

## **ICT education and the dissemination of new ideas: Channels, resources and risks**

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### **Abstract**

This paper examines university educators' perceptions of factors associated with the dissemination of teaching and learning innovations. The views of educators were elicited as part of the *ICT-Ed Project*. The project is a DETYA-funded investigation into Information and Communication Technology (ICT) education. Participants were educators from within ICT disciplines in Australia's universities.

ICT education is a diverse field encompassing a range of disciplines; both those traditionally classified as IT (e.g., information systems, computer system engineering and computer science) and newer disciplines which cross over a number of educational domains (e.g., business systems, web development and design, e-commerce).

The perceptions of participants were explored in a mini- conference format – a day-long workshop comprising brainstorming, discussion sessions and brief, informal presentations given by participants. Factors perceived as impacting upon the dissemination of ideas among university educators included:

- intellectual property
- inter-university competition
- risks associated with sharing ideas

- the value placed on teaching vs. research within many universities
- resources required to share and access ideas
- the availability of channels for the dissemination of ideas

It was found that the importance of these factors was related to the history of participants' institutions with regard to their pre-1987 status. Furthermore, the kind of factors reported appeared to be influenced by the geographical location of participants' institutions. The implications of the findings for university educators generally are discussed.

**Keywords:** Educational Change

Dissemination of knowledge refers not to the processes of distribution and collection, but rather the *spread* of knowledge (Zariski, 1997) – getting your message out to the right people and in a form that can and will be used. The discussion, debate and dissemination of new ideas lies at the very heart of 'what it is to be a university'. In fact, participation in the dissemination of knowledge is recognised explicitly as both a right and responsibility of higher education teaching personnel (UNESCO, 1997). In this paper, factors affecting the dissemination of knowledge and new ideas among Australian university educators will be discussed with reference to the perceptions of information and communication technology (ICT) educators. These factors will be discussed in relation to:

- a. the acknowledged rights of university educators to engage in the unfettered exchanged of knowledge;
- b. factors identified elsewhere as aiding and hindering the dissemination process and;
- c. the importance of collegiality to the improvement of university teaching across disciplines.

In this section the rights and responsibilities of educators in relation to dissemination will be outlined and a brief description of the *ICT-Ed Project* will be provided.

### **Dissemination as a responsibility and a right**

In 1997, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) adopted specific recommendations concerning the status of higher-education teaching personnel (in future, the *Recommendation*). The *Recommendation* illustrates conditions under which university teaching staff may be restricted in their academic activity; these conditions range from the national (eg., where political regimes constrain the activities of individuals within government controlled organisations) to the interpersonal level (eg., where an individual's academic freedom is compromised by perceived personal risk).

In regard, to activities associated with the dissemination of knowledge, UNESCO's (1997) *Recommendation* is explicit.

*4. . . . universities, are communities of scholars preserving, disseminating and expressing freely their opinions on traditional knowledge and culture, and pursuing new knowledge without constriction. . . . Where original research is not required, higher-education teaching personnel should maintain and develop knowledge of their subject through scholarship and improved pedagogical skills.*

13. *The interplay of ideas and information among higher-education teaching personnel throughout the world is vital to the healthy development of higher education and research and should be actively promoted. To this end higher-education teaching personnel should be enabled throughout their careers to participate in international gatherings on higher education or research, to travel abroad . . . and to use the Internet or video conferencing for these purposes.*

14. *Programmes providing for the broadest exchange of higher-education teaching personnel between institutions, both nationally and internationally, including the organization of symposia, seminars and collaborative projects, and the exchange of educational and scholarly information should be developed and encouraged.*

62. *The workload of higher-education teaching personnel should be fair and equitable, should permit such personnel to carry out effectively their duties and responsibilities to their students as well as their obligations in regard to scholarship, research and/or academic administration.*

The ideals expressed in the above items would seem attainable in a country relatively free from civil unrest such as Australia. However, our investigation of the perceptions of local ICT educators suggests that these ideals are under threat at a number of levels –governmental, institutional and individual. At the governmental level, the capacity of Australian university teachers to invoke these rights and responsibilities has been compromised over the last 15 years, due mainly to massive restructuring in the higher education sector. As a result of this restructuring, institutions themselves offer limited formal support for scholarly activities not seen as having immediate financial benefit to the institution. In turn, individual educators often lack the resources or motivation to engage in such scholarly activities after obligatory ‘financially profitable’ activities have been attended to. The inevitable consequence of these forces is a challenge to collegiality in the university sector.

### **The Unified National System and loss of collegiality**

The move from a binary to a Unified National System in the late 1980’s brought with it a shift in management practices within the higher education sector. With Dawkins’ 1989 *White Paper*, the older universities were asked to adopt the corporate management practices of the former Colleges of Advanced Education (CAEs) and conduct themselves as commercial organisations operating in a highly competitive and international market (Smart, 1997). This, in addition to the requirement that all universities negotiate ‘institutional profiles’ with the then Department of Education, Employment and Training, threatened what Bessant called the "sacred cows of academia – institutional autonomy, academic freedom and collegiality" (1996, online).

The concept of collegiality – "the sharing of knowledge, the free flow of ideas, the encouragement of creativity and new challenging concepts" – does not sit well within a corporate environment where ideas are products and education, a service (Bessant, 1996, online). It could be argued that this mismatch arises because the appellation itself is artificial; education is neither a product nor a service but a social process (Harvey, 1998). Regardless of one’s view of the appropriateness of corporate language in the academic realm, it is clear that the corporatisation of higher education has had considerable impact on the once collegial atmosphere, and hence the dissemination of new ideas, in Australia’s universities (Chipman, 2000). It is a goal of the *ICT-Ed Project* to investigate ICT educators’ perceptions of the factors impacting upon the dissemination of knowledge in the field of ICT education, one of the fastest growing areas in the Australian higher education sector.

## The ICT-Ed Project

Information and Communication Technology education is a diverse field encompassing a range of disciplines: both those traditionally classified as IT (e.g., information systems, software engineering and computer science) and newer disciplines which cross over a number of educational domains (e.g., business systems, web development and design, e-commerce).

The *ICT-Ed Project* is an investigation into innovation in ICT education in Australia's universities. The project is being conducted by the Computing Education Research Group (CERG) at Monash University and aims to identify innovations in ICT teaching and curriculum development initiated in response to the needs of students and employers. Associated goals include the identification of factors driving and inhibiting innovation in ICT education and issues related to the dissemination of innovations among ICT educators.

The project is funded by the Department of Education, Training and Youth Affairs (DETYA) and is administered by the Australian University Teaching Committee (AUTC, formerly CUTSD). The project is conducted within a collegial atmosphere, drawing on input from university ICT educators (Phase 1), employers (Phase 2) and graduates (Phase 3) from around Australia. It is hoped that by maximising the cooperative input from the ICT departments and faculties across Australia, the final project report will be seen as belonging to the national academic area.

In the current paper, discussion will be limited to data concerning issues surrounding the dissemination of innovations among university ICT educators, collected via *mini-conferences* during Phase 1 of the project. (For information regarding the larger *ICT-Ed Project*, visit <http://cerg.infotech.monash.edu.au/icted>)

### *The mini-conference program*

One of the main tasks of the *ICT-Ed Project* is to make recommendations to AUTC regarding the effective dissemination of teaching and learning innovations in Australia's universities. While the recent history of Australian higher education suggests a number of areas where change is needed, we believe that any recommendations contained in the project's final report must reflect the reported concerns of the practitioners themselves. To this end, we conducted day-long *mini-conferences*: forums in which university ICT educators can report on innovations in their department (school, faculty, university) and register their opinions regarding the factors affecting educational innovations and their dissemination.

The mini-conference program consisted of a series of day-long workshops comprising brainstorming, discussion sessions and brief, informal presentations given by participants. Mini-conferences were held in all Australian capital cities with the exception of Darwin where the mini-conference was conducted via video-conferencing technology.

### *Participants*

The teaching staff of all Australian university departments offering ICT-related courses were invited to participate in the program. Of Australia's 39 universities, 29 were represented in the mini-conference program. In total, there were 82 participants including teachers, educational designers and heads of units representing 51 administrative units.

Two of the 82 participants were from universities not funded by the Australian government (Bond and Notre Dame universities). Of the remaining 80 participants, 50 were from institutions which, prior to 1987, were colleges of advanced education or institutes of

technology where the focus was on teaching rather than research. Of the 30 participants that were from institutions that were universities prior to 1987, at least 10 worked on campuses that were formerly CAE or institute of technology campuses.

### *Mini-conference format*

Each mini-conference was of 6 hours duration (3 hours for the video-conference with Darwin participants) during which participants were asked to take part in discussions on issues relating to ICT education and to share information on their own teaching and learning initiatives. The proceedings of the mini-conferences were guided by workbooks provided by the researchers in which participants recorded their responses to stimulus items, provided written descriptions of their initiatives and made note of the ideas emerging from discussion sessions. The stimulus items contained in the workbooks were as follows:

1. *What are the factors driving educational innovation in ICT education?*
2. *What are the factors inhibiting educational innovation in ICT education?*
3. *Please describe a teaching and learning initiative in which you or your department are currently involved.*
4. *Deciding whether your teaching initiative is effective.*
5. *What issues would be involved in disseminating your initiative to other ICT educators?*

The workbooks acted as both the primary data source for this phase of the project and also proved a valuable resource to the participants in terms of networking and sharing ideas with one another.

To ensure that all of the ideas emerging from the discussion were captured, the sessions were audio- and video-taped. Video recordings were made to aid in the transcription and analysis of the audio recordings and did not constitute data, *per se*.

### *Dissemination and ICT education*

The question of dissemination was explored in an semi-structured forum. Opinions concerning the dissemination of new ideas in ICT teaching and learning were elicited by the question "*What issues would be involved in disseminating your initiative to other ICT educators?*" Participants were given five minutes to consider the question and record their responses in their workbooks. Participants were then asked to present their responses to the group and encouraged to discuss their perceptions and how they differed across participants and institutions. The researchers' role in the discussions were as moderators; they did not contribute to the content of the discussions but did seek clarification of issues raised.

## **Factors involved in dissemination among ICT educators**

A range of factors seen as influencing the dissemination of ideas among ICT educators emerged from the mini-conferences. In this section, specific factors reported will be presented and discussed in relation to the literature on collegiality and dissemination in universities.

### **Intellectual property**

A consistently reported factor was the restriction placed on dissemination by the intellectual property (IP) policies of universities and industry collaborators. The constraints of IP policies were seen as most evident in the production of online teaching materials.

Recent years have seen a huge increase in the amount of course content delivered online. Online material often includes lecture notes, tutorial activities and administrative material such as subject guides and information regarding assessment, university policies and contact information. Where courses are developed for off-shore delivery, it is not uncommon for students to access *all* course material online and to use electronic media (the Internet and email) as their sole means of contact with teaching staff and other students.

Participants expressed concern regarding the lack of intellectual ownership of course materials that they have developed and have then been packaged by their university into electronic form. The impact this has on dissemination is two-fold. First, the material becomes the outright property of the developer's university whereas, when the material is delivered 'live', the developer is relatively free to alter the content or its delivery to suit the needs of students. Secondly, the developers of the material lose control of the distribution and (mis)use of their materials when delivered online. This is especially so where access to their material is not restricted to students taking the course.

However, password protected access to online course materials may present other problems for dissemination. If access to online course material is restricted to students and teaching staff, it becomes difficult to obtain feedback on the material from peers outside of the course or institution.

Participants compared the Australian move toward the online availability of course materials to the Massachusetts Institute of Technology (MIT) OpenCourseWare project (for details, visit <http://www.mit.edu/>). In early 2001, MIT announced a plan to make all of its course materials available online (where practicable) within 10 years. MIT Staff participation in the project is voluntary and MIT assures the individual copyrights of authors and the institution where the development of materials involved significant use of MIT resources.

On the whole, participants of the *ICT-Ed Project* expressed reluctance at following MIT down this path, seeking consolation in the fact that, though their course content may be taken from their control, their individual style of delivering content and engaging with students cannot.

#### *University-industry collaborations*

Of particular concern to participants was the question of who owns the IP rights of an educational innovation. With the reduction in government funding for higher education, universities are increasingly required to seek funding from commercial organisations. ICT teaching tools and online course content are often developed in collaboration with commercial information technology organisations who may provide support financially or in terms of equipment. One *ICT-Ed* participant stated the problem as follows:

*" . . . there's an increasing amount of corporate sponsorship of online [content] . . . and with it goes either explicit or implicit the requirement that part of the material is theirs (the sponsor's) and only theirs, not for general use. So you end up having a light and a heavy version of what ever subject matter you're distributing and you can't talk about it until after the heavy version, the corporate version, is well and truly out in the marketplace, so it prevents the usual research ethos from allowing us to contribute freely. . . . It's like waiting for a patent. You wait for the patent and then you can talk . . . it's changed the way we do it"*

While industry sponsorship is vital to the survival of information technology faculties, it can be seen how the spirit of collegiality may be threatened by the reliance of universities on industry collaboration.

In summary, IP policies were viewed by many participants as potentially restricting the dissemination of their teaching and learning innovations and their freedom to discuss and share their 'products in development'.

### **Inter-university competition**

Related to the issue of IP is that of the corporatisation of Australian higher education.

*"We're no longer an academic community as seen and funded by the Federal government; we are a collection of universities competing for market share, which is a load of bullshit".*

As the above, somewhat disgruntled, *ICT-Ed* participant sees it, Australian universities are no longer centres for academia so much as corporate entities. If this is so, the natural consequence is that the role the university educator is now that of producer of products and deliverer of services. Inter-university competition was seen by participants as directly restricting the dissemination of innovations because innovations are the 'products' that give a university the 'market edge'. For the entrepreneurial or media savvy researcher, this does not pose such a problem. For the university staff member whose talents and interests lie chiefly in the domain of teaching and the development of course content, corporatisation can be frustrating. Where educators perceive the discussion of 'products in development' as being prohibited, they can feel isolated and miss out on valuable feedback from peers.

A further problem arising from inter-university competitiveness is duplication. A number of *ICT-Ed* participants noted that re-invention of the wheel is a common phenomenon within a corporatised higher education environment; where inter-university collaboration is prohibited, duplication is bound to occur. And duplication is not restricted to good ideas; limited collaboration across institutions is also likely to result in the re-invention of the square wheel.

It cannot be said definitively whether the reporting of ICT innovations in the mini-conference program was inhibited by IP and competition considerations. However, on the whole, participants reported that they felt free to speak about their initiatives and appreciated the opportunity to discuss their opinions and teaching practices within the collegial atmosphere generated by participants of the mini-conferences.

### **Teaching vs. research**

Perhaps the most pervasive factor reported by participants as influencing the dissemination of teaching innovations is the lowly status of teaching compared to research in most Australian universities. On the whole, *ICT-Ed* participants saw innovative teaching as not being highly valued in a higher education environment where a) research attracts funding and teaching does not, and b) promotion is based, for the most part, on an individual's research publication record. In the opinion of many participants, in such an environment, engagement in the dissemination of teaching and learning innovations is discouraged as it takes up precious time, more profitably (!) spent engaged in research. The following quote encapsulates many *ICT-Ed* participants' perceptions of the value placed on the dissemination of teaching innovations in Australia's universities.

*"How many faculty members [do you] actually see going to an educational conference or . . . reading an educational journal as a high priority? We're getting back to this cultural thing in universities that the research is important and I'll go and read 75 journals . . . and I won't open one on education because teaching's only what I do so that I can do research".*

This is not to dismiss the obvious and valuable role of research in universities, but there is a second layer to the problem. Research into technical issues was seen by *ICT-Ed* participants as being valued over research into teaching and learning issues. That is, they perceived research into teaching innovations and pedagogical issues as not being seen as 'important', or attracting the same level of funding (both institutional and from industry) as research into technological innovations. This is alarming given the increased use of new technologies in the delivery of education and many educators' poor understanding of the pedagogical issues surrounding the use of these new technologies. In an article examining the importance of research into computer science education, Daniels, Petre and Berglund (1998) note that, "learning in context cannot be done without co-operation between the 'two halves' (research and teaching), in two forms: technical research (about the content of the discipline) and educational research (about the learning of the discipline)" (p. 203).

However the problem of teaching vs. research does not lie solely at the feet of the universities. *ICT-Ed* participants recognised that the dissemination of innovations relies on information obtained through methodologically sound investigation – not anecdotes or mere descriptions of teaching activities. However, many participants reported not possessing adequate training in research design and evaluation methods, without which it is difficult to communicate the value of an innovation and identify the effective innovations of others.

#### *Evaluation of educational research*

In the dissemination of educational innovations it is "especially important to distinguish truth from assumption, to have practice that is well-founded. Evolving teaching practice is normal to good teaching, but evaluation reliant on anecdote is not good enough" (Daniels, et al, 1998).

While most participants have, or were, engaged in some form of educational initiative, many were unsure about how they should go about evaluating their initiative. This appears to be a wide-spread problem in the reporting of ICT educational innovation – there is a tendency in the relevant literature toward the description of innovations rather than their evaluation. In addition, there is trend in the literature toward the reporting of innovations that are 'good' – innovations that 'worked' or the 'students seemed to like'. Participants understood this problem as being due to ICT educators' general lack of training in research methods and educational theory – although a number of participants were originally trained as secondary school teachers or had completed graduate certificates in higher education teaching, many felt that they lacked the research skills to adequately evaluate their own innovations and critically assess the reporting of others.

Two other factors may be influencing the over-representation of 'successful' innovations in the literature: publication bias on the part of publishers and publication bias on the part of innovators themselves. It may be that publishers of ICT education conference proceedings and journals are reluctant to publish accounts of initiatives that 'don't work'. Similarly, it may be that authors do not recognise the importance to of reporting 'failed' initiatives to the improvement of ICT teaching practices.

On the up side, *ICT-Ed* participants were very keen to broaden their understanding of research and pedagogical issues. As one participant stated, ICT educators should be "reporting rigour, not rosiness". To extend the alliteration, they need also to be able to recognise the rigorous and the reliable.

On the down side, participants expressed concern that the speed of technological change means that new ideas have to be disseminated quickly to be useful to other ICT educators, leaving little time for lengthy evaluation. This problem is peculiar to ICT educators as the



content they deliver and the technology they employ is strongly influenced by fashion. The technology (platforms, programming languages, applications) supported by an institution this year may be considered old hat next year.

## Risks

*"The tricky thing is [the problem of dissemination] operates on an institutional level and . . . also a personal level . . . I mean, your institution has an interest in what you do but also we've got to accept it's much more competitive between academics now and if you say the great stuff you're doing when you haven't actually yet had your article published in a famous journal, then that's really tricky"*

As the above quotes suggests, *ICT-Ed* participants associated dissemination activities with a degree of professional risk. Specifically, participants felt that sharing work in progress with peers from other institutions may be seen by their own institutions as a conflict of interest, that their ideas might be 'pinched', consequently weakening their institution's competitive edge. Many felt that their job security may be put at risk should they be seen to be placing teaching (both practice and research) ahead of mainstream or technological research. Almost all felt that under certain circumstances, sharing successful innovations may be viewed by peers as confronting or 'being told what to do' – as one participant noted, "no-one likes a smarty-pants".

It is worth restating here a section of item 4 of UNESCO's *Recommendation* (1997): "universities, are communities of scholars preserving, disseminating and expressing freely their opinions on traditional knowledge and culture, and pursuing new knowledge without constriction". That the participants actually perceived collegial activities as risky is alarming and a problem for which universities should be answerable. As Gilbert (2000) reminds us, a university is obliged to

*"uphold on behalf of all its staff and students the intellectual freedom to be able without fear or favour to advance unconventional critiques of established social, political or scientific paradigms [and] needs to respect and preserve scholarship and learning for their own intrinsic value, and to provide scholars and researchers with an environment where free inquiry may thrive, independent of outcome or application"* (italics added; Gilbert, 2000, online).

## Resources

The availability of resources was also seen as affecting ICT educators' ability to disseminate innovations. Although a number of resources were identified by participants as inhibiting the dissemination processes, the most frequently cited was time – the time required to engage in dissemination and the lack of time available to ICT educators to engage in dissemination after teaching and administrative duties have been attended to.

The term "time poverty" was put forward by one participant to describe her perception that a standard academic workload leaves little time (during working hours) for anything other than what is strictly necessary. In regard to dissemination activities, time is required to develop ideas, put them in to a form that can be understood and utilised by others, to access and absorb the ideas of others and to incorporate new ideas into teaching practice. The following scenario was oft repeated throughout the mini-conference program:

*" . . . [I] went and saw some of the [conference] presentations and [I got the proceedings] and I've been trying to skim through the book . . . I'm about half way through it after, like, two months".*

In addition to having little time available for dissemination activities, these activities were seen by participants as, at times, being more trouble than they're worth.

*" . . . if we want to talk about [our innovations] with other people, it needs to be in some kind of forum. If it's a seminar, other people are teaching at that time, you've got to get to a campus, you don't have the audience because everybody's too busy. If you take it to a conference then it's got to be a fully refereed paper . . . , it's got to be a high standing conference, they've got to have proceedings . . . otherwise, you won't get funding".*

In short, participants perceived dissemination activities as being curtailed by workload, information overload and the likelihood that such activities will "create extra work . . . without the extra resources". This situation flies in the face of item 62 of UNESCO's *Recommendation* (1997) which proposes that the workloads of higher educational teaching personnel be determined such that obligations regarding scholarship, research and/or administration be met. If this recommendation is being taken seriously at an institutional level, this commitment does not appear to have been passed on to ICT teaching staff.

### Channels of dissemination

In spite of the pressures described in the preceding section, *ICT-Ed* participants unfailingly reported a desire to share their ideas and optimise opportunities for their dissemination. Table 1 shows the range of channels identified by participants for the dissemination of ICT innovations.

Table 1. Channels identified by participants for the dissemination of teaching and learning innovations		
Online	Internal	External
<ul style="list-style-type: none"> <li>• web sites</li> <li>• email</li> <li>• listservers</li> <li>• discussion boards</li> <li>• mailing lists</li> <li>• networking</li> <li>• online professional development courses</li> </ul>	<ul style="list-style-type: none"> <li>• seminar tours of university departments</li> <li>• teaching interest groups</li> <li>• staffroom/seminar</li> <li>• cross faculty seminars</li> <li>• journal clubs</li> <li>• professional development activities</li> <li>• bringing ideas from conferences back to your</li> </ul>	<ul style="list-style-type: none"> <li>• professional associations</li> <li>• conference</li> <li>• journals</li> <li>• workshops</li> <li>• teaching and learning symposia</li> <li>• professional development activities</li> <li>• in/formal gatherings</li> <li>• road shows</li> <li>• collaborative teaching</li> </ul>

	<ul style="list-style-type: none"> <li>• department/school</li> <li>• working papers</li> <li>• institutional education units</li> <li>• Graduate Certificate in Higher Education</li> <li>• collaborative teaching</li> </ul>	

*"There are plenty of opportunities to disseminate – the problem is one of take up"*

The channels identified by participants fell, roughly, into three categories: online forums; internal or intra-university activities and; forums external to their home institutions. The channels described can be classified in another way, in terms of their passive or interactive nature (Nahapiet & Ghoshal, 1998). Passive dissemination activities involve the direct transfer of information with no requirement on the part of the receiver to engage with the material or its sender. Passive channels identified by participants included journals, conferences, websites, discussion boards and mailing lists. Passive activities are useful for delivering large amounts of material to large numbers of people. However, this does not make it the most effective means of communication. Often, with online channels, you do not know who is using your information and in what way and may not receive on the material.

*"Academics like to think things through themselves and are reluctant to take other models off the shelf without a lot of personal input"*

The above comment highlights participants' desire to absorb new material, adapt it to their own needs and 'make it their own'. This is more likely to occur using interactive methods of communication. The majority of dissemination channels identified by participants were interactive in nature. Using these channels, the receiver is required to engage with the sender *and* their message and perhaps transform the information received. Nahapiet and Ghoshal (1998) believe that these interactive methods of communication are more likely than passive methods to change the behaviour of recipients. Interactive dissemination activities reported by participants included collaborative teaching, special interest groups, professional development activities and informal activities such as staffroom discussions.

Informal forums were perceived by participants as being more useful than formal forums because they felt that they learnt more from people they know and with whom they have common interests. The staffroom in particular, was seen as a rich source of information and a useful forum for exploring new ideas.

### **Effective knowledge sharing**

According to Nahapiet and Ghoshal (1998), successful knowledge sharing is dependent upon an organisational culture that promotes communication. They have identified six core conditions necessary for knowledge transfer and absorption:

- a shared vocabulary
- the sharing of collective narratives

- the development of trust
- adherence to common norms
- a web of obligations and expectations and
- identification with the group or community.

*ICT-Ed* participants' recognition of these criteria was reflected in their discussion of the factors influencing the dissemination of their own innovations. In describing the extant channels for dissemination, they noted that their success was especially dependent upon a shared vocabulary. Participants were aware that much of the language used in ICT education is 'discipline-bound'; the language is often technical, and contains many an obscure acronym. This phenomenon is familiar to most disciplines which, over time, have developed their own style of discourse and accompanying language. The translation of ideas from a discipline-bound language to one that can be understood across disciplines and institutions was seen by participants as a challenge for the innovative ICT educator.

Participants' responses also reflected an appreciation of Szulanski's (1994) four barriers to effective knowledge transfer: *ignorance, capacity, relationships* and *motivation*.

- Ignorance – for effective dissemination to occur, individuals need to recognise that they possess knowledge that would be of interest or use to others
- Capacity – individuals need to be capable of communicating and making use of ideas. Capacity may be limited by lack of money, time or management support
- Relationships – individuals are more likely to take up the ideas of those they know and trust over ideas coming from anonymous or distant sources
- Motivation – dissemination is less likely to occur where the individual sees no professional reason for sharing their ideas

The issue of ignorance was brought up a number of times throughout the mini-conference program. Many participants stated that their engagement in dissemination activities was inhibited by their not recognising themselves as innovative. Related to this is the issue of recognising your audience. Participants reported that identifying yourself as innovative was tied in with belonging to a community in which your initiatives would be seen as innovative; the idea of dissemination is meaningless where there is no identified audience or interested community.

### **Institutional differences**

There were clear institutional differences in the perception of factors involved in the dissemination of ICT educational innovations. These differences related mainly to the history of individual participants' universities and the geographical location of participants' institutions.

As mentioned earlier, a large proportion of participants were from universalities that, prior to 1987, were colleges of advanced education or institutes of technology. These participants had commenced their academic careers in institutions where the focus was on teaching rather than research. With the institutional mergers that followed the Dawkins Report, "it soon became apparent to senior management in the former CAEs . . . that they would have to lift their research profiles, which at the time were minimal or virtually non-existent. One of the achievements of the [Unified National System] was the creation of uniformity in research organisation with the universities, with the clear message that all had to lift research efforts, especially the former CAEs" (Bessant, 1996, online). With the introduction of the Unified National System, former CAE and institute of technology teachers found themselves in new organisations where research was rewarded and teaching was not.

Bessant's (1996) comments were borne out by the professional backgrounds of the participants. Of the 82 participants, 50 were from former CAEs or institutes of technology many of whom had completed, or were undertaking, PhD studies in response to their institutions' drive to 'lift' their research profiles and research-based promotion schemes. However, these participants have not lost their passion for teaching in the process and are now, as Daniels, et al (1998) suggest, investigating the effectiveness, and effects of, their teaching practices as part of their higher degree studies.

The under-representation in the mini-conference program of staff from the older universities was notable. This may reflect the older universities' level of commitment to the development of good teaching practices and higher education pedagogical theory. As Bessant notes, "it will take longer for the older universities to embrace modern teaching methods than for former CAEs to take on research" (1996, online). It is unfortunate that data concerning those individuals who declined to participate is not available. However, it may be assumed, based upon the comments of those who did participate, that in addition to factors at the institution level, time pressures prevented some educators from attending.

Differences in perceptions also appeared to be influenced by the geographical location of participants' institutions. Participants were more likely to report concerns about IP issues if they were from large metropolitan centres which are home to a number of universities. Those participants from more isolated locations such as Tasmania and the Northern Territory were more likely to cite the 'tyranny of distance' as affecting their dissemination efforts.

### Conclusions

Two main findings regarding dissemination practices among ICT educators have emerged from the *ICT-Ed Project* mini-conference program: 1) participants perceived a number of *potential* barriers to the dissemination of their innovations and; 2) participants are enthusiastic about *circumventing* these barriers. While a range of factors at government, institutional and individual levels were reported as threatening collegiality in Australia's universities, it is encouraging to see that participants are able to identify these threats and are, at an individual level, actively seeking ways around them.

Ways in which ICT educators, and university educators in general, can increase and optimise opportunities for the dissemination of teaching and learning innovations include:

- identifying themselves as innovative and identifying peers with whom to share their ideas
- engaging in institutionally supported programs that involve a dissemination component such as higher degree studies, higher education certificate courses and professional development programs
- incorporate their teaching practices into their research activities
- employing interactive, rather than passive, methods for communicating their ideas.

Of course, each of the above strategies requires some degree of institutional support and co-operation. For many institutions, this would necessitate some shift with regard to attitudes about teaching practice, teaching research and inter-university collegiality.

*"An issue that limits innovation extension is that it might mean real co-operation between unis at administration/Vice-Chancellor level and that seems too hard!"*

As the above quote indicates, for this participant, institutional-level change seems a long way off. Welch (1998) appears to agree, predicting an "increasing differentiation among staff from the same faculty towards senior, tenured staff (who do research) and junior, untenured staff (who are 'teaching only')" (p. 19).

A degree of pessimism appears endemic in the Australian higher education sector. In fact, the West Report (1998) laments that, "institutions have few incentives to be innovative or to re-engineer traditional approaches to teaching and administration. . . . It is hard to see tangible ways in which diversity among institutions is encouraged." (online). However, there is some suggestion coming from both *ICT-Ed* participants and the government, that a change is the air.

1995 saw a major review of the recognition and rewarding of good teaching practices in Australian higher education (Ramsden, Margetson, Martin & Clarke, 1995). More recently, the West Report (1998) acknowledged, albeit briefly, "the importance of teaching as a primary objective for universities" in the new century (online). Participants have noticed a small move within their own universities toward a greater recognition of the role of teaching:

*"Things are changing . . . the teaching is becoming more recognised. . . . And certainly, going for a job you've got to demonstrate you can do research and you can teach."*

However this observation is tempered with some cynicism. The above participant went on to say:

*". . . you can con the teaching bit often 'cause there's no objective measures [of achievement] like there are in research".*

Perhaps the strongest indicator of change in government attitudes toward university teaching is the very fact of the study reported here. The *ICT-Ed Project* is one of a number of projects instigated by DETYA examining teaching and learning outcomes with the stated aims of identifying teaching and learning innovations and encouraging the dissemination and adoption of these innovations in Australia's universities.

However, collegiality cannot be government imposed, it arises naturally within "a non-exploitative, suspicion-free context in which a culture of quality improvement and pedagogic innovation can flourish . . . [where] good practice [is disseminated] through an effective open system of communication . . . encouraging and facilitating team working among academic and academic-related colleagues." (Harvey, 1998, online). The responses of *ICT-Ed* participants suggest that, at least in ICT education, and probably in other disciplines, a re-establishment of the collegial atmosphere enjoyed by Australian university staff pre-1987 is dependent upon changes in the attitudes of individual institutions.

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