ThinkingISsues

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Competition vs. Cooperation - Models for Computing Education?

In the New Zealand educational scene for the last decade and a half Government policy has actively fostered competition in the educational sphere. It has been an article of strategic belief that *markets* are the sole effective coordinating mechanism. So, much government effort has gone into creating pseudo market mechanisms using techniques such as "funder - provider" models, with the government as "funder" and educational institutions as "providers". "Contestability" has been encouraged so that providers may be both private and state institutions, to whom degrees of autonomy have been granted. Of course to ensure the quality of providers and courses, a large bureaucratic quality assurance regime has been developed. This involves centrally regulated accreditation processes based upon a conception of education as an industrial product to be reproduced in prescribed and consistent ways. The model of quality could be deemed "quality as consistency of product delivery".

As with any market model, the system has produced winners and losers. Failing private institutions leaving students high and dry mid-qualification, legal cases over poor quality courses, state institutions in severe financial straits, and ongoing mergers, rationalisations and redundancies have been features of the tertiary education sector.

A change of government has brought a new philosophy to the social services provision area, and there is now a desire to have strategic intervention as opposed to pseudo-markets designed by bureaucrats. However institutions still wish to retain their autonomy, and models which permit simultaneous cooperation and competition are now sought. The term for this I believe is the rather ugly word "co-opetition" [1].

In the NZ Polytechnic sector (which shares attributes of both the community college and University sector in the US) there are institutional frameworks and models of computing curriculum development which do match this "co-opetitive" model. The National Advisory Committee of Computing Qualifications (NACCQ) a joint Industry/Polytechnic body, provides one such framework [2]. This body has played a major role in guiding the computing discipline in the NZ Polytechnic sector over the last thirteen years, with recent extensions into the University sector as mergers and changes of designation have occurred. The NACCQ annual conference is now the premier computing education conference in New Zealand [2].

One strength of the NACCQ in jointly representing computing sectoral and discipline interests has been its ability to develop and promulgate several national computing curricula. National qualifications have been developed at certificate and Diploma level [2,3]. These were developed through an established culture of shared expertise in curriculum development and a culture of voluntary contribution and collective ownership. The most notable qualification has been demonstrated through the so-called "Blue Book" [3], which grew by progressively developing and implementing throughout New Zealand years one to three of a tiered certificate/Diploma programme. The structure and regulations of the qualifications, and the curriculum content for each contributed course are contained within this document. Copyright for the courses is retained by NACCQ on behalf of member institutions, who in turn retain their own rights to the courses they develop under this umbrella. The curriculum structure contains a common core but offers wide discretion to each institution in how the overall qualification may be designed to suit local conditions.

Since deregulation in 1990 enabled Polytechnics to offer degree programmes, of the 19 Polytechnics in New Zealand 17 will be offering degree programmes in computing from this year. This represents a rapid transition to degree programme delivery in the sector over less than a decade. The inability of the New Zealand Qualifications Authority to come up with an acceptable definition of a degree programme, caused a breakdown in the earlier NACCQ approach based upon co-opetition. The collaboratively developed three-year National Diploma in Business Computing was effectively an applied, vocational degree-equivalent programme, but with no generic national degree definition there was no process by which it could be renamed or restructured to fit a degree definition.

This applied vocational focus for computing education meant that the bifurcated discipline model of Information Systems vs. Computer Science had never been acceptable to the Polytechnic sector. Their educational mission included producing effective citizens and productive practitioners. Thus began a costly and wasteful exercise whereby each institution created its own unique degree programme. This occurred in a context where institutions saw themselves as competitors, and the central regulatory authority had manifestly failed. However some "co-opetition" did occur thanks to relationships nurtured under the earlier sectoral model, and this has seen some degree programmes sold or franchised from one institution to another.

The challenge for NACCQ now with 17 institutions of varying sizes and strengths offering computing degrees, is to help to maintain the quality of these programmes and parity of esteem of computing degrees from whatever institution in the country. A key element in this is to develop once again a mechanism for sharing materials on a basis where all contributors gain from the process. A return from competition to "co-opetition" is called for. Positive signs of this are now occurring. At this year's conference we agreed in principle that programme structures and course curricula would be shared between institutions on the same collaborative basis as the "Blue Book". However each institution would necessarily retain its autonomy in course structure and delivery, since degree course structures and content are now widely varying. It is hoped that over time a consensus may develop over core elements and there should be much more sharing of expertise and materials, to reduce the huge workload pressures and cost imposed on small degree programmes by such rapid and significant developments.

While these arrangements within the sector may represent one set of models for "co-opetition", and joint curriculum development models are not new to ACM members (viz. CS'91 and IS '97 curricula [4]), the need for a supportive regulatory environment must be acknowledged. The reconception of education as a commercially provided service, as a business activity subject to free trade legislation (via GATT [5]) with sanctions for anti-competitive behaviour, increasingly threaten such collaborative models.

It appears to me that institutions will increasingly need to develop capabilities in this area of "co-opetition". The tensions between such challenges as the "rise of consumerism in education", 'the inability to meet demand" [6], the need for "life long learning" and continuing professional development for current IT practitioners will add increasingly to the pressures on computing educators to do things differently and better. Professor John Hughes refers to the phenomenon of "Mammon driven courses" where deregulated Australian Universities offer much more product and skill specific vocational education than university traditions might have allowed. This now sees the University of Technology at Sydney offering a Masters programme in Internetworking producing graduates with both the Masters level qualification and CISCO certification [6].

The ability to join in strategic partnerships and alliances with the computing vendor community will increasingly become a core capability for computing educators and their educational institutions. These partnerships may be many fold: partnerships over use of products such as ORACLE or SAP [7]; partnerships over provision of certification courses (such as MCSE and MCP with Microsoft) [8]; partnerships, contracts and alliances to provide upskilling and computing education to corporate business divisions or business units; or partnerships offering educational consulting for specific projects (e.g. providing a package of services to support a major corporate initiative).

These initiatives bring with them many concerns for computing educators. What is the role of the university? Where does the distinction between product training and broader education lie? How are issues of course ownership and copyright addressed? How ethical is it to offer students short lived certifications, as opposed to broader conceptual and problem solving skills? Is it

possible to effectively do both without distorting our mission? How do we develop the ability to run semi-commercial activity in a teaching and research focused environment? Who are our key stakeholders?

The NACCQ has commissioned a research project this year to address some of these questions, but it seems to me that these are topics urgently needing an international research effort by all the stakeholders in computing education.

1. Brandenburger A., & Nalebuff B., (1996) Co-Opetition, New York, Doubleday

2. Cf. NACCQ website: http//www.naccq.ac.nz

3. NACCQ (1998), New Zealand Polytechnic Qualifications in Business Computing, "Blue Book", Hamilton

4   Cf. ACM website: http://www.acm.org

5. Bridgeman N., Tiffin, J., Mosen, P., (1999), *The Global Virtual University (GVU): An Institution Designed For The New Learning Environment*, *Proceedings of the 12th Annual NACCQ Conference*, Dunedin, pp. 37- 42

6. Hughes, J., (2000), *The Challenges Facing IT Education*, Keynote address to the 13th Annual NACCQ conference, Wellington, New Zealand, July 2nd

7. Young A., & Surendran K., (1999) *Managing Strategic Industry Partnerships*, Proceedings of the 12th Annual NACCQ conference, Dunedin, New Zealand, July 4 -7th p. 241- 248

8. Weir D., Watson, R., (2000), *Industry Certification: Does It Have Any Place In Our Established Programmes*, Proceedings of the 13th Annual NACCQ conference, Wellington, New Zealand, June 30 -July 3rd p. 439