Troubling Trends

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Four troubling trends

1. Staff proportions are changing
2. Research funding is changing
3. Quality is measured quantitatively
4. Gender inequality remains an issue
1. Staff proportions are changing

Staff numbers are expressed in full-time equivalents (numbers are from K.U.Leuven year reports)

ZAP = professors
AAP = assistants
BAP = PhD students
post-doc researchers

ZAP = 958 (32%)
AAP = 793 (27%)
BAP = 1198 (41%)
1. Staff proportions are changing

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1. Staff proportions are changing

ZAP = professors
AAP = assistants
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ZAP = 993 (19%)
AAP = 469 (9%)
BAP = 3771 (72%)

2008
Changing proportions: consequence 1

- Average number of PhD students per fte professor:
  - 1992: 1 ½
  - 1998: 2
  - 2000: 2 ½
  - 2008: 3

- Inevitable consequence:
  PhD supervisors have less time for PhD students.
Changing proportions: consequence 2

- Much more PhD student positions, more post-docs positions, but same number of professor positions
- Chances to get tenure become slimmer and slimmer
- Inevitable consequence: Researchers have increasingly uncertain academic career perspectives.
- This has an impact on research priorities/quality
2. Research funding is changing

- Main reason for changing staff proportions
- Government funding
  - Structural funding is eroding (not sufficiently adjusted for inflation)
  - Temporary (project) funding increases
- Private funding becomes more important
- Independent research requires funding without “strings attached”
Research funding: government model

- University = paper factory?  (seems to be government view)
- Government aim: reduce budget while increasing productivity, by stimulating competition between institutes
- Vandenbroucke's algorithm:  (slightly simplified for clarity)
  - Let F = some initial amount of funding
  - Every year:
    - Let $O_{\text{tot}} = \text{total output of Flanders (publications, graduations)}$
    - For each institution $i$:
      - Let $O_i = \text{total output of institution } i$
      - Give institution $i$ funding $(O_i / O_{\text{tot}}) \times F$
    - Set $F = (\text{underestimated inflation index}) \times F$
Rationalization (cf. Soete report)

- What is “rational” w.r.t education is not necessarily “rational” w.r.t. research
- Courses/programs with few students...
  - are “irrational” according to Soete
  - are often important for research:
    - “big” courses are usually about “old” research
    - “small” courses are usually about “new” research
3. **Quality is measured quantitatively**

- What are the core tasks of an academic researcher?
  - **Read** papers
  - **Perform** research
  - **Discuss** with peers
  - **Write** papers
  - **Peer review**
  - **Teach** next generation of researchers
  - Explain results to a **broad audience**
  - Contribute to **society**
3. Quality is measured quantitatively

- How are researchers evaluated? What is measured?
  - Read papers
  - Perform research
  - Discuss with peers
  - Write papers
  - Peer review
  - Teach next generation of researchers
  - Explain results to a broad audience
  - Contribute to society
  - Attract funding
3. **Quality is measured quantitatively**

- Policy makers think they can measure the quality of papers **quantitatively** (e.g. using impact factors).
- Government funding world-wide is increasingly based on “magic numbers” computed by companies like Thomson Reuters. (a for-profit multinational giant, 2009 profits were $1.5 billion)

- Do these numbers actually represent quality?
Quantitative quality: consequence 1

- “Publish or perish”
- Number of publications increases exponentially
  - Over 1,000 publications per year since ~1800
  - Over 10,000 publications per year since ~1880
  - Over 100,000 publications per year since ~1950
  - Over 1,000,000 publications per year since ~1990
- Inevitable consequence: following the literature gets harder, nobody has time to check if ideas are actually novel so redundant, duplicated research is done
  (and gets published as if it was novel)
Number of publications per year
(as reported by Google Scholar)

Logarithmic scale!

Grows exponentially:
3.2% per year
(doubles every 22 years)

\[ f(x) = 1,255.88686 \cdot 1.03205^x \]
\[ R^2 = .96844 \]
Number of publications per year
(as reported by Google Scholar)

Logarithmic scale!

Grows exponentially:
3.2% per year
(doubles every 22 years)

Recent growth is faster:
today: 5-6% per year
(doubles every 10 to 15 years)

\[ f(x) = 1,255.88686 \cdot 1.03205^x \]
\[ R^2 = .96844 \]
Publications per 1M world population
Quantitative quality: consequence 2

• Policy makers discourage serious peer review
  – Reviews are usually anonymous, unpublished, so they do not “count”
  – Rejecting a paper harms the career of its authors; you do not want to hurt your peers
  – Accepting a paper in your field improves the impact factor of journals in your field, which benefits you

• Inevitable consequence: the quality of peer review is declining.
4. Gender inequality remains an issue
Gender inequality: reasons, solutions

- Historical reason: female students are “new”
- Highly competitive selection processes
  - “Academic freedom” = working weeks of >60 hours?
  - Hard to combine work and family
  - Children before tenure = bad career move
- Quota or government incentives cannot solve this
- Job security and “normal” working week are needed