

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

To lead or to follow: curriculum development in a world of commodifying technique, pragmatic students and research-oriented teachers

Presenters:

Dr James Peterson: Assoc. Professor and Foundation Director, Centre for GIS

<http://www.arts.monash.edu.au/ges/staff/jpeterson.php>

Mr Peter Wheeler: PhD student

<http://www.arts.monash.edu.au/ges/research/gis/public/wheeler.php>

Dr Shobhit Chandra: Professional Officer

<http://www.arts.monash.edu.au/ges/staff/schandra.php>

Centre for Geographical Information Systems,

<http://www.arts.monash.edu.au/ges/research/gis/index.php>

School of Geography and Environmental Science, Faculty of Arts, Clayton.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

This Symposium is about assessing and improving the employability of Monash University graduates. This theme relates to our research into the gap between policy and practice in servicing the spatial data and analysis industry with enough suitable new graduates and enough professional development for pre-digital graduates for IT graduates assigned to handle thematic data.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

The shortage of decision support from spatial data handlers is world-wide:

<http://www.itjobsforgraduates.com/browse/GIS-graduate-jobs/en>

http://www.gisdevelopment.net/magazine/africa/2006/oct-dec/30_2.htm

& this includes Australia.

<http://www.asiba.com.au/static/index.php>

<http://www.spatialsciences.org.au/>

Spatially Enabling Australia: a vision for the future
of the spatial information industry October 2007

© Australian Spatial Information Business Association
(ASIBA)

ABN 98 095 895 819

The recent report to the Spatial Education Advisory Committee highlighted the shortage of spatial science professionals at national and global level.

http://www.agta.asn.au/news/other/spatial_industry_report.pdf

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

We have our own surveys:

Wheeler, P.J., Gordon-Brown, L.N., Peterson, J.A. and Ward, M. (in press) 'Geographical information systems in Victorian secondary schools: current constraints and opportunities'. *International Research in Geographical and Environmental Education*

Wheeler, P.J. and Peterson, J.A. (in press) 'Exploring stakeholder views regarding spatial information and enabling technology use for ICZM: a case study from Victoria, Australia'. *Coastal Management Journal*

Peterson, J A (2008) 'Alternative approaches to face-to-face teaching: the changing status of options', *Foreign Language Education Research* 11(12): 19-30

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Peer review paper 1 (above) Geography teachers (survey population **n=197**)

[NOTE: the national curriculum will mandate inclusion of geography (with GIS) in the national curriculum]

50.3% have no better than 'poor' understanding of GIS

50% claimed to have experienced 'professional development' GIS training, and 30% no training whatsoever in GIS

10.3% claimed UG/PG training; of these only 15% were new teachers (between 0 and 5 years teaching experience). The rest were experienced teachers with greater than 10 years experience.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Summary:

Universities not training enough teachers with

- a) rigorous geography method (to at least undergraduate minor as standard);
- b) even fewer pre-service teachers leaving uni for the geography teaching workforce with GIS component to a 'competent' level of mastery.

Key implications include:

1. few 'geography/GIS champions' in the education sector in future;
2. not enough graduates equipped to drive geography forward once the national curriculum comes into force (GIS is mandated)

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Regarding the second listed peer review paper (above): data is from ICZM practitioners in Victoria (survey population **n=342**)

[NOTE: Integrated catchment and coastal zone management and digital data handling is public policy]

57% claim no coastal science education/training. Only 8% claim professional development training (indicating lack of agency PD). Only 17% have undergraduate, and only 9% have post-graduate coastal science education.

Of the GIS officers included in the survey (n=77): 75% have no coastal science education/training. 8% have coastal education (both undergraduate/post-graduate level are included here).

3% have Professional Development level training.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

GIS officers:

32% indicate poor/very poor ICZM understanding;

53% don't know what *ICZM* is;

70% don't know what 'adaptive management' is;

40% don't know what '*ecologically sustainable development*'
is.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Conceptual/applied implications: How can GIS officers analyse coastal science-related spatial information and pass on information/results to management and other staff as their decision support function requires of them?

Lack of coastal science education at undergraduate/post-graduate level, and lack of Professional Development in the Victorian ICZM program constrains implementation of that program.

How can they act as 'champions' for spatial information sharing and use among ICZM stakeholders if their information flows for decision-support, and awareness, is so poor?

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Our results echo results published in the ASIBA Policy Issues and Recommendations (12) monograph.

The Australian Spatial Information Business Association (ASIBA) advocates

‘a national reform agenda in which government, business and the community can act in concert ... [to be part of much-needed decision support reform , making sure that enough the new professionals with the new tools can emerge from the education and training institutions]’

111 closely-argued pages with 12 recommendations

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

ASIBA SURVEY Recommendation 1:

Action should be taken under the auspices of COAG to ensure that the initiatives the Spatial Education Advisory Committee is developing on education training and skills demands can be realised

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

- These actions should be coordinated with industry development activities referred to in the following sections of this report. As a minimum, governments should provide financial support for a joint industry/ government programme to:
 - establish a research programme to explore skill shortages and skill gaps in the industry and to develop projections of future skill needs and expected shortfalls
 - address the adequacy of the content of technical and higher education courses in terms of future skill needs and career paths in spatial information
 - measure the size of the spatial industry workforce, identify emerging skills shortfalls and implement action to address the shortfalls

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Clearly, the policy-to-practice gap in supply/employability of graduates refers to failure to meet demand.

In broad terms, we argue that this is due to inertia in curriculum reform in the spatial sciences.

Although every university faculty must nurture employability attributes such as good thinking and writing, and the ability to get along with other people, the significance of “employability” as a driving force must vary across the faculties because each profession/course answers /refers to a different market.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Even within faculties, what constitutes support for “employability” varies because each discipline has its own history of paradigm shifts and its own scope for adopting commodified techniques. Ideally, the curriculum adoption rate should match the adoption rate in industry.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Because commodification of technology can be significant in a cross-disciplinary way (eg in the spatial data industry, including academic research) there is scope for maintaining, or indeed improving the employability of graduates by collegial agreement to conflate curriculum to make room for new course units that will further improve employability. In our science, commodification has called for many curriculum changes.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

1950s: separate professions, all with a specialist approach to mapping:

Cartographers, Land surveyors, Hydrographers, Engineering Surveyors, Photogrammetrists, Map librarians, and archivists, as well as

Remote Sensing specialists (mapping from interpretation of patterns on air photos and satellite images), and

Urban and regional information analysts (Geographers, and other thematic mappers).

The advent of digital cartography and deployment of topological algorithms imposed conflation: adoption and diffusion of the digital approach saw the GIS industry expand progressively during the 1990s.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

In Australia there was:

Public policy in support: eg the SDI: State Digital Spatial Data Infrastructure

Amalgamation of professional associations six associations conflated into one: the SSSI

As usual, with paradigm shifts, the implications are multi-disciplinary

Commodification spawned a multi-billion dollar industry.

Curriculum reform was called for: some map-makers/spatial analysts have been more proactive than others in these terms

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Was the collegial system equal to the task?

The land survey curriculum has been updated, however, for the social and environmental sciences at Monash University; it has not been up-dated despite twenty years of internationally recognised research performance.

In both cases, the Australian University system is failing to provide enough graduates for the spatial data handling industry.

WHY?

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

As university corporatisation becomes more and more marked, “catch-up” is more and more unlikely because the corporatisation refers to economy of scale: larger classes are said to cost less to teach than small classes.

We argue that, for the generalist faculty academic, survival is based on having large classes, and promotion is based on research output. Without faculty re-structuring, for instance by vesting power in newly-appointed Directors of Curriculum, professions that do not need to recruit from graduates of very large classes may have to find their recruits elsewhere.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

One option is to revert to the pre-elite University days when some of the professions ran their own exams and professional registration system.

Our discipline is not unique in these terms: the commodification we refer to is cross-disciplinary. Every discipline in which progress is tied to convergence between theory, interpretation and technique will face this problem when a technical breakthrough is commodified.

University failure to deliver in these terms can be due to:

- failure to conflate curriculum (leaving it fragmented and over-crowded);
- such conflation as to leave it fragmented and over-generalised.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

SO:

the students are not taught enough of what the industry needs from them upon graduation, and nothing will change unless the University leaders monitor the commodification process and support the relevant curriculum reforms.

The alternative is to give the task back to the professions or step around the competition policy and offer the training in a cross institutional way.

There is another problem: given adoption of commodification, ~70% of the work-tasks that formerly could only be learnt by high performing students in a four-year course can be carried out by less conceptually-gifted students trained over a semester. What about the other 30%? They will be trained in even smaller sized classes.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

These smaller classes are supposedly even more unviable.

One solution is to stream each undergraduate intake into: an applied science stream and an elite stream (entry via advanced studies in the enabling sciences) provide professional development courses for them throughout their working life (the up-date for pre-commodification graduates can also be serviced in this way).

The elite stream taught by the key researchers on an Oxbridge model with such deep conceptual roots that the students can deeply understand the science behind current commodifications and predict the nature of successive waves of it in the future.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

The other solution is to teach cross institutional courses.
Another solution is to have ICT to the rescue (I refer to the
third peer review paper listed above): everything on line

Will this be hard for Universities to cope with?

Probably.

Another solution is for the course coordinator to form a
publishing company (or link with a publisher) to deliver course
content on-line and on DVD, and offer it to the world.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

General conclusions:

The real stakeholders in Tertiary education are the students and the employers. We have lost our way by organising things otherwise.

Actually this does not immediately matter so much if the employers are recruiting from courses that have large classes: but getting it right for the wrong reasons poses problems for the future.

It does matter if course rationalisation results in failure to service economically significant industries. Spatial data handling is one of them: what can be more important than decision support: bad decisions = bad future.

*To lead or to follow: curriculum development in a world of commodifying technique,
pragmatic students and research-oriented teachers*

Universities can always pass over access to *Fee-help* to the relevant industry peak bodies so that they can deal with their own problems.

THANK YOU

Questions are welcome



28/09/09 Monash University Employability Symposium: enhancing graduate outcomes in our rapidly changing employment environment.