

Making Lemons into Lemonade: implications for teaching in a research-intensive university

Paul Bailes

*Head, School of Information Technology and Electrical Engineering
The University of Queensland AUSTRALIA*

paul@itee.uq.edu.au

© Paul Bailes Nov 2009



Outline

- Troubled Times!
- The research-intensive university
- Maximise research return
- “Restructuring” case study
- Minimise research investment
- Research iff Teaching
- Conclusions



- **Troubled Times!**
- The research-intensive university
- Maximise research return
- “Restructuring” case study
- Minimise research investment
- Research iff Teaching
- Conclusions



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

ICT enrolments crisis

- down to 1/3 of early 2000s
- affecting all Australian universities
- affecting all “developed” countries

http://www.zdnet.com.au/jobs/news_trends/soa/US-students-saying-no-to-computer-science/0,130056653,139156201,00.htm

<http://esj.com/articles/2008/03/07/computer-science-enrollment-degrees-continue-decline.aspx>

http://www.pcworld.com/article/121857/gates_worries_about_decline_in_us_computer_scientists.html

- why?
 - post-Y2K
 - outsourcing/offshoring
 - whatever!



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

- Troubled Times!
- **The research-intensive university**
- Maximise research return
- “Restructuring” case study
- Minimise research investment
- Research iff Teaching
- Conclusions



Models of “University”

- Theological seminary
- Liberal arts academy
- Technology institute
- Other special-purpose institute
 - Medicine
 - Mines
 - Agriculture
- Comprehensive, Research-intensive
 - 98-5
 - Group of 8
 - Etc.



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

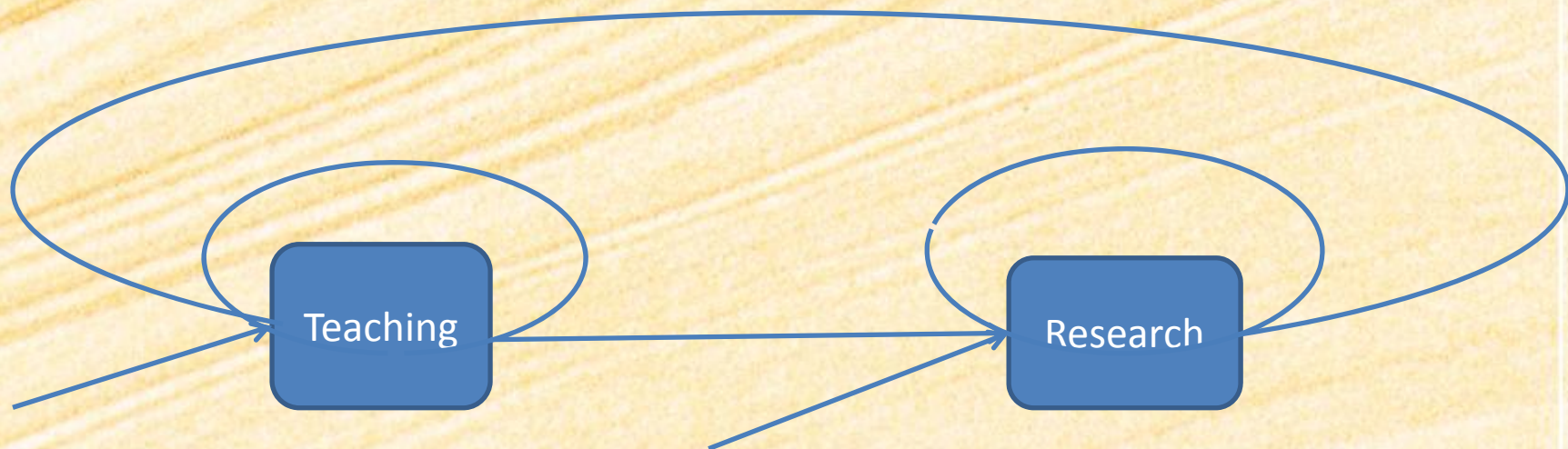
Cross-subsidisation from Teaching

- Reputation enhances revenue
- Teaching subsidises research



Return on Investment

- Teaching business needs to benefit from investment in research reputation



- Troubled Times!
- The research-intensive university
- **Maximise research return**
- “Restructuring” case study
- Minimise research investment
- Research iff Teaching
- Conclusions



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

Value of Research

- Leverage Objective Quality
 - Social & Industrial Impact
 - Economic benefit
 - Quality of life etc.
 - University IP
 - Integrity of (Engineering) Research
 - no large-scale experimentation?
 - solutions looking for problems?
 - significant industrial prototypes!



Measures of Value

- Placement in products
 - iPhone antenna; MRI scanners
- Patents
 - Uqlips video search
- Investment
 - development & consulting contracts
 - government - industry grants
- Peer Review
 - grants
 - publications



- Troubled Times!
- The research-intensive university
- Maximise research return
- **“Restructuring” case study**
- Minimise research investment
- Research iff Teaching
- Conclusions



“Good to Great” framework

Disciplined People

- *Leadership*: selfish for the organisation
- *People first*: best people attracted and retained

Disciplined Thought

- *Confront (brutal) facts*: some prized research is of relatively low impact
- *Focus (“Hedgehog Concept”)*: activity optimised around the intersection of (i) our passions (ii) economic drivers, in particular maximisation of ROI on academics’ time (iii) national **and** global competitiveness



“Good to Great” contd.

Disciplined Action

- *Culture of Discipline*: culture of individual responsibility; maintains direction and focus.
- *Flywheel*: persevere with the above, and allow positive feedback to take effect.

Greatness to Last

- *Clock-building not Time-telling*: build and depend upon systems to generate progress.
- *Preservation of Core, yet Stimulation of Progress*: distinguish timeless values/*raison d'être*.



Brutal facts – research assessment

- A. a firmly established research unit in high standing in academia and with industrial clients, at least on a trajectory e.g. to qualify as faculty research priority
- B. strong record of achievement but yet to satisfy convincingly according to one of the evaluation criteria;
- C. possesses strength but lacking in multiple criteria;
- D. sufficiently lacking in attributes for success as to have low probability of yielding significant return on investment.



evaluation criteria

- **Quality** [Competitiveness]: funding derived from competitive peer-reviewed sources (ARC, etc) - lo(w) vs med(ium) vs hi(gh).
- **Capability** [Passion]: Critical mass - lo(w) vs med(ium) vs hi(gh); taking into account known external collaborations.
- **Impact** [ROI]: Client-based (“Industry \$” and other related) funding - lo(w) vs med(ium) vs hi(gh).



evaluation measures

	Impact Client \$	Quality Peer \$	Capability Mass
hi	> \$1.5M	> 1M	5+ ITEE academics + 5 more (possibly external collaborators)
med	> \$0.75M	> 0.5M	3+ ITEE academics + at least a few more (possibly external collaborators)
lo	other	other	other



composing criteria

		Client \$								
		lo			med			hi		
		Peer \$			Peer \$			Peer \$		
		lo	med	hi	lo	med	hi	lo	med	hi
critical mass	lo	D	D	D	D	D	C	C	C	B
	med	D	D	C	C	C	B	B	B	A
	hi	D	C	B	B	B	A	A	A	A



- Troubled Times!
- The research-intensive university
- Maximise research return
- “Restructuring” case study
- **Minimise research investment**
- Research iff Teaching
- Conclusions



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

Minimise Research Investment (?!)

- Don't spend on staff
 - teaching-only?
 - limited scope
 - co-investment
 - industrial sponsors
 - internal sponsors
- Students are high ROI ...



Maximising research students

- smart(er than aging academics)
 - how if not what
- cheap
 - even allowing for sships etc
- plentiful
 - 5/50 unis vs 1/300 population (20x deficiency)
- teaching spin-off
 - tutors drive teaching quality



Teaching return on research investment?

- Undergraduates?
 - poor self-image
 - “anyone” can do it?
 - anti-intellectual advertising
- Research higher degrees?
 - scholarships/fee waivers
 - equipment
- Coursework masters?
 - !



- Troubled Times!
- The research-intensive university
- Maximise research return
- “Restructuring” case study
- Minimise research investment
- **Research iff Teaching**
- Conclusions



Research iff Teaching

- Teaching -> Research
 - research enlightens teaching
 - teaching without research?
 - not “university”
- Research -> Teaching
 - leverage research investment
 - not teaching -> not leveraging
 - research something else?



- Troubled Times!
- The research-intensive university
- Maximise research return
- “Restructuring” case study
- Minimise research investment
- Research iff Teaching
- **Conclusions**



Conclusions

- research maintenance/expansion not optional
- industry focus
 - maximise return
 - maximise impact **and** quality
- “don’t spend”
 - co-investment
 - research students
 - minimise costs
 - maximise quality
- teach <-> research
 - > research -> teach
 - > postgrad. coursework

