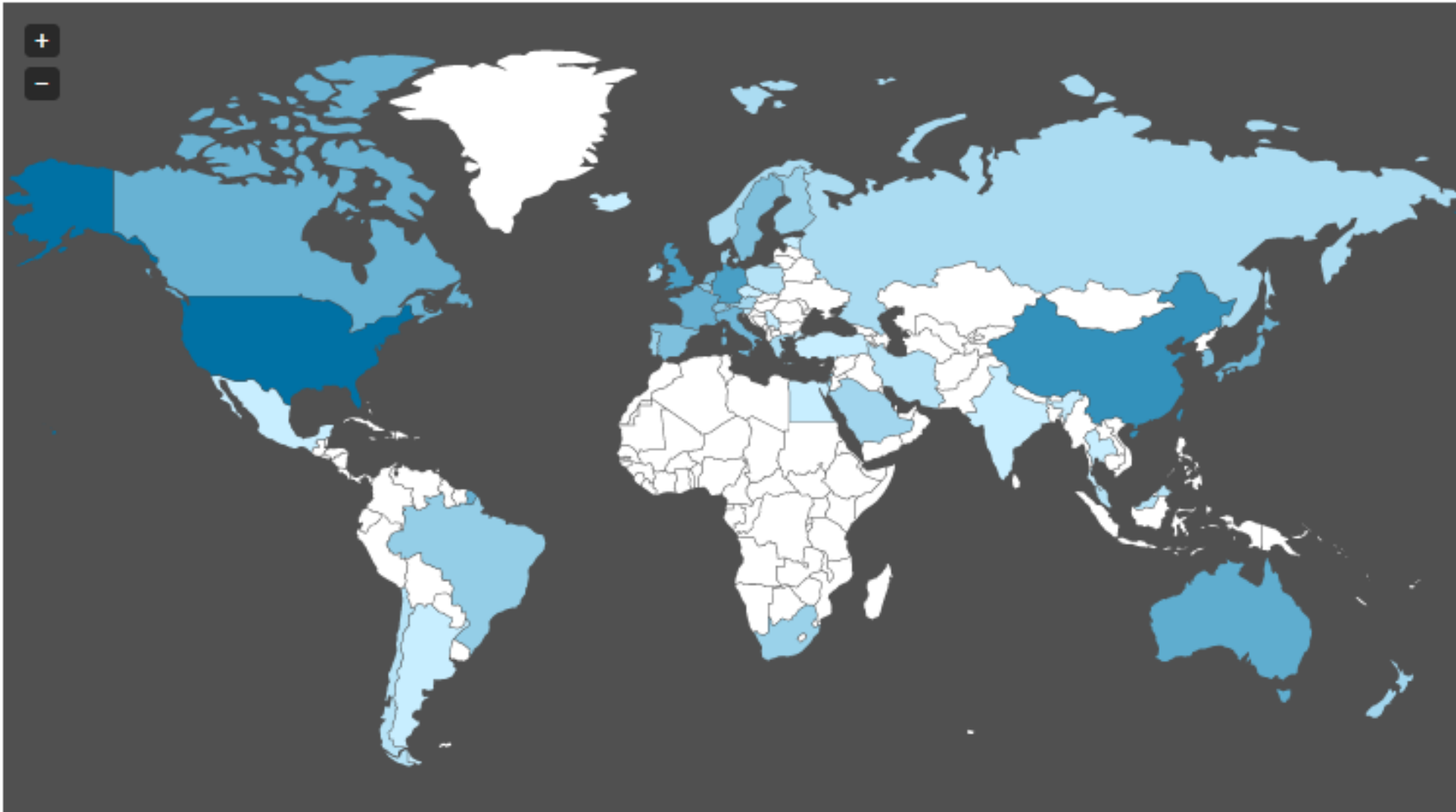
Country Performance Metrics
Globalisation or Massification

- Research & Development (US NSF)

- U21 – National Education Systems, QS,

- PISA and TIMMS – performance of pre-tertiary students in math, science and reading

- Innovation – World Intellectual Property Organization- Global Innovation Index 2017

http://www.wipo.int/pressroom/en/articles/2017/article_0006.html

SciVal Benchmarking of Scholarly Output 2011-2016
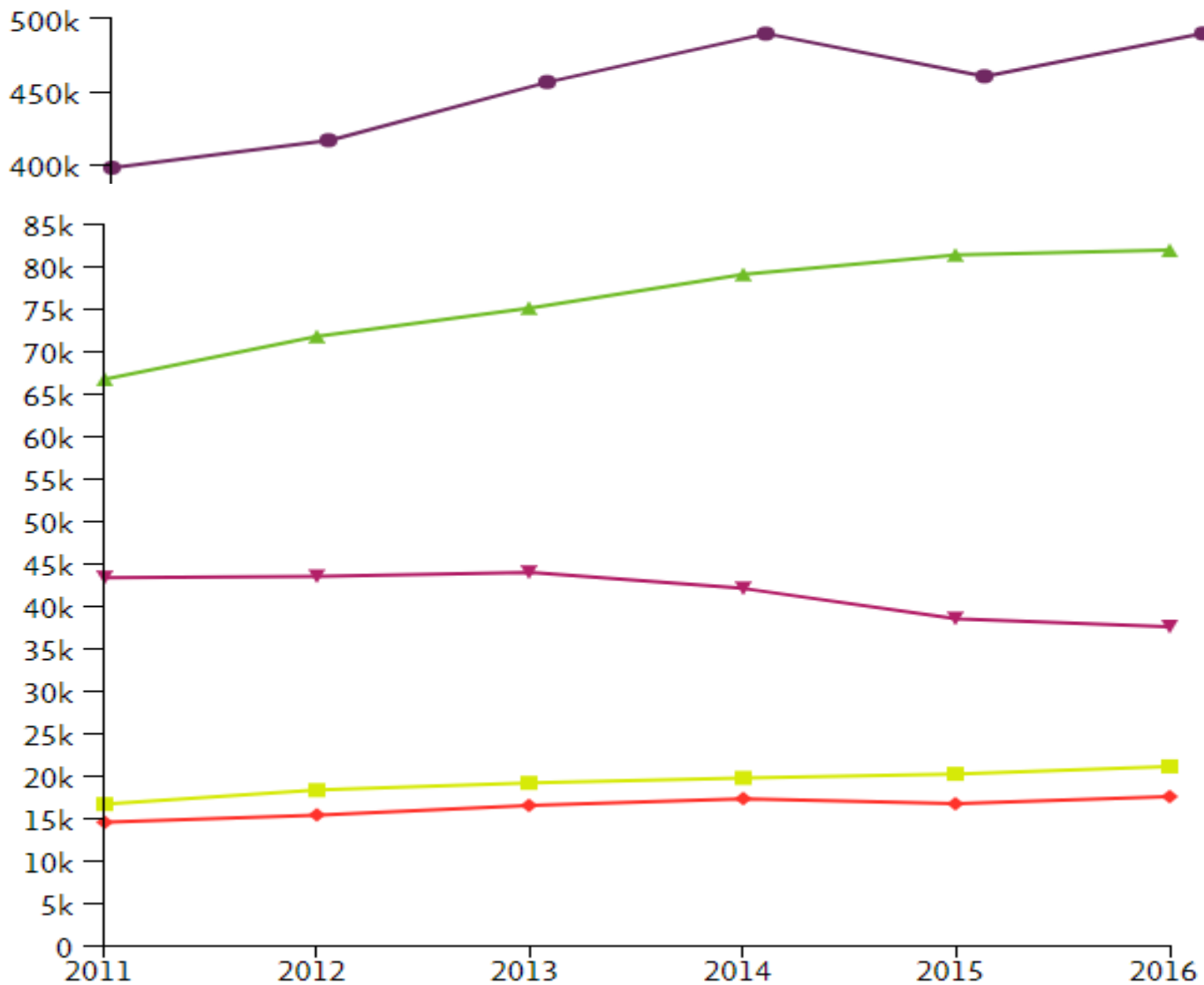
Countries and Groups		Output
●	China	490,000
♦	Hong Kong	17,504
■	Singapore	21.058
▲	South Korea	81,660
▼	Taiwan	037,502

Ranking higher education systems –U21 2017

Composite ranks and scores for 2012 and 2017 with 2017 individual measures

RANK		Country	SCORES		1R	2E	3C	4O	5ED	6QS
2017	**2012**		2017	2012	**20%**	**20%**	**20%**	**40%**		
6	11	Singapore	80.8	75.4	4	4	8	12	20	21
14	18	Hong Kong	73.7	68.9	12	6	11	22	26	20
20	20	Japan	63.2	66.1	24	22	25	15	36	10
21	21	Taiwan	60.7	62	29	10	22	24	38	17
22	22	Korea	59	60.2	21	43	30	18	34	9
30	39	China	52.7	48.3	43	19	45	21	14	8

U21 2017:-links to all reports

http://www.universitas21.com/article/projects/details/152/u21-ranking-of-national-higher-education-systems-2017

1R **Resources**: Expenditures on R&D and higher education
2E **Environment:** Diversity, data quality, policy
3C **Connectivity**: International students, collaborations, webometrics
4O Output: Publications, citations, world class universities
5ED Economic Development: Reranked based on level of economic development
6QS QS Higher Education System rankings based on the universities in QS world rankings

Know your Country's Policies Education and Evaluation

- **Support increase in post-secondary opportunities**
- **Developing HK as a regional education hub**

University Grants Commission (UGC)

Research Assessment (RAE)

"the post-secondary education system is in good health, as evidenced by, amongst other things……. the high rankings achieved by a number of Hong Kong universities in international league tables."

Internationalisation …should become one of the central themes of all UGC-funded institutions…. a focus on internationalisation does not mean that our institutions should neglect or lose sight of the significance of our traditional values and local needs."

Aspirations for the higher system in Hong Kong, December 2010, pgs. 9,12
http://www.ugc.edu.hk/eng/ugc/about/publications/report/her2010/her2010.html

REVIEW: Rankings highlights and low lights

1..QS -1000

2.THE- 1102

3. ARWU -800

4. USNews Global-1000

5. Leiden – 903

6. SIR – 5250

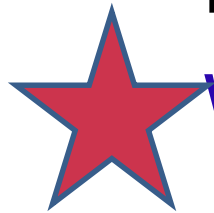7. NTU -   TW 800

8.. Nature – Top 500

1. 50% reputation; re-rank by indicator; spinoffs; different metrics and weights for regional ranking

2. 33% reputation; 200 individual ranks; spinoffs with marginal differences from world rankings

3. Nobel prize winners; 100 individual ranks; includes non-ranked universities in subject ranking

4. 25% reputation; all ranked; 45% size independent; displays only rank & score; no table with metrics

5. No composite; all ranked for each indicator; size dependent and size independent

6. 2966 in higher ed; unusual categories and results

7. 80% size dependent

8. Only natural sciences; size dependent;

Review - How to be number 1 in something
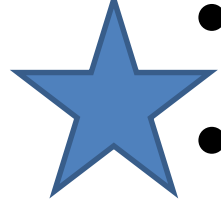
- Read the methodology for the rankings
- Drill down into the rankings to see scores and data, if available; [explore] the institution for more information
- Remember that size, age, subject, language, type matter
- Look beyond the "big three" (QS, THE and ARWU)
- Focus on a strong subject
- Be consistent in authors' names and affiliations
- List your articles in as many places as possible
- Work in an institution with government support to be #1

21st Century Issues In Higher Education Related To Rankings

The geopolitics of higher education: globalization or massification?

What is the impact of rankings on the university's research and teaching roles?

To whom are faculty and the institution accountable?

School or Department Requirements – What is the role of social media?

Faculty publications: What is the future of the journal and the book as scholarly objects?

Students- How do you balance the push for international students with the pull of local students?

MAHALO

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SEE: Ruth's Rankings in Access
http://librarylearningspace.com/ruths-rankings-1/