Quality assurance and evaluation at KTH

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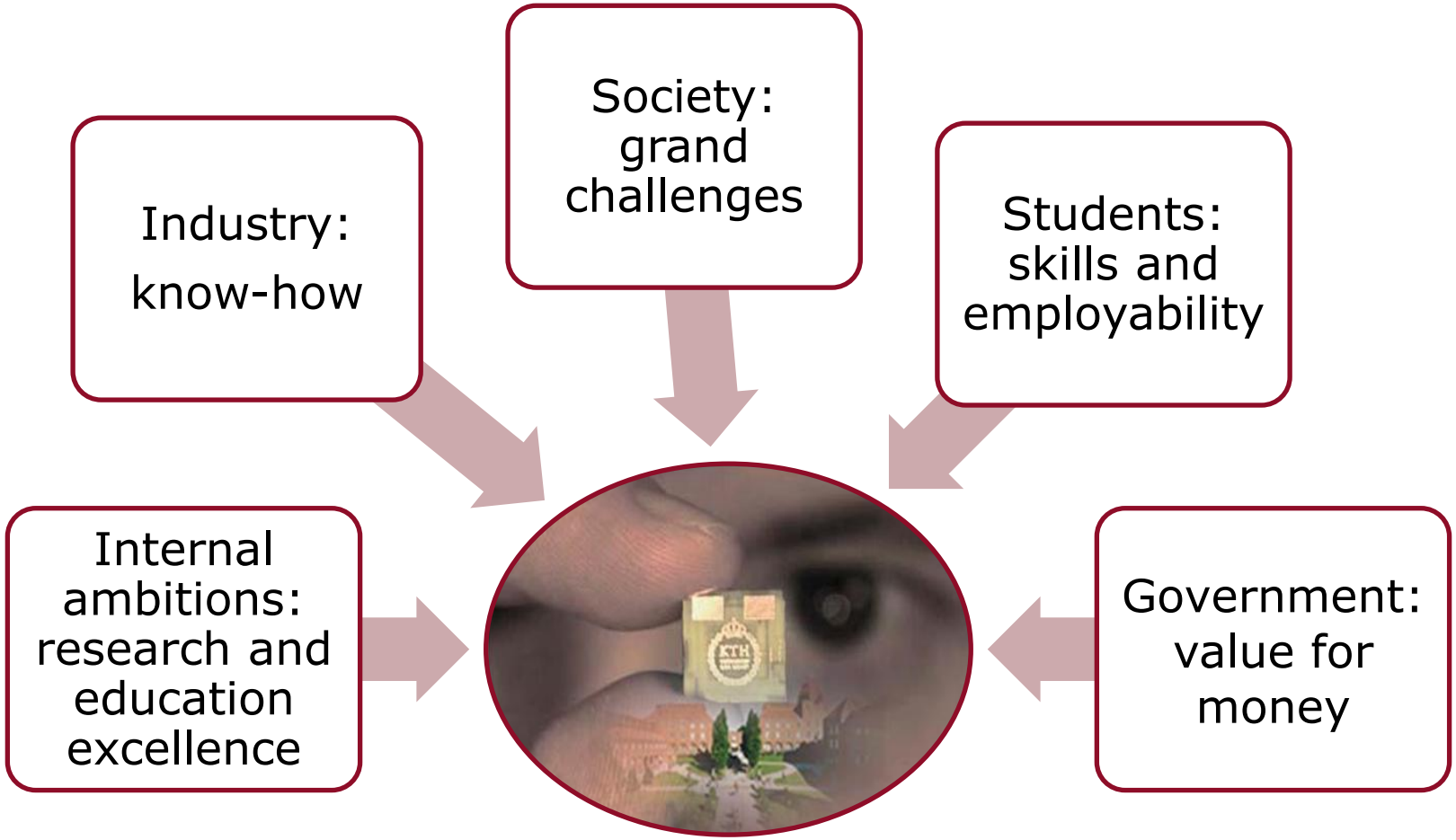
Backdrop: ever increasing demands



Political context (Sweden and Europe)

Increased HEI autonomy

Emphasis on utility

External quality assurance system (national authority, UKÄ) is focused on outcomes

Need for university-internal strategies for enhancement purposes

KTH response: quality assurance strategy + large-scale internal evaluation projects in research as well as education

Quality assurance strategy

The quality process at KTH is to be based on the principle of continuous improvement

Quality policy 2011-2015

- Education
- Research
- Interaction with the wider community
- Staff recruitment and professional development

Action plan to the quality policy

- Sets out priorities and activities for each year

Annual quality report

- Gives an overview of activities and results

Quality assurance: roles and responsibilities

Responsibility for quality is to be carried by the individual student, teacher and employee in their daily actions

Formal organisation

- Faculty Council: academic responsibility for quality
  - Dean, Vice Dean
- President, University Board
- University Administration
  - Department of Strategic Planning and Resource Allocation: quality assurance support
- KTH Schools
  - Director of Undergraduate and Masters' studies
  - Director of Doctoral studies
  - Programme Director

External Advisory Group
Networks

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Education Assessment Exercise (EAE) 2011

EAE: how it happened

- Scope: all education programmes at KTH (90 programmes, 45 self-evaluation groups)

- Methodology:
  - -Self-evaluation
  - -External panel input (50 members): site visit, report
  - -Follow up

- Focus: Learning outcomes

EAE: some results

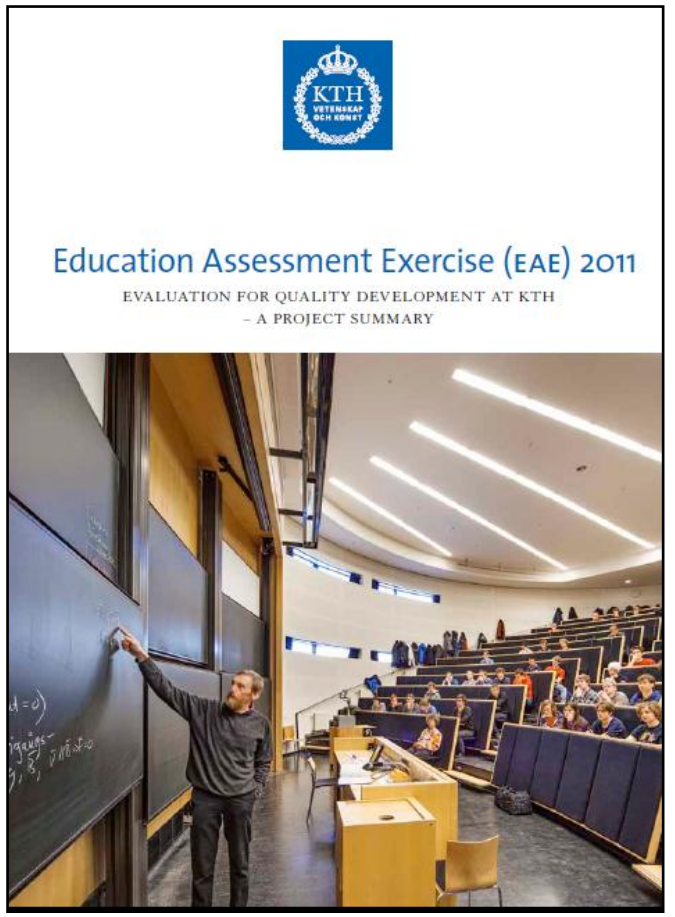
- Many strengths in KTH programmes, eg. employability
- Bologna implementation ongoing
- The parts work well, less so the whole
- Student retention a lingering quality issue
- Sustainable development – an area requiring attention
- More credit to teaching needed

More information: report available

Education Assessment Exercise (EAE) 2011

Evaluation for quality development

- A project summary



Research Assessment Exercise (RAE) 2012

RAE 2012: how it happened

KTH initiative

Led by Prof. Björn Birgisson, Vice-President for Research

The first RAE was conducted in 2008 – comparison is possible

Aim: identify areas of existing research strength and emerging potential against an international benchmark

Scope: 47 research areas (Units of Assessment)

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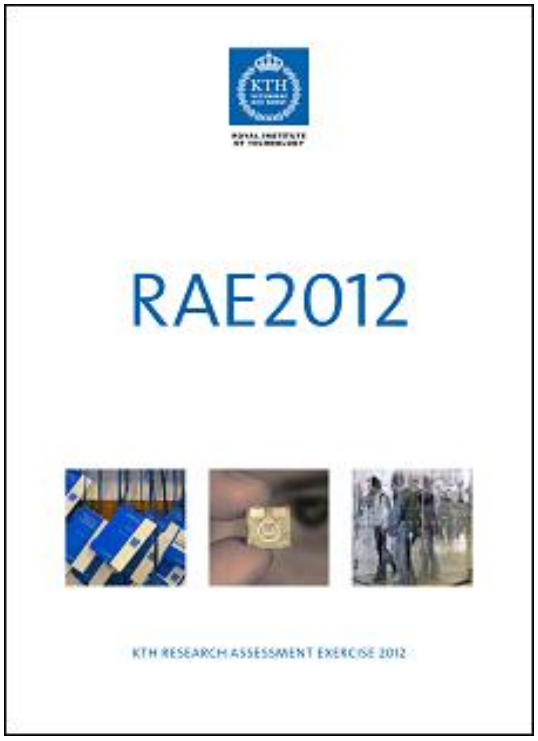
RAE 2012: some results

- KTH has strong impact and engagement with society
  - many different ways of interacting with society
  - more than half of the KTH research base found to have an "outstanding impact and engagement with society"
- KTH has a strong research base
  - almost half of KTH research units assessed to have a research output quality that is 'world-leading'
- KTH researchers have a strong tradition publishing in peer reviewed international journals
  - impact of their publications is increasing
  - increase in the average field normalized citation rate

More information: report available



RAE2012

KTH Research Assessment Exercise 2012

Queries?

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Ranking and surveys

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Ranking, a short background

- The first rankings appeared in the U.S. in the early 1900s
- Most rankings are provided by large media companies. Only a few rankings are given by universities, government agencies or foundations
- There are a large number of national and international rankings
- The first major global rankings by Shanghai Jiao Tong and Times Higher Education (THE) appeared in the early 2000s
- Only about 500 universities in the world get ranked, there are more than 20 000 universities in the world

Major players

- Times Higher Education (THE)
- Shanghai Jiao Tong (ARWU)
- QS Top Universities
- Leiden ranking (CWTS)
- Taiwan (HEEACT, NTU)
- SIR. SCImago institutions rankings
- Ranking web of World Universities
- Center for Higher Education, Germany (CHE)
- U-Multirank (EU Commission)
- U-Map (CHEPS, EU Commission)

World Class University

- Elite Universities seen as necessary for economic development, growth, innovation, and sustainable society and the knowledge economy. The American elite universities are seen as role models
- Research heavy and conduct high-quality research
- Requires considerable resources to create a creative learning environment and advanced research
- The best students, teachers and researchers in the world wants to study and conduct their research at the best learning and research environments
- High proportion of students on advanced level (high share of talent)
- High proportion of international students, faculty and researchers (high percentage of talent)
- Global war for talent, brain drain, brain gain

Methodology

- Most rankings based on a combination of:

- Reviews/expert panels, such as ”Academic/Employers review”, i.e. collection of opinions on HEIs' status in various respects
- Bibliometric data, i.e. data on citations and publications from the two databases Web of Science (most important) and Scopus
- Statistics, i.e. number of students, teachers, researchers, financial data, number of international students, teachers, researchers, etc. Reported either by the universities (e.g. THE and QS), or obtained by other means (e.g. official data from HSV / VHS)

Criticism of rankings

- Often poorly described and non-transparent methodology
- Major shortcomings regarding reliability and validity
- The providers of rankings generally do not live up to scientific standards on transparency, reliability and validity
- "One size fits all" - difficult to compare different university systems round the world
- Subjective and arbitrary choice of indicators and weightings
- Subject areas that are well covered in Web of Science and subjects areas that are citied frequently have a clear advantage, such as Medicine, Nature and Science. However, THE and Leiden compensates this with field normalization
- Inadequate control of reported data. Manipulation of both statistics and “Academic review" has occurred

Criticism of rankings

- Unclear selection to "peer/employer reviews." They are for the most part not representative and have poor response rate
- Unclear audience. Rankings is often said to help students in their study choices, but relatively few of the indicators are in fact relevant to these (e.g. lack of information on employability, student life, etc.). Nor are rankings particularly useful for researchers, employers, stakeholders, etc., or as a basis for decisions
- Negative impact on universities' efforts. The investment in order to advance in ranking positions has in some cases had a negative influence on the management and its priorities. Also said to result in a “reputation race”

Criticism of rankings

- Ranking tables gives the impression that there are larger differences between different universities than it really is. A few points can result in large differences in number of positions
- Ranking favors large and research intensive institutions
- Rankings favors English-language universities and the American and British university system. In bibliometric databases such as Web of Science scientific languages other than English has a clear disadvantage, such as German, Chinese and French. There are easier for English speaking countries to attract international students and academic staff than for non English speaking countries, an indicator that usually appear in the leading rankings

Criticism of rankings

- The ranking measures the university as a whole. In fact, most universities has both strong and weak institutions and subject areas. This is important information for students, policymakers, stakeholders, employers, evaluators, etc. Only a few universities are world leading in all subject areas

Positive effects

- Better focus on quality assurance
- Increased quality in both research and education
- Benchmarking, identify weaknesses and strengths
- Increased transparency of universities
- Easier to raise funds and compete for research funds for universities that are ranked
- Easier to identify suitable collaboration partners
- Increased student, researcher/teacher mobility and internationalization
- Recruitment of international students
- Recruitment of researchers and teachers

Times Higher Education (THE)

Dimensions:

- 30% Citations (measuring quality and impact, far more important than production)
- 30% Research
- 30% Teaching
- 7,5% Internationalization
- 2,5% Industry income: innovation (a way to measure knowledge transfer)

Times Higher Education (THE)

Times Higher Education (THE)

- Ranked as 140 best university (2011:187)
- Ranked as 56 best universities in Europe (2011:78)
- Not among the fifty best in Technology & Engineering in THE. This includes, however, a number of elite universities with several faculties. KTH most likely place 51st
- Among the purely technical universities in the world ranked as No. 18
- Among the purely technical universities in Europe ranked as No. 9

ARWU Shanghai Jiao Tong

- Number of alumni who have won Nobel Prizes and Fields Medals (awarded in mathematics) (weighted 10 percent)
- Employees who have won Nobel Prizes and Fields Medals (weighted 20 percent)
- Number of researchers within twenty-one broad subject categories that are highly cited (HiCi) (weighted 20 percent)
- Number of articles published in the well known journals Nature and Science (weighted 20 percent)

ARWU Shanghai Jiao Tong

- The number of published articles appearing in Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCI) (weighted 20 percent)
- "Per capita academic performance" (weighted 10 percent)
- Total raking:201-300
- Engineering: 76-100
- Physics: 101-150
- Chemistry: 151-200
- Computer science: 76-100

QS World University Rankings

- 40% Academic review (position 180)
- 10% Employers review (position 150, an advance of 49 positions since 2011)
- 20% Citations per faculty and researchers (position 294)
- 20% Number of students per teacher and researcher (position 168)
- 5% Ratio of international faculty and researchers (position 153)
- 5% Ratio of international students (position 64)
- KTH's position in the overall rankings 2012: 142 (2011: 180)
- 17th best pure technical university in the world
- Ranked as a top 57 university in Europe
- Ninth best technical universities in Europe

QS Ranking by Faculty

- Based solely on the questionnaire Academic reputation
- Engineering & Technology position 43 overall, No. 11 in Europe
- Natural & Sciences placing 133 overall, No. 57 in Europe

QS Ranking by Subject

- Based on the survey Academic reputation (40 percent), the survey Employers reputation (10-30 percent) and Citations (20-40 percent)

- Mechanical engineering position 28 overall, No. 8 in Europe
- Electrical engineering position 40 overall, No. 10 in Europe
- In Computer Science, Chemical Engineering, Civil Engineering, Materials science, KTH end up within the range 51-100. Within the range of 10-30 in Europe
- In Chemistry and Physics & Astronomy, KTH ended up within the range 101-150. Within the range of 30-60 in Europe
- In Mathematics, KTH ended up within the range 151-200. Within the range of 50-75 in Europe

CWTS

- *Mean citation score (MCS)*. The average number of citations of the publications of a university
- *Mean normalized citation score (MNCS)*. The average number of citations of the publications of a university, normalized for field differences, publication year, and document type. An MNCS value of two for instance means that the publications of a university have been cited twice above world average
- *Proportion top 10% publications ($PP_{top\ 10\%}$)*. The proportion of the publications of a university that, compared with other similar publications, belong to the top 10% most frequently cited

HEEACT/NTU

- *Research productivity* (weighed 20%) - The number of published articles of the last 11 years (10%) and the number of articles of the current year (10%)
- *Research impact* (weighed 30%) - Number of citations of the last 11 years (10%), the number of citations of the last two years (10%), and the average number of citations of the last 11 years (10%)
- *Research excellence* (weighed 40%) - The H-index of the last two years (20%), the number of highly-cited papers (15%), and the number of articles of the current year in high-impact journals (15%)

U-Multirank

- Covers five dimensions:

- Learning and teaching
- Research
- Knowledge transfer
- Regional engagement
- Internationalization

U-Multirank

- U-Multirank given by the European Commission and CHEPRA network. Has been tested in a pilot project, in which KTH participated
- International ranking
- The ranking is intended to create a new form of ranking, and aims to avoid the problem of "one size fits all" that characterize most rankings
- Multidimensional ranking
- U-Multirank focuses on a form of consumer information that turns to both students, policymakers, stakeholders, entrepreneurs, employers, researchers, etc.
- Measuring what the university is doing and what it performs
- Launched in 2013

KTH and rankings

- Ambition to increase the number of in order to be among top 100 on the THE ranking
- Advance on Shanghai, QS and other lists
- Remain one of the top ranked technical universities in the world
- Low profile in marketing and advertising of ranking results since risk of large swings in number of positions primarily due to defects and changes in the methodology of THE, QS etc.
- Doubtful if that ranking can serve as an altogether reliable quality evaluation system

Measures in order to improve the position

- Field normalization must be increased to a measure of about 1,3 (average current of approximately 1,20, World average 1,0)
- Publish mainly in journals that are indexed in the Web of Science (WoS)
- Write more articles in collaboration with leading researchers from other international universities, giving higher citation grades
- More articles published in High Impact Journals, as they provide higher citation grades
- Recruit HiCi researchers
- Invest in researcher that has the potential to be HiCi Particular focus on promising graduate students with the potential to become HiCi

Measures in order to improve the position

- Efforts to have a high proportion of students on advanced level (Master and PhD), a high proportion of student on advanced level provides more points in the rankings
- More resources: money from industry / business/government, donations, etc.
- Investments in improved visibility and trademark: name issue, conferences, visibility on the web, collaboration, publishing in journals with high visibility and impact, etc.

Measures in order to improve the position

- Increased autonomy, commitment to quality, evaluations of education and research
- Analyze results and compare with other technical universities and examine what prevents us from performing better
- Work more with the publication in international research databases, such as EurekAlert, Google Scholar, Alpha Galileo, IDW. Increased visibility and accessibility results in more citations and better reputation

Measures in order to improve the position

- Ensure that KTH's publications is available in Open Acess. Increased visibility affects both reputation and the citation grade positive
- For reputation surveys used for education, research and employability, it is important to continue to be very active internationally. Through international collaboration in education and research, joint programs and projects, participation in conferences and of course publications of various kinds, KTH will be visible on the international scene

KTH:s official surveys

- Beginners survey
- International beginners survey
- Inter annual survey
- Career follow up
- Doctoral follow up

- Given in collaboration with Statistics Sweden
- Was originally annually, now every third year, plans are to give them every fourth year
- Also serves as a basis for KTH indicators, EAE, quality enhancement etc.

Beginners survey

- Given to students that have started their education in Architecture, Civil Engineering, Bachelor of Science and Bachelor programs
- Students geographical and social background
- Why the students have applied to KTH
- Study motivation
- Where the students have noticed KTH
- Students' needs and preferences
- Future plans
- The view of the reception

Inter annual survey

- Given to students who are halfway into their education on the same programs as in the Beginners survey
- Education severity
- Pace
- Education subject content
- Education quality
- Education teaching plans
- How much time the students spend on their studies
- Study breaks and dropouts
- Retention
- Comfort, negative treatment and students' physical and psychosocial health

Career follow up

- Given to all graduates 2-3 years after they have completed their training
- If the alumni have found employment after graduation, what kind of work the alumni perform today, employers, if the alumni have attained a managerial position or not, income, work abroad, etc.
- The alumni's view on their education, if the alumni's have studied abroad or not, if the education have relevance to the alumni's daily work, if there was something missing in the education etc.

Doctoral follow up

- Given to all that have been admitted to doctoral studies, regardless if they have fulfilled their education or not
- If the doctoral students have found employment after graduation, what kind of work the doctoral students perform today, employers, whether the doctoral students have attained a managerial position or not, income, work abroad, etc.
- The doctoral students view on their education, if they have studied abroad or not, how much relevance the education has to the respondent's daily work, etc.