Bootstrapping a Research Culture: Lessons from the BInfotech Degree at CIT.

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ABSTRACT

With the transition of Polytechnics from teaching certificates and diploma courses to teaching degrees, new demands are placed on institutions to develop and foster research.

Previous research initiatives by Polytechnics have focused on increasing staff research outputs and developing support mechanisms to achieve this. These have often met with varying success. In a departure from these traditional methods, the author emphasises the use of students as one method of helping create a research culture. Polytechnics teaching "applied" degrees offer an ideal platform to underpin year III student projects with research and theory. This article outlines a strategy that the author has used in an attempt to jumpstart a research culture from the ground up using students as the focus. The introduction of teaching research methodology to second year degree students, as well as on DipBC conversion programmes, is one mechanism that Polytechnics can use to help foster a research environment in their institution.

KEYWORDS Computing, Culture, Degree, Methodology, Polytechnic, Research, Under-graduate

1. OUR BACKGROUND

The Central Institute of Technology (CIT) began as a National Polytechnic that offered specialised courses in a centralised location. Part of its original culture involved courses in Pharmacy and Occupational Therapy. However, government decisions meant that these courses were relocated. The research culture moved with them, leaving CIT predominantly teaching competency based courses, certificates and diplomas.

There were no requirements to publish or conduct research. Staff settled into the routine of teaching. However, with increasing demands for student numbers and changes in government policy, Polytechnics, including CIT, began to consider the offering of degree programs.

This led to the development of degrees, and the accreditation requirements associated with the right to confer degrees. The need for research stressed by monitor reports is similar to those demands placed on other Polytechnics teaching degrees.

The Business Computing department currently teaches the Bachelor of Information technology degree, originally purchased from Waikato Polyechnic. The degree was substantially altered, with some papers replaced and others modified. To provide the necessary research outputs, CIT embarked on a programme of updating staff qualifications, coupled with the recruitment of staff with Ph.D degrees to satisfy the requirements of accreditation.

As part of the accreditation process, CIT was required to demonstrate ownership of the degree, which it did so by offering modified and replacement papers. The second year communications paper was completely rewritten with the objective to teach students research methodology. Teaching research methodology to under-graduate students is the issue that this paper will address..

2. THE NEED FOR RESEARCH

As Polytechnics move from traditional trade courses to degrees, the issues of accreditation and research become increasingly important. Long a victim of its own culture, Polytechnics are facing increasing problems in generating sufficient research outputs to satisfy the demands of external monitors and accreditation requirements.

In their defence, Polytechnics have instigated a number of initiatives to address the issues of research. Amongst these have been research committees, research co-ordinators, updating the qualifications of existing staff, mentoring, and in some cases, hiring the correct people.

However, the issue of increasing research outputs by Polytechnics has met with varying success. It appears that generating research outputs is a much harder problem to address than simply providing the necessary funding and resources. Perhaps one real problem lies embedded deep within the traditional culture of Polytechnics, and it is this culture that prevents real progress being made.

So it raises the question. How do we change the culture of an organisation to achieve the desired outputs? External demands by monitors, unless accompanied by real change within the organisation, may have little or no effect.

3. METHODS OF FACILITATING RESEARCH

The Polytechnic organisational view of the late 90's is that the research outputs are insufficient to satisfy external accreditation demands and expectations. In order to increase research outputs, Polytechnics have resorted to a number of methods, similar to those used by Universities.

There is perceived to be too few staff engaged in research, so Polytechnics counter this by with hiring staff with research expertise (Murdoch University, 1998) or staff with post-graduate degrees (assuming that these new staff members will generate research). Polytechnics have also resorted to offering the upgrading of existing staff qualifications to Masters level, so that the presentation of a thesis can count as a measurable research output. This however can often lead to the alienation of existing staff members who see their opportunities diminish with each new appointment.

Another method of changing the culture is to set targets for research outputs for each staff member (as described for UNITEC by Cater, Clear and Young, 1999, p.19). This method has the advantage of addressing the skills of every staff member in the department, assessing their current standing and skill set, and providing a set plan for increasing both. CIT has set research targets at a department level (a points system is used to rate the varying research outputs), recognising the problems of having every staff member engaged in research. Differing skill sets and workloads means setting expectations for every staff member may be unreasonable. Other methods are comparing the research outputs against similar organisations (Monash University, 1998). Restructuring often provides an opportunity to change the culture of the organisation. With the proposed academic structure at CIT, Heads of Centres are required (written in their job description) to engage in research. To counter arguments for insufficient time to conduct research, most administrations offer reduced teaching workloads for staff involved in teaching degree programs (Sydney University of Technology, 1996). The expectation is that staff will use the available time for research, but often this time is absorbed by other duties. To assist staff unsure of the process or methodology of conducting research, training or mentoring is often used. Combined with appointments such as research co-ordinators or research teams (Bridgeman, 1997), training and assistance to staff engaged in research is often seen as a critical support component. Contestable research funds provide the necessary financial resources for staff to engage in research. However, this pool of funds is often limited (Cater, *et al*. 1999, p.18) and shared amongst an increasing number of staff. The share a staff member is allocated is often insufficient for the research to be undertaken.

Research seminars (Northland Polytechnic, 2000) are often a valuable means for promoting research and developing ideas. The holding of regionalised seminars for Polytechnics provides a means of sharing research and a venue for publication (Cater, et. al., 1999, p.20, & Francis, 1998). However, staff members are often required to use professional development leave or professional development funds to attend these seminars. This further restricts their research activities by using up leave and fund entitlements.

In summary, Polytechnics have used a range of tools to facilitate and encourage research. These have met with varying levels of success. Changing the culture within an organisation is often a slow process. An additional tool that has to date been largely neglected is that of undergraduate students. The following section will outline our own attempt at CIT to involve students in research.

4. ONE MORE PIECE OF THE PUZZLE

he Australian Commission for the Future in 1986 addressed the issue of creating an "innovative culture" that is forward looking, proactive and futures-orientated.

To achieve this, the commission identified that a necessary recipe for success was that the innovative perspective had to be broad-based and widely shared throughout the population (Patton, 1987). I would make the argument that all members of the Polytechnic community must share in "research culture". For Polytechnics, that community includes students, who make up the broad base of the academic population.

The rationale for this argument is simple. Degree students are involved in the generation of a third year project, and there is a discernable shift away from competency-based assessment. Teaching research methodology to under-graduate students provides the necessary theoretical framework in which the third year project may be encapsulated. All projects are thus able to be conducted using sound methodology and underpinned by theory, clearly demonstrating to external monitors and agencies of the increased value of student work.

The skills that students learn not only apply to their third year project. These skills also stand them in good stead for further research or post-graduate work. It provides validity to their work, and adds a base for extension to honours or masters level by ensuring students are capable of grounding their research using a sound theoretical basis.

The emphasis shifts from the application of knowledge to the interpretation of knowledge. Students were encouraged to interpret not only their project, but all things around them, using an armoury of available theories. Personal comments by students range from "its like a whole new world has opened up" to "I find myself thinking about thinking". During class, students would often interpret their favourite television shows, engaging in discourse and regularly finding new interpretations. Many students expressed the view that "they could hardly wait to apply" these new analytic skills to their third year project.

It is my argument that teaching of research methodology should occur during the second year, with the emphasis on the application of theory. I see no sound reason for teaching students research methodology in the third year. If the point is to provide a mechanism by which students can underpin their project, then the subject needs to be taught before the project begins. Teaching research methodology in the second year permits this, but also has the benefit of allowing the student to frame the project appropriately, allowing sufficient time for the necessary literature reviews and other important tasks that are prerequisites to research.

When students apply research methodology to their 3rd year project, it also forces the various project supervisors and mentors associated with the projects to deal with these issues, primarily due to the fact the students are raising them. This reverses the traditional role, enabling the student to be more proactive in the project and hence feel that they are "making valuable contributions".

We have discussed the when of teaching, now the how of teaching research methodology will be addressed. A theoretical base was used to develop the course. Different learning styles were reflected in assignment types and term requirements. The use of accelerated learning, mind-maps, audio, visual and other methods such as group interaction and storytelling captivated and involved the students. In terms of content, an overview of communication theories and research methodologies formed the major basis of the module. Primary emphasis was placed on understanding and applying theory to practical applications, resulting in changing the way we look at and interact with our world.

Other topics included the use of the Internet and search techniques, literature reviews and citation methods. Essay formats and standards associated with project documentation were addressed (see Bridgeman, 2000 for more information on project documentation). To a certain extent, this helped to counteract the problems with the report culture inherited by DipBC students and the cut/paste mentality of students.

The teaching of communication theories (inter-personal, group and organisational, system, cybernetic and information) was accomplished using a variety of methods, from the use of still images, storytelling, video and group discussions. Within a matter of weeks students were analysing their favourite sitcom shows using theory and classes often started with "Did anyone see that TV show last night". A typical student comment from a survey conducted at the end of the module was "the use of TV shows we could relate to made the theory come alive and showed us how to apply theory to real life".

Terms consisted of a number of images, newspaper articles, audio and video clips. Students were asked to indicate and explain what underlying theories were associated with each of the items. This provoked a significant amount of peer interaction, with many students forming small discussion groups to debate the various interpretations.

One assignment dealt with applying a number of communication theories to an object, relationship or organisation that they were familiar with. The list of organisations included McDonalds, whilst the list of objects included a room or a chair. Students again formed little discussion groups (outside of scheduled class time) to debate and explore the various subjects and how they

might be interpreted by relevant theory. This resulted in some very imaginative assignments.

When students were asked if they thought that the module was an important part of the degree, 54% agreed with 23% strongly agreeing. Eighty-five percent of students indicated that what they had learnt would help them with their project. When asked if they would have preferred more lectures (compared to the open discussion type sessions used) every student disagreed and indicated a preference for alternative methods of instruction, such as group interaction. One student suggested that the module "should be run in the morning, it deserves to get everyone's full attention".

Both formal and informal feedback from students suggests that they found the course interesting, stimulating and valuable. When visited recently by a number of third-year students concerning their project, I was pleased to find they had already conducted a literature review, established a number of hypotheses, selected a number of theories to underpin their project, and sorted out a possible methodology. In this selected instance, the objective of creating a theoretical framework for the students to encapsulate their project appears to have succeeded.

5.   CONCLUSIONS

I would suggest that the teaching of research methodology to under-graduate students, and having their projects underpinned by sound research methodologies is an additional tool that Polytechnics can use to further their research requirements.

In combination with the other standard techniques of fostering a research culture, student research complements and is a valid extension of staff research. It helps prepare the students for future post-graduate courses, and provides a sound theoretical base for project work. It complements the efforts of staff members and addresses the requirements for research by external authorities.

What do you do when you don't have a research culture, or staff that are not actively engaged in research. How do you get research going and create the necessary catalyst that might ignite the flames? It is the contention of this paper that sometimes to light a fire you need a match, and in this case the use of students to do research could be the match that some organisations need. Jumpstarting a research culture from the ground up may be one more tool an organisation can use to foster a research culture.

How effective has it been? From student comments alone, one could say very effective. Over time it will help to produce valuable material to demonstrate sound research to external monitors. A strong platform for post-graduate research by our students will have been created. Staff involved in year III projects will eventually be forced to address the issues of research being raised by students under their supervision. In time it will add to the research culture and further differentiate the degree students from the certificate and diploma students. By no stretch of the imagination is it the total answer. It is just one more tool in the bag of tricks for fostering research within Polytechnics.

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