

# DISSEMINATION, ADOPTION & ADAPTATION OF PROJECT INNOVATIONS IN HIGHER EDUCATION

A report for the Carrick Institute for Learning  
and Teaching in Higher Education

Jo McKenzie | Shirley Alexander | Carly Harper | Susan Anderson



# TABLE OF CONTENTS

Acknowledgements.....	v
<b>Executive summary.....</b>	<b>vii</b>
Methodology for the project.....	viii
Why did adopters choose to adopt or adapt and implement projects?.....	viii
How were adoption/adaptation, implementation and embedding facilitated and supported in new contexts?.....	ix
How students, teachers, academic departments and institutions were affected by the implementation of the innovation.....	ix
Systemic conditions which facilitated or constrained project dissemination and adaptation, implementation and embedding in new contexts.....	x
Approaches to funding and support for the innovation which encouraged dissemination, adaptation implementation and continuation.....	xi
Issues related to dissemination, adaptation and implementation of project outcomes in new contexts.....	xi
Recommendations.....	xii
For the Carrick Institute.....	xii
For both the Carrick Institute and Institutions.....	xiv
For Institutions.....	xiv
For Academic Developers.....	xv
For Project Developers.....	xv
<b>1. Background and literature review.....</b>	<b>1</b>
Introduction to the literature review.....	1
What constitutes an innovation?.....	2
What is being developed?.....	3
What is dissemination?.....	6
The language of dissemination.....	6
Innovation dissemination as change.....	7
Innovation dissemination as a system.....	8
Scaling up innovations.....	8
What innovations get developed and disseminated?.....	8
Who originates and disseminates innovations and why?.....	9
Individuals.....	10
Departments.....	11
Universities.....	12
How are innovations disseminated?.....	13
Distribution activities.....	13
Distribution outcomes.....	16
What conditions are necessary in order for innovations to improve teaching and learning in higher education?.....	22
Summary.....	23
<b>2. Methodology.....</b>	<b>25</b>
Aims of the project.....	25
Identifying cases and their contexts.....	26
Identifying successful projects.....	27
Developing case studies.....	29
Analysis of the case studies.....	30
Reporting.....	31

<b>3. Case studies: projects and innovations which have been successfully adopted and adapted across contexts</b>	<b>33</b>
Supplemental Instruction (SI), known also as Peer-Assisted-Study-Sessions (PASS)	34
Project description	35
Enabling Systems for adoption/adaptation and use	38
Enabling and constraining features of the project	41
Case summary	42
National Center for Case Study Teaching in Science	43
Project description	43
Enabling systems for adoption/adaptation and use	47
Enabling and constraining features of the project	49
Case summary	50
EFFECTS: The Effective Framework for Embedding C&IT Using Targeted Support	52
Project description	52
Enabling system for adoption/adaptation and use	56
Enabling and constraining features of the project/idea	57
Case summary	59
Generic Capabilities of ATN University Graduates Project and a case example: Embedding Graduate Capabilities in Core Units within Law and Justice Studies	60
Project description	60
Embedding Graduate Capabilities in Core Units within Law and Justice Studies (QUT): a case example	62
Enabling systems for adoption/adaptation and use: from the ATN project overall and the case example	65
Case summary	66
PILOT: Your Information Navigator	68
Project Description	68
Enabling systems for adoption/adaptation and use	73
Enabling and constraining features of the project/idea	73
Case summary	74
FIRST: for Improving Research Supervision and Training	75
Project description	75
Enabling systems for adoption/adaptation and implementation	76
Case summary	77
The RAPID Progress File (Recording Achievement for Professional and Individual Development) and RAPID 2000	78
Project description	78
Enabling systems for adoption/adaptation and use	81
Enabling and constraining features of the project/idea	83
Case summary	84
in:Context: Creating The Balance in the Nursing Curriculum	85
Project description	85
Enabling systems for adoption/adaptation and use	86
Case summary	87
Information and Communication Technologies and their role in Flexible Learning – The AUTC Learning Designs project	88
Project/idea description	88
Enabling systems for adoption/adaptation and use	90
Enabling and constraining features of the project	91
Case summary	92
Role-Play Simulations for teaching Middle-East Politics	93
Project/idea description	93
Enabling systems for adoption/adaptation and use	102
Case summary	105
an@tomedia™: A New @pproach To Medical Education: Developments In Anatomy	106
Project/idea description	106
Enabling systems for adoption/adaptation and use	108
Enabling and constraining features of the project/idea	109
Case summary	111

Mathematics video resource series.....	112
Project description.....	112
Enabling systems for adoption/adaptation and use .....	113
Enabling and constraining features of the project/idea .....	114
Case summary .....	115
Generating Puzzlement: strategies for engaging with electronic simulations .....	116
Project Description .....	116
Enabling systems for adoption/adaptation and use .....	117
Case summary .....	117
Enhancing Teaching-Learning Environments in Undergraduate Courses (ETL) .....	118
Project Description .....	118
Enabling systems for adoption/adaptation and use .....	119
Summary.....	120
<b>4. Adoption, adaptation, implementation and embedding of innovations: themes from the case studies</b>	<b>121</b>
.....	<b>121</b>
Why did adopters/implementers of projects choose to adopt, adapt and implement them?.....	121
Encountering the project .....	121
Initial engagement: perceptions of aspects of relevance.....	122
Exploration.....	123
How were adaptation, implementation and embedding facilitated and supported in new contexts? .....	124
Adoption and use by individuals.....	124
Adaptation and implementation by individuals.....	125
Adaptation and implementation across a course or department.....	126
Barriers to ongoing support for dissemination and implementation .....	126
How were students, teachers, academic departments and institutions affected by the implementation of the case study innovations .....	127
Institutional and external infrastructures and systems which support or constrain dissemination, adoption, adaptation, implementation and embedding of innovations .....	129
Supportive and proactive leadership of teaching and learning .....	129
Effective support and advice for adaptation and implementation.....	130
Events and other processes which enabled academics to share ideas and make contact ..	130
Perceptions of valuing, recognition and reward for teaching .....	130
Perceived barriers at the institutional level.....	131
Relations between supportive features and barriers .....	133
Disciplinary systems which support dissemination and adoption of innovations .....	133
Disciplinary or other special-interest education groups and networks.....	133
Professional and disciplinary associations.....	134
Cross-disciplinary systems .....	135
Necessary expertise for dissemination and implementation.....	136
Change agent capability .....	136
Staff development capability.....	136
Specific project capabilities .....	136
Technical capability.....	137
Scholarly understandings of teaching and learning .....	137
Summary.....	138
<b>5. Funding conditions and infrastructures relating to teaching and learning innovation, dissemination, adoption and embedding .....</b>	<b>141</b>
Findings from analysis of the interviews .....	141
Analysis of the granting schemes .....	142
Criteria and processes for grant funding .....	142
Support for grantees before grants are awarded and while projects are in progress .....	145
Integration of a funding scheme with other teaching and learning development and support initiatives .....	146
Infrastructures which support dissemination and adoption of innovations .....	148
Uniserve Science.....	148
The Higher Education Academy Subject Network.....	149



Summary.....	156
<b>6. Further issues and recommendations .....</b>	<b>159</b>
Issues raised about dissemination.....	159
What is meant by dissemination? .....	159
What aspects of projects can be disseminated and adopted?.....	162
Consultation, Collaboration and Community Building .....	163
Intellectual property.....	165
Valuing, recognition and reward for innovation, adaptation and implementation. ....	168
Summary.....	169
Recommendations.....	169
For the Carrick Institute .....	169
For both the Carrick Institute and Institutions.....	171
For Institutions.....	172
For Academic Developers.....	172
For Project Developers.....	173
<b>7. References .....</b>	<b>175</b>
<b>Appendices.....</b>	<b>181</b>
Appendix 1: Sample Interview schedules .....	181
Appendix 2: Acronyms used in this report.....	183

# ACKNOWLEDGEMENTS

The authors gratefully acknowledge the contributions of the many people who have provided advice and information for this project.

## Project advisory team members

Associate Professor Mark Freeman, University of Sydney  
Tanja Golja, UTS  
Simon Housego, UTS  
Dr Peter Kandlbinder, UTS  
Professor David Lowe, UTS  
Associate Professor Michael Prosser, University of Sydney (until February 2005)

## Steering committee members

Professor Lesley Parker, Carrick Institute for Learning and Teaching in Higher Education  
Tom Cochrane, QUT  
Professor John Dearn, University of Canberra  
Professor Gail Hart, RMIT University  
Dr Elizabeth McDonald, DEST  
Deborah Southwell, QUT

## Interviewees and informants

A large number of project developers, adopters, academic developers and representatives from funding and dissemination support agencies were interviewed or provided information for this project. Without them this report would not be possible and we express our appreciation for their time and thoughtful contributions.

In particular, we acknowledge the contributions of former members of the National Co-ordination Team, UK and representatives from the Higher Education Academy, in particular:  
Cliff Allan, Higher Education Academy  
Professor Graham Gibbs, Institute for the Advancement of University Learning, University of Oxford  
Rachel Segal, Higher Education Academy





# EXECUTIVE SUMMARY

This project aimed to improve understanding of the interacting systems of conditions which favour the dissemination, adoption, adaptation and implementation of innovations aimed at improving teaching and learning in higher education.

The overview of the available literature supported the need for this project to take a systems and adopter-focused perspective on the issue of dissemination and adoption, if the aim of dissemination is for innovations to be appropriately adopted, adapted, implemented and sustained in order to improve the quality of teaching and learning in new contexts.

The literature on dissemination of innovations is vast, and hence a focused approach was taken to the literature review. A number of issues were raised in the literature review which are important to the aims of the Carrick Institute for Learning and Teaching in Higher Education, and these are discussed below.

**What constitutes an innovation?** It would appear to be important to define precisely what is meant by 'innovation in teaching and learning' to avoid confusion for those intending to apply for grant funding. Some view innovation as 'something new', raising the question of 'to whom or what is it new?' Among the taxonomies used to define the latter are those that distinguish between entirely new approaches, approaches that are new to organisation or faculty, or new to the higher education system in general.

Some distinguish between 'product' and 'process' innovations, and between the outcomes of innovation which may be incremental or radical change. The effectiveness of each type of innovation over the other is highly contested.

**What is the problem to which innovation is the solution?** There is some evidence that innovation is a more costly and less successful way of solving the problems of an organisation than would be the case if the funding were used for re-generation or renovation of existing practices.

**What is dissemination?** Much of the literature distinguishes between making information about an innovation available (sometimes called 'distribution') and the ways in which decisions are made to embed the innovations in teaching and learning.

**What kinds of innovations in teaching and learning are developed?** Few 'innovations' are completely new to higher education, and most are adaptations of existing innovations in new contexts.

**Who should be responsible for innovation?** Most innovations would appear to be undertaken by individuals, although there is some evidence to suggest that these innovations rarely become embedded in the original context once the innovator ceases involvement. There is mixed evidence of the success of innovations conducted by discipline or faculty groups.

**How are innovations disseminated?** There is a range of ways of understanding the dissemination process, and in the absence of a unifying theory, all should be considered important. Innovators should be concerned about the needs and concerns of potential adopters, and have an understanding of the processes by which they make decisions about innovations. Attention should also be paid to the context in which innovations will be used, in particular the conditions which facilitate adoption and those which act as barriers.

**What conditions are necessary in order for innovations to improve teaching and learning?** Innovations are more likely to improve teaching and learning if implemented in student-focused ways. Student-focused approaches to teaching are associated with student-focused conceptions and with perceptions of transformative leadership, departments which value teaching and workloads which are not too high. Leadership and perceived recognition and rewards are important in supporting transformative change.

## METHODOLOGY FOR THE PROJECT

We sought to identify and analyse successful cases of ideas, projects and processes ('innovations'). A successful case was defined as one in which the innovation had been disseminated and successfully adopted, adapted, implemented and sustained in contexts beyond the development context. Particular attention was given to cases where there was clear evidence of improvement in teaching and learning or features which were likely to afford improvement.

The project took a two-phase approach. Phase 1 involved investigation of funding agency and other contexts associated with project development and adoption, along with the identification of cases of successful innovations. Phase 2 explored the successful case studies in more detail, focusing on the interacting system of features and conditions which contributed to the innovations' success in being disseminated, adapted, implemented and sustained in a new context.

Case study investigations were designed to address the questions of:

1. why teachers and other adopters/implementers of projects chose to adopt, adapt and implement the innovation, in terms of the perceived and actual features of the innovation and the ways in which the adopters became aware of and were initially engaged with it;
2. how the ideas, projects and processes were adapted, implemented and sustained by teachers, academic departments and/or institutions in new contexts. This included the changes in practice and understanding which were necessary for this to happen and the ways in which these were facilitated and supported, including information and other supports made available by the innovation developers;
3. how teachers, students, academic departments and institutions have been affected by the implementation of the innovation;
4. the systemic conditions, including features of the external and institutional contexts and forms of support or professional development, which facilitated project dissemination then adaptation, implementation and sustainability in the new context;
5. where innovations were funded, the approaches to funding and support for the innovation which encouraged dissemination, adaptation implementation and continuation.

Case studies or profiles were developed for 14 innovations, ranging from very large-scale internationally disseminated innovations with extensive support systems to small-scale resource projects. Case studies were based on extensive document analysis and interviews with project developers and adopters.

## WHY DID ADOPTERS CHOOSE TO ADOPT OR ADAPT AND IMPLEMENT PROJECTS?

This question was addressed in three parts: how adopters encountered projects for the first time, why they initially engaged with them and how they explored them further.

Adopters usually encountered projects through some form of personal contact, such as discussion with a colleague or participation in a project workshop. Very few adopters became aware of innovations through websites and none mentioned learning object repositories. Adopters engaged with projects because they perceived them to have aspects of relevance to their personal teaching and learning interests, their students and/or their teaching situations. Exploration of the innovation involved becoming aware of how it could be used in the adopter's context, and was intertwined with adoption and adaptation.

## HOW WERE ADOPTION/ADAPTATION, IMPLEMENTATION AND EMBEDDING FACILITATED AND SUPPORTED IN NEW CONTEXTS?

Adoption and implementation of project outcomes in new contexts were facilitated by an interaction of the qualities of the projects as perceived by adopters, the ways that adopters were supported to implement them, and particular features of institutional, disciplinary and cross-disciplinary contexts.

**Projects** which were adopted and implemented in other contexts typically:

- offered different and valuable ways of learning and teaching, or would enable particular kinds of learning outcomes, or addressed common resource needs or solved common problems;
- had recognisable scholarly qualities;
- provided evidence that they worked or were likely to work with the intended learners;
- were adaptable, either in themselves or in the ways they could be implemented.

**Adoption, implementation and embedding in new contexts** were facilitated when projects included support for their adaptation and implementation. The type of support which was helpful varied depending on whether the project was adopted or adapted by individuals, or required adaptation at the departmental level.

Adoption of resources by **individuals** was supported by the adaptability of the resource and the provision of implementation guidance, cases or exemplars. Adaptation or reinvention of processes or ideas by individuals was facilitated by support for them to think through the implementation process and in some cases to change their understandings. Workshops, training sessions, support from project developers or staff developers and collegial discussion were seen as useful. Some projects offered small amounts of funding to adopters, to support implementation.

Adaptation, implementation and embedding at the **curriculum and departmental levels** typically involved reinvention of the innovation. This required additional support within the adopting context. Strong leadership of the innovation and effective collaborative processes and staff development within the course team or department were necessary to build commitment and understanding. Implementation funding was necessary and policies and systems needed to be aligned to the reinvention.

Some projects used consultative, collaborative and/or cascading approaches, in which development occurred concurrently with implementation across several sites. This enabled implementation support to be provided alongside development, with adopters' feedback affecting ongoing development.

## HOW STUDENTS, TEACHERS, ACADEMIC DEPARTMENTS AND INSTITUTIONS WERE AFFECTED BY THE IMPLEMENTATION OF THE INNOVATION

Effects of the projects on students' learning depended on the nature of the project and the extent to which project outcomes were embedded in the students' learning environment. Positive effects ranged from changed understandings and worldviews to improved learning of subject matter and development of discipline-related and generic attributes such as teamwork, critical thinking, problem-solving and the capacity to reflect on their learning and development. Improved motivation and interest and improved flexibility of learning were also noted. However, students often needed to be consulted and provided with support to engage in more active and reflective forms of learning.

Positive effects on teachers included changed understandings of teaching and learning, new teaching practices and increased satisfaction and enthusiasm. Both innovators and adopters also benefited from engagement in collegial networks, enhanced reputations, invitations to present the innovation and publication. Some innovators were formally recognised through awards or promotion.

Some innovators and adopters also experienced negative effects, including lack of promotion, lack of support by colleagues or Heads of Department and increased workloads.

Some innovations had wide-ranging effects on departments and institutions, for example through the implementation of graduate capability-based curricula or the embedding of computer and information technologies into the curriculum and support systems. In these cases, the innovation was typically accompanied by necessary changes in institutional policies and systems.

## SYSTEMIC CONDITIONS WHICH FACILITATED OR CONSTRAINED PROJECT DISSEMINATION AND ADAPTATION, IMPLEMENTATION AND EMBEDDING IN NEW CONTEXTS

Aspects of institutional and external contexts and the capabilities of developers and adopters could facilitate or constrain all aspects of a project's dissemination and take-up, from initial awareness raising to implementation and embedding.

Aspects of institutional systems which facilitated awareness raising included events, activities and information brokering which facilitate the sharing of ideas. Aspects which supported adaptation, implementation and embedding of project outcomes included:

- supportive and proactive leadership of teaching and learning;
- support and advice for adaptation and implementation, including academic development support and advice on intellectual property;
- perceptions that teaching, teaching innovation and the scholarship of teaching, were valued, including through systems of recognition and reward.

Institutional barriers included an absence of supportive leadership and valuing of teaching, along with:

- high workloads and lack of time;
- policy blocks;
- technical blocks.

Disciplinary and cross-disciplinary agencies could facilitate distribution of information and initial engagement with projects. Disciplinary systems included education special interest groups, networks and professional and disciplinary associations. The relevance of some project outcomes to professional communities outside the university encouraged their wider adoption.

Cross-disciplinary agents and activities which supported dissemination and initial engagement included national level agencies, such as Higher Education Academy (HEA) and their advisors in the United Kingdom (UK) and higher education associations and communities such as HERDSA. Academic developers and consultants working across institutions acted as knowledge brokers and also provided support for implementation.

A range of capabilities within project teams were seen as necessary to enable dissemination and implementation of innovations intended to improve teaching and learning. In addition to the specific capabilities necessary to develop and enthusiastically promote the project, these included change agent and staff development capabilities and scholarly understandings of teaching and learning.

## APPROACHES TO FUNDING AND SUPPORT FOR THE INNOVATION WHICH ENCOURAGED DISSEMINATION, ADAPTATION IMPLEMENTATION AND CONTINUATION

General features of the context outside the university which facilitated aspects of dissemination and adoption included the alignment of projects with national strategic priorities and initiatives or with common institutional or disciplinary needs. Collaborative arrangements between universities facilitated implementation across contexts if the collaboration was genuine and well managed.

Wider project dissemination, adoption and implementation were also encouraged by a range of features of granting schemes which are addressed in the recommendations. In particular, staged and supported bidding for funds, clear descriptions of what will be funded, strong requirements for evaluation, adoption-focused approaches to dissemination, consultation and collaboration and support for ongoing dissemination after project completion are required.

There is a need for a national and internationally linked infrastructure which can support the dissemination, adoption and adaptation of project outcomes. There is likely to be considerable value in integrating 'engaged' forms of support, such as events, network development and information brokering within and between disciplines, with more passive forms of support such as those offered by web-based repositories. Such an approach requires clear expectations of the services to be provided and clear management structures and systems. Funding and staffing need to be adequate in order to support an integrated set of activities. Any discipline-based agencies need to have the autonomy to respond to their different communities from within a common management framework. Leadership is crucial, with directors needing to have the reputations and seniority necessary to ensure credibility of the agency.

## ISSUES RELATED TO DISSEMINATION, ADAPTATION AND IMPLEMENTATION OF PROJECT OUTCOMES IN NEW CONTEXTS

A number of issues were raised which are important in understanding and addressing dissemination and take-up of innovations and which, along with the other findings from the case studies, inform a range of recommendations:

- Dissemination has a range of different meanings, as exemplified in the literature and the responses of our interviewees. Understandings of dissemination which focus on the use or impact of innovations or on the ongoing processes of engaging users are more likely to lead to take-up than understandings which focus only on the distribution of products or ideas.
- Each project may have a range of aspects which could be disseminated, from products to processes, tools or conceptual ideas. Different dissemination processes may be necessary for different aspects.
- Different kinds of projects might lend themselves to different kinds of collaboration. Large scale collaboration might be less effective than collaboration involving fewer institutions at a greater level of depth.
- There are a number approaches to dealing with intellectual property, but for any given project the approach needs to be clear and to acknowledge academic contributions to the work.
- Scholarship of teaching outcomes need to be valued in institutions, and this should consider both publications and scholarly innovations in themselves.
- There are issues of defining innovation compared with adaptation and implementation or reinvention. It needs to be acknowledged that all of these may require support, including time and funding.

# RECOMMENDATIONS

The findings of the project lead to a large number of recommendations directed towards more effective dissemination, adoption, adaptation, implementation and embedding of project outcomes. In the following sections, recommendations are directed towards the Carrick Institute, Institutions, Discipline groups and Project developers.

## FOR THE CARRICK INSTITUTE

**Types of projects** recommended for funding include:

- projects aimed at adapting and implementing successful innovations in new institutional and/or disciplinary contexts, in addition to well designed innovation projects;
- projects which integrate aspects of institutional development, staff development and learning and teaching innovation, as well as for projects which might fall into one or the other of these categories;
- projects based on priorities determined by the Carrick Institute, for example those based on National priorities or known sector needs identified through previous projects;
- both individual projects and collaborative projects, funded through separate granting pools with a greater proportion of the total funds available for collaborative projects;
- within the definition of collaborative projects, those involving a lead institution and a set of consultation partners, collaborations involving a small group of partners and cascade models of collaboration. Desirably, provide the same maximum amount of funding for consultative or collaborative projects, to encourage whichever form of project design is most appropriate for achieving wider implementation of the project outcomes.

In relation to **collaborative and consultative projects**:

- provide adequate funding and timeframes for projects, to enable them to engage appropriate project management staff to support the collaboration. A minimum of \$200,000 over two years is suggested;
- require collaborative projects to provide documented evidence of the role and responsibilities of each partner in the collaboration, either at the final bidding stage or within the first year of funding.

In relation to **application processes**:

- provide clear guidelines for applicants that describe what the Carrick Institute interprets as the meaning of 'innovation' and 'adaptation and implementation' projects and how these are distinguished from projects which are regarded as the normal business of a university;
- develop a staged bidding process with sufficient time for applicants to develop their applications between stages;
- provide feedback and support to short listed applicants at each stage, to enable them to develop their applications further and in particular to:
  - develop well-designed evaluation and adoption-focused dissemination plans. The Carrick Institute could create a framework to support the development of these plans;
  - clarify and where possible formalise the intellectual property arrangements for the project;
  - formalise collaboration arrangements between institutions.

In relation to the **criteria for assessing applications** for funding, include criteria which:

- emphasise scholarship, particularly in project design and evaluation;
- emphasise effective evaluation (as described above);

- require adequate proportions of the budget to be devoted to project management, evaluation and dissemination;
- require applicants to consider approaches to dissemination which engage potential users throughout development and are focused on the intended adoption, implementation and embedding of project outcomes. For example, applicants could be required to describe
  - the intended users of their project outcomes, and the range of outcomes which could be adopted and implemented by different groups of users;
  - how they would enable each group of intended users to become aware of the relevant outcomes and learn how to make use of them effectively;
  - how they would engage with intended users and obtain their feedback during project development;
  - how they would evaluate the impact of their project outputs within the intended user communities during and following project development.

Develop mechanisms for providing **guidance, advice and support to applicants** on a range of critical issues including:

- project management and team management for projects;
- forms of consultation and collaboration and their management;
- effective approaches to evaluation for different types of projects;
- approaches to enabling the dissemination and wider adoption of project outcomes. Guidance and advice should acknowledge the range of meanings and purposes of dissemination, the different types of project outcomes which can be disseminated adopted and implemented, and the different groups of potential adopters of these outcomes;
- budget planning, including providing budget templates and advice;
- intellectual property and copyright issues.

In relation to **intellectual property**:

- develop and communicate a clear position in relation to the ownership of intellectual property for projects supported and partially supported by Carrick Institute funding.

In relation to the **continued dissemination of project outcomes** following project completion:

- develop an infrastructure to support and continue dissemination, adoption and implementation of project outcomes after projects are completed, using both engaged and passive strategies;
- consider ways in which aspects of the Higher Education Academy Subject Centre model could be creatively adapted in order to be implemented and sustainable in the Australian context;
- develop formal links with the Higher Education Academy and the Subject Centres, in particular considering ways in which such links could benefit both sides and avoid replicating in Australia work which has already been done in the UK context;
- develop effective two-way linkages with existing discipline-based and cross-disciplinary organisations to promote awareness of the Carrick Institute and relevant funded projects and to inform priorities for new projects.

In relation to **alignment between granting schemes and other aspects of the higher education context**:

- consider developing alignment between granting schemes and aspects of the expanded teaching awards scheme, for example to reward activities which foster the dissemination, adaptation and implementation of project outcomes which improve teaching and learning;
- consider developing alignment, where appropriate, between the funding of institutional or integrated projects and the criteria for the Learning and Teaching performance fund, for example to enable the scaling-up of good practices from institutions.

## FOR BOTH THE CARRICK INSTITUTE AND INSTITUTIONS

In relation to **valuing, recognition and reward** for teaching innovation:

- develop mechanisms for enabling scholarly publications on teaching development and innovation to be counted for the purpose of any research assessment exercise, and provide advice on these mechanisms to relevant organisations;
- develop mechanisms for enabling scholarly innovations to be subject to formal peer review processes and recognised as works of scholarship for the purposes of research assessment. One way to achieve this for scholarly products could be through implementing the recommendations of the previous EIP study (Taylor and Richardson, 2001).

In relation to **leadership of teaching**:

- provide or facilitate participation of academic leaders in professional development aimed at fostering awareness and skills and encouraging the sharing of good practices related to transformative leadership and valuing of teaching and teaching innovation. Activities should include academic leaders at all levels but in particular Heads of Department.

## FOR INSTITUTIONS

In relation to support for teaching innovation, adaptation and implementation:

- recognise in workload allocation formulae the time taken to engage in teaching innovation, including the adaptation and implementation or reinvention of innovations developed in other contexts;
- recognise scholarship of teaching outcomes, such as publications and conference papers focused on scholarly teaching and teaching innovation as well as scholarly products, in promotions criteria and in performance management plans for academics;
- provide small scale grants to:
  - support pilot projects intended to develop ideas for possible funding by the Carrick Institute schemes;
  - support the adaptation and implementation of effective innovations that have been developed in other contexts;
  - support scholarship in teaching activities designed to build the conceptual frameworks or designs for projects which could be supported by the Carrick Institute schemes;
- provide sources of institutional support and advice for applicants, in particular on evaluation and intellectual property;
- ensure that there are clear arrangements for managing the intellectual property of projects which are partially funded by the institution, and ensure that any such IP arrangements enable widespread dissemination and use of project outcomes;
- encourage the development of cross-institutional networks and a small number of events to facilitate sharing of good practices across the institution;
- recognise and support the brokerage and professional development roles played by academic development staff and encourage projects in which academic developers work alongside or provide advice to project teams;
- encourage participation of academic staff in formal teaching and learning courses and other development activities aimed at sharing good practices and developing the skills and conceptual understandings necessary to develop, evaluate and disseminate projects effectively;
- ensure that project developers who receive funding to support time release are able to do so, or receive equivalent release from other duties (for example administration).



## FOR ACADEMIC DEVELOPERS

- provide responsive support to project teams on issues such as evaluation and dissemination;
- ensure that formal courses on teaching and learning:
  - embed some innovative approaches so that teachers can participate in them as learners;
  - enable teachers to share good practices and innovations;
  - support teachers in developing student-focused understandings of teaching and learning necessary for engagement in teaching and learning improvement;
  - encourage scholarly approaches to teaching development and, where possible, the production of scholarship in teaching outcomes;
- facilitate the brokering of information about innovations across the university.

## FOR PROJECT DEVELOPERS

In addition to developing projects which effectively address the criteria and conditions described above, it is recommended that project developers:

- consider the range of possible methods that might be adopted for involving potential users from the beginning of a project, for example
  - collaborative development by a strategically selected group of partners;
  - consultation with potential users at various stages of the process, from initial project design to prototype evaluation, pilot testing and cascading to others;
  - involvement of potential users in needs analysis related to the intended project;
- provide support for adopters to engage in the learning necessary to adapt, implement and evaluate the project outcomes effectively, for example through
  - implementation guides accompanying the project;
  - provision of case studies and exemplars of implementation;
  - provision of support or training workshops or other events;
  - provision of consultancy support and services from the project team;
  - consultative and collaborative forms of development which enable potential adopters to learn and inform project development;
- consider the range of potential adopters of the project and use appropriate methods for engaging with them, such as through links with disciplinary or cross-disciplinary organisations.



# 1. BACKGROUND AND LITERATURE REVIEW

This project aims to improve understanding of the interacting systems of conditions which favour the dissemination, adoption, adaptation and implementation of innovations aimed at improving teaching and learning in higher education. The project takes the view that the adoption, adaptation and implementation of ideas, projects or processes in new contexts involve change within systems involving teachers, departments and institutions as a whole (Elton, 2003). This perspective is particularly important when the overall aim is not to achieve dissemination per se, but to improve teaching and learning. Dissemination which focuses on reporting information about a project, whether in traditional academic publications and conferences or other forms, is unlikely to bring about adaptation, implementation and continuation of project outcomes in new contexts (Gibbs, Holmes & Segal, 2002; Elton, 2003). A project or process which improved aspects of teaching and learning in one context will not necessarily do the same if adopted in a different context by teachers with different understandings of teaching and learning (see for example Freeman and McKenzie, 2002).

The project is intended to benefit a range of groups

- the Carrick Institute, by informing the design and operation of its teaching and learning improvement activities, including its granting scheme and mechanisms for the dissemination of innovations and good practices in teaching and learning;
- teachers who develop teaching and learning innovations which they intend to be useable by others;
- university leaders and policymakers who influence the institutional contexts in which innovations might be disseminated, adapted and implemented;
- students, if teaching projects and practices which improve learning become more widely used.

## INTRODUCTION TO THE LITERATURE REVIEW

Central to a review of the literature on the dissemination of project outcomes is the development of a framework for analysing the substantial body of literature that exists on dissemination of innovations in general, and in teaching and learning in higher education in particular. Although the project brief does not specifically highlight 'innovations' as the objects for dissemination, the 'project outcomes' that are referred to there are presumed to be, by and large, innovations in the sense that the project outcomes of interest to the Carrick Institute for Learning and Teaching in Higher Education will arise as a result of a major competitive grants scheme to, at least in part, realise the 'innovation in teaching and learning' goal of the Institute. It is our understanding that the Committee wishes to promote the 'dissemination, adoption, and implementation' of those project outcomes, and hence (as foreshadowed in our expression of interest), this review provides a discussion on the range of meanings of 'innovation', and a review of the literature on dissemination of project outcomes which are considered 'innovations' in higher education.

Thus this chapter begins with a review of the notion of innovation with particular attention to what is being developed, by whom, and for what purposes. Next, two aspects of dissemination are analysed. The first is the notion of dissemination as a distribution **activity** – 'a series of conscious actions, planned by persons and organizations and intended to make something known or to be sent to other persons or organizations' (Stokking, 1996, p. 269). This might include sending out information about the innovation to persons who might find it to be of interest or use. The second aspect of dissemination is referred to as an **outcome**, and this concept will be further elaborated below.

## WHAT CONSTITUTES AN INNOVATION?

The precise definition of what constitutes an innovation is often the cause of confusion, particularly when a granting program specifies that funding is for the purpose of 'innovative programs', without the benefit of inclusion of a definition of what counts as an innovation. In the absence of such guidance, applicants try to 'second-guess' what the committee might value, often framing bids in terms of a recent technology (such as the Internet), or a specific area deemed to be of particular interest to management and/or government (such as graduate attributes).

The predecessor of both the Australian Universities Teaching Committee (AUTC) and the Committee for University Teaching and Staff Development (CUTSD), the Committee for the Advancement of University Teaching (CAUT) for example, announced its first round of grants in 1992, a time at which there was significant interest in new technologies which made possible the educational use of sound, video and graphics on computers. The Chair of the Committee was reported<sup>1</sup> as saying that members of CAUT were 'embarrassed by the preponderance of high-tech applications'. For this reason, we believe it an opportune time to consider the various meanings of innovation in the literature, as the range of meanings of innovation may be of value in fostering discussion around the guidelines for future grants.

Common to the study of 'innovation' across discipline areas as diverse as Management, Education, Design and Economics, is the view that innovation is critical to the ongoing viability of organisations, be they business, government, education or industry. Innovation is seen as the means by which organisations are renewed, achieve growth, and remain competitive. In his foreword to Van de Ven et al.'s (1999) book *The Innovation Journey* for example, William E. Coyne, Senior Vice-President of 3M writes: 'successful innovation brings us joy and confidence and well-being. It generates long-term, sustainable growth'. In a similar vein, Janszen (2000) writes that 'innovation is the golden route to building and growing a prosperous company'.

Innovation is also seen as a renewal process, and necessary for survival, as noted by Tidd, Bessant and Pavitt (1997, p.12) 'unless organizations are prepared to renew their products and processes on a continuing basis their survival chances are seriously threatened'.

In higher education, the situation is not too different. The changing context in which higher education operates sees government questioning the international ranking of Australian higher education institutions and increasing the accountability requirements for all activities, at the same time as it decreases the level of funding it provides for these activities. With expectations of higher levels of research output and improved student learning outcomes, set against decreased input in terms of funding, it is clear that higher education must find new ways to go about its business, in teaching, in research and in community service. In terms of the former, the holy grail of teaching innovation has been to increase the quality of learning, the productivity of learning, while increasing access to learning.

One approach to improving the quality of learning was a program of competitive awards administered by CAUT. The committee intended that the successful projects 'lead to practical improvements in teaching by supporting outstanding innovation in teaching, learning and assessment, and by ensuring wide dissemination of project results' (CAUT, 1993b, p. v).

The first round of grants made available in 1993 made no mention of the precise meaning of 'innovation' in the guidelines to applicants. As noted above however, the committee was then surprised at the high number of grant submissions proposing to use Information and Communication Technologies (ICT), and it is interesting to note that CAUT went on to fund a high proportion of applications involving interactive multimedia – 66% in 1993 (Alexander & McKenzie, 1998, p.4). It was perhaps not surprising then, that the Guidelines for Applicants issued for the next round, did in fact specify innovations and incorporated a definition of what it considered to be an innovation (see below for further discussion of this).

Finally, this section would be incomplete without reference to the Latin origin of the word 'innovation', and almost every book on innovation includes reference to its roots from the Latin word 'novus' meaning 'new' and 'is derived into the verb 'in+novare' that covers the meaning 'to make something new'(Tidd et al.,

<sup>1</sup> Campus Review, Sep 2-8, 1993

1997). Thus it is perhaps not surprising that many of the definitions of innovation relate to the concept of newness, and this is discussed below in terms of precisely 'what' the innovation is, or 'what' is being developed.

## WHAT IS BEING DEVELOPED?

Examination of the question posed by this section of the review of 'what constitutes an innovation' necessitates some discussion of the variation that exists between categories of innovations that, once developed, are distributed within the community, and which then may, or may not, be adopted. As is the case for much of the content contained within this review, the literature on this issue is vast. For the purposes of this review however, only the most commonly cited distinctions are discussed, beginning with the notion of 'innovations' as something new, as processes or products, and resulting in incremental or radical change. The section also includes some discussion on the different contexts in which an innovation might be 'new'.

### Innovation as something new

The most common view of the concept of innovation is that of something 'new'.

In business, this view is exemplified in Janszen's (2000) definition of innovation as 'the commercialization of something new, which may be:

- a new technology;
- a new application in the form of a new product, service or process;
- a new market or market segment;
- a new organizational form or a new management approach' (p. 8).

This view is also evident in Government publications such as the UK Government's 1994 White Paper on Competitiveness and its companion innovation website<sup>2</sup> both of which refer to innovation as 'the successful exploitation of new ideas'.

Many authors however, acknowledge the fact that few ideas are truly 'new', rather they may be new to the context. This is raised by Tornatzky and Fleischer (1990) who view technological innovation as involving 'the situationally new development and introduction of knowledge-derived tools, artifacts, and devices by which people extend and interact with their environment.'

Others highlight innovation as a way of regenerating practice, for example Dempster and Deepwell (2002), who refer to innovation as involving 'a shift away from traditional practices to embrace new approaches'.

Within the description of innovation as something new, one might well ask 'new to what or whom?'

### To whom or what is the innovation 'new'?

One group of definitions focuses on the degree to which the idea is new to the individual involved. For example Potgieter (2004), refers to innovation as 'an idea, practice, object or combination of these that is perceived as new by staff' (p. 271). Similarly, Tornatzky and Fleischer (1990) write that 'we will generally consider innovation to be a change of scope that is significant at least to the person or organisation doing the innovating'.

Another group of authors refer to a range of groupings of people to whom the innovation is new. The most widely cited is the work of Olson et al. (1995), who, (citing the original work of Booz, Alen and Hamilton, 1982), defines four groups to which an innovation is new:

1. new-to-the-world;
2. new to the marketplace but not to the origin;

<sup>2</sup> <http://www.innovation.gov.uk> 18.3.05

3. me-too products (new to the organisation but not to the marketplace);
4. product modifications.

Others have built on this taxonomy including the Tasmanian Government Innovations Program which includes in its *2005 Guide for Potential Applicants*<sup>3</sup>, six categories of innovative products. The document outlines innovations as being:

1. new to the world;
2. new to Australia;
3. new to the firm;
4. improvements and revisions to existing lines;
5. repositioning;
6. cost reductions (described as being 'the least innovative of all categories').

In CAUT's second version of Guidelines for Applicants (CAUT, 1993a, p. 6) a similar approach is used in terms of the projects which are eligible for funding. These guidelines stipulate that

'the teaching innovation will be either new in itself or a new application of an existing approach to a different discipline or to some kind of problem arising from teaching, which will:  
lead to practical improvements in teaching, learning and/or assessment within a discipline or more generally;  
integrate successfully into the total learning process for the relevant course of study;  
address possible obstacles to implementation; and  
to the best of the applicant's knowledge, not duplicate work undertaken elsewhere.

What is missing from the above statement however, is any reference to the possibility of funding for innovations which, to use the words quoted immediately above, constitute 'improvements or revisions to existing practices'. The fact that this was not perceived to constitute an innovation may have contributed to the current phenomenon, in which academics are more likely to develop something from scratch than to use resources developed elsewhere, simply because there is a lack of opportunity to gain the funding often needed to make the revisions required for use in a different context. Rather, the focus has been on the development of innovations which are 'new'.

Just as the 'innovate or die' mantra of the commercial world that has characterised the last decade is being questioned in the literature, so too might higher education benefit from such a debate. The reliance on expensively produced 'innovations' as the optimal means by which organisations can best solve their problems is being subjected to some scrutiny, given the low success rate of many innovations (which some estimates put at only around 1 in 50 product innovations). Rather, the concept of 'renovation' instead of innovation has been promoted as a more cost-effective way for organisations to move forward. So too might higher education investigate the cost-effectiveness of this approach involving 'improvements or revisions to existing practices', but with the benefit of being able to base these improvements on the considerable evidence about good practice that already exists in the literature, but is often not implemented in practice.

## The nature of innovations

As noted earlier, what seems to lie at the core of confusion about what constitutes an innovation in higher education, is the concept of innovation as a product or process that is, of itself 'new'.

In this section we consider some of the dimensions of the innovations themselves, beginning with consideration of what the innovation or change is.

### Product versus process innovations

The description of innovations as being either 'products' or 'processes' has become increasingly common in the literature. Tornatzky and Fleischer (1990, p.20) for example, define 'product' innovations as 'those which are ends in themselves' and 'process' innovations as 'those adopted as instrumental to

<sup>3</sup> <http://www.development.tas.gov.au/InfoPotentialApplicants.pdf> 18.3.05

some other end'. Tidd et al (1997) describe 'product' innovations as 'the things which an organization offers' and 'process' innovations as 'change in the ways in which [products] are created and delivered'.

Typical teaching and learning 'product' innovations might include CD-ROMs or websites containing multimedia databases of subject resources, simulated laboratory exercises, databases of multiple choice questions, and 'trigger' videos. Typical 'process' teaching and learning innovations might include online role-play simulations, the use of problem-based learning, peer-assessment and criterion-based assessment.

This distinction is important for discussion later in this report in terms of whether different types of innovations are more or less likely to be taken up and more widely used than others, with some of the literature suggesting that innovations that are difficult to change and adapt (such as many product innovations) may not be as widely disseminated as others.

The extent to which a product or process must change in order for it to be considered an 'innovation' is also relevant to this review.

### Radical versus incremental innovation

This work originated with the notion of 'routine' versus 'radical' innovation first proposed by Nord and Tucker (1987). They distinguished routine innovation as 'the process of introducing 'something' that can be implemented with only minor adaptations of existing organizational routines and that fits within the existing norms and values of organisation members' from radical innovation, which is defined as 'the process of introducing something that is new to the organization and that requires the development of completely new routines, usually with modifications in the normative beliefs and value systems of organization members' (p. 41).

Based on this work, more recent authors (Tidd et al., 1997; Tornatzky & Fleischer, 1990) have labeled these different approaches as 'incremental' versus 'radical', the former indicating change of a minor nature, while the latter is intended to convey significant change which transforms practice. Other similar labels are **substitution** - innovation which occurs in small jumps (increments) and **transformation** – dramatic jumps (Westera, 2004).

The question of whether incremental or radical changes/innovations are more, or less, likely to result in widespread dissemination and better outcomes is highly contested. On the one hand, proponents of some process innovations such as continuous improvement (usually as part of a Quality Cycle) would argue that incremental changes achieved over a number of cycles of planning, doing, evaluating and improving have long lasting consequences.

Westera (2004) claims that in education the 'incrementalists outnumber the transformationalists by far' (p. 509), since they are a group comprised largely of teachers who can continue to build on previous practices. However, the author acknowledges that those innovations rarely achieve significant structural change.

The critics of incremental change however, believe that it is not possible to achieve the major changes often needed, by making small changes to existing products/ processes. Seymour Papert is one such critic, saying that 'One could not move from a stagecoach to a jumbo jet by making a series of small improvements' (Papert, 1997). Similarly, Christensen (1997), in his well known book about 'disruptive' technologies, writes that many organisations are actually weakened because they are so focused on listening to customer feedback and making incremental changes to their products and processes, that they fail to see the 'disruptive' or radical innovations emerging.

# WHAT IS DISSEMINATION?

As is the case with the term 'innovation', there are multiple ways of understanding precisely what constitutes 'dissemination' in general, and in higher education in particular. There are also difficulties associated with the language used to describe dissemination, as other terms may also be used to describe this phenomenon, some of which have only subtle differences in meaning, while others have quite divergent meanings. For this reason, a representative range of meanings is discussed below.

## THE LANGUAGE OF DISSEMINATION

Although often used synonymously, many authors make a clear distinction between the terms 'distribution' and 'dissemination'. In defining the former for example, Stokking (1996, p. 269) distinguishes three kinds of **distribution**, all which involve the dissemination of information. This 'distribution' can be:

- an **activity** – 'a series of conscious actions, planned by persons and organizations and intended to make something known or to be sent to other persons or organizations';
- a **process** – 'the fact that, either as a result of consciously planned actions or unplanned actions, ideas and materials are transferred between persons' resulting in the ideas and materials becoming known to more people;
- a **result** – a snapshot, 'the degree to which the ideas and materials are known to and possessed by individuals at a given moment in time'.

With these distinctions in mind, the range of **distribution activities** discussed in the literature is described separately below. Similarly, distribution processes that have been uncovered in the case studies are discussed later in the report in chapter 3.

A second term that is also sometimes used synonymously with dissemination is **diffusion**. Some authors, such as Stokking, define this as a term used to denote the collective 'processes of free distribution' which, once they become more directed, become known as **dissemination**. On the other hand Rogers (1995), in his seminal work, defines diffusion as 'the process by which an innovation is communicated through certain channels over time among members of a social system' (p. 5). He makes no distinction between planned or unplanned distribution. Thus he and others, (Tidd et al., 1997) for example, use the term diffusion to refer to the same activities known as dissemination to others.

A further area of difference in meaning relates to the ultimate purpose of dissemination. In a study of institutional approaches to funding and disseminating of innovation projects, supported under the UK's Teaching Quality Enhancement Fund, Gibbs, Holmes, and Segal (2002) distinguished different categories of dissemination, involving different strategies and leading to different outcomes. These categories appear in a very similar form in the HEFCE guidelines for FDTL phase 3 projects (HEFCE, 1999).

**Dissemination for awareness** typically involves one-way informational processes such as presentations or project case studies. On its own, providing information about the project is 'unlikely to succeed in spreading and embedding new practices' (p. 14), and so needs to be complemented by other strategies. **Dissemination for understanding** typically requires interaction with others who have developed and used the innovation, for example through participating in an interactive workshop or visiting the innovator.

**Dissemination for use** involves adaptation and implementation, resulting in change in practice. It requires more complex mechanisms, such as involvement of innovators and potential adopters in ongoing networks and communities of practice, combined with funding mechanisms and recognition and rewards which encourage the spread of innovations rather than only their development. Professional development support and adjustments to workload allocations may also be required depending on the nature of the innovation.

Focusing on dissemination in higher education in general, Elton (2003) attributes the failure of the dissemination of teaching innovations as lying 'in the uni-directional approach used and the reliance on



dissemination through education, both of which are in conflict with well established change theory'. He describes the current process of dissemination as relying on processes which are essentially a one-way transmission of the innovation to the adopters using websites, conference papers, workshops etc. In his case study approach, he highlights a number of successful dissemination projects including:

- dissemination of the use of project work in the UK (which he attributes to the innovation fitting with the research ethos of academia);
- increased use of Problem Based Learning (originating with dissatisfaction with student learning outcomes, consistency with the practices of the profession and successful evangelism);
- the success of the Enterprise in Higher Education Initiative as an agent of change (attributed to their particular approaches to project development, funding and ongoing interaction between the funding body and the institutions and the way in which they actively involved both institutions and departments).

## INNOVATION DISSEMINATION AS CHANGE

In one group of theories relating to dissemination, Elton (2003) Fullan and others talk about the innovation dissemination process as change. This view appears to regard dissemination as the operationalisation of inventions – taking something that has been invented, and creating the conditions which maximize the likelihood of its adoption within a particular context. In her '*Desiderata for successful introduction of change*', Moses (1988) describes the particular conditions required within higher education:

1. *The innovation needs to be compatible with institutional traditions and personal values.* It should be superior to ideas and practices it supersedes, its adoption should be rewarding and advantageous; its chances of adoption are increased if its complexity is low, if it can be divided into stages, and the effects are observable.
2. *Someone has to take initiative and responsibility for introducing the change.* The innovator needs the support of the power elite and the trust of the members of the organisation where change is to be introduced; if change in personal values and attitudes is the target for change, the change agent has to serve as a role model.
3. *Members of the system where the change is to be introduced need to be informed of the intended change and its effects on their life and work.* They need to have influence on the development and some control over its use. They need to become aware of the innovation's advantages to them.
4. *The organisation where change is to be introduced should be supportive and lend its authority or power to the change and provide adequate power, financial, human and technical resources.*
5. *If the external environment is exerting pressure on the organisation or parts of it, those pressures need to be considered.* (p. 126)

In more recent work on successful change processes, Scott (1999), provides a series of what he refers to as 'checkpoints' that one should be aware of in understanding the complexity of the change process which include:

- **a wide range of sources and influences**, some with more or less influence than others;
- **different types of change** – in terms of the learning programs and in the milieu in which those programs are delivered, adopted and supported;
- **changes in scope, size and condition** of the educational change – some of which are large, others small, some are localized, others are system-wide;
- **motivation: the human dimension of change** – the key influences on an individual's motivation to engage with change may be individual (job security, stage of career etc), relate to the way the change process is handled, and be influenced by the local operating milieu;
- **evaluation** – how an individual perceives the worth of what is being proposed.

## INNOVATION DISSEMINATION AS A SYSTEM

Others take a more systematic view of innovation, such as Van de Ven et al (1999, p. 6-7) who define an 'innovation journey' as one in which:

*new ideas* that are developed and implemented to achieve desired *outcomes* by *people* who engage in *transactions* (relationships) with others in changing institutional and organizational *contexts*. (Italics added by authors).

Their detailed seventeen year study of how and why innovations develop over time highlights the relationship between the new ideas, the outcomes they achieve, the critical role of people and their relationships, all within a particular context.

Another recent approach to understanding dissemination processes within a systems framework uses an **ecological metaphor**, where the innovation is viewed as an invading, exotic species, academics as members of a keystone species, and universities as ecosystems, all of which interact within particular ecological conditions to result in successful or unsuccessful invasion of the exotic species (the innovation). In their study of the use of computers in schools using this metaphorical framework, Zhao and Frank (2003) studied the teacher's niche in the ecosystem, the teacher-ecosystem interaction, teacher-computer disposition, along with opportunities for mutual adaptation, thus illuminating the complex interactions, activities, processes and practices in operation which serve to inhibit or support the adoption and reproduction of the innovation.

## SCALING UP INNOVATIONS

Finally, another way of understanding dissemination beyond the usual quantitative descriptions of use, is contained within Coburn's (2003) four levels of 'scaling up' an innovation. These levels relate to:

- **depth:** the innovation has resulted in change in the classroom that 'goes beyond surface structures or procedures such as changes in materials...to alter teacher's beliefs ... and pedagogical principles' (p. 4);
- **sustainability:** the change, as described above is sustained over time in the original and subsequent contexts;
- **spread:** the innovation spreads to a greater number of contexts; and
- **shift in reform ownership:** 'ownership' of the innovation shifts from the original innovator to the adopter.

This framework presents a useful way of viewing the fate of innovations some time after their original implementation, an area which has so far been neglected in the literature.

## WHAT INNOVATIONS GET DEVELOPED AND DISSEMINATED?

As noted earlier, the first version of the guidelines for CAUT did not include a definition of 'innovation' and the committee received a very high proportion of applications involving ICT. In its second version of the guidelines, the definition of innovation reported earlier was included, however that appears to have done little to stem the tide of ICT applications, and CAUT went on to fund a significant proportion of grants involving ICT (79%) in the next round of grants in 1995.

Probably more important than the definitions of innovation found in the literature, is an understanding of what academics view as innovation. An analysis of the focus of projects funded by CAUT (1993-1996) conducted by Evans et al. (1999) revealed an interesting mixture of project foci and project delivery mechanisms. The former included practical work, self-directed work, project, case and problem based, literacy, assessment and peer collaborative learning, while the latter included distance education and ICT. There was also evidence of a small number of significant shifts in focus over those years, as summarized in Table 1.

The table includes only those categories of grants which increased or decreased over the years 1993-1996. The decrease in percentage of grants awarded for projects related to assessment is of particular interest, given that this is an area that is consistently highlighted as the area in which there is the greatest need for improvement in practice.

**Table 1: Selected CAUT funded projects (percentages) adapted from Evans et al (1999)**

Project	1993	1994	1995	1996
<i>Increased % of projects funded</i>				
Educational Development	12.59	25.19	31.62	48.6
Practical Work	6.82	8.15	6.84	18.69
Project, case & problem-based	12.5	14.81	23.08	15.89
<i>Decreased % of projects funded</i>				
Assessment	19.32	11.11	5.13	14.02

Some categories remained reasonably constant over this period including 'large group teaching' where no projects were funded in 1993, and less than 1% in 1996, distance education (11.36% in 1993, 13.08% in 1996), literacy and remedial (4.55% in 1993, 5.61% in 1996), peer collaborative learning (3.41% in 1993, 6.54% in 1996) and self-directed work (21.59% in 1993, 20.56% in 1996).

In a major UK study which reviewed the 'impact of innovations in teaching and learning', Hannan & Silver (2000) reviewed the following innovations of individuals or small groups of academics, which resulted from funding from the Partnership Trust during the period 1988-1996:

- group or team work;
- 'real world projects';
- simulation;
- presentations;
- skills development (many generic or subject-specific);
- seminars and lectures;
- assessment;
- other.

It should be noted that, on the face of the categories of description, none of the 'innovations' mentioned above could be considered entirely 'new-to-the-world', but rather, a new application of a previous innovation.

## WHO ORIGINATES AND DISSEMINATES INNOVATIONS AND WHY?

Just as a range of people and groups is involved in innovation and dissemination, so too there is an equally wide range of reasons for their involvement. This section explores these issues.

Hannan and Silver (2000) put forward the following 'typology of innovations', which provides a link between the reasons behind undertaking an innovation and those involved in its development:

- **individual and group innovations** – direct response to student needs;
- **disciplinary initiatives** – sponsored by subject associations or professional bodies;
- **innovations responding to the educational media;**
- **curriculum-prompted innovations** – meet the needs of new structures, and in response to changing content of fields of study;

- **institutional initiatives** – policy decisions of many kinds, staff development processes, work-based learning;
- **systemic initiatives** – government creation of new and different kinds of institutions, national schemes to extend use of ICT etc;
- **systemic by-products** – resulting from system wide policies eg Teaching Quality Assessment.

Next we examine the available literature relating to these groups.

## INDIVIDUALS

In this section we discuss the characteristics of the individuals who disseminate innovations, beginning with the characteristics of the original innovators, since they are the group most likely to have ultimate responsibility for dissemination. We also explore their experience of dissemination, including the associated difficulties.

In the general literature, the most widely cited work is that of Rogers (1995), who describes five categories of adopters (discussed in more detail below). One of these categories is the 'innovator', comprising approximately 2.5% of any population according to Rogers. He describes the characteristics of innovators as venturesome, being interested in new ideas, and having a wide circle and variety of social networks. They are said to be able to cope with high degrees of uncertainty, the occasional setback, and are said to have a desire for 'the rash, the daring, and the risky' (p. 264).

The characteristics of innovators in teaching and learning in higher education have been described by Hannan and Silver (2000) as:

- those who describe themselves as being 'at home with change' or 'willing to take risks' (p. 26);
- academics for whom particular teaching situations are not working, and in need of change;
- academics with previous successful experience of innovation.

In his well known work, Bates (2000) has described the individuals who work on innovations in higher education (particularly related to the use of ICT) as '*lone rangers*', characterising them as working independently to experiment with innovative uses of technologies, but often failing to produce the end product, or not succeeding in having it embedded in the subject or course. This general failure of innovations developed by individuals to be embedded in teaching and learning is a common theme in the literature. For example, Lueddeke (1999) says of individuals, 'their track record' for embedding serious educational reforms remains rather weak' (p. 240), while noting that teaching has continued much as it always has with lectures as the dominant teaching method.

Since most innovations have originated from individuals, the reasons why their work is or is not adopted is worthy of some examination.

Studies of the dissemination experiences of innovators have pointed to a range of both positive and negative responses to their work. In terms of support, Hannan and Silvers's (2000) major study reported that innovators said their colleagues' attitudes toward the innovation were positive when:

- they were able to read positive student evaluations, subject reviews and so on which persuaded them of the innovation's effectiveness;
- they witnessed positive student reaction and/or enthusiasm.

The innovators also encountered opposition from colleagues, which mostly took the form of:

- a perception of them (the innovators) as being eccentric, 'odd-balls', and/or a bit 'lightweight';
- being told the project would collapse around their ears;
- perceptions about lack of resources for the implementation, such as lack of appropriate skills;
- concerns about adopters being made redundant, fear of ownership being taken away, loss of face-to-face contact, and the risk associated with adopting the innovations;

- concern for students in the sense that they would be overworked, that they would not be assessed fairly, and that the learning experience would be too challenging and not theoretical enough.

Hannan and Silver (2000) also found an almost universal perception of the career hazard associated with a focus on teaching and learning initiatives to the exclusion of research.

In their evaluation of the CUTSD initiative, Schofield and Olson (2000) note that in terms of individual grant holders, 'almost all reported attempting some kind of dissemination (usually through the well understood academic mechanisms of publishing, conference papers, etc), a number acknowledged that it was difficult to get their colleagues involved in adopting grant outcomes, and that dissemination was generally more difficult and time consuming than they had expected' (p.25).

Schofield and Olson (2000) also noted the difficulty of gaining departmental commitment to an individual's innovation 'where research had a high priority and innovations in teaching were, in practice, the concern of only a minority of staff' (p. 29). They go on to say that the commitment was highest however, 'when there was active support by the head of department; where the subject of the grant was felt to be relevant to important departmental needs; and where a culture existed with strong commitment to enhancing quality'.

In terms of the ways in which academics make decisions about the use of particular teaching strategies (and hence innovations), there is a significant gap in the literature. What literature there is, typically reports on 'factors' influencing the decision to adopt, rather than the often complex processes associated with this decision. Typical of this kind of study is Pajo's (2000) report of his survey of responses from 250 academics, in which he found the following to be influential factors in the decision to adopt an innovation (in this case web-based teaching):

- personal innovativeness;
- prior experience with computers;
- intrinsic motivation based on perceptions of anticipated enjoyment.

## DEPARTMENTS

Although not as prevalent as the literature on dissemination of innovations by individuals or small groups of individuals, there are some exemplars of innovations being developed and disseminated as a departmental activity or 'whole of course' activity.

One such example is the Faculty of Law at Queensland University of Technology (QUT) which, with funding from two internal Large Grants, has made significant progress in dissemination of an innovation within its undergraduate curriculum (Kift, 2002).

The innovation itself (embedding generic and discipline-specific graduate capabilities in the curriculum) is not new to higher education, but was new to the Faculty at QUT as it would be to many Faculties of Law.

Through a collaborative and incremental approach to the project, all units in the undergraduate curriculum incorporated graduate attributes by 2002, a change which affected some 1400 students. There were resulting benefits to students, staff, the Faculty, and the University.

Kift describes the range of influences on the process of identifying and then embedding the graduate attributes in the curriculum as:

- availability of scholarly resources and examples to assist the project team;
- the 'significant paradigm shift' required within the faculty to effect such significant change in the teaching and learning environment;
- the leadership and commitment to the project made visible to academics through appropriate workload allocations, adequate resource allocation and staff development opportunities;
- a 'whole of university commitment' to the innovation itself;

- availability of resources for staff use.

This innovation, now embedded across an entire curriculum, would be difficult to abandon were the original project team to leave the university, or were there to be minor changes to the content of the curriculum. Rather, it would in fact take a significant effort on the part of the faculty to abandon this innovation.

In terms of CUTSD's organisational grants, Schofield and Olson (2000) reported mixed outcomes in terms of dissemination, although it should be noted that these grants were still relatively new at the time of their evaluation. In those institutions reporting a greater impact of the grants, the authors found evidence that they had: integrated the grants with the institution's teaching and learning priorities; forged strong links between the grant holders and academic development units; and created a supportive climate. However, they also encountered a number of organisational grantees who appeared to be without institutional support.

One of the distinguishing features of the successful versus unsuccessful grants in terms of impact, appeared to be the way in which the organizational grant was originally conceived. For those perceived to be less successful, the projects appeared indistinguishable from individual grants in all but the size of funding, since they too were 'primarily concerned with developing teaching materials within a single disciplinary context' (op cit., p. 34).

## UNIVERSITIES

### The Pew Learning and Teaching Program

In an interesting and apparently successful approach to innovation, the Pew Grant Program in Course Redesign (with support from the Pew Charitable Trusts in the US), funded 30 projects for a total of \$US6 million in a program targeted towards encouraging colleges and universities to 'redesign their approaches to instruction using technology to achieve cost savings as well as quality enhancements' (Twigg, 1999). The grant program targeted large enrolment, introductory courses in an effort to achieve maximum impact as well as the highest possible return on investment.

There was a three stage process in which intending grantees (universities) were required to progress through a three-stage selection process to: demonstrate their readiness to participate in the program; identify a suitable course for redesign; and develop a project plan. The actual grant process is discussed elsewhere in this report, but it is of interest to note the success of the Program in achieving significantly enhanced outcomes for students, as well as dissemination of the project ideas beyond their origin.

### The IT Alignment Program at RMIT

In an ambitious project, RMIT University sought to align its approach to the use of information technology in teaching and learning to its Teaching and Learning Strategy in a project known as the Information Technology Alignment Program (ITAP), (McNaught, Kenny, Kennedy, & Lord, 1999). The project was allocated a significant budget of AUD\$50 million to include funding for the IT infrastructure, a Learning Management System, Student Management System, and staff development program over the three years 1998-2001. This funding was allocated from two sources: central Strategic Initiative Funds and as an agreed percentage of faculty budgets quarantined for approved ITAP projects (Lines, 2000). In a specific target, the RMIT Teaching and Learning Strategy (1998-2000) required all courses to be refurbished to include flexibly delivered courseware within five years, and 60% by 2000.

The university-wide approach to innovation involved multiple strategies including:

- a requirement for all academic staff to develop workplans for their own professional development (Kenny & McNaught, 2000);
- establishment of a web-based Clearinghouse to record projects and provide resources for staff (Lines, 2000);
- implementation of a Distributed Learning System (Kenny, 2002);

- a Learning Technology Mentor Program (Gray & McNaught, 2001);
- development of an Academic Management System (Kenny & McNaught, 2000).

There have been some small-scale evaluations of each of the components of this program, but there is not as yet a comprehensive, holistic evaluation of the effectiveness of this whole of university approach. The Technology Mentor System was said to show some promise when it was first initiated as a 'grass roots' dissemination strategy, but was not sustained because the Heads of School as key stakeholders did not have a sense of ownership and commitment regarding the scheme.

There has been much discussion about the failure of the project to meet the initial ambitious goals, mostly because of the failed implementation of the Academic Management System, and the subsequent financial losses incurred because of the inability to invoice students.

More recently the University has invested considerable effort to simplify organisational structure and processes to reduce the risks associated with implementing a new system. The downside of this necessary restructuring is reported as being that it has distracted staff effort and energy from the initial vision for educational technology at RMIT.

## HOW ARE INNOVATIONS DISSEMINATED?

There is some discussion in the literature about the optimal climate in which change within higher education is more likely to occur. Levine (1980) for example, concludes that 'the likelihood of change is enhanced when there is a crisis in the environment, when people have a shared interest in change, when there is a power imbalance in the environment, when the environment has experienced structural changes, and finally, when it is consistent with *zeitgeist* or spirit of the times' (p. 219).

That crisis, according to Slowey (1995), is most likely to be related to lack of resources, with decreasing faculty budgets and new funding mechanisms as two examples of such triggers in higher education.

The next section of this review begins with a discussion on the ways in which academics become aware of innovations, described as **distribution activities** (after Stokking, 1996), and then reports on the dissemination literature using a framework based on different theoretical frameworks surrounding dissemination.

### DISTRIBUTION ACTIVITIES

The typical activities that are undertaken (usually by the innovators) in seeking to ensure their innovations become known to potential adopters are discussed below.

#### Websites

There was little evidence of the value of websites in disseminating innovations found in the literature, except for a number of comments about the one-way nature of websites, and the fact that they are not seen to be of very much value in disseminating ideas.

In one of few papers however, Collins and Lynch (2001) report on their study of the dissemination of ideas among university teachers of ICT. At a mini-conference designed to explore participants' perceptions of dissemination of teaching approaches, participants described 'passive dissemination' activities as involving the 'direct transfer of information with no requirement on the part of the receiver to engage with the material or its sender'. At the mini-conference, participants identified websites, journals, conferences, discussion board and mailing lists as passive communication channels.

## Conferences, external workshops, symposia

There are mixed views about the effectiveness of these face-to-face gatherings to distribute information about innovations.

As part of a consortium project across 15 UK universities which aimed to disseminate effective teaching, learning and assessment practices in mathematics (Burton & Haines, 1997), invitations were sent to some 700 key practitioners in mathematics education to attend regional workshops and a national symposium at little or no cost. The authors report that 'only 139 academic staff from 49 different universities attended' (p. 282) leading them to conclude that 'members of mathematics departments do not appear to perceive innovation as necessary or deserving of their attention'. Some of those who did attend were critical of the approach used in the workshops which sought to model the very approach to teaching being proposed (including both medium and message).

One group of theories that would support this kind of distribution mechanism is based around cultural and social approaches to dissemination. One particularly well-known example is that of Granovetter (1973) whose 'strength of weak ties theory' claims that a tightly-knit social group is unlikely to adopt an innovation because the individuals are too similar to each other, and do not encounter new ideas and practices. The dissemination of new ideas, practices and other innovations is said however, to be greater within a social group in which at least one member has external links or ties however 'weak' they might be. This facilitates the introduction of new ideas and processes to the group for consideration.

## Papers and other documentation

Although once again, there is very little mention of the effectiveness of conference papers and other documentation in making academics aware of innovations, there was evidence of the effectiveness of these in the case studies, and this will be discussed later in the report.

## In-house forums

Participants in the mini-forum described above by Collins and Lynch (2001), reported that they were more likely to find out useful information from in-house forums, believing they 'learnt more from people they know and with whom they have common interests.'

## Clearinghouses and databases

Since this issue will be dealt with in some detail in the recently announced commissioned project for the Carrick Institute, only brief mention will be made here.

In their EIP study McNaught et al. (2000, p.175) reported the general response of the 81 participants in the case studies that 'existing databases were not particularly helpful in promoting or assisting those looking to adopt or make better use of computer-facilitated learning.

The authors reported that several of those interviewed indicated that they 'would not use a clearinghouse deliberately'. The main reason appeared to be related to the technical difficulty experienced by interviewees in relation to the CAUT Clearinghouses, specifically the difficulty associated with submitting materials to them, as well as in their retrieval.

Other reasons given for low usage related to concerns about:

- losing competitive advantage through sharing valuable resources;
- the use of intellectual property by others;
- the lack of customisability of materials in databases;
- the expense involved in purchasing materials.

Despite the concerns highlighted by the study above, the authors went on to recommend the development of a 'unified, Australia-wide collaborative framework for interoperable online databases' (p.185). The



framework was believed to have potential for wider applicability than computer-facilitated learning alone. Included in the recommendations was a requirement for the database to include reviews of the materials contained within them.

A subsequent EIP study by Taylor and Richardson (2001) entitled 'Validating Scholarship in University Teaching', arose in part as a way of addressing concerns that are relevant to this study. One was 'a need for the collaboration and dissemination of knowledge regarding the design, nature and availability of ICT-based resources', and the other, 'a need for ICT-based resource developers to be recognized and rewarded for their achievements' (p.2). Among the aims of the overall project that are relevant to this study were:

- to provide a basis for encouraging staff to engage in the adaptation and creation of ICT-based teaching resources;
- to encourage the use of existing resources through provision of readily accessible and credible information on their features and value;
- to contribute to the improved use of existing resources through a process of adaptation and re-use by developing strategies for sharing the outcomes of those reviews, and making resources more readily discoverable by use of metadata standards to describe them. (p. 8)

In their report, the authors put forward detailed recommendations for a system of peer review of ICT-based teaching resources, including details regarding control of the review process, support for creators of resources, support for reviewers, access to resources and accompanying documentation, publication of information about resources that have been reviewed, conduct of the review process and provision of feedback to the creator/s of the resource. This EIP report marked completion of stage 1 of the overall project, and was published early in 2001.

Stage 2 of the project was to have been a trial of the proposed scheme in the disciplines of business management, engineering and nursing across three universities, with stage 3 to be a more general roll-out.

Although there had been strong support from the academic community for control of the peer review process by journal editors, there was a general lack of further interest in progressing the work on behalf of the journals, and thus stage 2 of the project was undertaken as a pilot with the ASCILITE Awards process. In 2005, a local peer review project involving Griffith University, QUT, and the University of Queensland, recommended further consideration of such a project on a broader scale. Stage 3 of the Peer Review project will comprise small and large scale trials during 2006 at Griffith University.

In summary, attempts around the world to encourage academics to contribute to, and make use of, databases of learning resources have so far met with more difficulties than solutions. There appears to be a lack of interest in the use of databases of resources because of cost, lack of facility to make changes to the resources, combined with a lack of evidence of the effectiveness of the resources, all of which have been exacerbated by:

- failure to implement a system of peer-review to date;
- inadequacy of evaluations of effectiveness of resources;
- paucity of academics who are able to articulate a deep, scholarly understanding of what they have produced, and why (Zimitat, 2005).

In one of few studies of how academics do, in fact, engage with the literature on teaching and learning, Lueddecke (2003), in his investigation of the relationship between the characteristics of academics and their preferences for scholarship of teaching, found that the academics' discipline and approach to teaching had a strong influence on their approaches to the scholarship of teaching. Those holding a conceptual change concept of teaching nominated a preference for the following approaches to scholarship:

- interest in seminars and workshops;
- programmes recognizing outstanding teacher-scholars;
- engaging students in research activity;

- adopting inquiry approaches in classroom situations (p. 220).

Further, Luedekke reported that:

- those with teaching qualifications appear to be more open to investigating alternative curriculum approaches;
- the higher the conceptual change/ student focus teaching orientation, the more interest in seminars on research methods, in programmes recognising outstanding teachers, and ways of engaging students in research activity;
- significantly more academics with the conceptual change/ student focus teaching orientation were interested in adopting interactive approaches in classroom situations (p. 221).

Despite the plethora of dissemination activities described above, there is a fairly widespread belief that teaching and learning in higher education is very difficult to change, and is still largely characterized by the lecture and three hour exam format. Some, Lueddeke (2003) for example, believe this is because academics hold on very firmly to their existing beliefs about teaching and learning, despite the existence of evidence of the effectiveness of other, more innovative approaches.

## DISTRIBUTION OUTCOMES

The outcome of the **distribution** of innovations is varied, and, as noted above, non-adoption is one of the most common outcomes.

### Non-adoption of innovations

Although there are often very good reasons for decisions **not** to adopt innovations, the existence of a pro-innovation bias in the literature has been acknowledged by many. Rogers (1995), for example, notes the implicit assumptions in much of the dissemination literature and research that 'innovations should be adopted' (rather than rejected) and that they 'should be diffused rapidly'. This he says, has resulted in researchers' 'ignoring the study of ignorance about innovations, overlooking re-invention, and failing to study antidiffusion programs designed to prevent the diffusion of 'bad innovations' (p. 100).

In fact those who make a decision (rational or otherwise) not to adopt are often labeled pejoratively as 'resisting' the innovations, and Rogers himself has labeled the very late adopters as 'laggards'. Bauer (1997) defines **resistance** in the context of adoption of innovations as 'an activity which is unexpected in both content and form by the innovators', noting that it is seen as a 'diversion from the "one best way' (p. 13). Given the earlier discussions of the poor quality of evaluations conducted on many of the innovations in teaching and learning, it is perhaps not surprising that academics do not choose to adopt, since it is often far from evident that the particular innovation is the 'one best way'.

In many contexts, the decision not to adopt may be the optimal one for the academics concerned. In their major study, Hannan and Silver (2000) noted the potential for the adoption of innovations to become 'a hearse' (p.26) rather than the bandwagon commonly described. They note the potential career risk to academics through what they term the 'punitive effects' of adopting innovations as:

- severely increased workloads;
- initial undermining of confidence and competence; and
- unpopularity with colleagues who 'suspect motivations, resent any favourable allocation of resources, and feel threatened by the ideas' (Hannan & Silver 2000).

Further, that risk is said to increase where adoption of the innovation: 'departs from the specialized subject structure on which promotion is based; embodies values that are sufficiently innovatory to threaten the establishment; and 'involves the teacher extensively with pupils of limited ability'.

In a similar vein, at the end of her article on the challenges faced by academics as they adopt 'distance education' approaches, Bower (2001) writes:

Faculty are not recalcitrant Luddites. Many have simply been disillusioned by previous technologies touted as innovations that would alter the course of education. Faculty are exhibiting healthy skepticism when they resist the call to jump on the latest educational bandwagon before assessing how this new technology will help students learn.

Finally, Westera (2004) notes 'the simple notion that innovation implies progress and thus leads to a better world, unmistakably reflects the values of our modern society' (p. 507). Those values he notes at present as including capitalism, materialism, competition and scientific positivism.

## Adoption of innovations

The literature on dissemination of innovations is extensive, and a vast range of models for describing how innovations are disseminated exist. To review all of these models would involve several years of work, and hence, for the purposes of this report, only those that are most commonly drawn upon in the higher education literature are included.

Some of these models focus attention on the attributes of the innovation itself, with the implication that if developers can just get these right, then the innovation will be adopted. Others focus on a detailed description of a linear stage that potential adopters go through in order to reach a decision. And finally, some more recent work describes systems approaches to understanding the spread of innovations.

In another area of the literature, Surrey (1997) refers to **systemic change** and **product utilization** theories of dissemination of ICT, where the former focuses on institutional changes afforded through the use of the technologies, and the second on the adoption and use of specific educational products. Each of these is further divided into two groups – a focus on the **developer** (deterministic) and the other on the **adopter** (instrumentalist). The former view technological change as an inevitable leap forward although some take a dystopian view of the outcomes of this, while others have an unmistakably utopian view.

### Focus on the innovation itself

Of significant interest to dissemination researchers are the characteristics of the innovations. Rogers (1995) for example, believes that five characteristics (as perceived by the individual adopter) account for the very different adoption rates of innovations:

1. **relative advantage** – the degree to which an individual perceives convenience, cost and social prestige advantages as superior to what is currently being used;
2. **compatibility** – the consistency of the innovation with the values and norms with those within the target context;
3. **complexity** – the perceived degree of difficulty of use;
4. **trialability** – the ease with which a potential adopter may experiment with the innovation;
5. **observability** – the degree to which potential adopters can observe the benefits of the innovation.

This framework is probably the one which is most commonly used in the literature.

### Focus on the adopter of the innovation

This body of literature on dissemination focuses all attention on the adopters of innovations. Two such approaches described below are from Rogers' (1995) widely-cited work on 'categories of adopters' as well as his description of the 'innovation-decision' process, which outline the discrete stages through which the potential adopters of innovations are said to pass as they make adoption decisions.

Rogers describes five 'categories of adopters' of innovations (although he acknowledges these as 'ideal types') as follows:

- **innovators** – the people who launch the innovations (~2.5% of the population)
- **early adopters** – often the opinion leaders, this group is usually the first to adopt the work of the innovators, and to provide evaluations of its effectiveness (or not) (13.5%)

- **early majority** - this group takes a longer period of time to make a decision about adoption of an innovation, and only does so after seeing some evidence of its effectiveness (34%)
- **late majority** – approach the adoption of innovations with some skepticism, and often do so as a result of peer or other pressure, but need to feel a high degree of safety in their decision (34%)
- **laggards** – the last to adopt, this group is said to need to be ‘certain that a new idea will not fail before they can adopt’ (16%)

He argues that each of these groups has different needs, and hence should be the object of decisions about different dissemination strategies.

In another area of work, Rogers describes a number of prior conditions which include ‘felt needs/problems’, ‘previous practice’ and ‘norms of the social systems’ (p. 163). Individuals are then said to pass through five stages of an innovation-decision process in a linear fashion:

1. **Knowledge** - of the existence of the innovation, and how it operates;
2. **Persuasion** - the potential adopter forms a favourable or other view of the innovation;
3. **Decision** – the choice is made to adopt or reject the innovation;
4. **Implementation** –the innovation is used; and
5. **Confirmation** – the decision to continue use of the innovation.

Research on dissemination that is underpinned by this view often focuses on each of these discrete stages. For example, Rogers has described a number of ‘perceived characteristics of the innovation’ which have been discussed earlier in this review.

A similar approach is Hall, George & Rutherford’s (1986) Concerns-Based Adoption Model (CBAM) which described the stages that users move through in making decisions to adopt innovations as:

- awareness;
- informational (learning more about the innovation);
- personal (how will it affect me);
- management;
- consequence (decision about the outcomes of use of the innovation);
- collaboration (what are others doing);
- refocusing (how might this be improved).

### Factors affecting the dissemination of teaching and learning ideas, approaches, products and processes

Knutel (1998) describes **variance** and **stage** models, with the former being used to confirm the influence of a number of independent variables on adoption of an innovation at a given time. Examples of this approach from the higher education context include Collis and Moonen’s (2001) description of the 4-E model in which factors affecting an individual’s use of a technological innovation were found to be:

- environment (vision and support for level of use);
- educational effectiveness;
- ease of use;
- engagement.

### Factors influencing adoption of innovations

Much of the research on dissemination of innovation, focuses on uncovering the range of factors that either influence adoption, or which act as barriers to adoption, the latter being the most common. These issues are reported below according to the category of adopter.

#### i) At the level of the individual

The influences on the adoption of innovations at the level of the individual academic reported by Beggs (2000) are:

- perception of improved student learning;
- advantage over traditional teaching;
- equipment available;
- increased student interest;
- ease of use;
- compatibility with discipline;
- time needed to learn to use the innovation;
- materials available in the discipline;
- compatibility with materials;
- training needed;
- administrative support;
- personal comfort with the innovation;
- colleague use.

#### **ii) At the level of the institution**

The literature on dissemination at the level of institutions varies, according to kind of innovation being adopted.

Dissemination activity within one university was found to be more successful when the innovation or project was 'responsive to an institutional need' (Burdett, 2003).

The take-up of action learning at another university was thought to be related to:

- that university's mission, which is to provide higher education for professional practice (and hence the innovation was thought to be a good fit);
- the role of 'process champions' within the university;
- its embedding within the Graduate Certificate in Higher Education, enabling graduates to acquire ownership of the concept by engaging with it as an approach to their own learning, and then subsequently applying it to their own teaching. (Bourner, Cooper, & France, 2000)

The dissemination of three innovations in teaching and learning at another university (online and blended learning, flexible learning, and unit alignment and graduate attributes) was underpinned by a change management theory approach characterized by:

- leadership at multiple levels;
- presence of change champions;
- approach to planning;
- clear purpose for change;
- institutional culture which is team-based and collaborative. (Cummings, Phillips, Tilbrook, & Lowe, 2005)

#### **Barriers to adoption of innovations in higher education**

A number of factors have been reported as acting as barriers to adoption. Again, they are grouped as barriers operating at the level of the individual, the department and the university.

##### **i) At the level of the individual**

The range of factors which act as barriers at the level of the individual include:

- the risks associated with sharing ideas, in particular greater sense of competition between academics resulting in reluctance to share practice (Collins & Lynch, 2001);
- perception of the importance of teaching vs research – in particular
  - career path of academics is research focused, hence commitment to teaching is often low (Drummond, Nixon, & Wiltshire, 1998);
  - the perception that teaching innovation is not as valued as research (Collins & Lynch, 2001; Newton, 2003);
- low quality of evaluation of educational innovations (Collins & Lynch, 2001; Dempster & Deepwell, 2002);
- over-representation of 'successful innovation' in the literature (Collins & Lynch, 2001);
- concern about the effectiveness of new technologies for learning (Butler & Sellbom, 2002);
- resources required to share and access ideas including lack of time for academics to disseminate innovations (Beggs, 2000; Butler & Sellbom, 2002; Collins & Lynch, 2001);
- lack of time required to implement innovations (Burdett, 2003; Newton, 2003; Schoepp, 2005);
- lack of time for maintenance of learning resources (Newton, 2003);
- unreliability of hardware and software (Burdett, 2003; Butler & Sellbom, 2002);
- lack of training (Beggs, 2000; Schoepp, (2005);
- lacking expertise, experience and confidence to adopt new approaches (Drummond et al. 1997; Schoepp, (2005);
- inability of academics to see the student as central (Drummond et al. 1997).

#### ii) At the level of the department

The barriers reported as operating at the departmental level included the traditional systems of departmental management which make sustaining long-term development of initiatives difficult. These included:

- lack of credibility of many rewards systems which are said to provide recognition and support for a culture of innovation;
- resource implications which affect ability to respond to changing demands;
- reluctance to adopt innovative approaches to teaching (Drummond et al. 1997).

#### iii) At the level of the university

Finally, at the level of the institution, the barriers identified were:

- lack of institutional support in general (Butler & Sellbom, 2002; Schoepp, 2005);
- Intellectual Property issues such as restrictions to sharing innovations as a result of individual university's IP policies (Collins & Lynch, 2001);
- competition between universities when innovations are seen as providing a 'competitive edge' (Collins & Lynch, 2001);
- institutional inertia – 'typified by non-executive management systems' (Drummond et al., 1997);
- 'systematic prioritisation of research, which in most cases is linked to funding and promotional systems, devalues the contribution of teaching' (Drummond et al. 1997);
- concerns about loss of academic freedom (Drummond et al. 1997);
- implementation of systematic quality management procedures at one university encountered a number of barriers including
  - difficulty of persuading staff of the value of the quality processes;
  - persuading busy staff to give time and energy to implementation;
  - ensuring that staff at all levels have some sense of ownership of the innovation (Dyan & Clifford, 2001);
- inadequacy of reward structure (Newton, 2003; Schoepp, 2005).

## Holistic systems

The various approaches to understanding dissemination discussed above have been widely used, but have more recently been the subject of some critique in the literature.

Models which describe dissemination as taking place in a series of predicatable linear stages have been criticised for failing to take into account 'the true nature by which decisions are actually made' (Lueddeke, 1999, p. 240), the underlying reasons for the actions taken, and the role of the non-human aspects of the innovation such as failure of a critical piece of equipment (Simpson, 2000). They also fail to explain why change has been so slow in education.

Dissemination research which focuses on the innovation itself, is characterized by some as a 'technologically deterministic perspective' where the innovation is seen to 'impact on teaching and learning' (Dutton et al. 2004). This approach portrays academics as passive beings who, when subjected to a force, react to it in a predictable way (much as a bowling balls do when impacted on by the Jack).

A second area of critique revolves around the adequacy of the close examination of individual factors which affect dissemination, where those discrete factors are studied 'in isolation from each other', in isolation from 'the system in which they interact', and without reference to their relative influence and importance (Zhao & Frank, 2003). The authors say this has resulted in exhaustive lists of 'what' affects dissemination, but fails to illuminate the all-important 'how'.

Thirdly, there is no acknowledgement of the power relationships that inevitably exist in most contexts, beyond that of recognizing the existence of 'opinion leaders' who influence the ways in which potential adopters regard an innovation in either a positive or negative way.

Proponents of actor-network theory for example, rather than using the cause and effect framework of many dissemination models, trace the interplay of a range of influences (human and non-human) on an innovation, seeking to illuminate the 'manoeuvres, compromises, twists and turns of the negotiation as it changes or is translated during the process of adoption' (Simpson, 2000).

Zhao and Frank (2003) call for 'a unifying framework for the current research, which approaches the issues from many perspectives: cognitive, social, organizational, technological and psychological' (p. 810). They adopt an ecological metaphor for their research in which the innovation being studied is regarded as an invading species which interacts with existing species and the environment to result in survival or not.

In their case study of the introduction of a Virtual Learning Environment (VLE), (often referred to in Australia as a Learning Management System or LMS), Dutton, Cheong and Park (2004) identify a number of 'games' that operate in universities. These include the game 'university competition', with students, parents, schools, journalists as major players, and goals and objectives which see universities competing for students and academics 'locally and globally by seeking top rankings' (p. 143). Examples of other games included in the fifteen identified in their paper as part of a complex ecology operating in a university are: 'budget allocation', 'inter-departmental divides', and 'assessment of students'. For each game, a number of actors are identified who compete or cooperate to achieve their own diverse objectives

Both studies reported evidence that teachers/ academics will use technologies that fit with their existing practice, thus requiring 'little adjustment to their teaching practices' (Zhao & Frank; p. 820), or able to support existing pedagogical models (Dutton et al., 2004).

# WHAT CONDITIONS ARE NECESSARY IN ORDER FOR INNOVATIONS TO IMPROVE TEACHING AND LEARNING IN HIGHER EDUCATION?

The literatures described above primarily focus on whether innovations will be adopted and implemented in new contexts, and the processes and conditions required. By contrast, the literature on teaching and learning in higher education focuses on whether and how the adoption, adaptation and implementation of innovations might bring about improvements in teaching and learning.

While particular innovations might afford improvements in teaching and student learning, whether their potential is realised depends on how teachers integrate them into the learning environment (Laurillard, 1993; Alexander & McKenzie, 1998). Over the last three decades, an extensive body of research has developed on students' perceptions of their learning environment, approaches to learning and learning outcomes (Prosser and Trigwell, 1999; Marton, Hounsell and Entwistle, 1997; Ramsden, 2003). More recently, there is evidence that teachers' conceptions of and approaches to teaching have consequences for student learning. Information transmission/teacher focused approaches to teaching are related to surface approaches to learning and poorer learning outcomes. Student-focused approaches to teaching are more likely to encourage deep approaches to learning (Prosser and Trigwell, 1999). Changing teachers' conceptions of teaching can bring about changes in students' approaches to learning (Ho, Watkins & Kelly, 2001).

Research on teachers' conceptions and approaches has not generally focused on innovations, but there is evidence that differences in teachers' conceptions of teaching relate to differences in the focuses they take when designing and using computer-based learning (Bain & McNaught, 1996; Bain, McNaught, Mills & Lueckenhausen, 1998). Teachers taking teacher-focused approaches also implement web-based course management systems and other technology tools differently from those taking more student-focused perspectives (Housego and Freeman, 2000; McKenzie, 2001). Teacher-focused approaches typically involve distributing materials and information, through posting lecture notes and making announcements, often with the aim of gaining teaching efficiencies and flexibility of access. Student-focused approaches may also involve the provision of materials and announcements but focus more strongly on interaction and student engagement with the subject matter through activities such as discussion forums, online debates and role-play simulations. The intention is to bring about improvements in student learning, typically involving both understanding of disciplinary subject matter and development of attributes such as critical thinking and appreciation of multiple perspectives and values. There are evident benefits for student learning, in addition to the benefits of flexibility gained from online materials (Alexander & McKenzie, 1998).

Differences in teachers' perceptions of an innovation and their consequent approaches to implementation may also result in an innovation which improves teaching and learning in one context actually making it worse in another. One example comes from a web-based system which enables student self and peer assessment of contributions to group-work and was evaluated across several subjects (Freeman and McKenzie, 2002; McKenzie, 2001). In the originating context and some others, lecturers perceived the system to be about improving team learning as well as managing 'free-riding'. Use of the system encouraged students to reflect on their teamwork skills and contributions as well as substantially reducing complaints about 'free-riding' in group assignments. However in other subjects, lecturers largely perceived the system to be a tool for deterring free-riding. Students were not introduced to the system in the same way, did not see it as helping them to reflect on teamwork skills and complained about the way the system was used.

Teachers' approaches to teaching are also affected by their **perceptions** of their teaching situations, for example whether they **perceive** teaching to be valued in their department (Prosser and Trigwell, 1999) and how they perceive leadership within the department (Martin, Trigwell, Prosser and Ramsden, 2003). Teachers who perceive subject co-ordinators' leadership to be transformational are more likely to take conceptual change/student-focused approaches to teaching and less likely to take information transmission/teacher-focused approaches. Forms of leadership which teachers perceive as imposing



decisions on changes to subjects, or seeing no need for change, are more likely to relate to teacher-focused approaches (Martin, Trigwell, Prosser and Ramsden, 2003). From this, it can be inferred that departmental and subject leaders' conceptions of and approaches to leadership of teaching are likely to be important in whether student-focused forms of innovation are developed or adopted in a particular subject, and whether they are sustained if they are introduced.

Focusing broadly on changes in academic work, including curriculum initiatives, Martin (1999) also sees a critical role for academic leaders. She analyses the conditions for academic change through drawing parallels with student learning and learning organisations theory. Change is seen as requiring engagement by teachers and commitment and leadership within institutions, combined with appropriate systems of recognition and reward.

Drawing together some threads from the research literatures on dissemination of innovations in higher education and approaches to teaching and learning suggests some clear parallels concerning teachers' or adopters' perceptions of teaching innovations and the contexts of teaching and innovation adoption. These parallels suggested a methodological framework for the project which is described in the next chapter.

## SUMMARY

The literature on dissemination of innovations is vast, and hence it has only been possible to include a small section of this literature here. A number of issues have been raised in this literature review which are important to the aims of the Carrick Institute for Learning and Teaching in Higher Education, and these are discussed below.

**What constitutes an innovation?** It would appear to be important to define precisely what is meant by 'innovation' in teaching and learning to avoid confusion for those intending to apply for grant funding. Some view innovation as 'something new', raising the question of 'to whom or what is it new?' Among the taxonomies used to define the latter are those that distinguish between entirely new approaches, approaches that are new to organisation or faculty, or new to the higher education system in general.

Some distinguish between 'product' and 'process' innovations, and between the outcomes of innovation which may be incremental or radical change. The effectiveness of each type of innovation over the other is highly contested.

**What is the problem to which innovation is the solution?** There is some evidence that innovation is a more costly and less successful way of solving the problems of an organisation than would be the case if the funding was used for re-generation or renovation of existing practices.

**What is dissemination?** Much of the literature distinguishes between making information about an innovation available (sometimes called 'distribution') and the ways in which decisions are made to embed the innovations in teaching and learning.

**What kinds of innovations in teaching and learning are developed?** Few 'innovations' are completely new to higher education, and most are adaptations of existing innovations in new contexts.

**Who should be responsible for innovation?** Most innovations would appear to be undertaken by individuals, although there is some evidence to suggest that these innovations rarely become embedded in the original context once the innovator ceases involvement. There is mixed evidence of the success of innovations conducted by discipline or faculty groups.

**How are innovations disseminated?** There is a range of ways of understanding the dissemination process, and in the absence of a unifying theory, all should be considered important. Innovators should be concerned about the needs and concerns of potential adopters, and have an understanding of the processes by which they make decisions about innovations. Attention should also be paid to the context

in which innovations will be used, in particular the conditions which facilitate adoption and those which act as barriers.

**What conditions are necessary in order for innovations to improve teaching and learning?** Innovations are more likely to improve teaching and learning if implemented in student-focused ways. Student-focused approaches to teaching are associated with student-focused conceptions and with perceptions of transformative leadership, departments which value teaching and workloads which are not too high. Leadership and perceived recognition and rewards are important in supporting transformative change.

## 2. METHODOLOGY

The overview of the available literature supported the need for this project to take a systems and adopter-focused perspective on the issue of dissemination and adoption if the aim of dissemination is for innovations to be appropriately adopted, adapted, implemented and sustained in order to improve the quality of teaching and learning in new contexts.

Much has already been written about the barriers to dissemination and successful adoption, so the project team took a different approach. We sought to identify and analyse successful cases of ideas, projects and processes ('innovations'). For the purpose of this project, a successful case was defined as one in which the innovation had been disseminated and successfully adopted, adapted, implemented and sustained in contexts beyond the development context. By successful adoption, we mean cases in which the adoption was seen to lead to improvements within the adopting context. Particular attention was given to cases where there was clear evidence of improvement in teaching and learning or features which are likely to afford improvement.

### AIMS OF THE PROJECT

The project took a two phase approach. Phase 1 of the project involved investigation of some of the external contexts of project development and adoption and the identification of cases of successful innovations for follow-up. The aims of this phase were to:

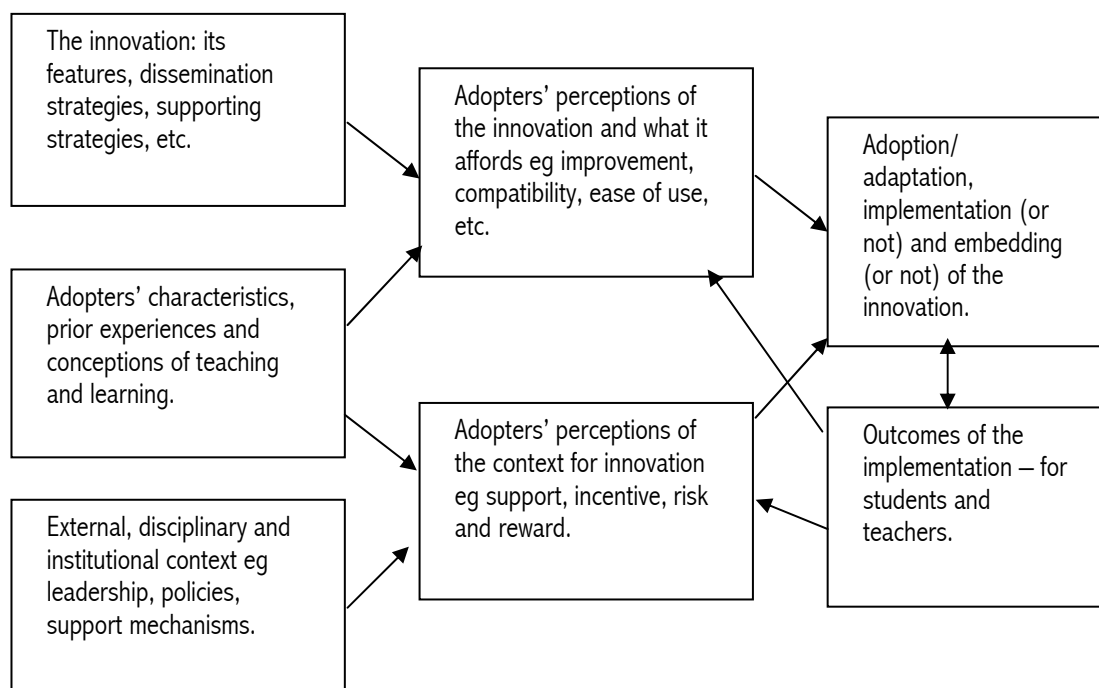
- triangulate information from a variety of sources to **identify cases of innovations which have been successfully disseminated and implemented in new contexts**, particularly focusing on those for which there is evidence of improvement in teaching and learning;
- identifying any **distinctive features of granting or other schemes which have facilitated and supported the success of these innovations**;
- identify any **features of clearinghouses and resource banks** or the information that they provide that enable teachers to **locate innovations** relevant to their settings and **decide whether to engage further** with them.

Phase 2 of the project then explored the successful case studies in more detail. The aims of this phase were to:

- **analyse and describe**, for a range of innovations, **the interacting system of features and conditions which have contributed to the innovations' success** in being disseminated, adapted, implemented and sustained in a new context;
- **develop in-depth case studies** of a range of successful innovations from those identified in phase 1;
- **analyse the dissemination and implementation outcomes** of projects which had characteristics which the literature suggests are more likely to lead to success, such as wide collaboration across institutional contexts and involvement of potential adopters in project development.

A heuristic model (Figure 1) was developed and used to design the overall approach for this project and provide a framework for investigating and analysing cases of successful dissemination, adaptation, implementation and embedding of innovations which improve teaching and learning. This model is modified from the work of Prosser and Trigwell (1999) and Freeman and McKenzie (2002). It illustrates a complex pattern of interactions likely to affect whether and how a particular innovation is adopted, adapted and implemented and sustained in a new context. It takes into account the features of the innovation (Rogers, 1995) and the supporting mechanisms which may be developed to facilitate its dissemination for awareness, understanding or use (Gibbs et al, 2002), teachers' prior experiences and conceptions and their perceptions of the contexts in which they work.

The model is intended to be heuristic and relational, rather than causal. It is intended to both illustrate the complexity of the aspects involved in successful innovation and change and also highlight different ways in which an external agency might focus its efforts in facilitating and supporting the process. For example, attention could be focused on the funding particular kinds of new innovations and/or strategies for the dissemination and implementation of existing innovations. Alternatively, attention could be focused on adopters' perceptions of the contexts for development and adoption, and on strategies for enabling institutions to develop particular kinds of implementation support, recognition or reward.



**Figure 1:** A proposed relational model for investigating dissemination, adaptation, implementation and embedding of innovations in higher education.

## IDENTIFYING CASES AND THEIR CONTEXTS

Identification began with a range of centralised granting schemes and other initiatives which had been designed to foster innovation or improvements in practice, or to encourage dissemination and adoption of innovations, particularly in higher education. The review of these schemes made use of the public documentation about the scheme, typically available from the scheme's website, along with any review or evaluation reports available, journal publications and other available sources. Schemes which were focused on in particular were:

- AUTC and its predecessors CUTSD and CAUT in Australia;
- the Teaching Quality Enhancement Fund (TQEF) which included the Fund for Development for Teaching and Learning (FDTL) Phase 3 was focused on (UK);
- the Teaching and Learning Technology Programme (TLTP), in particular TLTP3, UK;
- the Economic and Social Research Council's Teaching and Learning Research Programme (TLRP) (UK) which funds research aiming to improve learning outcomes;
- the Learning and Teaching Support Network (LTSN), which became the Higher Education Academy Subject Centres, UK;
- Fund for the Improvement of Postsecondary Education (FIPSE), in particular the Comprehensive program and Disseminating proven reforms program (US);

- the Pew Charitable Trusts, in particular the Pew Undergraduate Forum (US);
- the Swedish Council for Renewal of Higher Education (Sweden).

In addition to identifying successful cases, another aim of the review of granting schemes and initiatives was to identify any particular characteristics of the scheme which were intentionally designed to foster dissemination and adoption or which appeared likely to do so. In the case of the UK schemes the review of documentary evidence was complemented by evidence from interviews with five representatives of the Higher Education Academy, which is now responsible for the FDTL and Subject Centres, representatives from two Subject Centres and four senior academic developers, in addition to project developers and adopters.

The review of granting schemes was complemented by focused reviews of literature and websites on 'innovation' projects, processes and teaching and learning ideas in higher education, including curriculum and assessment changes which have improved teaching and learning. This review also focused on identifying projects, processes and ideas which had been adapted outside their original development context, and those which had been collaboratively developed and sustained across multiple sites. It sought to include both discipline-based and generic initiatives. A major aim of this review was to follow up on or triangulate information about projects listed on granting scheme sites, and identify any unfunded cases.

Although these two processes were broadly followed for both the Australian and International contexts, the detailed process was somewhat different for each because of the nature of the different contexts.

## IDENTIFYING SUCCESSFUL PROJECTS

A progressively narrowing approach was used in order to track and identify projects which have been successfully disseminated and adopted in other sites. Emphasis was initially placed on projects which had been funded five or more years ago, in order to give sufficient time for projects to show evidence of sustainability in their original context and adoption in others. After the initial stages, the process differed for Australian and international projects.

**1. Examination of granting scheme sites.** In the case of Australian projects, reports made available on AUTC website were analysed, focusing particularly on the periods between 1996 and 1999 and those projects which appeared in the 'Report Outcomes List'. The final reports provided a summary of the project and in some cases indicated various dissemination strategies employed during the project. Typically these included conference presentations, publications and workshops that came out of the project.

Overall this documentation provided the starting point for identifying successfully implemented innovations. Not surprisingly however, while many projects described some degree of sustainable implementation within the organisation that they originated from and may have effected change in teaching practices of their context of origin, it was significantly more difficult to find examples of projects which had been taken up and changed teaching practices in other organisations. Indeed for many of the projects it was difficult to find evidence of tangible outcomes or evidence of any further development and uptake.

Similar initial processes of selecting successful cases were used with the Pew Forum, FIPSE Comprehensive and Carnegie granting sites in the US, beginning with listings on the site itself. In the UK, a range of projects was initially identified through the National Co-ordination Team project archive (now being redeveloped as part of the Higher Education Academy site) and the listings for TLTP3 and FDTL phase 3 accessible via the HEFCE publications site.

**2. For Australian projects, conference proceedings** were analysed for papers about or referring to projects. This focused on the proceedings of ASCILITE, Effective Teaching and Learning Conference, HERDSA, International Lifelong Learning Conference, Regional Teaching and Learning Forums and the Improving Student Learning symposiums in the UK, predominantly focusing on the period from 1998 onwards. The conference programs proved useful in terms of identifying the emergence of 'key players'

and common ideas and themes within innovations on teaching and learning, for example, Graduate Attributes and Mentoring or (PASS) Peer-Assisted Student Support and Student-Peer mentoring or Supplemental Instruction (SI).

**3. Cross-referencing** the conference resources with the documentation available about AUTC projects helped to refine and narrow the overall **selection criteria** for Australian projects and to identify projects where there had been at least some attempt to make the project outcomes and ideas publicly available. Following citations and references from conference publications also provided important evidence of a projects influence, and how the project has been made use of, either in terms of ideas or a specific 'product'. It also suggested which projects might have stronger degrees of influence, or at least of citation (ATN Graduate Attributes for example).

**4. For Australian projects**, cross-referencing created a **shortlist of projects** on which further searches were conducted using **internet searches** on both the project title and the list of project members. This indicated some specific uses which had been made of the project ideas and outcomes and suggested further research avenues. Internet searches were complemented by search attempts on journal articles using 'FirstSearch' and other education databases available through the library. This tended not to produce as many results as searching conference proceedings or internet searching in terms of tracking specific innovations or projects.

Three levels of evidence of the possible dissemination and impact of shortlisted projects were identified:

- the project or its publications are cited or referenced in literature only;

- the project is explicitly referred to in policy statements or other institutional documents and initiatives;

- there was evidence of use of the project beyond its original context of development, either directly in teaching and learning or other aspects of the students' learning environment or in influencing policy (i.e. a policy claims to have built on or used the principles developed in a project). This category included projects which had been used within the university by disciplines other than those in which it was first developed, or projects taken up and used at another institution or organisation.

For international projects, following initial searches of the granting sites, shortlists were compiled based on evidence from the project descriptions and granting websites (where available). The process differed for each scheme, depending on what was available about funded projects from the website or documentary evidence.

For example, relevant educational projects funded by The Pew Charitable Trusts are listed on the Pew Forum on Undergraduate Learning site ([http://www.pewundergradforum.org/project\\_list.html](http://www.pewundergradforum.org/project_list.html)). The project map lists themes with which projects can be affiliated, with some projects appearing in more than one category.

The National Center for Case Study Teaching in Science was identified in three of the categories which seemed particularly relevant for our project focused on dissemination, adoption and improvement in teaching and learning: Action projects, Institutional collaboration and Institutional improvement. Follow up of the project website suggested that the project was comprehensive and accessible and had been extremely widely used, including by some Australian academics. The project was therefore selected for shortlisting, along with six others.

In the UK context, HEFCE produced summaries of all funded projects for FDTL phase 3 (HEFCE, 2001) and TLTP 3 (HEFCE, 1998). These summaries were used as initial sources of information about projects. A range of projects for which the descriptions suggested strong focuses on dissemination and/or collaborative activities were shortlisted and then followed up in more detail through their websites and paper citations, as for the Australian projects. In the case of the ESRC's Teaching and Learning Research Programme (TLRP), only two higher education projects were listed prior to 2004.

Projects for case studies were chosen from the shortlist to try to maximise the range and variation across the following project features:

- **Scale of the project:** from extremely large in the cases of Supplemental Instruction and The National Center for Case Study Teaching in Science which have received multiple sources of funding, to small in the case of the Mathematics Video series resulting from a series of small CAUT and CUTSD grants;
- **Generic or discipline-based:** whether the project was primarily generic, was based in a particular discipline or had transferred across disciplines;
- **Level of intended impact of the project:** from change across the sector to staff development, curriculum reform, student support or improved student learning of particular subject matter;
- **Type of project outcome:** process; idea, such as a learning design; products of various kinds, such as case studies, websites, software systems, CD-ROM/DVD or video;
- **Intended learners from the project:** organisations, staff, students or combination;
- **The forms and extent of dissemination and adoption or adaptation** evident from available project documentation such as articles, reports and websites.

Consideration was also given to the accessibility of sources of information about the project, including the availability of people who had been directly involved in the project and were willing to be interviewed about it. In addition to projects selected through the above analyses, four known projects were selected for specific reasons. The fIRST consortium project was selected as a project which has been self funded through institutional memberships, with 39 current institutional members. PILOT was selected because it has been disseminated internationally, adapted and badged with the names of a range of different institutions. The AUTC learning designs project was selected on the basis of its development approach, which involved a large number of evaluators and developers of learning designs, and the evaluation of AUTC projects (Hicks, 2004) which noted that its dissemination approaches had given it wide exposure. The Generating Puzzlement project was selected because of its specific focus on enabling reuse of previously developed simulations. The final list of case study and profiled projects is provided at the beginning of chapter 3.

Descriptions of shortlisted projects were used along with the case studies to analyse the range of approaches that were designed to disseminate and encourage adoption of the project, or which were designed to encourage wider use through collaboration.

## DEVELOPING CASE STUDIES

Following the approach taken by Alexander and McKenzie (1998), both major case studies and shorter case profiles were written. Major case studies sought to illuminate the ways in which different features and conditions contributed to success in more than one context, exploring all of the aspects of the model shown in Figure 1. Short profiles focused on projects which illustrated particular features of interest. Two of the profiled projects, in:Context and Enhancing Teaching-Learning Environments in Undergraduate Courses, were not yet completed but were chosen for profiling because of their integrated development and dissemination approaches..

In investigating and analysing the cases of successful projects, our aim was to take, where possible, an adopter-focused perspective. The term 'adopter' was used to describe people who had made use of a project and were not part of the original development team, regardless of whether they had adopted project outcomes in their original form or adapted them substantially.

Case study investigations were designed to address the questions of:

1. why teachers and other adopters/implementers of projects chose to adopt, adapt and implement the innovation, in terms of the perceived and actual features of the innovation and the ways in which the teachers became aware of and were initially engaged with it;
2. how the ideas, projects and processes were adapted, implemented and sustained by teachers, academic departments and/or institutions in new contexts. This included the changes in practice and understanding which were necessary for this to happen and the ways in which these were

- facilitated and supported, including information and other supports made available by the innovation developers;
3. how teachers, students, academic departments and institutions have been affected by the implementation of the innovation;
  4. the systemic conditions, including features of the external and institutional contexts and forms of support or professional development, which facilitated project dissemination then adaptation, implementation and sustainability in the new context;
  5. where innovations were funded, the approaches to funding, reporting and support for the innovation which encouraged dissemination, adaptation implementation and continuation.

Major case studies or profiles of successful projects were carried out using a combination of:

- **document analysis** related to the innovation and to the development and implementation contexts. In most of the selected cases the documentation related to the project was extensive and included evaluation reports or articles;
- **interviews with the innovation developers**, particularly focusing on dissemination and support for the adaptation and implementation of the innovation. Interviews were semi-structured and followed a common framework which was adapted to some extent for each project. Typical interview schedules for developers and adopters are provided in Appendix 2;
- **interviews with project adopters**, defined as people who have adopted or adapted and implemented the innovation in different contexts. For case studies, the numbers of adopters ranged from one, in the case of the Mathematics video series to 12 in the case of role-play simulations. For most projects, responses were provided by between two and four adopters. In some cases, interviews with some adopters were replaced or complemented by email questionnaires. In other cases, interviews were complemented with conference papers, articles or other materials written by adopters about their use of the project. Adopters were not interviewed for the two profiled projects which were not yet complete.

The original brief suggested that we might also carry out focus groups with students (or equivalent learners) to evaluate the outcomes of the particular innovation for learning. These were not done as the document analysis of the majority of selected projects included student evaluation of various kinds.

## ANALYSIS OF THE CASE STUDIES

The interviews were analysed using a combination of a constant-comparative approach (Strauss & Corbin, 1998), and a phenomenographically influenced focus on variation and perceptions of the situations of development and adoption (Marton & Booth, 1997; Prosser & Trigwell, 1999). Within each particular project, the focus was on describing the project itself and the adopters and developers' perceptions of the enabling and constraining contexts (national, institutional, departmental and personal) and enabling and constraining features of the project which related to its dissemination, adoption, adaptation, implementation and sustainability across contexts.

Across projects, the focus was on analysing the similarities and variation in perceptions of enabling and constraining contexts and project features, taking into account instances where there were differences between developers' and adopters' perceptions or between either of these and other forms of evidence about the projects. This resulted in identification of themes related to the questions of interest, with variation within these themes relating to the types of projects and development and implementation approaches.



## REPORTING

The case studies and the themes identified in relation to adopters' awareness, adoption and implementation of projects and the support and systemic conditions related to adoption and implementation are described in the next chapter. A common framework was used for all case studies, as follows:

Name of case

Originating location

Type of case eg project, idea, network

Funding source(s) (if applicable) and amount(s)

Reason for choosing the case

Project/idea description

Origin

Aims

Design and activities, including dissemination activities

Adaptation and embedding in other contexts - examples

Outcomes for learning and teaching

Enabling and constraining systems for adoption, adaptation and use

Enabling and constraining features of the project/idea

Case summary



### 3. CASE STUDIES: PROJECTS AND INNOVATIONS WHICH HAVE BEEN SUCCESSFULLY ADOPTED AND ADAPTED ACROSS CONTEXTS

This chapter contains case studies and profiles of a highly diverse group of projects and innovations. Each case study begins with a description of the project, its adoption or adaptation in different contexts and its outcomes for teaching and learning. These descriptions are followed by analyses of the enabling systems for adoption/adaption and use, including both contextual features and features of the project or innovation in itself. There is some variation in the design of the case studies which reflects the nature of the different innovations.

The following list shows the categories of projects and the order in which the cases and profiles appear.

- |   |  |
|---|--|
| Large scale, learning environment projects, disseminated and adopted internationally over long timeframes             | <ul style="list-style-type: none"> <li>• Supplemental Instruction</li> <li>• National Centre for Case Study Teaching in Science</li> </ul>   |
| Medium scale, institutional, staff development and learning environment projects, disseminated and adopted nationally | <ul style="list-style-type: none"> <li>• EFFECTS: The Effective Framework for Embedding C&amp;IT Using Targeted Support</li> <li>• Generic Capabilities of ATN University Graduates project and a case example: Embedding Graduate Capabilities in Core Units within Law and Justice Studies</li> <li>• PILOT: your information navigator</li> <li>• fIRST: for Improving Research Supervision and Training (profile)</li> </ul> |
| Discipline-originated learning environment focused projects   | <ul style="list-style-type: none"> <li>• RAPID</li> <li>• in:Context. Creating the balance in the Nursing Curriculum (profile)</li> </ul>  |
| A project intending to facilitate dissemination and adoption of learning designs                                      | <ul style="list-style-type: none"> <li>• Information and Communication Technologies and their role in Flexible Learning</li> </ul>   |
| A exemplar of a learning design   | <ul style="list-style-type: none"> <li>• Role-play simulation</li> </ul>   |
| Products aimed at improving learning  | <ul style="list-style-type: none"> <li>• an@tomedia™</li> <li>• Mathematics video series</li> </ul>  |
| A project aimed at reuse of existing simulations  | <ul style="list-style-type: none"> <li>• Generating Puzzlement (profile)</li> </ul>  |
| A research-based learning environment focused project   | <ul style="list-style-type: none"> <li>• Enhancing teaching-learning environments in undergraduate courses (profile)</li> </ul>  |

# SUPPLEMENTAL INSTRUCTION (SI), KNOWN ALSO AS PEER-ASSISTED-STUDY-SESSIONS (PASS)

## Originating location

SI was originally developed at the University of Missouri-Kansas City (UMKC) in 1973 by Deanna Martin. It was developed for students in courses in the professional schools of medicine, dentistry and pharmacy who were having academic difficulty in foundational courses. The program was then expanded to UMKC's College of Arts and Sciences, and is now active in more than 1,000 institutions around the world.

In Australia, a certified national trainer based at the University of Wollongong (UOW) provides training through a formal inter-institutional arrangement with UMKC.

## Type of case

Learning support system and resource centre.

## Website

<http://www.umkc.edu/cad/si/>

## Funding

- Initial Funding of US \$7,000 given to Deanna Martin.
- The National Diffusion Network (NDN) - the national dissemination agency for the US Department of Education - provided federal funds for the dissemination of SI following its selection as an 'Exemplary Educational Program' by the US Department of Education in 1981.

## Reason for choosing the case

- Supplemental Instruction has been particularly successful in achieving its teaching and learning aims of improving student performance and reducing the attrition rates in targeted courses.
- Developed as 'a field-based response to an academic need' which addresses the requirements of specific groups of students/learners, rather than a static model which is imposed from above (Burmeister, 1996).
- Supplemental Instruction and other peer-mentoring variants enable cost effective means of providing academic support to students. That is, costs involved with implementing the SI Program and its variants – both financial and time wise – are generally perceived as being outweighed by longer-term benefits of the program for teachers, learners and institutions.
- S SI has been widely adopted in the US, Australia and UK, and its use has been **sustained** over extended periods of time within a variety of disciplines and institutions. Key Australian universities to have successfully adopted the SI Program include Queensland University of Technology (QUT) and The University of Wollongong (UOW). Implemented as the PASS Program (Peer-Assisted-Study-Sessions), it is supported by a trained full-time Project Manager at UOW (<http://www.uow.edu.au/student/services/pass/>). At QUT the program receives support on a faculty specific basis, rather than being a campus wide initiative, in particular the faculty of IT where the program is supervised by a Teaching Support Officer (<http://www.fit.qut.edu.au/students/pass/index.jsp>).
- Implementation of SI has attracted a number of CAUT grants which have resulted in significant reforms in teaching strategies, class-room practice, curriculum design, policy and funding directions<sup>4</sup> at several universities in Australia, for example

<sup>4</sup> Dr Martin Murray from QUT's School of Civil Engineering ... began to modify the structure of first-year engineering units which directed the schools funds from being centered on the 'teaching' of lectures, towards supporting the learning of students.

- Peer Collaborative Study Programs in Anatomy for First Year Nursing Students, 1994, Henry Loh, Queensland University of Technology, CAUT Grant;
- Multidisciplinary peer collaborative study programs for first year Aboriginal and Torres Straight Island students, 1995, Henry Loh, Queensland University of Technology, CAUT Grant.

## PROJECT DESCRIPTION

### Origin

The project was developed as a response to high student attrition and failure rates at the University of Missouri, Kansas City. It was motivated by the need for alternative models of academic assistance which were in line with the institutional climate and context of UMKC and more responsive to local needs (Arendale, 1993; Martin, 1992). In particular, project developers identified problems with the remedial focus of existing tutorial programs and their assumption that individual student deficiencies or weaknesses should be the primary indicator for student assistance and that responsibility lay with the student (i.e. following a 'Medical Model'<sup>5</sup>). Developers perceived the need for a more generalised approach to improving student performance which focused on the *mismatch* between the level of instruction, professors' expectations and the level of student preparation and performance (Martin, et al. 1977). Accordingly SI was developed as a voluntary and 'proactive' model of student peer-mentoring which sought to address this gap by supporting high-risk courses rather than reactively targeting high-risk students (Arendale, 1993; Arendale, 1994).

### Aims

The three overarching goals of Supplemental Instruction, as described on the 'The National Centre for Supplemental Instruction' website are:

- to reduce rates of attrition within targeted historically difficult courses;
- to improve student grades in targeted historically difficult courses;
- to increase the graduation rates of students.

Underpinning these outcomes are broader pedagogical and philosophical aims that relate to developing the students' critical thinking and abstract reasoning skills and promoting their role as autonomous learners. A founding assumption of the SI model is that, in order to become more proficient in the specific course content and materials, students must also develop more general or abstract study and learning skills. The SI model thus employs collaborative and peer-learning strategies that foster interactive and participatory approaches to student learning, with the assumption that students must construct their own knowledge to be able to fully conceptualise and understand it (Martin & Arendale, 1993). The SI model of instruction thus aims to integrate students' awareness and understanding about the **processes** of learning with the teaching of course materials as a way to improve academic performance. In its 'purist' forms SI claims to 'integrate how to learn with what to learn' (<http://www.umkc.edu/cad/si/>).

## Design and activities

### Design and Organisation of SI programs

SI is a 'Learning Model' or 'academic assistance program' that utilises a unique model of peer mentoring as a way to improve student learning and retention. SI programs involve providing structured regularly scheduled peer-facilitated study sessions which are attached to historically difficult **courses**. Study sessions are run by SI leaders who are typically students who have successfully completed the targeted subject. SI leaders are expected to attend all class lectures, takes notes and act as model or 'ideal' students for their class-mates. The SI model works from the premise that students are a valuable teaching and learning resource, and that 'by learning with supportive mentors, students gain confidence in their own ability to practice within the discipline and are thus encouraged to take control of their own learning' (Miller et. al. 2004: 31). As one SI Adopter confirms: 'The initial excitement of getting students

<sup>5</sup> 'SI adopts a 'public health' rather than a 'medical model': by focusing proactively on 'difficult' courses rather than reactively on 'at-risk' students, SI fosters systematic improvement and avoids being stigmatised as remedial'

guide other students was the principle that remained constant and drove the modifications so that the scheme was successful'. (adopter A)

A key feature of the SI model is its emphasis on formal training and clearly-defined roles for each of the participants. The developers and current hosts of 'The National Centre for Supplemental Instruction' at UMKC strongly advocate that SI adopters participate in formal training sessions and workshops made available through the centre, and thus become 'qualified' SI supervisors who can train leaders in the appropriate facilitation skills. Training sessions for SI supervisors might typically cover issues relating to: theoretical and scholarly underpinnings of SI; implementation and management; evaluation and funding of the program; training and supervision of SI leaders; effective learning and study strategies; and theoretical frameworks underlying the SI model (Arendale, 1996; UMKC Website).

The qualified SI Supervisors (either disciplinary academics, academic developers or learning support staff members) train the SI leaders and play a key role in administering further training, support and dissemination within their institutions. They are regularly cited as being crucial to the success and continuation of SI schemes within the adoptive institution or discipline. As Adopter B suggests 'The most important thing is the collaboration between the PASS team and academics who are involved. Without this collaboration in place, I believe there is no program that can be run successfully'.

### Development of the Supplemental Instruction Centre and further dissemination activity

UMKC hosts The National Centre for Supplemental Instruction, which provides formal training and resources for SI practitioners and developers. The centre's website offers general background information and materials as well as supporting dissemination of the program through formal dissemination activities such as training sessions, presentations and workshops. The Website includes:

- information about official training and workshops. (The centre offers six SI supervisor workshops annually with a required attendance fee of \$US495.00);
- up-to-date news about upcoming presentations and SI conferences;
- information about international developments and relevant news and research results;
- SI newsletter;
- general background information on SI including an overview of SI learning model and information about its theoretical underpinnings and background;
- an active listserv for the 'SI leaders' called the SI-discuss for supplemental instruction leader discussion group;
- links to other SI programs both within the US and internationally;
- the site provides specific information relating to effective teaching practices designed to assist the practitioner in engaging the learner;
- extensive documentation of SI publications and research including;
- an annotated bibliography of articles, book chapters, dissertations, and monographs written about SI.

Over the years, staff members from the centre have also been pro-active in engaging and collaborating with potential user-communities. As one SI Adopter A states; 'Team members from UMKC have strongly supported the growth of SI in Australia through regular visits to local universities such as QUT, helping to train supervisors, promoting interaction with UMKC ... and through regular communications' (Murray, 1999: 1). While this contact dropped off from the late 90's, UMKC has now nominated a Certified National Trainer in Australia, and this newly established relationship between the Centre and the participating individual/institution has forged an increase in communications and contact<sup>6</sup> (Sally Rogan). The Australian National Trainer is responsible for offering training and support for local versions/adaptations of the SI program, as well as ensuring some degree of 'quality control' in terms of how SI is being disseminated and embedded in the Australian context. For example, UOW will soon be offering official training workshops for SI Leaders, similar to those offered by the International Centre at UMKC. (Sally Rogan)

<sup>6</sup> "Since the late 90's there has been little contact as both Ron Gardiner and Deanna Martin retired. When Sandee Zenger visited UOW in Feb that was the first visit for some 6-7 years as far as I am aware" (Sally Rogan).

## Adaptation and embedding in other contexts

SI has been trialled and embedded at several institutions in Australia as PASS – or Peer Assisted Study Sessions – where it has been sustained with varying degrees of success and support.

At University of Wollongong, it is a part of the university's officially adopted suite of systems for improving student learning and receives full-time support through funding and the presence of an officially trained and full-time SI co-ordinator. Its implementation is very widespread and centrally managed. PASS now operates in an average of five faculties per semester, including Informatics, Commerce, Engineering and Education and Health and Behavioural Sciences, and is in its fourth year of operation. Importantly, UOW maintains regular contact with the International Centre at UMKC, and have an established relationship with the new director and other staff members. This relationship has been recently formalised by the selection of their PASS Program Manager as the official Certified National Trainer for PASS/SI in Australia.

At Queensland University of Technology, PASS/SI is also an established program and it is this institution which has the longest history of using Supplemental Instruction in Australia. Professor Ron Gardiner, then the Associate Pro Vice-Chancellor (Academic) pioneered the program at QUT in 1992 after hearing about the SI program at a conference (Kelly & Gardiner, 1994). Henry Loh (lecturer) then started using the SI program for his subject, Anatomy in the School of Life Sciences in 1992 and received CAUT funding. Professor Gardiner was previously the SI/PASS Program Coordinator at QUT as well as being a certified National Trainer, and he was heavily involved in championing the program more broadly. This role continued after his retirement, when he delivered a three day workshop at UOW, at the request of staff who were interested in the concept prior to its establishment at that university. It is widely acknowledged that throughout the 90's, QUT had a very large and established SI program operating, and it is still perceived as having a strong tradition of embedding SI/PASS. However, while SI is still supported in some specific faculties by teaching support staff<sup>7</sup>, in more recent years it has tended to operate in individual disciplines through the support of enthusiastic faculty members who perceive that the program is addressing particular problems they have identified in their teaching and learning, rather than being a systematic or university wide initiative. Overall the program is perceived to be less visible and systematically supported by the university by individuals both within and outside the institution. The perception being that the SI scheme is sustained 'because of the commitment of the individuals' and the perception that it is consistent with their own existing teaching principles, rather than fitting in with the university's strategic directions or agenda. At the same time, however, some of these localised adaptations of SI are recognised and perceived by other adopters as being exemplars of good-practice in the area, particularly in relation to how strongly SI is embedded within the discipline:

Martin Murray has got it very strongly embedded ... I maintain a strong interest in what he does, and he has obviously done an excellent job with it. (Sally Rogan)

Interestingly, in both case-studies, SI has been successful in terms of both the outcomes achieved for student-learning and its sustainability, but through the application of relatively divergent models of implementation and use.

## Outcomes for learning and teaching

### For Teachers

SI has many benefits for teachers, which can again be viewed in the broader context of the way SI encourages a more, interactive, responsive and student-centered learning experience. In particular, teachers that have attached SI to their lectures, typically note how SI facilitates an important feedback link between the students and lecturer concerning the comprehension level of students. This enables the

<sup>7</sup> The faculty of IT at QUT uses SI, where it receives some funding and is supervised by a Teaching Support Officer: "In 1995, Ruth Christine, lecturer from the faculty of IT (where I am) won an equity grant to provide SI support to students in equity groups in first year subjects. It worked very well and the faculty decided to provide funding to run the program for all first year subjects" (Sauwan Cheah: Pass Program Supervisor at QUT). "We ran SI for all foundation first year subjects (8 in number) in the Bachelor of IT. This year we decided to run it for only subjects at risk. The SI leaders attend the lectures (normally 2 hours). They are paid an hour for preparation and also time for the facilitation of the SI sessions. A total of 5 hours (normally) (Sauwan Cheah: Pass Program Supervisor at QUT).

lecturer to 'revisit' content that has been poorly comprehended, and or to make timely adjustments to their teaching strategies and style. Accordingly, it is common for lectures to experience positive effects in terms of their own 'personal and professional development' and as a result an increase in satisfaction with their teaching role in general (adopter A). Rewards were also felt in relation to the students increasing enjoyment and the positive feedback lecturers received in courses that may have been previously perceived as difficult and unsatisfactory. As one SI co-ordinator confirms:

It's a very rewarding program to be involved with... and I think sometimes people in institutions struggle a bit to see the value of what they are doing and how it might actually benefit students... they are possibly in a role where they come across the difficulties involved with working in a uni, rather than the positive... we get fantastic feedback from the students; how much they are getting out of it and what a positive experience it is... So there is constant positive reinforcement in a role like this.' (Sally Rogan)

### For Students

Aside, from the tangible learning outcomes achieved for students in terms of improving academic performance, students were also perceived as developing an increased sense of 'ownership' and confidence in dealing with the course materials. SI therefore appears to contribute to a more general sense of student satisfaction and 'empowerment' because it grants students some measure of control over their study in terms of being able to cover material at their own pace; controlling the direction and depth of discussion and investigation in SI sessions and exploring course concepts and materials in a relaxed and non-threatening environment (Murray, 1999: 4) (Miller et. al. 2004). As one adopter states:

This program allows students to learn and study together with their peers. This way, they are not enforced by an environment where they hesitate to ask questions to their lecturers... and their peers will be able to give some thoughts based on their understanding of the subject in the past. (adopter D)

Adopters also point out the important connection between SI and the development of 'graduate attributes' or 'transferable skills', whereby students who have participated in SI are perceived as being 'more prepared for the transition between university and the workplace'. (adopter A) In particular, students recruited to be 'SI leaders' were reported as benefiting in terms of the development of their professional skills as facilitators and mentors, and the contribution this would make to their future employability.

### For Institutions

Institutions benefit in several ways by implementing strategies that enhance the students' learning experience and help to facilitate a more 'student-centered' learning environment. Many of the institutions that have implemented SI have found that there has been a significant decrease in student drop-out rates, as well as an increase in overall course grades and quality of the students work. Moreover, both the case-studies and the literature in the area confirm, the 'student-centered' approach of SI, also provides a comparatively cost-effective approach to the issue of academic support and assistance. For example, for Adopter A, the integration of SI into a basic engineering statistics course transformed the course from a

... traditional lecturer-centred teaching mode into a student-centered resource-based model, a shift which not only not only raised academic performance and the quality of learning, it also meant that; [The] total cost of running the unit is now less than it was originally for the whole unit' (adopter A).

By re-structuring the course and reducing lecture time, resources could be put into SI instead and this resulted in a reduction of the total cost of running the courses:

Before SI's introduction, the student unit cost was more than \$51 ... ,(each week, 2 hours of lecture and 1 hour of tutorials), and was reduced to less than \$42 (each week one hour lecture, one hour tutorial, one hour of SI, study guides, computer exercises and E-mail) (Murray, 1997).

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### Institutional contexts and support

At the institutional level, the major enabling features for adopting and embedding of SI were perceived as being related to institutional support, expertise and funding made available to academic staff and SI supervisors. In particular, one adopter emphasised the need for a dedicated, full-time staff-member with



the appropriate 'skill-set' to ensure the ongoing support and maintenance of the SI program at a university-wide level. These aspects were perceived as important both in terms of organisation and management, but also in terms of forming relationships with staff and in keeping the programs on the agenda by demonstrating how and why they are benefiting the students, the leaders, the faculties and the institution:

You need high level organisation and communication skills and I think that goes back to sometimes, that because people are well intentioned and enthusiastic its sort of like: 'would you like to run this on top of what you normally do' and they don't necessarily have the time or skill set or organisational capacity to deal with it ... I think there has to be a dedicated person for that role. You can't just hand over to an academic or other staff member on top of what they already do and say... 'Can you squeeze this into your lunchtime?' ... It has to be properly staffed and resourced like anything else ... Otherwise you get attempts that have happened in some institutions where someone is trying to do it on top of an already busy workload ... and then the program ends up falling in a heap, and people blame the program, or that individual, rather than saying well maybe we really just didn't implement it in an appropriate way (Sally Rogan – coordinator)

I am a permanently funded staff-member and that again is one reason why it has been successful here. In other institutions around Australia and over in America a lot of the time they will pull out some poor lecturer from another area and say you can do this as well, and it is always a bit half-baked if you know what I mean ... you have to resource them properly and that's the bottom line. (Sally Rogan – coordinator)

However, while there was generally consensus about the need for adequate resourcing and supervision, there appeared to be some differences in opinion about the 'extent' of support required to sustain SI successfully in the long-term. For example, clearly providing a full-time staff member, trained in the appropriate skill-set provides a more supportive environment for the maintenance and sustainability of SI at a much larger scale. In particular, this type of staffing arrangement is a necessity in institutions where SI is extensively implemented, that is, where it is operating in numerous faculties as part of a planned university-wide strategy or policy (i.e. Case study C, a university more formally aligned with UMKC)

However SI has also experienced long-term success and implementation, at an institution that is not perceived as providing extensive support either officially or unofficially albeit in a less overarching and systematic fashion. In this instance SI appears in individual faculties or departments, and while it may have been an established and significant part of the institutional culture at certain points in time, ongoing embedding has come about through the commitment of various individuals, rather than being a university sponsored development. Some of the SI schemes did commence with a special grant from the university central funds, but generally they have not received any continuing money from outside their faculty or department (Murray, 1999: 1). Interestingly, however while these two case-studies differ in their approaches to implementation, and the extent to which SI is embedded throughout the institution, an important part of their success can be attributed to the way they approach and manage the issue of funding and financial support. The SI trainer realised early on that it was crucial to try and implement SI without necessarily relying on extra funding and grants in the long-term:

... Some Unis that have trialled it in Australia have relied on special grants that have come out of the VC's office or whatever and others have scraped money together through various special grants and programming and things. The concern with that is that if you rely too heavily on that, as soon as the political climate changes and the funding dries up things tend to fall in a heap. When I was asked to implement this here we didn't have any money ... No budget, no special funding at all. No funds allocated. So I basically got the faculties to pay for the leaders and the deal was that the faculty would pay for their leaders and the deal was that faculty would pay for the leaders and student services would provide me to run it and that was the deal it was initially sold on. (SI trainer)

Another way of approaching the problem of additional funding, which has been utilised in several contexts of adoption has been to get the SI leaders to practice their role for academic credit in a particular module or subject rather than relying on financial re-imburement. This has proven an effective approach at several institutions both in Australia and overseas..

Adopter A also perceived the problems inherent in funding, and suggests that it is in fact the belief by some adopters that the project's success and continuation relies on the availability of continuing and additional funding, which contributes to its limited longevity and success in some institutions. His enthusiasm and commitment to the project meant that he was prepared to try and work around these constraints, rather than simply abandoning it. The unique approach to overcoming lack of financial and institutional support relied on restructuring the unit in which SI was operating so that funds could be re-

directed from conventional teaching practices, such as face-to-face lecturing and put into the running of SI. By cutting back on lecture time, and embedding supplemental instruction into the course structure, the staff member was able not only to improve the students' learning experience but also to run the course within the normal budget and *without* additional funding..

The success of Adopter A in maintaining and embedding SI without funding does not imply that the initial implementation stages of SI can necessarily be carried out without funding or assumed to be part of normal course development. Local adaptation and initial implementation of SI often requires some financial support, whether from within or outside the university.

Constraining features which inhibited implementation and embedding of SI included perceived differences between the pedagogical aims of SI, in particular ideas about 'student-centered learning' and academic staff which might come from a more 'traditional sort of political frame'.

Some academic staff grasp the concept quite easily, very readily, and if they come from a student-centered position they usually fall in love with it and become big converts. Some people come from the more traditional political frame and don't think it has any place ... Usually I find it's because it doesn't fit with their own agenda ... my call is that they are threatened in some way. (SI trainer)

I think with any program like this, within individual faculties there have been some members of staff that haven't been fans no matter what sort of results you get. And they tend to be people, who for their own agendas, it just doesn't fit with. They've got some philosophical objection to peer-learning. (SI trainer)

Other constraining features relate to institutional perceptions about what constitutes valuable or essential teaching innovations and the ability to attract funding based on these perceptions. In the particular context of SI there was the perception from some developers that because it didn't explicitly fit in with or match the university plans or guidelines it isn't worth supporting.

Where the institution sees the implementation as being straight forward and would promote [it] on the map, and can see it fitting in with the way they are doing things, they'll support it.

Perceptions that there would be difficulties in implementation, or that it might cost the institution money, often mean that an innovation like SI won't be promoted.

## Effective Supervision and Training

While there are clearly differences in perceptions about the extent of support required for the successful implementation of SI, adopters do agree on the need for constant and rigorous supervision of the program by people who 'know what they are doing', as a way to ensure the core principles of SI are being managed properly. In particular, adopters concur that rigorous reporting and evaluation of SI leaders, by trained SI supervisors, is essential to maintaining that the core philosophies of SI, specifically relating to the key principles of peer-mentoring and collaborative learning, and the differences between the leader's role as facilitator and that of a standard academic tutor. As SI trainer (Sally Rogan) suggests:

SI has a unique dynamic[s], it's not just that they get exposed to content for an extra hour as in standard tutorial. It's that PASS is all about the leaders helping these new students in learning how to learn that discipline.

It is in this context in particular then that adopters stress the need for adequate support and supervision:

On-going on-the-spot supervision and feedback is critical to prevent a tutor-centered type environment from creeping in to the SI sessions. (adopter A)

The issue of adequate **training** and **supervision** of SI leaders is thus perceived as being critical to the overall effectiveness of the project. Again the focus here is on ensuring that the initial excitement about the idea of getting students to guide other students, rather than simply act as 'experts' who re-teach was the principle that needed to remain constant. Another interviewee confirms:

The leader is not there to re-teach or be surrogate tutors in any way ... we look out for that very rigorously ... while I am not saying that it never happens, (certainly in some disciplines it is easier to avoid re-teaching than in others), but we actually do QA checks on our leaders and make sure that they're running their sessions properly (SI trainer)

Given that SI/PASS leaders play such a pivotal role in creating the appropriate learning environment, the initial **training** is also an important issue that requires significant consideration and commitment. As these comments suggest, it is important that there is both the funding and expertise to train SI leaders in the appropriate learning techniques so that they don't simply try and re-teach the students. The resources required to adequately train SI leaders are thus two potentially significant limitations with the scheme. However, while in many instances the initial training of facilitators is perceived as being insufficient to ensure that SI runs as it was meant to, this is where rigorous, ongoing and comprehensive supervision becomes crucial to ensuring the success and longevity of the program. Adopter A experienced difficulties with the training of SI leaders, in particular "Leaders were found to be acting as teachers in their sessions rather than facilitators". In response to these difficulties Adopter A changed the training so that it was more interactive, however perhaps most crucially they introduced a more intensive supervisory system, whereby previous leaders acted as supervisors to the new second year leaders:

Each supervisor has three leaders under them and in each session each week, so that leaders don't slip back into a tutorial structure. With the supervisors, this tendency can be prevented and the principles of SI can be managed properly whereby the instructor is invisible and the students are doing everything. (Adopter A)

As these examples illustrate, the training and supervision of SI leaders are two aspects of the scheme that need to be adequately resourced and managed in order for the program to be successfully implemented and embedded.

## ENABLING AND CONSTRAINING FEATURES OF THE PROJECT

### The quality of the framework

The SI model is designed and contextualised in ways that make it immediately attractive to institutions and staff developers on a number of interrelated levels. In particular, SI is founded on developmental and constructivist approaches to learning, and makes use of collaborative and peer-learning teaching strategies, the benefits of which are well known, if not widely practiced in the area of teaching and learning (Martin, 1992). The theoretical framework and founding assumptions of SI are thus consistent with many existing ideas and practices relating to increasing the effectiveness of teaching and learning. In this sense when considering the potential benefits of the SI program, the core principles and pedagogy are already readily perceived as attractive for potential user-communities. One interviewee commented that on encountering the program for the first time:

I thought 'that sounds right'. Not knowing a lot about it, it just sounded right to me and I believed it from that point onwards and I began implementing it because I knew that students learned best off students . . . anything that would promote interaction amongst students in a guided and structured way, I thought 'this has got to work'. (Adopter A)

Indeed, the SI/PASS program is repeatedly cited as working so effectively because the core concept is immediately perceivable to potential users as being highly responsive and beneficial to their local teaching requirements and problems.

### Project personnel approach and strategies as perceived by users

The training and resources available through the UMKC SI website are regularly cited as benefiting users and developers, as is the assistance and collaborative efforts provided by staff at the centre. In general, the organised and programmed nature of the SI model is viewed positively by both adopters and users, although there are some instances in which the training was viewed as perhaps too prescriptive.

### Perceived benefits for students

One of the immediate strengths of the SI program is that it is an established program with a proven track record and the results in improving student performance and lowering attrition have been well documented both in Australia and overseas. Moreover as one adopter argues, SI is also more readily perceived by the students as being beneficial to their studies than other forms of mentoring and

assistance. Adopters suggest that the reason that SI/PASS as a model of student assistance works so well in comparison to other forms of academic support is that it is very clearly embedded in a subject, this gives the students a very clear 'hook'. (SI trainer)

We always make it very clear to our students that it is an integral part of the subject ... these programs are voluntary and open to everybody enrolled in a subject. Now if you are trying to sell a program that's voluntary and you are saying you should give up an hour of your time ... to come along and do this I think it needs to be very clear to people what they are likely to get out of it ... A lot of mentoring programs that run in Australia have relied to heavily in my opinion on just a sort of touchy-feely, buddy type thing. 'Come along and meet new people and make a friend!' ... we've never gone down that track. We always make it clear that if you come along to PASS and you attend regularly it will improve your mark by 10-15 marks on average and that you'll have a significantly better chance of getting through the subject. (SI trainer)

## CASE SUMMARY

Particular aspects of the system which favour adaptation and implementation of SI at contexts outside its original location of development include:

- it responds directly to local teaching needs and problems;
- it is a well organised and established program supported by organised forms of training on how to contextualise and embed in the model in particular contexts;
- potential costs are generally perceived as being outweighed by the benefits to participants, students and institutions involved with the program;
- it can be sustained to different degrees, in a variety of contexts, and with varying models of institutional support and financial assistance;
- it is adaptable enough to be customised for different institutional and disciplinary contexts and requirements, yet its core principles generally remain coherent and effective;
- it creates a critical form of feedback between staff and students, and is thus potentially capable of instigating significant reforms of teaching and learning.

# NATIONAL CENTER FOR CASE STUDY TEACHING IN SCIENCE

## Originating location

University of Buffalo, State University of New York.

## Type of case

Institutional improvement through curriculum reinvention and staff development.  
Case study repository.

## Website

<http://ublib.buffalo.edu/libraries/projects/cases/case.html>

## Funding Sources

Three sources from 1991 – 2007: the Fund for the Improvement of Postsecondary Education (FIPSE), the National Science Foundation and The Pew Charitable Trusts. Total exceeding \$US2million.

## Reason for choosing the case

This case was initially chosen for its:

- transfer and adaptation of case based teaching from disciplines such as business management and law into the sciences;
- scaling up from a local to a national program;
- use of a variety of approaches including face-to-face workshops and digital communication and resources to encourage adoption and adaptation in other contexts;
- repository of open access science case study resources.

## PROJECT DESCRIPTION

### Origin

The project has evolved over 15 years in response to the perceived limitations of the traditional lecture method, and to promote student participation and critical thinking in cooperative and team learning contexts. (project developer)

A university wide curriculum reform initiative commenced in 1989. A selected team of scientists was given the task of redesigning their courses with more emphasis on developing the critical thinking of senior undergraduate and post-graduate science and engineering science students. This has since evolved to become a National Center supporting the development of teaching skills for student centred learning and a repository of case studies which are being used at all tertiary and some secondary levels. The majority of case studies are now used in courses for students fulfilling general study requirements. The Project Developer was initially unaware of the potential for these courses designed for students with non-science majors or how it would fulfill a need for their teachers which has been demonstrated by the popularity of the website and the continuity of workshop participation.

The focus on active student learning was a response to both locally perceived and nationally identified concerns related to the:

- ascendance of quasi and pseudo-scientific reasoning prevalent in popular culture and amongst undergraduate students;
- failure of scientific courses to draw significant participation from minority groups and women;
- the decline in scientific leadership with implications for the USA's international competitiveness in science and technology.

## Aims

The aim of the National Center for Case Study Teaching in Science, as stated on the website, is 'to promote the development and dissemination of innovative materials and sound educational practices for case teaching in the sciences.' It recognises the need to support explicit teaching methodology and scientifically accurate subject matter so that students develop a rigorous approach to the discipline.

... in order to draw valid conclusions, students need to be provided with sufficient background knowledge obtainable through the exploration of relevant, contemporary case studies that expounded scientific principles. (project developer)

To achieve this, the project set out to:

- provide case studies for academic staff, recognising that time demands and or lack of expertise in case study design limited their ability to develop their own cases;
- develop a national website devoted to the publication of cases in science as a 'a repository and dissemination center, similar to those that exist for law and business schools, such as at Harvard'; (project developer.)
- run summer workshops for academics to learn how to write and use case studies;
- run an annual conference to facilitate the exchange of teaching strategies;
- develop a set of videos demonstrating different styles of case teaching;
- publish an annual issue of the *Journal of College Science Teaching* devoted to cases;
- provide a one-year gift subscription of *Journal of College Science Teaching* to each workshop participant who would also nominate four colleagues to receive a year's free subscription, amounting to 1500 trial subscriptions. (An initiative discontinued because the journal readership remained essentially unchanged.)

## Design and activities

Training academic staff began with workshops on one campus (1990 – 1993) and has now expanded to an annual conference, five-day residential summer workshops and an online library of case materials. Participants are primarily from institutions within USA but representatives from countries including Sweden, India, Canada, Taiwan and Australia have also attended.

At different times since 1991, the Project Developer has also conducted workshops internationally and now, supported by the most recent National Science Foundation (NSF) grant, (2004 – 2007), satellite workshops in locations throughout the USA for audiences of academics serving minority Hispanic and Afro-American communities.

### The website

The website is seen as highly successful by the project team and advances the 'great promise as a pedagogical technique for teaching science'.

### The workshops

The National Science Foundation sponsors two annual residential five-day workshops and subsidises attendance costs including travel and accommodation. Workshops have attracted over 430 participants including senior faculty members since 1999.

### The conferences

The annual conference, which has been conducted since 2000, caters for experienced and novice practitioners of the case study method. Featured speakers are academic users from other universities in a range of scientific specialist areas. Comments from former participants are available on the website (<http://ublib.buffalo.edu/libraries/projects/cases/conference/conference.html>) and include the following:

'... This is one of the best organized, consistently worthwhile [conferences] I've attended in some time. Particularly enjoyed meeting so many people – participants and staff – ... struggling with, challenging, developing case-based teaching.'

'Interesting, informative, and motivating... Lots of examples and lots of motivational and excited people.'

### The Case Study Collection

Visitors to the website are invited to use the bank of case studies in a range of ways.

The accessible case studies are written by workshop participants and subjected to a double blind peer review prior to their publication on the website. A more detailed form of the case studies is published in a special annual edition of the *Journal of College Science Teaching*.

The digital repository has over 250 cases organised according to discipline categories, each with a synopsis hot-linked to the case detail and teacher's notes. Users of the case studies are invited to provide feedback and suggest additions or alternative applications or modifications.

### Copyright

Copyright is held by the National Center for Case Study Teaching in Science, and use for educational purposes is permitted without contacting The Center. Commercial providers are required to secure authority to use or publish content from the site. Conditions apply to the publication of case studies from the repository for use in a course package. The reproduction of the teaching notes is not permitted.

### Videos

A set of two videos has been produced to demonstrate teaching methods that use a case based method and has been purchased by universities across the country with some, e.g. the University of Minnesota purchasing 50 copies for distribution to all faculties.

### The Listserv

The listserv is password protected and provides a moderated mailing list with archive capacity. The co-directors manage the postings.

### Adaptation and embedding in other contexts

The Project Developer's description of case based teaching programming suggests an approach to suit the intended outcomes of a given course.

As the teacher of the largest class on campus, I alternate case studies and mini tests. The order in which they are alternated will depend on the topic. It may be two or three mini tests in a row then a case study or the sequence might be mini test - case - mini test - case - case. It may be irregular as to the structure but the cases tend to integrate the material. (project developer)

Adopter A outlined the implementation of case based teaching practice specifically in first year biology course for 350 students at an Australian university:

Sessions run five times a week with classes of up to 80 students and we get positive student engagement, deep and provocative questioning and controversial responses. Really, you get everybody in the class participating.

Unlike the context described by the Project Developer, the curriculum in this instance was not case-based but rather, cases were used to complement lectures as part of the tutorial program.

Adopter B's approach to teaching has not been confined to the use of case studies, and he takes a broader approach to engaging students in their learning. He is involved in teaching undergraduate courses across traditional discipline boundaries and case studies are among the strategies used in a cross-discipline course attracting students from 32 degree programs in a course that integrates practical work-related context and builds critical thinking skills. The course integrates:

... the practical vocationally oriented aspects of first year Forestry, with first year Geography's broad ranging society-environment concerns and first year Sociology's emphasis on critical thinking. (personal website, retrieved, 23/04/05)

Adopter B referred to the positive course evaluations as measurements of the successful use of case studies and related strategies acknowledged also through the recognition by a national award for his course design and approach. Furthermore, he measures the success of his teaching strategies through the similar methods now being used by former students. His remarks reflect his key motivation:

'I'm interested in finding ways of getting [my students] to think. I'm prepared to do whatever I can to do that.

I expose undergraduate students to complexity of discipline [and] bring the real world into the classroom.  
(adopter B)

These interests and the ways in which the principles of case based teaching have been adapted are evident in the comments found on the website Resource Directory of Case Study Teachers. They show the flexibility of approaches derived from a common set of principles and the growing community of practitioners. (<http://ublib.buffalo.edu/libraries/projects/cases/people.html>).

Similarly, Adopter A contrasted teaching contexts for case based teaching to large classes of 300 – 800 students in undergraduate generalist science classes and small groups of between 9 and 12 in a specialist medical degree where Problem Based Learning provides the course design. Whereas in a science tutorial the purpose is to elaborate and enrich conceptual understanding, in medicine the purpose is to lead students to a clinical diagnosis. The problems carry the curriculum. Tutor training for large class settings require skills that encourage open-ended questioning and speculative responses whereas those guiding medical students require explicit directions leading to specific and intended conclusions.  
(adopter A)

The techniques and approaches associated with converting course delivery from a lecture format to one using alternative approaches require understanding, as do issues of change management. The Project Developer reflected on the dangers of introducing new methodology so that it confronts and meets with resistance from students successful in traditional classrooms. He stressed the importance of good implementation, the support of other faculty members and administrators, and the backing of the growing body of research evidence identifying the positive impact of student based learning procedures

## Outcomes for learning and teaching

### For teachers who participate in workshops

The workshop program interlaces case based theory, the writing of case studies and practice teaching, enabling participants to learn how to implement the case method and test it out with students:

They were fantastically professional. They do... and you know, you go there and we had to write a case and teach it in that week and we had to teach to a group of students we knew nothing about who they paid to come in to be taught. So it went right from 'here's the theory, here's what you try and do, this is how you might do it, now go away and start writing and you're going to teach it at the end of the week', and then they come in and they watch you teach it and give you feedback and that's brilliant it's all done ... and I mean that's really how you do it because you come away with 'oh gosh, when I tried to teach that it didn't work because ...'. It was nerve-racking but it was [an] incredibly important part of that workshop. (adopter A)

An independent survey of workshop participants from a four year period found a high rate of dissemination and active commitment to case based teaching.

84% reported they were using cases in their classes after having attended our workshop; 80% reported they were actively engaged in writing cases. In addition, a number had converted one or more courses to entirely case-based exercises, and several noted their departments had changed their entire curricula to a case approach. (Schiller, 2004)

Adopter A confirmed the influence of the workshop experience, and said it was 'the best ... I have ever been to'. Adopter B perceived the workshops were restrictive in their applicability to course programming. Nevertheless as a practitioner already using case studies in a non-science based discipline, he valued the opportunity to glean useful ideas and strategies to enhance processes and



practices already part of his teaching repertoire. His criticism was more directed towards debate that confines teaching strategies by labelling them thus restricting their application and good practice.

### For students

While the introduction of a case based approach was intended for students typically in higher levels of science disciplines and engineering science, the resources of the National Center for Case Study Teaching in Science are used by a much larger audience. Regardless of the level of usage, both Adopter A and B echoed the Project Developer's intention to secure active student participation and critical thinking through contextualised subject matter.

Comprehensive teacher's notes provide a rich range of outcomes the case studies are designed to achieve. General principles associated with collaboration and enrichment of conceptual understanding, ways of encouraging and guiding divergent thinking and critical evaluation is encouraged through suggested or scripted open-ended and provocative questioning. In both a general sense and in content specific case studies, the articulation of outcomes including definition, identification, classification, speculation, understanding difference, providing a clearly expressed position are strategic in the way they direct the momentum of the learning agenda.

The Assistant Project Developer expressed the team's interest in opening possibilities for learning. New and creative approaches are not seen as inconsistent with rigorous enquiry. In common with the wide range of supporting comments regarding disciplines and contexts for the inclusion of case studies, they offer what Adopter A described as 'Multiple input from the class, a 'what do you think about that?' approach.

### For institutions

Institutions benefit from strategies that enhance and/or renew teaching-learning dynamics. Educational reform, from curriculum revision to assessment measures, provide new and diverse locations for case based teaching. Furthermore, the internationalisation of the student cohort, the growing appeal of virtual learning and the opportunity to share knowledge digitally suggest expanding opportunities for institutional specialisation.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### National initiatives

The National Centre has received strong support in the US context. Adopter A expressed a desire to set up a similar workshop process and repository for case based teaching in Australia, modelled on the lines of the National Center but reflecting Australian curricula. The possibilities remained unfulfilled for the following identified reasons:

- lack of money and time;
- limitations of uptake and interest of colleagues dissuaded because of the commitment required;
- pressure of other professional obligations;
- promotion to new positions with demands changing the practitioner's focus.

### Institutional support

In the first instance, senior personnel on campus identified the Project Developer as having the capacity to conceptualise case based teaching in his discipline, secure grant funding and bring the process to fruition. After he had determined ways of applying the principles to science, and developed successful practice, three features stood out: the financial incentive used to encourage staff to undertake training during the first three years; the contractual commitment of those trained to teach in specified subjects once trained; and the authority of the Dean to ensure the trained staff were given the appropriate classes.

At the adopting university, the influence of the Vice Chancellor on the one hand and initiatives taken at the 'grass roots' through collegial interest groups on the other, enabled the conditions for adaptation. Adopter A and B both emphasised the value of the university's climate supporting explicit emphasis and focus on innovative research into enhancing teaching practice as valuable backing. It supported their attendance at the workshops held in USA in the first place, and their activities on return.

Adopter A took advantage of the opportunity and involved the head of school in developing and teaching a redesigned course. A course that continues to be taught in this way three years after Adopter A had secured promotion and moved to another faculty.

In reference to the sharing of knowledge that will improve teaching within Australian universities, Adopter B commented on the disparity between the collegiality of academics who use opportunities provided by workshops, conferences and increasingly through websites to debate and share information, and institutional rivalry which worked as an inhibitor to sharing effective innovative practice.

## Leadership expertise

Features of leadership that enabled systems to adopt and adapt new practice evident in this case include the capacity to:

- formulate principles for adapting innovative practices in new contexts;
- engage collaborative networks and supportive teams to develop the ideas and put them into practice;
- adapt new learning to build, modify and reinforce essential learning outcomes;
- appreciate the psychological hurdle many successful practitioners have in giving up known teaching strategies;
- adopt new approaches including the application of emerging technologies;
- identify personnel with the skills and ability to support and expand the reach of the initiative;
- use reputation and seniority established through similar or discipline based research to expound the advantages of the innovative approach;
- use demonstration with good facilitators to show 'how easy it is';
- find ways of informing Deans and other faculty leaders to champion innovations so they become embedded in practice.

The practical processes that built the National Center confirm Adopter B's analysis that

Leadership at the national level [is] just as important as it is at the institution. There are structures in place and reward systems to encourage excellence. In addition, there needs to be emphasis on expanding networks which are now possible. Use the web as all academics are now using it.

## Responses to changed conditions in the tertiary sector

Adopter A organised the implementation of cases in a redesigned course following her attendance at the workshops. Tutorials employed the 'Interrupted case study model' and provided an answer for a faculty facing cut-backs in the employment of lab assistants and reduction of equipment and provisions traditionally used in hands-on experimentation.

In science you can't run ... in science you traditionally run students in labs ... it's almost now unaffordable because of the money for consumables and things. We wanted to engage these students. (adopter A)

## Forums for promoting innovations within the institution

When Adopters A and B returned to their university, they took immediate steps to share their knowledge by presenting lunchtime seminars, running workshops for interested colleagues and commenced the writing of case studies. This was facilitated by the existence of a collegial forum previously established through an academic development centre. However, two practical factors constrained the effectiveness of their efforts: the amount of work required to institute innovative practice, and the importance of explicit

training in group management and effective questioning techniques prior to the introduction of student centred learning initiatives.

### Recognition and rewards

Although there was consensus that teaching innovations were not seen by others as having much importance, and their professional reputations rested on their discipline research, the Program Initiator identified the evolution of a more supportive environment within the university culture.

The Program Initiator saw this in the emerging dialogue reflected in the growth of literature, requests for key-note addresses and increase in the themes of international conferences relating to strengthening student learning and performance. All agreed that for many colleagues an important prerequisite was the wide dissemination of positive research findings and enhanced recognition of participation in this work.

### Longevity/cultural context

The project evolved over more than 15 years in response to both local and national factors. At the local level, the institutional initiative to improve course delivery complemented the existing concerns, identifiable from the end of World War II, regarding the failure of the educational system in the US to provide international leadership in scientific thinking. The scaling up from a local to a national program was enabled through successive grants. Personnel from the funding bodies were also instrumental in supporting its expansion by providing consultation prior to the finalisation of grant submissions.

## ENABLING AND CONSTRAINING FEATURES OF THE PROJECT

The Project Initiator identified two key elements enabling the project: explicit teaching of the teachers in extended workshop sessions and significant financial backing.

A key fact in making things happen was that faculty needed faculty development to change what they were doing ... they volunteered and were paid for attending the workshops – that's what attracted them. What they needed was to see in practice how the innovations could be implemented within their discipline.

In contrast, he noted that although conferences provide the opportunity to promote the value of the processes, the interest engendered is a result of good presentation skills and does not, in itself lead to the adoption of innovative practices.

One hour doesn't change minds because they haven't been shown how to do it. I'll always find people who are ready to do it. To overcome the time barrier where you're doing it cold is most important. In smaller colleges the influence is greater because the faculty are more accountable for teaching whereas in the larger universities the emphasis is on discipline research.

### Leadership

In both the Project Initiator and the Adopters' contexts, the leadership of specific individuals was an important feature. This included

- the program developer's evolving skill and understanding of effective strategies which were then communicated to staff in training;
- the program developer's charisma and enthusiasm for both his discipline and teaching and learning processes that engage students in rigorous and critical thinking;
- serendipitous and inspirational forces – including engagement in progressive debate with practitioners in other educational fields including such diverse origins as early childhood, law and business;
- the practitioner's motivation to explore ways reputable innovative practice could be implemented in their known discipline context.

These qualities are directly evident in the National Center's status, its longevity and appeal to international workshop participants. Further indicators are the translation of case studies into different languages and the status of the National Center topping the Google list of cases for science teaching.

The National Center has grown from a less professional initiative to what it is today and has taken the following course:

- training of staff to implement initial curriculum reform and provision of money as an incentive for uptake within the founding university;
- offering of training to personnel in surrounding institutions;
- refining workshop option and extending its reach to interested parties subsidising of costs for personnel attending;
- creating and using a website for multiple purposes;
- securing grant funding specifically for dissemination;
- initiating further grant application to upgrade the repository of case studies as a digital library;
- identifying spin-off grants – research assessing the relative merit of student centred learning in comparison to lecture-based courses conducted by former workshop attendees.

The evolution of the Project Initiator's understanding of ways to program a course without lectures was a personal journey supported by key senior personnel. In the first stages the backing of the Dean and at a later point the support of the senior librarian enabled the extension from a faculty based professional development program through workshops to the building of a bank of accessible and transferable case studies.

### Adaptability of the model

Adopter B's comments that case based teaching fits into a conceptual framework aimed at the broader building of critical skills reflects a significant enabling feature. Although critical of the limitations of the workshop framework, the adaptability and relationship to other flexible learning arrangements are evident.

Changes brought about by promotion and the move from a science faculty where the issue was engaging students in large class settings, to responsibility for course delivery in the medical faculty draws attention to key points of adaptation. The differences between the two contexts draw attention to the capacity of the adopter to identify links and contrasts such as those listed in the table below.

The invitational nature of the directions on the website and the policy of permitting open access to the repository also support the intended flexibility of their use:

Here are some ideas that we encourage for the use of our cases:

- Use them in their current form.
- Modify them to fit your classes, or 'personalize them for your students.
- Use them as examples to develop your own cases.
- Use them as examples for the case study method.

<http://ublib.buffalo.edu/libraries/projects/cases/guidelines.html>

### CASE SUMMARY

Key features resulting from the investigation of the National Center for Case Study Teaching in Science are:

- the value of an enthusiastic project champion;
- the value of project longevity;
- teacher perceptions that the case study approach would be effective for students' learning;
- teacher perceptions that the approach could be adapted to their teaching situations;

- development support for teachers which enables them to understand the case study approach and how to use it, and prepare to use the approach in their own contexts;
- the case study resource repository is a living resource as cases continue to be added. Cases are designed according to a scholarly framework and include advice on use;
- academic processes for ensuring quality of resources in the repository through detailed guidelines and peer-review;
- departmental support and leadership is important in influencing the extent to which the approach spreads from an individual teacher participant to others in a department. Active engagement of the head of department by an enthusiast can improve the chances of embedding. There is potential for incremental spread of an innovative approach through involvement of a team and tutors responsible for delivering a common program.

# EFFECTS: THE EFFECTIVE FRAMEWORK FOR EMBEDDING C&IT USING TARGETED SUPPORT

## Originating locations

University of Plymouth with partners Oxford Brookes, UMIST, University of North London (now part of London Metropolitan), University of Southampton.

## Type of case

Staff development aimed at applying and embedding C&IT in courses.

## Current website

<http://www.elt.ac.uk/>

## Funding

Teaching, learning and technology program TLTP3, a HEFCE fund. Three year funded project with additional transferability component. Total £291,000.

## Reason for choosing the case

This case was initially chosen for its:

- development and dissemination approach which involved collaborative development across five institutions followed by cascading to further institutional partners, developing a professional accreditation framework and establishing a professional development network;
- evidence of impacts at a range of levels: national, institutional, departmental, teacher/participant and students.

## PROJECT DESCRIPTION

### Origin

The project was initiated by staff developers and motivated by a desire for more structured processes for supporting staff to embed C&IT in teaching and learning as part of their normal roles. The need for more systematic embedding of C&IT into teaching and learning and the requirement for associated staff development were consistent with recommendations made in an evaluation of TLTP rounds 1 and 2 (HEFCE, 1997) and the Dearing Report (1997).

### Aims

The aims of the project, as described in the project final report (Fullerton and Bailey, 2001) had a clear focus on embedding and ongoing dissemination. The project aimed to:

- Establish a generic framework which institutions could adapt to support the embedding of C&IT into the teaching of a wide range of disciplines
- Develop local support frameworks that would be sustainable after the end of the project, and support institutional change
- Support staff through these programmes to embed C&IT into at least 70 teaching courses
- Evaluate the effectiveness of each effects institutional model
- Develop a nationally accredited scheme of professional development for staff embedding C&IT
- Cascade the EFFECTS framework to at least 5 partner institutions;
- Establish a Professional Development Network to disseminate the project outcomes

## Design and activities

The project design began with the development of a generic framework for embedding C&IT into course modules (subjects) and the embedding of this framework into staff development programs in the initial five institutions.

### Development of a framework

The EFFECTS framework was developed by the project team in the early stages of the project and revised after consultative workshops with other members of the academic community. The framework specified a set of seven learning outcomes which related to the scholarly processes that staff development program participants would use to successfully embed an appropriate form of C&IT in one of their teaching modules, develop the capability to engage in appropriate embedding in other modules and disseminate the experience to others. These outcomes were:

**Outcome 1:** Conducted a review of C&IT in learning and teaching and shown an understanding of the underlying educational processes

**Outcome 2:** Analysed opportunities and constraints in using C&IT and selected C&IT appropriate to the learning situation

**Outcome 3:** Designed a learning resource, programme or activity to integrate appropriate C&IT

**Outcome 4:** Implemented a developed strategy

**Outcome 5:** Evaluated impact of the interventions

**Outcome 6:** Disseminated the findings of the evaluation

**Outcome 7:** Reviewed, planned and undertaken appropriate actions related to your own continuing professional development

(Fullerton and Bailey, 2001)

### Implementation in partner institutions

A key feature of the project was that each institution was expected to develop its own approach to embedding this common framework, based on its own culture and priorities. For example:

- University A developed a Masters level Embedded Learning Technologies (ELT) module which used the EFFECTS framework and built on an existing SEDA accredited Learning and Teaching program for new lecturers. The approach of developing an accredited module has been adopted by a number of the initial and cascade partners.
- University B's approach evolved from an initial series of workshops with one-to-one support for participants to a short intensive course with more structured online and tutor-based project support. Accreditation was later sought.
- University C initially developed a program involving participant action research and preparation of a portfolio, initially outside the context of an accredited course. It then developed a 'light' version which included a focus on supporting participants to embed the use of Web-CT or other systems into their modules.
- University D used the EFFECTS framework to extend, formalise and further support existing strategic programs aimed at enabling staff to use new technology facilities.

Within each institution, the EFFECTS program funded a 0.5 FTE project officer or equivalent and there was also a 0.5 project manager in the lead institution. These team members played a key role in working with others in the institution, developing the institutional program and supporting staff participants in investigating, implementing and evaluating the use of their chosen form of C&IT in their modules. EFFECTS participants were expected to produce a case study and a portfolio of evidence to demonstrate that they had met the learning outcomes.

The project was evaluated extensively, both in individual institutions and in external evaluations (Harvey & Oliver, 2001; Hall, 2003). The final report for the project (Fullerton & Bailey, 2001) notes that C&IT had been successfully embedded in 72 modules at the original five institutions with further modules at cascade partner institutions. A significant number of staff in each institution were involved in the program but many did not complete a portfolio, having learned what they perceived that they needed and

implemented the desired C&IT. The project was perceived to have been successful in encouraging innovation at the individual level and having flow on impacts within institutions.

### **Cascading to other institutions and further dissemination activity**

The framework, materials and implementation experience developed in the initial institutions were disseminated more widely via a 'cascade' process in which each of the initial partners sought to work with at least one further institution in its region. The process of engaging potential participants from other institutions began within the first six months of the project's development with consultations on the outcomes framework and early project developments in the form of papers at the Association for Learning Technology (ALT) and Staff and Educational Development Association (SEDA) conferences and national EFFECTS workshops in Manchester and London. A project document 'EFFECTS guidelines for Institutions' (Beetham & Bailey, 1999) was produced and distributed after one year.

From very early on in the project, members of the project team ran participative workshops, gave conference papers and produced a large number of reports, documents and articles. The team members at Plymouth, the lead institution, were particularly pro-active in engaging with potential user communities. The final report for the project (Fullerton & Bailey, 2001) lists 24 project workshops and conference papers in the second year of the project and 30 in the third year, along with 17 written reports, documents or journal articles in each year. Many of the written documents were available on the project website and continue to be available on the Embedding Learning Technologies (ELT) site (<http://www.elt.ac.uk>) developed after the EFFECTS project's completion.

The final report lists four cascade partners in which the program became embedded, with one institution where it failed to attract ongoing participants (Fullerton & Bailey, 2001). The ELT website lists 12 institutions with current EFFECTS/ELT programs, of which seven have been externally accredited.

### **External accreditation**

External accreditation of the program was considered from the beginning and achieved through SEDA as the first of its professional development frameworks. This outcome was considered to have benefited both EFFECTS and SEDA

It was the first PDF (Professional Development Framework) award that was written out. So it was the best first example for all the others. It could only have been that because it was sympathetic to the SEDA values anyway. (cascade partner)

### **Development of the network**

The project team members initially formed a network and email list for the project. This grew as members ran events and shared their practices and resources with others, and came to include the team members, leaders of EFFECTS programs in institutions, people developing EFFECTS programs and others with an interest in ELT (Hall, 2003). The network was one of the focuses of the EFFECTS Transferability project. An evaluation of this component of the project (Hall, 2003) described the network as including a range of examples of good practice, including active encouragement for new participants to share their experience, regular events, ongoing maintenance of contact lists and providing a 'national focus for professional development work in this area without losing its initial philosophy of learning (Hall, 2003, p. 23).

The project also resulted in the development of informal ELT community of people wanting to improve student learning and change the quality of teaching and learning through technology. Members of this community linked up through the project and continue with ongoing discussions when they encounter each other in other contexts.

### **Outcomes for learning and teaching**

The project external evaluation (Harvey & Oliver, 2001), reports and case studies provide evidence for impacts at multiple levels.



## Participants in EFFECTS programs – teachers and learning support staff

The case studies and evaluation reports suggest that many participants in the initial institutions achieved significant learning outcomes whether or not they completed their portfolios. Examples from the case studies suggest learning outcomes related to learning and teaching in general as well as to the processes of implementing technologies:

The use of 'Question Mark' has meant that objective tests are now thoroughly understood in terms of design parameters. One of the key benefits of 'Question Mark' is the feedback facility for each individual question. However, the feedback had to be written by the person who set the assessment and this required a great deal of careful thought and fed into the way in which the assessments were designed. (Case study – improving feedback, Biology)

Through ELT I have been made ware of what technology is available to me, what it can do for me and what the limitations are; Learned about the pedagogy of student learning and how the consideration of this is of paramount importance in determining the appropriateness of [technology supported] teaching and learning strategies. (Case study – diversity, Business)

Practitioner skills required for teaching are different to those required for the development of innovative C&IT. The ability to be able to recognise this difference and employ the skills of people to build programs efficiently and effectively is very important. (Case study – software applications, Psychology)

## Students

Reported benefits for students focused largely on improved flexibility of access to learning materials and improved student-student and student-tutor communication (Harvey & Oliver, 2001, EFFECTS case study website <http://www.clt.soton.ac.uk/effects/casestudies/>). There were also reports of improvements in feedback to students, largely through the use of self-paced assessment tools. In addition, some case studies reported that students improved their IT skills or increased their use of computer-based resources such as professional databases, that had previously been underutilised. In assessing benefits for student learning, it needs to be noted that the majority of cases listed on the EFFECTS case study website are categorised as providing online resources, so the reported outcome of improved access often matches this desired intention. Not all case studies include evaluation results, and many evaluations are limited to typical end-of-semester questionnaires or other measures of student reaction (Harvey & Oliver, 2001), an issue in common with other studies of ICT use in teaching (Alexander & McKenzie, 1998).

## Departments and Institutions

One outcome of EFFECTS for institutions was the development and embedding of innovative approaches to using technologies in modules where this would not have otherwise occurred. Other, broader effects were also reported in the participating institutions. Staff who had completed an EFFECTS program were often seen as sources of expertise for others in their departments or the institution, although this was valued to different extents in different departments.

In all five initial institutions, EFFECTS programs were linked to strategic goals for increased use of C&IT and associated staff development. Implementation of the program and identification of participant needs in some participating institutions resulted in long-term changes to their systems of support for staff using learning technologies. In some cases it brought about closer collaboration between different structural units such as staff development, IT support and faculties that accredit EFFECTS courses. In other cases, new integrated support units were set up to provide continued support beyond the life of the EFFECTS funding.

## National level

On the national level, EFFECTS has been noticeably successful. I think almost uniquely. ... It has a much broader impact than any other single TLTP. (cascade partner)

EFFECTS was seen as a program which had influenced future e-learning and embedding and other professional development initiatives, in part because of its broad dissemination and in part because most of the initial project team members moved institutions during or just after the project and some became involved in national organisations such as JISC. The project also influenced another project on embedding learning technologies institutionally:

The institutional model of materials really came out of the EFFECTS materials for personal development. It was this sense of raising that process to the level of the institution rather than the person and looking at some of the same issues. ... And we developed some materials for looking at your own institution ... it was kind of an audit really of what was working well, where were things getting blocked, where were things moving well, what were your strengths and weaknesses. And then trying to find ways of pushing forwards. And we had ... I think there was [sic] seven or eight different institutional models put about for e-learning and technologies. Most institutions used three or four of them. (project team member)

## ENABLING SYSTEM FOR ADOPTION/ADAPTATION AND USE

### External contexts: national priorities and timing

The EFFECTS project was designed from the initial bid to link to national priorities, creating an external incentive for institutions to become involved. At the policy level, the project was clearly consistent with priorities identified in the national TLTP 3 bid document (HEFCE 14/97, 1997), in particular the embedding of technologies into mainstream teaching and encouraging sharing and collaboration between institutions. The project bid was put together at a time when the Dearing (1997) report into higher education had emerged and included recommendations focused on more formal qualifications for university teachers and membership of the yet to be formed Institute for Learning and Teaching in Higher Education. In this context, the potential for national program accreditation was recognised by the EFFECTS team and seen as important for making the program attractive to other institutions:

... [the team member] insisted when we put the project together we'd seek national accreditation. I think it's the one, if there was one, factor that moved it from being something that was potentially interesting but not very attractive to something that was actually attractive to other institutions. The idea of having something that had some sort of currency. This is what [team member] kept saying 'if it has currency between institutions so somebody can say well I've done the EFFECTS program at this institution' when they go somewhere else, it would help them to actually embed it in. (project team member)

### Institutional contexts: priorities, expertise, leadership, recognition and rewards

At the institutional level, the major enabling features for institutional implementation and embedding of the EFFECTS program were seen as existing strategic priorities related to the increased use and embedding of technologies in teaching and learning, appropriate technical infrastructures and appropriate staff support systems. In some cases these features or an institutional commitment to resource them was in place prior to the EFFECTS program and EFFECTS added to or enhanced existing provision.

The ELT document, *Lessons learned* (ELT, 2003) notes that:

Institutional development requires progress on a large number of issues simultaneously (technical infrastructure, learning and teaching culture, reward systems, staff development, support staff, research and development...) and different factors will be limiting development at any one time. (p. 6)

### Constraining features at the institutional level

Constraining features which inhibited institutional implementation and embedding of EFFECTS included:

- institutional structures or cultures in which there were no links between staff or educational development expertise and C&IT expertise or support;
- lack of C&IT interest amongst members of the staff development community in institutions;
- the inability of some potential program leaders to read their institutional cultures sufficiently to gain acceptance for the EFFECTS framework or adapt it effectively in their institutions.

... the limit of that (adaptation of different models) is whether you have people in institutions who can contextualise it, who can analyse their own institution effectively, who know what will work in their institution and who could be creative about what you're offering to them. (project team member)

While the initial institutions were seen as supportive overall of embedding C&IT more widely, supportive academic leadership at lower levels was seen as necessary to support any wider impact of EFFECTS within departments:

[One participant] while she was doing the project, was systematically organising web discussions in the department, but she was already working in a department with enlightened academic leadership. (cascade partner)

Departments were seen as varying in their level of commitment to embedding which spread more widely than a project completed by a single innovator:

Some of these projects end up as demonstrations of good practice in their departments ...but it can just be a showcase thing in isolation that doesn't have any wider impact, because the wider impact is limited by factors other than the success of any particular project. It's down to much wider and deeper questions of motivation of staff and rewards and recognition, which the success of one program is not going to have much impact on. (cascade partner)

### Constraining features for participation

Constraining features which affected participation within institutions included workload policies which only counted teaching in face-to-face contact hours, high academic workloads, pressure to engage in research and promotion policies in which teaching was not seen to be valued.

There are more staff with enthusiasm to do something than will actually do something because they just feel so time restricted. ... It's a combination of feeling overloaded by teaching and partly the ever present demand to do research work for promotion. Most people are caught between those demands. (cascade partner)

### Participant motivation and interest

Interest and commitment to learning technologies and students' learning resulted in some participants completing conference papers and publications or joining the team members in presentations about the project. Time constraints, alternative commitments and the individual interests and motivations of participants were seen as limiting whether they completed their portfolios, but not necessarily whether they embedded C&IT their modules.

The big thing that struck me [as a participant] was 'this is a big commitment'. People's circumstances change or they do the project and don't write it up because they're just not interested in the qualification. (cascade partner.)

There's always a tension between [the framework and] what the participants expect and want, which is usually more technically oriented. You could polarise that as interest in the technology vs interest in the educational reform. (cascade partner)

Some institutions were reported to have given small amounts of time release or funding to participants in EFFECTS programs

## ENABLING AND CONSTRAINING FEATURES OF THE PROJECT/IDEA

The project included a number of features which were perceived as enabling development and transferability across institutions.

### The quality of the framework

The EFFECTS framework of learning outcomes was designed in ways which made it recognisable and attractive to accrediting bodies, institutions and the staff developers who were intended to adapt it for their institutions. Its initial formulation took into account the accreditation frameworks of SEDA and the ILT (Harvey & Oliver, 2001). The framework was underpinned by an action research background philosophy, embedding academic values such as scholarship, enquiry and reflection, with an emphasis on the appropriate rather than uncritical use of technology (Harvey & Oliver, 2001). This underpinning philosophy and values were familiar to members of the staff development community who were the intended adopters of the framework, and this was attributed to the expertise of the project leaders and their backgrounds and experience in staff development for e-learning. One participant commented that on encountering the framework for the first time:

It became obvious to me almost straight away that what they were doing was really valuable and I was going to try and do it at [my university] . . . The learning outcomes gave it a good structure and I clicked with those straight away – I thought ‘yes, I can see that’s going to work, that’s a good way of doing it’. (cascade partner)

While this respondent described minor disagreements with aspects of the framework, it was seen as a good basis for institutional program development. The initial project teams also encouraged potential partners to become participants in one of the initial programs before beginning to run a program of their own.

### **Adaptability across institutions and multiple models of use**

As the framework specified learning outcomes and gave examples of evidence for these outcomes but did not prescribe how staff should be supported to achieve the outcomes, it enabled each institution to develop an approach which was relevant to its staff, support provision and strategic priorities. This adaptability was perceived as necessary for transfer and as providing a range of models that further institutions could draw from.

We would try and show the different models whenever we were promoting the whole EFFECTS framework and there was [sic] new ones coming along as well once we got into the cascade because places like [university X] decided they were going to actually integrate it into their post-graduate certificates. (team member)

### **Adaptability by participants**

For participants, the EFFECTS framework had the advantages of enabling them to investigate and adopt technologies to suit their needs.

All the projects are different and the thing that ties them together, the one unifying factor, are the learning outcomes. (cascade partner)

### **The collaborative and consultative development approach**

The approach of having a smaller number of initial collaborators followed by a cascade, rather than a larger number of partners enabled effective communication within the initial team and enabled the framework to be piloted in a number of institutions which could then work one-to-one with cascade partners.

As was noted above, the project team participated in constant activities which engaged the potential user community. Cascade partners found out about the project through activities such as workshops, conference papers or personal contact. This was related to key project team members seeing dissemination as an ongoing and iterative process, with one describing a view of dissemination as participative research:

I’m very much in favour of what I would call participative research or participative consultation so I think when it comes to any complex thing, and e-learning is very complex, it involves all sorts of different factors and its very different in different institutions and sectors, you have to talk to people about what you want to ask them about and then ask them about it and I see the processes of what you might call dissemination and what you might call data gathering as one and the same process so I’m always thinking about what I want to ask people and what I want to know from them and what I want their opinion about at least as much as I’m thinking about what I want to tell them. And also I’m thinking about what their concerns are before I think about what I want to tell them. If you see every encounter . . . almost whether it’s a workshop or an online discussion forum or a paper, see every encounter as an opportunity to improve what you’re doing by finding something out . . . you’re actually genuinely interested. You’re not making it interactive because you know you ought to you genuine care about what people think about what you’re doing. (project team member)

### **Intellectual property and copyright approach**

The project’s approach to these issues was largely based on academic values and to some extent a staff development tradition which favoured sharing of resources and materials between institutions. New partners perceived that there were resources which they could use or adapt for their institutions.

Resources were made available via the project websites and many resources produced as part of the project continue to be freely available via the ETL site.

### Qualities of the project team

The project management team and initial partners were seen as having considerable experience and expertise in e-learning and in staff development. The core team members, particularly the project manager and consultant were also seen as excellent and pro-active facilitators, writers and communicators, enabling them to engage large numbers of others through workshops, conference presentations, written materials and direct networking between partner institutions and with potential cascade partners.

## CASE SUMMARY

EFFECTS can be seen as a good illustration of the complex interactions between project activities and systems which are necessary to favour adoption and adaptation of institutional projects, and is also relevant to participant adoption within institutions. Particular aspects of the system which favoured the further scaling up of EFFECTS included:

- the scholarly qualities of the framework, enabling it to be recognised and seen as valuable by potential adopter/implementers and accrediting agencies;
- the capacity of the framework to be adapted to different institutional cultures and the capability of the staff involved to read their institutional contexts and adapt the program accordingly;
- the capacity of the framework to be implemented in different ways by participants at the individual level;
- the consciously iterative processes of engagement with adopter/implementer and other communities through multiple methods ranging from one-to-one discussions through workshops, an email network, the website, materials and academic articles;
- the cascade model of collaboration;
- the strategic linking of the project to institutional and national priorities.

# GENERIC CAPABILITIES OF ATN UNIVERSITY GRADUATES PROJECT AND A CASE EXAMPLE: EMBEDDING GRADUATE CAPABILITIES IN CORE UNITS WITHIN LAW AND JUSTICE STUDIES

## Originating location

Australian Technology Network universities: Queensland University of Technology, RMIT University, University of South Australia, University of Technology, Sydney (UTS), Curtin University of Technology.

## Type of case

Curriculum reinvention

## Current websites

Project website: <http://lsn.curtin.edu.au/ATN/>

Project report: <http://www.clt.uts.edu.au/ATN.grad.cap.project.index.html>

## Funding

ATN project: Department of Employment, Education, Training and Youth Affairs (DEETYA) \$164,500  
Embedding Graduate Capabilities in Core Units within Law and Justice Studies, QUT Large Teaching Development Grant \$144,277

## Reason for choosing the case

This case was chosen and developed in two parts because:

- the ATN project report has been widely cited in literature and in policy from universities outside the ATN;
- it has influenced curriculum reinvention which has been embedded and sustained, leading to improved teaching and learning in context. The Embedding Graduate Capabilities project is a case of substantial curriculum reinvention and illustrates a range of features which were necessary for this to happen.

## PROJECT DESCRIPTION

This pair of cases is structured to begin with the ATN project, describe the features of the Embedding Graduate Capabilities project as a specific case of adaptation and implementation in context, then return to summarise features of the enabling and constraining contexts related to both the broad ATN and specific cases.

## Origin

The project commenced at a time when there had been considerable debate in the higher education community about the need for university students to develop capabilities which went beyond subject specific content. Australian universities had statements about generic qualities of their graduates, but in many cases these were implicit rather than explicit in the curriculum. The project was initiated by a perceived need to clarify what generic capabilities (the term adopted at the time) meant in the contexts of different disciplinary and professional courses, and develop ways of describing, developing and assessing them more explicitly. The ATN project originated with four members of the ATN Teaching and Learning Committee group and the fifth ATN university later joined the group.

## Aims

The project aimed to 'support a systematic and explicit strategy to cultivate and evaluate the development of relevant generic capabilities over a course of study' (Bowden, Hart, King, Trigwell & Watts, 2000, p. 3). It aimed to create staff development materials and a range of exemplars to support course teams in identifying and describing graduate capabilities, designing learning experiences to develop them and designing appropriate ways of assessing them.

## Design and activities

In each of the ATN universities, there were graduate capability related initiatives which were already underway, although some were further down the track than others. In each, there was at least one Faculty course team which was involved to some extent in identifying and describing capabilities for their discipline.

The project involved the creation of a frameworks and guidance for course teams involved in designing graduate capability based curricula, based in part on the mapping of good practices across the ATN universities and other sources. Alongside this, the project supported the development of 13 case studies from the curriculum initiatives already taking place across a range of disciplines.

The framework was designed to be flexible enough to allow for the distinctive graduate capability initiatives which were already underway, and the different priorities and cultures of the partner universities. It was expected that each university and course would identify and implement graduate capabilities which were applicable to its own mission and context.

One major outcome of the project was a report which was designed as a resource that universities and course development teams could use to inform the development of graduate capability based curricula (Bowden et al. 2000). The report includes a framework for action with six principles (Bowden et al. 2000, <http://www.clt.uts.edu.au/Frameworkforaction.htm>):

Desirable capabilities are most usefully formulated at both university and course level.

The development, practice and assessment of capabilities are most effectively achieved within the context of discipline knowledge.

Exposure to, and reflection on, a variety of teaching approaches and learning experiences fosters a focal awareness of capability development.

Assessment practices should align with course/subject goals and teaching/learning practice.

A package for assessing generic capabilities incorporates items designed for a range of purposes.

Students benefit from progressive feedback on the development of capabilities.

The report also includes guidance for developing graduate capability based programs. This begins with policy development and addresses dissemination (within the group), commitment, implementation, monitoring and evaluation.

The case studies were intended to document the curriculum developments in order to capture their salient features and facilitate sharing of good practices across institutions. They came from a range of disciplines including Business, Engineering, Nursing, Social Sciences and Sculpture. Some involved initiatives across all years of a course and others focused on smaller course sections, including the first year. Each case included key themes, the particular attributes which were focused on, issues involved in the development, actions taken and lessons learned.

Following the development of the frameworks, the project team ran workshops for senior managers and staff at the five ATN universities. The workshop leaders were always from universities other than that at which the workshop was held.

The report and case studies were published in printed form and a website was developed in which points made in the report text were linked to illustrative case studies.

## Adaptation and embedding in other contexts

The ATN project has been widely cited in literature on graduate attributes and in graduate attributes policy statements from universities both within and outside the ATN. In terms of university policies, the most widely cited aspects appear to be the definition and the framework for action. A web search for references to the project website suggest that it is a common reference given on sections of university sites which focus on graduate capabilities/graduate attributes/generic skills.

At the five ATN universities, the project and report has had different types of influence. At one university where significant initiatives were already underway and strongly centrally supported, the project was reported by a developer to have 'reinforced for Heads and Managers that graduate qualities [was] part of a national development and linked to [the] international community'. At another, the project informed the extension of existing initiatives in some faculties to other faculty groups. At a third, the project was referred to in the university's graduate attributes policy but most faculties have not undertaken significant course reinvention.

The following case study is of a project which was not one of the original 13 cases. It began after completion of the ATN project, was influenced by it but substantially extended its scope in the case of a particular discipline.

## EMBEDDING GRADUATE CAPABILITIES IN CORE UNITS WITHIN LAW AND JUSTICE STUDIES (QUT): A CASE EXAMPLE<sup>8</sup>

### Origin

The project was influenced by a number of sources. In the discipline of Law, a review by the Australian Law Reform Commission had emphasised the need for legal education to focus on developing lawyering skills as well as simply knowledge of the law. This was consistent with calls for the development of law students' generic and transferable skills and professional values in both the US and UK (Christensen and Cuffe, 2002). In this context, the ATN report was described as providing a definition of graduate capabilities which was adopted by the project team (Kift, 2002) and a 'broad brush framework' which influenced the project team's thinking about levels of capability development.

### Aims

The project aimed to develop a framework for describing core graduate capabilities for Law and Justice Studies, and then embed these capabilities into the curriculum. It sought to create an

authentic learning environment for students through appropriate learning objectives, teaching and learning approaches and assessment methods which take into account the global workplace, social and ethical values and the development of life long learning skills

(Christensen and Cuffe, 2002, p.7)

### Project activities

#### Development and embedding

A staged, holistic and consultative approach was used to develop the project and ensure its embedding. In the first stage the project team deconstructed broad capabilities to create clusters of attitudinal, cognitive, communications and relational skills. They then adapted the scoping, enabling, training, and relational levels described in the ATN report to create three progressive levels that related to students' skill development (Christensen and Cuffe, 2002). This was an intellectually demanding and time-consuming process. Students and staff were involved in several rounds of feedback as the skill descriptions and levels were defined. The outcome of this process was the development of a Table of Core Skills.

<sup>8</sup> A version of this case study is reported in McKenzie & Alexander, 2004.



The second stage involved a review of the existing LLB course. Actual and desired skill development patterns were mapped across units and years of the course. First and final year students were also surveyed about their perceived levels of skills.

The third stage involved incremental redevelopment of units to embed the identified core skills, beginning with the first year then years 2-4. Redevelopment focused on both the aims, content, teaching and learning approaches and assessment of units and embedding processes to encourage students to reflect on and record their capability development within and across years. There was a clear focus on integrating disciplinary and more generic capabilities within and across units. By 2001, all first year students were provided with a document outlining the graduate attributes program and Table of Core Skills. By the beginning of 2002, all 24 core units in the LLB had redeveloped outlines, specifying the skills to be taught, the teaching and learning strategies and the assessment. Students were encouraged to use journals to reflect on and document their skills development.

Evaluation processes were planned in consultation with an expert in evaluation. Evaluation throughout the stages was extensive and informed ongoing project development. Processes included staff consultations, student questionnaires and focus groups, self-audits of students' skills and analysis of student journals and assessment tasks as well as regular unit evaluations. The project was also externally evaluated.

The changes to the course documentation, objectives, teaching and learning processes and assessment have resulted in graduate capabilities being fully embedded in the course. Embedding is supported by changes in the culture of teaching and learning and in many teachers' understandings and practices (Christensen & Cuffe, 2002).

### Dissemination

The project team engaged in a wide range of dissemination activities inside and outside the university. Inside the university, they contributed to working groups on graduate capabilities and gave presentations at university-wide conferences and forums and in other faculties. Between 2000 and November 2002, members of the project team gave 15 conference papers and presentations, published four journal articles and gave presentations to five internal forums (Christensen & Cuffe, 2002). Dissemination processes continue.

## Outcomes for learning and teaching

### For students

The project write up (Christensen & Cuffe, 2002) described a range of impacts on student learning outcomes including:

- increased student awareness of and capacity to reflect on their levels of skills;
- increased self-directed learning, evident through the use of skills journals;
- improved understandings of skills relevant to being a legal practitioner;
- development of skills required for lifelong learning;
- increased valuing of skills.

The report notes that introducing the approach required a shift in later stage students' learning expectations away from content transmission in lectures and towards active development of and reflection on their own skills. Students came to see the benefit once they began applying for jobs. A project developer also noted that students rate the course highly in the generic skills section of the Course Experience Questionnaire.

### For teachers

The project write up (Christensen & Cuffe, 2002) describes teaching and learning outcomes for staff including:

- greater awareness of curriculum design and student learning (77% of staff);
- improved teaching practices (68%);
- improved assessment practices (92%), which included examples of improved practices for giving feedback to students.

In addition, team members have been recognised inside the university and externally, in part for their work on the project. One team member, Sally Kift, received an Australian Award for University Teaching. Two members of the team received distinguished teacher awards at QUT and several team members were reported to have been promoted.

### For the Faculty

The project was described as creating an overall change in the culture of teaching and learning in the faculty, from 'content driven to capability driven, from teacher focused to student focused and from the attitude of teaching students in a "talking head" fashion to providing learning environments' (Christensen & Cuffe, 2002, p. 73). The implementation of this project created broader awareness in the faculty of the need to ensure that assessment processes were aligned with developing and giving feedback on desired generic capabilities and documenting their attainment. This led to a follow-up large grant: *Assuring Quality in the Assessment of Social, Relational and Cultural Generic Capabilities in the Faculty of Law*.

The project also resulted in development of a new faculty workload policy and identification of a need for different staff development for casual staff.

### For the university

At the university level, the project has had a number of influences. The framework developed in the project influenced the university's graduate attributes statements and policy.

As a direct result of greater awareness generated by the Faculty's project the University Teaching and Learning Committee established a working party in 2001 to revise the university's statement of graduate capabilities (Christensen & Cuffe, 2002, p. 72).

The project also influenced the development of graduate attributes projects, for example in the faculties of Business and Education, and the development of a university-wide student capability profiling system. The project developed a resource website on graduate attributes, teaching and learning and assessment resources which was made available university wide. The project could also be said to have contributed to the reputation of QUT and of the Law Faculty in the higher education community.

### For the higher education community

This project took an approach which was acknowledged as best practice for curriculum restructuring in Law by the two external members of the project reference group, the President of the Australian Law Reform Commission and a Professor from William and Mary College, USA who also conducted an external evaluation (Christensen & Cuffe, 2002). Internal assessors rated the project as excellent.

Members of the project team have given numerous presentations on the project. For example, the team member who received an Australian Award for University Teaching has given numerous keynotes and presentations on graduate capabilities development and assessment at conferences. She has also been invited to present the work at a number of other universities, both to Law Faculties and the university more widely. Law curricula in other universities have been influenced by the QUT developments.

Law academics from another university who were asked about the QUT project had become aware of it through hearing about it and meeting a team member at the Australian Law Teachers' Association. The project was perceived to be currently influencing their thinking about graduate attributes development.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE: FROM THE ATN PROJECT OVERALL AND THE CASE EXAMPLE

The ATN project report (Bowden et al. 2000) described four policy and support conditions which needed to be met to implement a graduate capability curriculum. We have separated one of their points into points 3 and 4, below.

1. university commitment to support the change is required:

The highest priority is the management, implementation and resourcing required to move to a capability-driven curriculum. The process needs to be planned as a university-wide activity and given sufficient resources to facilitate change to the teaching-learning process. (Bowden et al. 2000, <http://www.cl.t.uts.edu.au/Frameworkforaction.htm>);

2. the change to a graduate capability based curriculum needs to occur through an overall course development and review process, rather than being bolted on to an existing course;
3. staff development is necessary, as implementing a graduate capability based curriculum requires changes in staff understandings and practices;
4. curriculum change and staff development need to be included in rather than added on to staff workload allocations;
5. students need to be informed and involved in major curriculum changes. Bowden et al. (2000) also argue that such curricula should be student-centred and include students' self-assessment of their learning outcomes.

The Embedding Graduate Capabilities project illustrated the way that these points were played out in a specific context. This project, and the case studies included in the ATN project suggest that all of these points, and a number of others, are important in achieving the scaling-up (Coburn, 2003) of the idea of a graduate capability based curriculum.

### University commitment and support

The Embedding Graduate Capabilities project was funded by a large teaching development grant from QUT, which provided \$144,277 over two years. It was aligned with an objective of the QUT teaching and learning plan to 'develop the graduate attributes of QUT's students' and with Faculty priorities.

University commitment and support for the development of graduate attributes based curricula has varied across the ATN universities. Even when university commitment is high at the senior management level, implementation is likely to be an incremental process. An interviewee from one university which had a commitment to and public profile for its graduate attributes before the ATN project, noted that embedding in all curricula in the university would probably take 10 years.

University commitment also needs to include the development of policies and infrastructures which support graduate capability based curricula. For example, course approval processes need to include requirements for the courses to describe the intended capabilities of graduates and the teaching and learning and assessment processes which support and assess their development. Course quality processes then need to include indicators which monitor whether the processes are being implemented and relevant qualities developed. Staff need to be aware of these policies and understand their relevance to the courses and subjects that they teach in.

Further, if students are expected to record and reflect on their capability development, systems need to be in place to support and value this activity. It was noted that an early intention of the ATN project was to develop or acquire a student capability profiling system which could be shared across the universities. To our knowledge, two different systems have been developed in two universities and not all universities have the current intention of implementing such a system.

The substantial cultural change required to implement and embed a graduate capability based curriculum needs to be supported by Deans, Heads of Department and course co-ordinators. This was emphasised in some of the ATN case studies and in the Embedding Graduate Capabilities project. In one reported case, changes in the management of a faculty and increased pressures for research were perceived to

have reduced the level of support for a graduate capability based curriculum since the project was implemented.

### **Embedded support for staff development and for change in the culture of teaching and learning**

The Embedding Graduate Capabilities project team explicitly acknowledged that restructuring the curriculum to focus on graduate capabilities required a significant change in the culture of teaching and learning. A project developer noted that the first year of the project had a strong focus on building commitment and understanding amongst staff in the faculty. The project involved collaborative staff development processes aimed at developing shared faculty understandings of graduate capabilities. In the first stage of the project, staff development activities went hand in hand with the identification and mapping of core skills. In the redevelopment stage, teaching teams from units worked with a mentor and were encouraged to identify needs for staff development and resources.

Similar processes were reported from other cases in the ATN project, although most were less extensive and ambitious than the Law case. The need for staff development was a frequently reported issue. Many disciplinary academics, including those who enthusiastically support the development of graduate capabilities, still need to learn how to embed relevant activities in the learning environments of their subjects and assess them appropriately.

### **Recognition and valuing of staff involvement in curriculum reinvention**

The ATN project and the Embedding Graduate Capabilities case both emphasised the need to recognise the time taken for academics to develop substantial curriculum changes. Staff are unlikely to perceive that the initiative is valued if the additional work is not included in workload allocations. Further, curriculum reinvention of the kind involved in most of the graduate capability cases needs to be recognised and rewarded as scholarly intellectual work.

### **The need to build commitment and understanding in students**

Several of the case studies, including Embedding Graduate Capabilities, noted that students often needed to be convinced of the value of capability development. For students who have been used to a culture of passive learning, active engagement and reflection on capability development is a major challenge. Involving students in the curriculum change process and building in processes, such as orientations, to help students to change their understandings and learning practices are likely to be necessary.

Some of the case studies and one of our interviewees also noted difficulties in seeking to develop common sets of graduate capabilities in students in onshore and offshore offerings of the same course. It was noted that international and local students may have different initial understandings of some graduate capabilities and that students need opportunities to reflect on these differences and develop broader understandings.

## **CASE SUMMARY**

This pair of cases illustrates a number of points which are important for the dissemination and take-up of curriculum reinvention innovations:

- curriculum reinvention typically involves change in the culture of teaching and learning;
- there needs to be support and commitment at all levels, from the senior management of the university to teaching staff and students. The support of Deans, Heads of Department and course co-ordinators is particularly important;
- funding is typically necessary, to provide time release for project leaders and other staff and resourcing to support materials development;
- policies and systems need to support rather than create barriers to the change;

- staff development needs to occur hand in hand with curriculum reinvention;
- staff need to perceive that their involvement in the reinvention is recognised and rewarded;
- students need to be involved in curriculum change.

Considering Coburn's (2003) criteria for scaling up an innovation, the pair of cases reported here clearly meet all four.

1. **Depth:** as noted above, graduate capabilities based curricula require overall change in teachers' understandings and practices. This was illustrated in the Embedding Graduate Capabilities case and in the case studies provided on the ATN site;
2. **Sustainability:** the changes involved in developing and implementing the new curricula have generally been so substantial and embedded in course documentation and practices that a further reinvention would need to occur to remove them;
3. **Spread:** the ATN project influenced the specific Law case and both have influenced other course changes. It is important to note that both projects were also influenced by other debates and initiatives around the idea of graduate capabilities, thus illustrating some of the problematic aspects of 'innovation' compared with 'reinvention' or adaptation. Both projects have clearly developed new knowledge and ways of thinking about and implementing graduate capabilities in the curriculum.
4. **Shift in reform ownership:** The development and implementation of graduate attributes based curricula requires substantial reinvention each time, even when they are in the same discipline. Each of the ATN case studies and the Embedding Graduate Capabilities project demonstrated ownership of the curriculum innovation and reinvention at the local level.

# PILOT: YOUR INFORMATION NAVIGATOR

Queensland University of Technology's Online Information Literacy Tutorial

## Originating Location

PILOT was developed at Queensland University of Technology (QUT), Australia. It is based on California State University's (CSU), 'Information Competency Project'. PILOT is copyright of QUT, California State University and Victoria University of Technology.

## Type of case

PILOT is a web-based information literacy tutorial/resource

## Current Website

<http://www.library.qut.edu.au/pilot/>

## Funding

Funding for the development of PILOT was provided by the university's 'Central Initiatives Scheme' in 1999 for \$26,599.

Developers are currently in the process of acquiring further funding to produce a revised version of PILOT based on recommendations from a 'Flashlight' evaluation that was carried out in 2003.

## Reason for Choosing the Case

The case was initially chosen for its:

- high profile in Australia and overseas, where PILOT is recognised as an instance of best-practice which has had a significant influence in the development of similar information literacy tutorials as well as being directly taken-up and adopted;
- connection with national policies and agendas on graduate attributes/capabilities, as a tool which aims to support and facilitate the development of information literacy competencies and skills for graduates;
- quality as a teaching and learning tool, specifically as an example of an *online* learning innovation which has been sustained in its original context of development as well as being taken up and recognised by other institutions.

## PROJECT DESCRIPTION

### Origin

PILOT was developed to support the broader information literacy goals at QUT, which were established as part of a strategic, university-wide focus on graduates' attributes. Information skills and knowledge were considered to be critical in enabling the development of other core capabilities (Dorskatsch, 2000; Project Developer). More specifically PILOT was developed in accordance with the university's *Flexible Delivery Policy* which aimed to 'create a teaching environment that meets the diverse needs of students by providing ways to give students flexibility in their time and place of study'. When QUT established the role of Information Literacy Coordinator, developing an online information literacy tutorial was thus already on the university's agenda.

### Aims

PILOT aims to develop students' basic information literacy and research skills, with a specific focus on supporting and enabling the **flexible** delivery goals of QUT. Developers wanted to create an online system which would provide access to students studying in any mode, including flexible delivery and distance

learning, as well as taking into account the diverse learning needs and requirements of students, for example those that might not be comfortable with learning in class.

## Design and Activities

PILOT is a generic web-based /online tutorial which is designed around a series of discrete 'tutorial/instructional modules' which target a range of different information competencies. The nine tutorial modules which guide students in how to: 'effectively search electronic databases and the internet for information; communicate information using technology, such as Word, PowerPoint, e-mail and the WWW; evaluate and organise information; and observe copyright and avoid plagiarism' (McCarthy, 2001). The modules are:

- Defining your topic
- Determining your information needs
- Locating and retrieving relevant information
- Researching with electronic tools
- Evaluating information
- Organising your information
- Communicating with technology
- Using information appropriately

<http://www.library.qut.edu.au/pilot/>

PILOT was developed using the same modular structure as California State University's Information Competence Tutorial, which was originally conceived as allowing for flexibility in both **use** and **implementation**. In particular, the online modular format was intended to enable self-paced learning, allowing students control over how and when they use the program as well as being able to start at any point of the tutorial and work through them at their own pace (project developer). The modules were envisaged as a way to facilitate integration and 'embedding' of the system into the content of the course, in the sense that instructors could select individual modules according to their specific curriculum requirements and objectives. The generic content was similarly designed to accommodate a variety of subject disciplines as well as enabling different modes of implementation within the courses it is embedded in (McCarthy, 2001).

At the originating university, PILOT is used in a number of different ways as a :

- teaching-resource for liaison librarians;
- generic information literacy service which students can access off campus;
- compulsory part of core units;
- compulsory for assessment in other units;
- general link from course home-pages.

Aside from its more general role in terms of flexible/external delivery and online learning, in the long term developers and adopter overwhelmingly favour embedding the system in course units, rather than simply attaching it to courses as an optional resource. (project developer). It has been embedded into all Built Environment and Engineering Courses at its university of origin, via units called 'Professional Studies' where it is a mandatory part of first year and assessed on a pass/fail basis. Students can also access PILOT through the library's website, and on finishing receive their 'Pilot's Licence', a certificate of completion.

Aside from California State University's willingness to openly share the system, PILOT developers chose to base their tutorial on California State's information literacy tutorial because it was designed as a 'process' driven, rather than a 'resource' driven model of developing information competencies. PILOT thus adopts the conceptual framework of CSU's tutorial, based on the assumption that taking students through the stages of information, and within that process teaching them how to use specific tools is a more effective model than taking a tools approach and building process on as an aside.

### Dissemination Activity

Throughout the development and implementation of PILOT, there have been significant attempts by project developers at awareness raising – in particular through conference presentations, workshops and the sharing of ideas and strategies through active participation in professional networks such *The Libraries of the Australian Technology Network (LATN)*.

Project developers also emphasised the importance of **marketing** as a dissemination activity, and a percentage of the original budget was reserved specifically for promotional purposes, although this activity is in the context of awareness raising within the originating institution, rather than disseminating it to other contexts and institutions. Project developers perceived the marketing of PILOT within QUT as wide-spread and intensive, particularly through merchandising such as posters, displays and informational ‘post-cards’ which were customised to target both students and academics. The ongoing ‘personal’ marketing and selling of PILOT carried out by liaison/academic librarians was also considered to be crucial to the internal dissemination and implementation of PILOT. Liaison librarians were perceived as not only essential in informing students and academics on how to **use** PILOT, but were also recognised by the Project Developer for their role in advocating the need to **embed** PILOT in courses and subject disciplines (PILOT developer)

Adaptation and embedding in other contexts. The PILOT system has been directly taken up and customised/modified for use at several other universities in Australian and overseas<sup>9</sup>, although there are variations in modes of its implementation, particularly in relation to the degree to which it is embedded in particular courses of disciplines.

University B has two primary uses of PILOT:

- As a generic information literacy service which supports the university’s commitment to providing students with flexible and external delivery options in particular for those students studying off-campus. (adopter B)
- Where the tutorial is attached or embedded in specific courses. Here academic or liaison librarians work with course-coordinators encouraging them to make links to specific parts of INFOGATE that are appropriate to their disciplinary or curricula context. As Adopter B suggests, ‘We’re really punching it down into learning objects, because I think it is unrealistic to ask a student to work through all the modules ... that’s really intimidating’.

This second approach is being used in a ‘professional issues’ course in the discipline of Nursing at university B, where it is embedded as a part of the assessment requirements in a large assignment. The academic worked closely with liaison librarians and selected the components most relevant to the learning requirements of her students. Anecdotal evidence from this case study supports the developer’s ideas about the benefits of embedding information literacy tutorials into the core activities of the course:

... they took it seriously, they really did see how understanding INFOGATE and hence using that knowledge was actually real for them so that they actually put it into practice straight away.

Interestingly, Academic B also perceived that it was the generic and modular nature of the system that made it so appealing and easy to implement, because there was no real need for any customising or adaptations to suit teaching of the course:

INFOGATE was perfect for what we wanted to do – it just worked ... there were no real adaptations. We were really happy with it as it was. We discussed with the librarians which modules were most relevant. These modules mostly related to what we wanted the students to understand, and then it was used pretty much as it is ... what

<sup>9</sup> Australian National University (ACT) - *InFlite*, University of Technology Sydney (NSW) - *Catalyst*, Victoria University of Technology (VIC) - *InfoWiz*, James Cook University (QLD) - *VISA*, Leeds Metropolitan University (UK) - *PILOT*, Leeds Metropolitan University (UK) - *PILOT*, University of South Australia (SA) - *InfoGate*, Education Queensland - *EQUIP* (professional development tutorial for all Qld teachers) (*authentication required*), Queen Margaret University College Library (Scotland), University of Windsor (Canada), University of Wollongong (NSW), Southbank Institute (QLD), Brisbane North Institute of TAFE (QLD) (PILOT Homepage <http://www.library.qut.edu.au/pilot/util/links.htm>)



it does is offer that general perspective for them to be able to apply those skills in a number of ways and you know I think that's what we were looking for and that's what it gave us. (academic B)

These comments also underscore the necessity of support, in this case in the form of liaison and academic librarians, in facilitating that implementation of information literacy tutorials like PILOT and INFOGATE. That is, while a certain degree of adaptability and ease of use is ensured by the systems generic nature, the *implementation* of such systems within specific subjects or courses is substantially dependent on the involvement of committed support staff, and requires at least some degree of **collaborative effort** on the part of both academic and library staff. Truly embedding PILOT into the course curriculum for example, would thus require well-established professional relationships between librarians and faculty staff.

Even within this integrative or disciplinary approach to implementing information literacy, the comments from adopters and support staff at University B foreground the different **levels** and understandings of embedding that operate throughout the university. On this issue adopters clearly advocated the need to move away from the simple promotion of the tutorial where it is attached as a link on a course home-page towards embedding it into courses via curriculum development and assessment (adopter B; academic support B). In this sense, adopters at University B are aligned with the more widely accepted understanding that 'Disciplinary context is the best way of embedding information literacy'. However, in order to facilitate a deeper type of embedding, beyond its implementation within a disciplinary context via the use of selected modules, adopters at University B are currently in the process of exploring the prospect of including content specific to the disciplines it is 'embedded' in and 'creating discipline specific, contextualised pathways from it'. (adopter B). This move towards discipline or subject specific versions, while initially resisted by project developers because of administrative and maintenance issues, is now perceived by many of those involved with implementing PILOT (and other information literacy tutorials) into courses and subjects as the next logical step in its expansion and development:

It has not yet been modified to suit my disciplinary or work requirements, however our team is planning it in the near future. (academic support B)

... but now, yes, I think it is time to include some content specific to the BEE disciplines. PILOT stood well against time, it is worthwhile to invest time into it. (academic support A)

## Outcomes for learning and teaching

### For Students

The initial basis for online information literacy tutorials like PILOT was that they would act as a supplementary or alternative form of support which addressed the increasingly different learning needs of students, particularly in terms of flexible delivery to external students, those that studied part-time or preferred to learn at their own pace outside of class-time. (project developer) There is statistical evidence that supports the increasing number of 'hits' PILOT receives at QUT, and clearly there has been success in terms of its promulgation and dissemination to a range of institutions outside its context of development as well as its formal adoption by a number of courses. However, while statistical information such as this provides evidence that students are **accessing** the system, it is clearly more difficult to assess the qualitative effects and the outcomes of such online tools on student learning. Both the Project Developer and adopters at University B were confident that students were continuing to use PILOT, an impression that they gained through feedback from liaison librarians and academics. Academic adopters from University B had the impression that students perceived it as being a useful learning tool, as evidenced by their own active dissemination of it to other students.

While there have been no formal evaluations of how PILOT or other information literacy tutorials based on it affect student learning outcomes, the academic adopter interviewed at University B had the impression that the tutorial was significantly improving the students' information literacy skills and contributing to a more satisfactory experience overall and was 'really looking forward to the feedback in the course from this year because I am anticipating it will be much better than last'(academic adopter B) There had been positive feedback from students throughout the course, as well as a sense of a general improvement in the quality of the work where the students had used it. Discussing the success of the project. Academic Adopter B felt that it was working well, and that 'the response had been really uplifting':

... in terms of feedback, overwhelmingly the students have said they learnt so much, and that they really have enjoyed using INFOGATE and ... how this was a life-long learning skill that they needed. (academic adopter B)

While aware of the difficulties in formally assessing whether it had achieved or changed student learning, Adopter B had also received some positive anecdotal feedback from students via academic librarians and discussion lists:

...our academic librarians in some courses are on the discussion list, so I know its been reported to me from a nursing discussion list where a student would be saying that it was absolutely fantastic and saying 'hey you need to go through this system it really helped me work through my assignment. In this sense students have been quite good disseminators of it. (adopter B)

Others involved in adopting the system at University B provided a more critical perspective on how students might be engaging with the tutorials. There was the perception, particularly when it was used outside of the requirements of a particular assignment or course, that students' use might be superficial in the sense that they were 'not taking time to work through the modules' (academic support B). This perception was supported by anecdotal feedback from students which said that while the tutorial can be self-paced '...it covers so much they feel discouraged from attempting it'. In particular, students under time-pressure, while realising it would help them in the long run, '...didn't have the time to work through relevant modules'. (academic support B):

Even when it is pointed out they can choose appropriate modules and do one at a time if they wish, they sometimes still say that the modules are long. Hopefully, if more were customised and embedded into certain courses/assignments the students would have more motivation. (academic support B).

These responses suggest that, as with the IT projects evaluated by Alexander and McKenzie (1998), the learning outcomes for students would depend strongly on how teachers implemented PILOT within their own learning environments. This is supported by impressions from academics that have embedded PILOT and other information literacy tutorials into the courses/assignments. (academic adopter B; adopter B).

### For teachers and learning support staff

Information provided by information literacy co-ordinators and academic librarians consulted for this case-study suggests that online information literacy tutorials like PILOT are useful in that they provide an already established and generic framework for teaching information literacy. That is, where there might have previously been resistance to embedding information literacy because of the perceived difficulties in changing course curriculum etc, or complexity of the concept of information literacy itself (academic adopter A), online tutorials are often perceived as being a relatively easy option in that they provide a resource which is already established and set-up:

... the benefits for liaison librarians are the same, that where they have lecturers that are resistant to engaging in any great depth in which we can do with information literacy and getting the assessment changed and embedding it, PILOT is a good option to throw in, because it basically says you don't have to relinquish anything or even think about this because we have this online tutorial and all you have to do is encourage students to use it. (project developer)

Academic staff also perceived the benefits of PILOT and other information literacy tutorials as being useful because they provide an already established teaching resource, which due to its generic nature, requires little adaptation or customisation to integrate into the course. Commenting on the benefits of PILOT/INFOGATE Academic Adopter B suggests:

... because it's already set up and it's so generic it took less time than other things to get going ... there was no huge time factor for me. I had good support from the library staff who knew more about [the tutorial] and who were willing to answer students' questions if I couldn't ... there were no financial costs and the benefits far outweighed any resources that went into using it. (academic adopter B)

PILOT was also cited as an important resource, because it was an on-line information literacy package, which provided an alternative to face-to-face delivery and in this sense was perceived by teachers as helping to meet the needs of off campus students:

PILOT serves around 600 Built Environment and Engineering Students (BEE) (including the unexpected international students who joined our programs in the middle/end of our courses). There is no way I could reach them all without PILOT. (academic support A)

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### Professional Community and Networks (LATN)

One of the major enabling features surrounding the cross-institutional dissemination of PILOT appears to be the collaborative culture enabled by participation in The Libraries of the Australian Technology Network (LATN), as well as more informal processes of sharing based on personal networking and the perceived nature of library culture more broadly. Both the Project Developer and Adopter B cite participation in the LATN network as being important in the dissemination/adaptation process. In particular, the Project Developer identified membership in the LATN networks as being an important factor in their decision to share PILOT with participating institutions. As well as the significance of such professional communities in enabling dissemination, Adopter B also emphasised the importance of pre-existing personal networks between participants in facilitating forms of sharing and communication. Finally, Adopter B also perceived that the very nature of the library profession itself was in a sense underpinned and characterised by a philosophical pre-disposition to sharing information or open-sourcing. Discussing this culture of collaboration Adopter B suggests it is implicit in the library profession:

Because of the nature of the profession, that culture was already there, it was sort of like something you don't need to tell us, because that's what we normally do ... it's a mind-set. (adopter B)

Libraries are really good at sharing ... other people don't really like doing those sorts of things ... Libraries are good at sharing information and open sourcing. (developer)

### Institutional Contexts – Existing Strategic Priorities

One of the major enabling features for both the development and further adoption and adaptation of PILOT was existing strategic priorities related to promoting information literacy as a core graduate attribute, as well as its alignment with the goals of flexible and online learning which were high on both the originating and the adoptive universities' agenda:

... the university of South Australia is built on the pillar of flexible delivery and I am forever saying to my staff if you are doing something face-to-face you also have to think how you are going to put it into the virtual environment. what are you doing for the student in rural and remote areas ... the offshore student ... so that was very much the thinking and just that it aligned with the universities strategic direction. (adopter B)

Similarly, at the originating institution, there was a strong institutional focus on supporting flexible delivery and PILOT was seen as another crucial initiative in achieving these goals:

From the purposes of learning we thought we needed to give the students another alternative ... not all students can come to class, not all students like learning in class ... and also because the student population, at that stage was looking more and more part time ... We were having more and more online resources for students to work from home and it was just another way to actually work in with the universities role in terms of online learning and flexible delivery. (project developer)

## ENABLING AND CONSTRAINING FEATURES OF THE PROJECT/IDEA

### Generic Nature of the System

One of the core ideas underpinning the original design and intentions of PILOT was that it would be generic in nature, thereby enabling some degree of flexibility in use by students, as well as adaptability in terms of its integration into a diverse range of subject disciplines and courses (McCarthy, 2001). The benefits of PILOT's generic nature are supported by Academic Adopter B who cites the 'general' nature of PILOT and its 'applicability across a broad range of contexts' as a key factor in their adoption and use of PILOT, because it meant the system could operate within their disciplinary context without significant tailoring to their teaching needs or course. Interestingly however, PILOT's modular format is also

designed to be customised by academics, and this aspect of PILOT is cited as one of the features that also make it particularly easy to use:

... having used INFOGATE and assisted students I would say that as it is broken down into small sections within the modules, it would be reasonable easy to customise or transfer to a specific subject area. (academic support B)

This points towards an interesting tension within the design and implementation of PILOT, namely that it is regularly perceived as being effective because of its generic and thus adaptable design, but that this is often within the context of customising it for specific courses and disciplines. While many of the adopters did cite its generic nature as one of the key factors behind its successful adaptation and adoption there was also a more general call for a subject specific version of PILOT to be developed in the future. This was the general impression from adopters at its original context of development particularly those involved with embedding it in all Built Environment and Engineering courses, and also at the university that adapted PILOT, where they are currently working on formally embedding INFOGATE into the Nursing curriculum and creating a discipline specific version.

## Leadership and Expertise

The leadership provided by the Project Developer was an important feature for the project's success and dissemination, and those involved with embedding PILOT at QUT, as well as adopters from other institutions, regularly commented on the professionalism and commitment to supporting and furthering the project:

Our Information Literacy Coordinator (Pilot Project Manager) is the most inspiring person I have ever worked with. Leadership of this calibre is hard to come by. (disciplinary adopter A)

Aside from the importance of the project developer's enthusiasm and motivation in discussing and sharing the details of the project, she also has considerable experience within the discipline of information literacy and is widely recognised as a leading figure in the field both here and overseas. This high profile within the field, as well as her membership in various professional bodies such as ANZIL (Australia/New Zealand Institute for Information Literacy) and LATN have contributed to awareness raising via the informal processes of 'word of mouth'.

## Intellectual Property and copyright approach

The project's approach to these issues was perceived as being based upon a library culture which was seen to more readily favour and embrace open-sourcing and sharing of information. PILOT was originally adapted from CSU's Information Literacy Tutorial which was prepared to share the coding free of use. PILOT is now the copyright of QUT, California State University and Victoria University of Technology and, aside from acknowledgement, developers have been willing to share the system with two provisions. Firstly, they stipulated that if any of the adopting 'partners' did any major changes or developments, they would make those readily available to project developers. The second stipulation relates to copyright and the images used on PILOT which they wouldn't release, so those interested in adapting/adopting the system would have to manage that on their own. Clearly, the fact that PILOT is free to use has impacted on the likelihood of its dissemination and uptake at other institutions.

## CASE SUMMARY

This project illustrated a range of features including:

- the value of strong disciplinary or professional communities in supporting dissemination;
- the effects of embedding in courses, as compared with availability, on students' use of and learning from learning support systems;
- an intellectual property approach which encouraged dissemination through enabling free sharing with acknowledgement

# FIRST: FOR IMPROVING RESEARCH SUPERVISION AND TRAINING

## Originating location

Australia, originating institutions ANU, QUT, University of Sydney, UTS.

## Type of case

Consortium and resource website for postgraduate supervision development.

## Current website

<http://www.first.edu.au>

## Funding

The project has been self-funded by subscriptions from consortium members.

## Reasons for choosing this project for a profile

This project was chosen because:

- it has expanded from an idea shared by staff from four universities to a consortium with membership from 39 Australian and New Zealand universities;
- it illustrates an approach to collaborative resource sharing between institutions.

## PROJECT DESCRIPTION

The project has its origins in the emphasis placed on the quality of postgraduate research Australian Government's White Paper *Knowledge and Innovation* (Kemp, 1999) and in an unsuccessful bid for CUTSD funding by a group from the four originating institutions. At the Quality in Postgraduate Research conference in 2000, the group put forward a proposal to establish a cross-institutional consortium to share existing supervision development resources and develop new resources for the benefit of members (Boud, Brew, Browne, McKenzie, Pearson & Wissler, 2000). The group ran a workshop at which participants were invited to contribute their ideas about the kind of approach and resources which should be developed. Eighteen institutions made an initial commitment to join the consortium and contributed \$5,000 each. Most offered resources which had been developed at their institutions. Membership has since expanded.

A steering committee was formed, comprising the original group members. This included representatives of the Deans and Directors of Graduate Studies (DDOGS) group and directors of academic development units. The arrangement of having members of both groups represented on the committee has continued. DDOGS meetings are one of the ways in which the steering committee consults with members.

The consortium has developed a website in two parts. The public part contains the rationale for the consortium and resource development, based on a framework developed by Pearson and Brew (2002). This focuses on a broad and holistic approach to research education and supervision development. The members' part of the website contains sets of resources including online learning activities, workshop guides, tools, links and an annotated resource bibliography.

Resources which are made available on the fIRST website are reviewed by members of the steering committee. Resources which are offered are typically adaptations through collaboration between the developer and a fIRST steering committee member or consultant, to ensure that they are usable by others and consistent with the site rationale. Adaptations typically involve developing guidelines for use (although users are free to use the resources in whatever way they see fit) and ensuring that the

resource includes evaluation material. All resources on the site acknowledge the originating author and institution.

The fIRST website and ways of using the site were presented at the Quality in Postgraduate Research conferences in 2002 and 2004. The DDOGS group has now assumed official responsibility for the consortium.

### Use of the fIRST resources

The resources are used in a range of different ways in different institutions. In universities A and B, they are linked to institutionally developed websites which support online supervision development programs. In university C, they are used in conjunction with online discussion via a course management system as part of a formal course module for supervisors. In university D, they are used by an academic developer in workshops for supervisors, again as part of a course. In university E, supervisors are introduced to the site and invited to explore it, during and after a series of supervision workshops.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND IMPLEMENTATION

### Alignment with national and institutional priorities

The *Knowledge and Innovation* paper (Kemp, 1999) created a shared need amongst institutions for supervision development. The project originators were aware that individual institutions did not necessarily have all of the resources needed, but could share what they had and develop more resources collaboratively than any institution could do on its own.

### Project leadership

Leadership of the project by a leading member of the DDOGS group was important in the initiation of the project and in gaining commitment from other institutions. DDOGS membership on the steering committee has been seen as crucial for the credibility of fIRST within institutions. Involvement by academic developers is seen as important for both resource development and institutional implementation.


### Institutional awareness and support for use

Analysis of web logs of use provide some evidence of considerable differences in the levels of use between member universities. An investigation of consortium members' websites suggests that around half have a public reference to the university's membership with information about how to obtain the password. Some others were reported to provide supervisors with information via inductions or email lists. Universities which have been most closely associated with fIRST, for example through membership of the steering committee, or which have staff who have contributed resources to fIRST, tend to be heavier users of the site, with little use apparent from some member universities.

Feedback from presentations at the Quality in Postgraduate Research conferences has suggested that use of the resources is most likely when an institution has someone, usually an academic developer or member of DDOGS, who acts as a champion for the project. Despite the provision of detailed implementation guidance, some people who do not have a research background or expertise in supervision did not feel confident in using the resources and would prefer to engage a consultant from the fIRST committee. Other potential users expressed a preference for a site which was more like an instructional package, rather than a set of resources which could be used in multiple ways.

### Qualities of the site and resources

Adopters reported that the site was easy to use. One adopter particularly noted that the resources were of high quality and 'always worked' as intended in supervision development contexts. This was attributed



to the collaborative development process and the reputations of those involved as resource developers and steering committee members.

### **Intellectual property**

The project uses the approach of collaboratively developing resources and acknowledging the intellectual property of original authors using acknowledgement on the site and on downloadable documents.

## **CASE SUMMARY**

This project illustrates a number of features which were important in the expansion of this project:

- the project was timely in the national context and addressed a common need;
- potential members were consulted from the beginning of the project;
- use of the project resources within institutions appears to vary, and is affected by steering committee involvement and institutional expertise in supervision development;
- the resources on the site are reviewed to ensure an appropriate level of quality;
- intellectual property arrangements follow academic principles of acknowledgement.

# THE RAPID PROGRESS FILE (RECORDING ACHIEVEMENT FOR PROFESSIONAL AND INDIVIDUAL DEVELOPMENT) AND RAPID 2000

## Originating location

Loughborough University, UK, Partner institution the University of Central England (for FDTL project). NURAPID (The Newcastle University 'Recording Achievement Professional and Individual Development' system), is a version of RAPID which has been adapted and implemented at Newcastle University, Australia.

## Type of case

Web-based software development project, initially based in one discipline and adapted and implemented in others.

## Current website

<http://rapid.lboro.ac.uk>

## Funding sources

RAPID The Department for Education and Employment (DfEE) funded project 'Recording Achievement in Construction' (1998-1999) approx £100,000.

RAPID 2000 Fund for the Development of Teaching and Learning (FDTL3) 2000-2003, £249,970.

NURAPID University of Newcastle, 2002 \$50,000.

Transferability funding awarded, 2003-2004, £25,0000.

## Reason for choosing the case

The project was chosen because:

- it used a collaborative approach in which project development, dissemination and implementation at multiple sites occurred concurrently;
- it has been taken up by 10 UK institutions beyond the original site;
- it is an example of a project which was initially developed in one discipline and has been adapted and implemented in other disciplines;
- it has been adapted and implemented at an Australian university, highlighting issues related to the international dissemination and adaptation of project products.

## PROJECT DESCRIPTION

### Origin

The RAPID progress file was originally developed in order to prepare students and graduates to meet the requirements of the Chartered Institute of Building (CloB) professional development program by learning to reflect on their personal and professional achievements. The first RAPID project was one of six projects funded under the Recording Achievement in Higher Education project scheme of the DfEE, consistent with recommendation 20 of the Dearing Report that focused on student achievement profiling and development. Funding was sought in partnership with the CloB, the major professional association for the Construction Management discipline in the UK.



## Aims

The RAPID projects aimed to develop and extend systems which support students and graduates in construction management disciplines to 'monitor, build and reflect upon their own personal and professional development.' (<http://rapid.lboro.ac.uk>).

## Design and activities

The RAPID progress file is a web-based system which guides students in their personal and professional development planning. It includes two tools, PACE which guides students in building a CV and SPEED, a larger tool which enables students to plan, record and provide evidence for their achievements of skills. The SPEED tool includes sections for recording students' key skills, personal and professional skills, subject specific skills and personal attributes. For each skill, students are presented with a list of four statements representing increasing levels of competence. They select the statement which best represents their competence level, then enter information about the evidence that supports their claim and where this evidence is located. A help system provides advice on issues such as the adequacy and authenticity of evidence. A project developer noted that developing the competency level statements was one of the most challenging but productive aspects of creating different versions of the system.

The initial version of RAPID focused on the Construction Management subject area. As at April 2005, there are 12 different versions of RAPID, 11 discipline specific and one generic. Further versions are under development.

From the beginning, the project team informed construction management academics from other HEIs about what they intended to do and created a database of those who were interested in further contact. Once a paper prototype was available one year into the first RAPID project, a project conference was held and institutions were invited to express interest in participating in the pilot phase. Six institutions were chosen to represent a diverse range of potential uses of RAPID. They received support to implement and evaluate their use, and have continued their involvement with the project.

The aim of the RAPID 2000 project, funded under the FDTL, was to expand the use of RAPID to further institutions and develop further discipline-specific versions. Seven customised versions were developed and 10 institutions were supported to implement RAPID. Ten events were held during the course of the project, including:

- a joint conference run with other Built Environment FDTL projects;
- three evaluation workshops in which participating institutions gave feedback and shared experiences of implementation;
- six dissemination seminars, focusing on transferring RAPID to other institutions and sharing good practices.

Participants in these events included representatives from universities, professional bodies and the Built Environment and Engineering Subject Centres.

According to the project final report (Loughborough University, 2003) the more successful dissemination activities were:

- small project focused events, as above;
- involvement in presentations with the Built Environment (CEBE) and Engineering Subject Centres;
- encouragement for adopters to disseminate within their institutions.

The RAPID team also engaged in dissemination activities through Subject Centre publications and network groups, a project reference group, professional conferences, a website and email communication. Presentation of conference papers and involvement of industry representatives in a reference group were seen as less successful dissemination strategies for this project (Loughborough University, 2003).

The RAPID 2000 project was evaluated by an external evaluator who was also a participant observer member of the project management team. Evaluation involved staff interviews, student questionnaires

and focus groups and institutional case studies across four universities which were using RAPID (Tolley, 2004).

### Adaptation and embedding in other contexts – examples

Within the UK context, RAPID is being used in a range of different ways. At Loughborough, the originating institution, it has been in use since 1999-2000. An initial and ongoing use was for Construction Engineering Management students to record their skills development during a required six-month work placement (Maddocks & Wright, 2004). The university has recently made the decision to recommend RAPID to all departments as a tool which can be used to support students and address National PDP requirements. To assist in this process, the RAPID team is developing a generic version of the system which focuses on key and transferable skills. They are also developing a new interface and 'skills bank' that will allow departments to customise RAPID to suit their discipline areas. (Maddocks, 2005, personal communication).

Adopter A became aware of RAPID through the initial email from the project team asking for expressions of interest. At her institution, RAPID has become embedded in all modules in the Building course, encouraging students to progressively develop their skills. Students in each module use information that they record in RAPID to write a short report reflecting on and critically analysing their skills development to date and planning future development needs relevant to the module. This is worth 15% of the assessment. Adopter B saw RAPID as having a number of advantages over other PDP systems for their environment. In particular, it did not need to be adapted as it was specifically designed for the discipline, it is relevant to professional requirements and it is perceived to be easy for students to learn.

Adopter A was in a formal leadership position as Director of Teaching and Learning in the Built Environment School. She has championed the use of RAPID in the school and university, including running workshops and presenting RAPID to university committees. After comparison with other systems, an academic committee recommended that RAPID be adopted as the university-wide PDP tool. However, this recommendation has not been supported by the university's IT section as RAPID is not compatible with the customised student transcript system. Because of this, it appears likely that the university will develop its own PDP software, based on similar principles to RAPID.

Adopter B became aware of RAPID through a workshop on PDP systems, most probably one run in conjunction with the CEBE Subject Centre. He is the Undergraduate programs leader in his department and has a strong interest in PDP and links with the professional association. Like Adopter A, he saw an immediate relevance of RAPID to the requirements of the profession. He has embedded RAPID in a first year and a third year module in the course and is planning to have it embedded in a second year module and used by students while on work placements. Like adopter A, he has promoted the use of RAPID in his university. It is accepted as the PDP tool for undergraduate students in his Department. It was perceived as less suitable for Masters students, and this point is being addressed by the RAPID team in the development of new versions of the system.

Adopter C has embedded RAPID in an individual module which focuses on professional development. He was informed about RAPID by his Head of Department and was happy to adopt it as it fitted with his module and his personal interest in PDP. Using RAPID is part of the formal requirements for the module assessment.

At the Australian site, funding was obtained through an internal grant to adapt RAPID, pilot it in three disciplines in the university and evaluate it. NURAPID is maintained on a central server and available to anyone at the university. The majority of the money was spent in adapting the program code and adding an interface so that people who were not programmers were able to change the skill statements and criteria. Considerable time was spent in analysing the university's Key Skills requirements and to break them down into criteria statements, then consideration was given to skills specific to the profession or discipline. The intention was to implement it in Construction, Education, Nursing and IT. It has been most successful in Nursing, where it is being used by approximately 2000 students and linked to the clinical placements. Nursing was seen as having a favourable environment for use because professional competencies could be embedded directly in the NURAPID skills statements.

Ways of implementing it fully in Construction are being considered as part of a current course re-accreditation, and some staff have used the framework to encourage students to reflect on parts of the program. The project leader was well aware of the importance of bringing staff along and ensuring that they were committed to its use.

## Outcomes for learning and teaching

### For students

Both developers and adopters commented on the benefits of RAPID for encouraging students to reflect on their development of professional and personal skills and identify areas of potential development. Students who used RAPID on work placements reported that it enabled them to: identify their strengths and weaknesses, identify clear processes for developing their competence, and create and record evidence relevant to their competence and professional development (Maddocks & Wright, 2004). At adopter B's institution, students who have used RAPID throughout the course are seen as more critically aware of their levels of competence, able to create plans for developing their competence and able to demonstrate their levels of competence to employers and for future professional development.

### For teachers

Tutors working with students on work placements noted that RAPID provided a framework to guide students in auditing, developing and reporting on their skills (Maddocks & Wright, 2004). It was seen as easy for students to access and requiring limited tutor support.

Developing the skill statements and levels for RAPID was an intellectual task which involved considering thinking about student development of skills. The development of NURAPID was also seen as affording insights into other disciplines and productive cross-disciplinary collaboration. The presentation and publication of papers was seen as a benefit both by the Loughborough and Newcastle developers.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### National and institutional requirements

The UK national requirement for institutions to have PDP systems in place for students for the 2005-6 academic year is encouraging adoption of PDP systems in UK institutions. Adopters' comments suggest that some institutions are moving towards a centralized system. In this case the continued embedding of RAPID may be influenced by compatibility with other student administration systems. Other institutions are enabling departments to adopt different systems, and in these cases departments which are using it currently are likely to continue their use.

### Institutional support for development: culture, location, academic development

Loughborough University is perceived to have provided a supportive context for the development of RAPID. While Loughborough is a research university, it is rated as excellent for both research and teaching. The Faculty of Engineering houses the Higher Education Academy Engineering Subject Centre, which is co-located with a very active Engineering Education Centre. The RAPID project has been located within the Engineering Centre. The university also has a strong academic development unit. A senior academic developer has played a strong role in the RAPID project team and the project's consultative development and dissemination approaches. It is particularly interesting to note that the project originator for RAPID left Loughborough but the RAPID projects continued and expanded. The Associate Dean (Teaching) in Engineering, who is also Director of the Engineering Subject Centre, became the new RAPID project leader providing further expertise in consultation and dissemination within the disciplinary communities.

At Newcastle, NURAPID was made possible by the availability of funds from an internal teaching development grant scheme. The cross-disciplinary approach was seen as valued within the university.

Development of the application for funding was assisted by an academic developer who continues to support the project.

### **Institutional support for use: technical, student support**

As a web-based application, RAPID requires a server and relevant support. Adopting institutions varied in the extent to which they successfully supported RAPID, both technically and in terms of user needs. One adopter used the server at Loughborough while initial technical difficulties were resolved at his institution. Interestingly, providing off-campus 24 hour access to web-based systems was still seen as an issue at some institutions.

The evaluation report (Tolley, 2004) suggests that students expected to have access to support for RAPID which was similar to that for other institutional online IT or library systems. Students who had poor experiences due to technical problems at some institutions were less likely to want to use RAPID in future. Students also perceived a need for orientations to RAPID which included both how to use it and why they would benefit from using it.

### **Professional synergy**

The degree of 'synergy between the culture of a faculty and professional requirements' (project developer) was seen as a key factor influencing the use of RAPID. RAPID and NURAPID were reported to have been most successful in disciplines which have clear professional competencies. Most of the 12 discipline-specific versions of RAPID are for more technically oriented professions, with one version for Postgraduate Certificates in Education. An original context of use in the UK was in work placements in Building disciplines, and it continues to be used there.

Attempts to engage some humanities and social sciences departments in the use of RAPID were reported to be less successful. One adopter noted that its 'checkbox' approach was not as appealing to those disciplinary cultures.

In Australia, NURAPID has been most successfully adopted in Nursing, where it is used on clinical placements. The developer noted that professional associations in the construction field in Australia appeared less influential than the CloB in the UK, so this provides less of an incentive for students

### **Departmental contexts: leadership and valuing of PDP**

All of the adopters we interviewed were in departments where the Head and/or others in leadership positions were supportive of RAPID and encouraged its integration in modules. Early evaluations of RAPID pointed to the need for it to be integrated into the curriculum, particularly the assessment, if students were to use it effectively. A recent evaluation report (Tolley, 2004) notes that students need to be convinced of the value of PDP in general, particularly if they have prior experiences of it not being valued. Tutor and lecturer commitment is critical. Use of RAPID was encouraged by tutors and workplace supervisors who frequently emphasised PDP in their work with students, even when that use was not explicitly assessed.

Lack of leadership in particular departments and lack of motivation or interest of individual staff were perceived as barriers to wider use. This echoes comments made in an early report on the use of RAPID:

Institutional practices, both within the academic environment and in the work place can discourage the use of the RAPID Progress File by students. There is a considerable task involved in persuading people to support and promote the use of the Progress File by students, particularly where this might not complement existing practice. (Maddocks 2001, p. 6)

In the department in which RAPID was used in every module, staff were said to differ in their level of commitment to the system some being enthusiastic supporters and others not being initially supportive but now taking it for granted as part of the overall Departmental approach to PDP. RAPID was perceived to be fully embedded in the curriculum.

## ENABLING AND CONSTRAINING FEATURES OF THE PROJECT/IDEA

### Project management, collaboration and support

RAPID's project management, management structures and approach to collaboration were described as key aspects of its success in being adopted by other institutions. Members of professional bodies and other institutions were included on an advisory steering group. The management group included a disciplinary expert with strong institutional and external links and considerable teaching and learning leadership experience, an external expert evaluator, a staff developer with extensive experience and knowledge of institutional trends and processes and large scale projects and with links into other external communities, and an experienced and pro-active full-time project manager.

The collaborative approach involving a selected number of other institutions which were supported in trialing RAPID and giving feedback. Their feedback was taken on board in the development of the system and implementation advice. As a team member noted:

When you have a critical mass of people who are going to trial and pilot and grow and own the system, they are much more likely to run with it afterwards.

Evaluation took place over the life of the project and included evaluation of use across institutions, enabling findings and implementation advice to be shared with further adopters. Workshops and seminars also enabled the collaborating institutions to share their experiences of use.

The project manager was perceived to be both pro-active and extremely responsive to the needs of collaborating institutions. He continues to provide support for RAPID, including the development of new versions, even though the project has officially come to an end. This continued involvement is made possible because the team secured funding for a new and somewhat related project.

### Intellectual property arrangements

The RAPID team have set up a licencing arrangement. The terms of the FDTL grant require free distribution of RAPID to other HEIs covered by HEFCE and DENI for two years. The licencing allows the skills and skill statements to be adapted by institutions with relevant programming expertise, while retaining the project team's ownership of the core system. This approach was designed to enable the team to commercialise the system later, if desired. In practice, the team has licenced RAPID free of charge to professional bodies, in order to encourage wider use.

Newcastle (Australia) currently has the right to use RAPID free of charge in the university on condition that it acknowledges Loughborough as the original developer and does not exploit it for commercial gain. The team there has already created an administrative interface for RAPID and made other adaptations within their licence. They are currently seeking advice on the IP status of the adapted version, NURAPID, and wish to maintain good relations with Loughborough. The project developer noted that differences in the levels of project funding between Australia and the UK were a potential issue in managing the take-up of projects and sharing of resources across countries. UK products are relatively much more expensive to buy into from Australia.

### Ease of use and built-in support

RAPID was described by adopters as easy to use and to integrate into modules which focused on professional practice or development. The web-based system was seen as more accessible and easier to use than paper-based PDP systems. It was also seen as easy to introduce to students, although some students perceived that more orientation would be better. The system interface is simple and there is a help section which includes frequently asked questions, guidance and examples.

The discipline-specific nature of RAPID was seen as a clear benefit by teachers in the relevant disciplines, as RAPID could simply be adopted rather than adapted. Adoption typically involved changing the assessment in subjects.

## Design of the system – enabling and constraining

While RAPID was designed to enable users to adapt skill statements for different disciplines and needs, this did not happen in most adopting institutions. One reason was that adaptation was not needed, as RAPID was used in disciplines for which a version had been developed. Another reason was because institutions lacked expertise in the Perl programming language used in RAPID's development or lacked funding to do further development. One such institution reported adapting the skill templates, but doing this in *Word* files which were made available online separately from the RAPID installation.

It is interesting to note that the Newcastle (Australia) team used part of their funding to develop a separate administrative interface to allow anyone with appropriate access and everyday word processing skills to change the skills statements. The Loughborough team indicated that a similar development was occurring there.

## CASE SUMMARY

This project illustrated:

- a model of collaboration in which potential users were involved early on, including through prototype evaluation and feedback, enabling them to have a sense of ownership of the project;
- a good project management structure with a very experienced management/leadership team, ongoing evaluation and a project manager who is both pro-active in making contact with potential users in multiple ways and responsive to the user community;
- attention paid to ease of student use, integration into curriculum design and teacher feedback during the prototyping and development phases;
- the value of linking to priorities in the external higher education agenda;
- the value of linking to professional bodies in the discipline where these are valued by the academic and student community;
- different approaches to departmental and institutional implementations, where the seniority and leadership status of the institutional project champion were important in embedding across modules, and adopters' pre-existing interest in PDP was important for individual engagement;
- a combination of licencing arrangements and software design which enable local adaptability but also permit the originating institution to commercialise later if desired;
- challenges involved in transfer of project resources across different countries.

# IN:CONTEXT: CREATING THE BALANCE IN THE NURSING CURRICULUM

## Originating location

Huddersfield, UK.

## Type of case

Online, context and case-based virtual learning environment

## Current website

<http://www.in-context.info/>

Penfield Virtual Hospital [http://www.hud.ac.uk/hhs/departments/nursing/penfield\\_site/default.htm](http://www.hud.ac.uk/hhs/departments/nursing/penfield_site/default.htm)

## Funding source

FDTL phase 4, £249,994.

## Reason for choosing the case

Although it is not yet complete, the project was chosen for profiling because:

It was planned with take-up in mind by a developer who had developed scholarly understandings of dissemination and take-up processes;

Its development has been managed but collaborative, with a high level of support for the collaboration;

There is a plan in place to support its continuation after project completion.

## PROJECT DESCRIPTION

The major aim of the project is to 'produce, and effectively disseminate, learning materials that address the gap that is developing between the practical training component for nurses on the one side and the philosophical and theoretical component on the other'. (FDTL project 114/02 summary)

The project has involved the collection and anonymisation of 200 real patient cases and the development of Penfield Virtual Hospital, a simulated general hospital where students can engage with these cases in context. Penfield provides students with workspaces where they apply theoretical concepts to patient scenarios in the context of patient care. It is underpinned by its own learning management system and database developed as part of the project.

The development of learning resources is taking place in four phases:

- development of the case histories;
- mapping learning outcomes onto the case histories to create learning materials;
- embedding the learning materials into the nursing curriculum and educating nursing academics on ways of using them;
- making the materials accessible through the Penfield Virtual Hospital simulation and creating guidance notes for students and teachers.

Dissemination has been embedded within the development process, following a set of essential points for successful dissemination outlined by the developer (Ward, 2004). The project's second stage bid describes a complex and extended process of collaboration and consultation between the developers, nursing academics and other relevant groups such as the Subject Centre for Health Sciences and Practice (University of Huddersfield, The University of Glamorgan and Sheffield University, 2002)

All phases of the development involve collaboration. The project team sent invitations to all 53 UK HEIs which offer nursing programs, inviting them to join the project. Nursing teachers from 46 HEIs are participating, and they represent a wide range of nursing fields. Participants were offered £750 and the title of curriculum developer to the project on condition that they contributed to all development stages and made presentations on the project at teaching and learning committee and department meetings in their universities. Evidence of presentations, such as meeting minutes, was required before participants qualified for the funding. Participants were also expected to contribute to the collection and development of patient case histories.

The team ran a series of three workshops in each of nine regions in the UK over the period of the project, a total of 27 workshops. Workshops in each region were held about six months apart. Each workshop included aspects of consultation with the teachers and teacher development:

- conceptual workshops were held at the beginning of the project and involved teachers in exploring the storyboard and sample resources for the project and some sample resources and contributing ideas about how they would be developed;
- skills workshops were designed so that the teachers could provide feedback to the developers from their departments and could develop skills in relating case histories to learning outcomes. A project developer noted that teachers needed to learn how to 'see the stories' in the cases that would enable students to achieve particular learning outcomes and experience theory in context;
- knowledge workshops enabled teachers to provide another round of feedback and supported them to develop learning resources which were based on the case histories and learning outcome mappings and explore ways of relating these to their individual contexts.

The ongoing collaborative development process is supported by regular updates on the project website. The project also uses a formal project management system and engages in regular communication with other stakeholders, including via steering committee meetings.

The developers are aware that Penfield Virtual Hospital will require ongoing maintenance after the project funding is expended. Their continuation plan involves seeking relatively small subscriptions from the participating HEIs. It is anticipated that most will subscribe because of the ownership they will have developed in the resources. There has also been international interest in subscribing.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### The focus of the project on common needs

Curriculum design was defined as a Nursing Subject Priority Area by the QAA. There was particular emphasis on a need for practice-driven curricula which integrated theory and practice. The focus of the project on addressing this need made it relevant to all HEIs which offered Nursing.

### Scholarly understandings of dissemination

The embedded dissemination approach for the project was developed as a result of the project leader's interest in the issue of why innovations in teaching and learning were not used outside the development context. His concern led to scholarly investigation of effective dissemination, with a particular focus on the health and education sectors in which there is a lack of practitioner use of research and innovations. The outcome was the creation of a series of key points for effective dissemination which were built into the design of the *Creating the Balance* project. A short, developer-focused paper describing these ingredients and the project was entitled *Invented Everywhere: In Pursuit Of A Dissemination Strategy That Works* (Ward, 2004).



## Collaborative development, with recognition of contributions and teacher development

The funding of participating nursing teachers and giving them titles related to the project served to acknowledge their contributions. The requirement to present in order to be eligible for funding legitimised further communication about the project in the participants' departments. The series of participative workshops combined feedback and teacher development, recognising both the value of contributions from different contexts and the need for staff development to support teachers in engaging in new approaches to teaching and learning.

## CASE SUMMARY

Although this project is not yet completed, it illustrates a range of features aimed at supporting widespread ownership and implementation in participating institutions:

- relevance of the project to subject area priorities;
- a model of collaboration based on a very strong project leader and core development group, with potential users from other institutions being funded and required to participate in consultation and knowledge building workshops, share what they've gained with their own departments and respond to requests for project case studies;
- a project leader who developed a scholarly understanding of effective dissemination approaches prior to commencing the project;
- a model developed for ongoing maintenance and development of the project site, prior to project completion.

# INFORMATION AND COMMUNICATION TECHNOLOGIES AND THEIR ROLE IN FLEXIBLE LEARNING – THE AUTC LEARNING DESIGNS PROJECT

**Originating location**

University of Wollongong in partnership with Edith Cowan University, Australia.

**Type of case**

Web-based repository of reusable learning design tools and exemplars.

**Current website**

<http://www.learningdesigns.uow.edu.au/>

**Funding source and amounts**

AUTC, \$400,000.

**Reason for choosing the case**

The case was chosen because:

- it involved a very large number of learning designers, evaluators and others in its development;
- its aim was to create reusable resources;
- the review of AUTC projects by Hicks (2004) noted that the large number of people involved had been a source of incidental dissemination, and the project had also been profiled extensively in Australia and internationally, but that reservations had been expressed about how widely the site would be used. It seemed appropriate to follow up on Hicks' (2004) comments, given that a further year had passed since the end of the project.

## PROJECT/IDEA DESCRIPTION

**Origin**

This project was commissioned by the AUTC as one of a number of strategies designed to disseminate the outcomes of previous CAUT and CUTSD grants. The committee recognised the significant number of successful projects which had been produced using ICT, but recognised the difficulties faced by academics in trying to implement those project ideas in different areas.

**Aims**

The aim of the project was to produce 'generic/reusable learning design resources ... which may be generalized beyond the level of individual projects to assist academics to create high quality, flexible learning experiences for students'. (AUTC Project Final Report, 2002, p. 11).

## Design and activities

The project involved three major components:

1. Identifying learning design exemplars which contributed to high quality student learning experiences and had the potential for re-use in other contexts. A set of principles for high quality learning and an Evaluation and Redevelopment Framework (ERF) which embedded these principles were developed to enable identification of relevant designs. Learning design exemplars were obtained from the Alexander and McKenzie (1998) report, emails to a range of people and other types of searches.
2. Selecting exemplars suitable for redevelopment. An evaluation team of 64 people was involved in selection. Many of the evaluators were selected on the basis that they were experts and opinion leaders in the field. Pairs of team members used the ERF to evaluate the initial pool of exemplars, which was narrowed to 15 learning design exemplars. Designers of the original exemplars were invited to complete a description template.
3. Developing the exemplars into reusable learning designs and making the design guidelines, tools and exemplars available on a website.

The website was designed primarily with the higher education community in mind, as a repository and a way of sharing ideas about learning designs and their uses. Other outputs from the project include the concepts of learning designs and learning design sequences, four generic software tools, guidelines for five learning designs and the set of learning design exemplars.

Evaluation of the potential learning designs took place during the project and there was some evaluation of the resources as they developed. The Project Final Report (2002) recommends more extensive evaluation, particularly focusing on the extent to which the site resources can be used. The project team's current research projects have some bearing on this area, but they note a lack of ongoing funding to support any changes to the site which may be desirable.

## Dissemination activities

The project team perceived that there was ongoing dissemination during the project, due to the 140 people, including national and international opinion leaders, who were involved in evaluation or committees. Conference papers were given throughout the project, and a presentation was given at the AUTC National Teaching Forum at the end of 2003 with attendees given a postcard to register their interest in the site. The project manager was perceived to be excellent at keeping people who were involved informed about the progress of the project, particularly in stages when developments were not obvious to those outside the team.

Web statistics from the site are collected to give some idea of general diffusion. Project team members noted about 1000 users per month, with just over 50% not being automated data gatherers and about 25% coming from universities. Of the university users, about 75% are from Australian universities. The most popular pages are the exemplars, with the predict-observe-explain exemplar and tool being most popular. The role play simulation exemplars rank in the top 20 pages.

## Adaptation and embedding in other contexts

From the information provided to us by the project team and academic developers, it appears that resources on the learning designs site are most commonly used by academic developers, who mediate its use by teachers, and by researchers. It is also used by academics in the fields of e-learning or learning technologies.

Researchers, including members of the original project team, are using site and/or the ideas behind it to pursue or inform further research projects and have been able to gain funding for several projects. The site is being used by researchers with an interest in how teachers might use learning designs to inform their practice, and by those with an interest in categorisation of and metadata for learning designs, among other interests. The team attempts to track where the site has been cited in other projects. Most

citations come either from people who have been involved in the project or those who are part of the ASCILITE community.

At the originating university, the team has also investigated ways in which academics are using the site to inform their subject redesigns (for example, Bennett, Lockyer and Agostinho, 2004). The team would like to interview people who have used the site in different ways, in order to provide examples for others.

Of four academic developers who completed brief questionnaires for our project, three were using the site. In two cases this use was part of a formal course or formal workshops for academics. A respondent who was contacted for further information reported using it in two ways. It was firstly used in course sessions to introduce different learning designs to assist teachers to develop ideas. Participants then used it as a resource for an assessment task which required them to select a learning design, either from the site or another resource, and give a presentation on how they would use it in their own context.

## Outcomes for learning and teaching

### For teachers

A small study on teachers' use of the learning design resources as part of a formal subject reported that 'learning designs are useful as a trigger for thinking about how new strategies might be applied to an existing subject design' (Bennett, Lockyer and Agostinho, 2004, p. 121). It was noted that the exemplars were necessary in order for participating teachers to interpret the generic learning designs. Adopter A similarly reported that teachers who were asked to use the site found it useful as a source of ideas for subject redesign.

### For students

The learning designs and exemplars were selected on the basis of evidence that their features would support high quality learning. This suggests that, as with the IT projects evaluated by Alexander and McKenzie (1998) from which some of the learning designs were derived, the learning outcomes for students would depend strongly on how teachers implemented them within their own learning environments.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### Timeliness in the national and international research field.

Some of the use of the site, including the involvement of project team members, is generated by interest in learning designs within parts of the e-learning and educational technology research communities. Research funding obtained by members of the project team has enabled key team members, including the project manager, to maintain some involvement with the site. Conference presentations and research publications based on aspects of the project also serve to continue to raise awareness of it in the research community.

### Institutional support

The University of Wollongong, the university at which project management and site development were based, is seen as having been supportive of the project and continues to host the website. For project staff, ongoing research publications from the project are recognised, and internal research funding has supported activities such as collection and analysis of web statistics. A university teaching innovation grant has been obtained by some of the team members to see how the site could be used as a source of learning ideas by teachers. The university is perceived to be looking for ways in which to recognise teaching. Teaching innovation is viewed as being valued in academic career development, probation and promotion.

### **Availability of academic development or educational support**

As current evidence suggests that much use of the site by teachers is mediated by academic developers or similar who can assist them to interpret the learning designs and adapt them for their contexts, the presence of this support in a university appears necessary for wider use of the resources. The most common methods of providing such support appear to be formal learning programs or courses, or individual consultations.

### **Constraining feature: lack of continuation or maintenance funding**

The possibilities for the site were perceived to be constrained by the lack of ongoing funding. A member of the project team commented that there was no ongoing support for continuing to add exemplars to the site as they emerged and no features on the site which enabled online dialogue with potential users. There was perceived to be a lack of encouragement for 'moving the field forward and for tertiary teachers learning from each other'.

## **ENABLING AND CONSTRAINING FEATURES OF THE PROJECT**

### **The involvement of a large number of project participants**

The number of people involved in providing examples and evaluating learning designs or as experts on a variety of committees was seen by the project team and by Hicks (2004) as having some significance, as it means that those people know about it. There is limited evidence as yet of the extent to which the 140 people involved use the website or promote the ideas to others. In June 2004, members of the project team surveyed 76 people who had either been part of the project in some way or had indicated an interest. They received a 22% response rate. Most respondents had returned to the site, at least to look at what was there and in some cases to make use of the materials. It seemed to have been most strongly used by researchers and by people in academic development roles who used it to demonstrate particular learning designs or in consultations with others. A team member commented that those who are known to use it most are people who 'have been most actively involved and have previous experiences and a previous track record in the area'.

### **The 'generic nature' of the learning designs**

One of the major ideas behind the project was that learning designs may afford adaptation and implementation more readily than do learning objects. There is some evidence from the project team and adopters that teachers are able, with assistance, to adapt particular learning designs to their own contexts. The multi-disciplinary exemplars on the site are seen as being of practical use to teachers seeking to adapt and implement the learning designs in their own subjects.

As flagged by Hicks (2004) the language used on the site can be problematic for teachers from non-educational discipline backgrounds, and this was confirmed by members of the project team who had used it with teachers. The exemplars are necessary for enabling teachers to engage with the language and concepts used on the site, and much site use is mediated by people who are more familiar with this type of language. This may in some ways be desirable, as teachers and educators/academic developers working together may create more effective implementations of the learning designs than either working alone. Interestingly, the language and abstract concepts were also seen as having some benefits. A team member noted that the site was perceived by some teachers as a resource which could assist them to learn to use educational language and evidence for their ideas, particularly in the context of developing applications for teaching grants or similar.

### **The necessity of mediated use - constraining or enabling?**

Wider adaptation and implementation of the learning designs available on the site appears substantially dependent on the involvement of academic developers and others who can continue to mediate site use. This may have some advantages, in that contexts such as formal courses on teaching and learning afford

opportunities for teachers to learn from each other about different uses of the learning designs and also to learn about, evaluate and reflect on their use of relevant learning designs.

As noted in the recommendations of the report, more extensive evaluation of the site with a wider range of users may have enabled it to be more directly useable by teachers. However, it seems likely that discipline based teachers would be most likely to become aware of the site through staff who have academic development or related roles.

## CASE SUMMARY

This project provides an example of a set of resources which were explicitly designed with the intention of reuse. Some adoption, adaptation and implementation of the resources is occurring, substantially through mediated use. It may still be too early to tell the extent to which the project is having an impact on the use of the particular learning designs and the extent to which this use improves students' learning experiences. Some points which can be made from this case include:

- the importance of the adaptability of the learning designs in enabling their re-use. The case study of role-play simulations illustrates one example of this adaptability, although the examples given in that case developed earlier than the learning designs site itself;
- the importance of the exemplars in enabling use of the learning designs;
- the role of academic developers or similar in supporting teachers to interpret and adapt the learning designs for their own situations;
- there is not yet clear evidence about whether the involvement of a large number of expert evaluators and learning designers in the project has resulted in wider dissemination, adaptation and implementation of the learning designs than would otherwise have been the case. Involvement does seem to have resulted in distribution of the idea of learning designs, as indicated by research citations;
- the project raises the importance of evaluating project products extensively with their intended users, in this case university teachers, throughout a project rather than afterwards, to enable the project to be adapted to the users. An alternative, based on evaluation findings, may be that the desired users of a project are different from those originally imagined;
- the issue of the continuation and maintenance.

# ROLE-PLAY SIMULATIONS FOR TEACHING MIDDLE-EAST POLITICS

## Originating location

University of Melbourne and Macquarie University

## Type of case

Online role-play simulation

## Funding sources

1994 Committee for the Advancement of University teaching (CAUT) grant, \$33,165

1995 Macquarie University Teaching Development Grant, \$34,995

## Reason for choosing the case

This case has been selected because the project has previously been studied in some detail for the Alexander and McKenzie (1998) Evaluation of Information Technology Projects for University Learning report, providing a unique opportunity to review the progress and outcomes of the original project ten years after its receipt of the initial CAUT funding.

## PROJECT/IDEA DESCRIPTION

### Origin

This project had its origins at the University of Melbourne in the late 1980s with Dr Andrew Vincent's concern that, in order to learn about the complexities of politics in the Middle East, his students needed an opportunity to engage in more authentic learning activities than those afforded by the reading of books. Whilst on study leave in the United States, he encountered the use of role-play and introduced it in his classes at The University of Melbourne using the technologies of paper, pencils and 'runners' to carry messages between classrooms.

Somewhat serendipitously, Dr Vincent met Dr John Shepherd, a Computer Scientist (also from the University of Melbourne), who suggested the use of email to facilitate communication between the teams of students who were playing various roles in the simulation. After initial successful trials, Dr Vincent and Dr Shepherd were successful in their application for a CAUT grant which enabled them to develop more sophisticated software to manage the role-play simulations. The following year, the CAUT grant was supplemented by a Teaching Development Grant from Macquarie University.

### Aims

There were a number of aims of the original CAUT-funded project. Dr Shepherd thought the funding would enable the development of more stable software so that students would be free of the existing technical difficulties, and thus able to focus on playing their roles in the simulation itself. Development of this software would also facilitate the take-up of role-play simulation by other staff within the Department, within Macquarie University, and within other interested universities.

The purpose of the project was for students to gain:

- an understanding of negotiation and decision making skills;
- an appreciation of the inherent complexities of social systems;
- computer/ network skills;
- an enhanced understanding of Middle East politics (Alexander & McKenzie, 1998).

Finally, it was anticipated that the project would enhance Macquarie University's reputation for excellence in teaching.

## Design and activities

Some ten years on from the original simulation, the project is still run in very much the same way as it was in 1994, with the original project design considered to be successful.

Students still work in small groups of 3 or 4, and each group is allocated the role of a person or organisation that is prominent in the Middle-East. Over a period of approximately 2-3 weeks, each group develops a detailed profile of the role they are playing, which they then post on the web for other students to view. Once the profiles have been completed, Dr Vincent releases a scenario of an event that is likely to happen in the Middle-East.

Over the next 3 weeks, students participate in the simulation asynchronously, working to advance the interests of the role they are playing. A small group of 'controllers' monitor the simulation, ensuring its fidelity. Finally, a live teleconference is held where students discuss issues that have emerged during the simulation. More often than not, the simulations have involved students from other countries, and this live teleconference provides an important opportunity for them to 'meet', and debrief the entire activity. At the conclusion of the live teleconference, Dr Vincent hosts a BBQ for all students involved from Macquarie University.

## Adaptation and embedding in other contexts – examples

Not only did the original project continue at the University of Melbourne long after Dr Shepherd and Dr Vincent had moved to Sydney, but the project itself has been influential in the decision of others to take up the use of role-play simulation in Political Science departments at other universities, in other discipline areas within the higher education system, and more recently, in the schools sector. A commercial organisation has also based the development of its role-play generation software on the original ideas of Dr Vincent, and their recent customers have included the United States Army. Each of these examples will be discussed in more detail below.

## Embedding in original context

As noted above, the simulation continues to be offered at Macquarie University in its original form ten years on from the original grant and, according to Dr Vincent, has been very successful, with the students being universally positive about their experience.

The success of the project however, appears very much dependent on the presence of Dr Vincent. When he was absent on sabbatical leave recently, for example, his classes were cancelled. The simulations have not been taken up by any of his colleagues in the discipline, nor is Dr Vincent aware of any other academics within the University who have taken up the approach. Dr Vincent's work appears to have a low profile with other academics within the University, and he does not participate in central teaching and learning activities such as forums and seminars. Dr Vincent believes that, were he to leave the University, the simulations would cease.

In 1998 Dr Vincent and Dr Shepherd published an article (Vincent & Shepherd, 1998) on the role-play simulation in an international, peer-reviewed journal, and this article has been widely cited by others who have adopted the approach. In the same year, Dr Vincent applied for an Outstanding Teacher Award but was not successful. He says that he has also been advised not to apply for promotion to Associate Professor because he does not have sufficient research publications. When asked about his research, Dr Vincent says that the time taken up by the simulations has meant that he has not been in a position to undertake the level of research usually required of an academic. He says however, that if one were to judge his success as an academic on the level of student satisfaction, then he has been enormously successful since hundreds of students have participated in them over the years, and they never forget the experience.



Dr Vincent says that he has received support for the simulations from his department. When questioned about the nature of this support, he says that he no longer has to pay the people who act as controllers for the simulation out of his own pocket (as he has previously done), nor does he have to fund the final class BBQ personally, as his Head of Department has recently been able to assist in this regard.

The University has showcased the project, featuring it in a video on innovation in teaching, which it uses to market courses to overseas students, and in other promotional materials.

The recently-formed ICT Innovations Centre at the University has recognised the value of the simulations, and has recently begun collaborating with Dr Vincent to adapt the role-plays for use in the schools context (discussed in more detail below).

### **Adaptation and embedding in the same discipline, in a different university or context.**

A number of Political Science Departments have taken up the use of role-play simulations, and they all cite Dr Vincent's original work.

#### **The University of Melbourne**

At the University of Melbourne, Roni Linser was one of the original controllers for Dr Vincent's early simulations when email was the only technology used to support communication. When Dr Vincent left the University in late 1993, Mr Linser continued the simulations because he thought they were the best teaching method for Middle East Politics, he had ever encountered. He continued to run the simulations every year from 1994 to 2002, and was instrumental in persuading a number of his colleagues, both within his department and outside it, to use simulations in their teaching. The role-play simulations have now been used in a variety of political science courses 'including Middle East politics, World Politics, Theories of Power, Russian Politics, Australian Foreign Policy, and International Politics of the Asia-Pacific' (Linser & Ip, 2002).

Mr Linser estimates that he can create a basic role-play simulation in Middle East Politics in 2 hours using the Fablusi software (see below) including collecting information required (such as resources, role information etc) but says this is because it is a subject area he is familiar with.

In addition, Mr Linser supported two of his colleagues (Dr Majula Waniganayake and Dr Sue Wilks) from the Department of Learning and Educational Development to use simulations during 2002, 2003 and 2004 in the subject *Leadership in Early Childhood*.

When his contract expired at the end of 2002, Mr Linser left the University of Melbourne and, in partnership with Albert Ip, formed the company Fablusi Pty Ltd, whose major product is a Role-Play Simulation Generator. Since his departure all the simulations in Political Science appear to have ceased. The University no longer offers the Middle East Politics options, and Peter Shearman (who also used simulations in his teaching of Politics there) has also left the University. Similarly, the simulations previously being run in the Department of Learning and Educational Development ceased when Dr Waniganayake resigned and moved to another university, and Dr Wilks moved to the Faculty of Architecture (although she has plans to introduce simulations there). Having now been at Macquarie University for approximately six months, Dr Waniganayake hopes to investigate the use of role-play simulations in her teaching there, but first needs to clarify any issues relating to copyright of the simulation process, and to locate available sources of funding to support their development.

#### **The University of Western Australia**

At the University of Western Australia, Dr Samina Yasmeen, as part of a CUTSD grant, conducted a simulation 'based on an international scenario which required resolution by members of the UN Security Council' (Kinder, Fardon, & Yasmeen, 1999). The initial simulation (1998) differed from the Vincent approach in that each student (rather than a group of students) was assigned a role, and the simulation was conducted entirely face-to-face within each of the tutorial groups. After an evaluation of the initial

simulation, the second version made use of Internet-based software, such as a bulletin board and chat rooms, for all communications between participants. This software utilised existing packages such as Filemaker Pro and Lasso rather than using the software developed as part of the Vincent and Shepherd simulation.

### Use in different disciplines, in a different university

In 1997, Dr Vincent was invited to present his work on role-play simulations to a forum at the University of Technology, Sydney (UTS), where several of the academics present became interested in the approach and subsequently adapted it to their own teaching.

#### Faculty of Engineering, UTS

A group of academics, who were teaching the subject *Technology Assessment*, were concerned that their students only ever had an opportunity to learn the socio-technical aspects of engineering and, having heard about Dr Vincent's simulations, thought this would be an ideal way for the students to engage with the political dimensions. Thus, in 1999 the Engineering students from UTS joined the Political Science students from Macquarie University and from the University of Maryland in the United States, in a simulation which was tailored to include roles for technical specialists around the area of water management.

This collaboration occurred only twice, because, although it was considered to be reasonably successful by both staff and students, it was deemed too difficult to:

- create alignment in the assessment items and learning outcomes between different student cohorts (McLaughlan & Kirkpatrick, 2001); and to
- continue to find legitimate technical roles for the Engineering students, along with incorporating new scenarios which included these roles every year.

There were also some difficulties associated with the relationship between both staff and students from what are essentially two quite different cultures of Engineering and Political Science.

#### Faculties of Business and Law, UTS

Associate Professor Mark Freeman perceived the advantages of the role-play simulation to be that they are 'engaging for students, complex and requiring them to reconcile ambiguity'. He thought they would 'give students a motive for stepping in the shoes of someone who thought differently' and that was of enormous appeal to him.

In 1998 he and his colleague (Professor Michael Adams), adapted the simulation for use in teaching the Finance subject *Securities Market Regulation* with research assistant John Capper supporting its evaluation. This subject involved students in understanding the regulation of securities markets where there are two conflicting paradigms – Finance and Law. The former has efficiency solutions as the primary concern, whilst equity is the concern of the latter (Freeman & Capper, 1999).

The organisation of the simulation differed in three ways from the Vincent approach:

- individuals (rather than groups of students) were allocated a role;
- the simulation was conducted anonymously such that the students were unaware of which of them was playing which role (although this was revealed after the very end of the simulation in the debrief activity); and
- the simulation was conducted entirely online (rather than the combination of online and face-to-face) although the debrief was conducted face-to-face.

Initially the project used the Learning Management System *TopClass* which had been adopted at UTS, although this later changed to *Blackboard*.

Professor Freeman noted a number of challenges in adopting the role-play simulation approach. Firstly he had to sell the idea to his co-teacher on the subject. Secondly, he had to find ways of making his own

subject interesting and appealing. He is of the view that Middle East politics is inherently interesting, but that *Securities Markets Regulation* is much less so, and that the role-play affords an opportunity to force students to engage with the competing legal and financial paradigms in dealing with securities market regulations. Thirdly, at that time there were no specific guidelines available for him to follow in terms of what 'steps' to take in setting up the simulation although he found conversations with Andrew Vincent and his students very helpful in this regard. Fourthly, he had to come up with scenarios that would be inclusive of all participants playing individual roles (and to do this every year). Finally, he had to sell the concept to the students, since it is a very different way of learning, which takes a lot of work on their part.

In terms of support for this innovation, Professor Freeman felt he had support from the central teaching and learning unit where there were staff with whom he could talk through particular issues or difficulties he encountered. He received invitations to present his work to university-wide forums, and was frequently called upon to talk with visitors to the University. He also received invitations to present his work nationally and internationally.

Although there was no specific interest in simulation itself within his own Faculty, he felt his work was valued by them because he was able to publish the research he carried out on this innovation, and the simulation assisted in attracting students to the Finance subjects and majors.

Professor Freeman received recognition for his work in several ways. In 1998 the simulation was recognised by the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) with the 'Best web-based teaching project' award. In 1999 his paper describing the simulation was published in the Australian Journal of Educational Technology, and he was promoted to Associate Professor. He believes that the success of the simulation contributed to his promotion.

The simulation continued to be run every semester until Professor Freeman left UTS in 2000. His co-teacher declined to continue the simulations in Professor Freeman's absence, and no-one else in the Faculty has taken it up (despite Professor Freeman having developed a training video to assist students and staff in understanding how it affected students' engagement). He is now working in an educational development role at another University, where he is not in a position to run simulations himself, but has been encouraging others to do so.

#### **Faculties of Engineering at UTS, the University of Adelaide and Sepang Institute of Technology, Malaysia, and the School of Geosciences at the University of Sydney.**

Dr Robert McLaughlan from the Faculty of Engineering, was another UTS academic who heard Dr Vincent's presentation. He had initially come across the idea of using hypotheticals for industry and he started using them in face-to-face contexts in 1994 and 1995, and hence was already attracted by the pedagogical value of simulations.

After hearing about Dr Vincent's work he formed the view that the online simulations could be very interactive for students, and he was attracted by the way that this approach could foster students' bringing multiple perspectives together, and facilitate their recognition of complex socio-technical dimensions. He then migrated the simulation to electronic form in 1996, using it in his teaching of the subject *Contaminated Sites Management*, which enrolled both senior undergraduate and postgraduate students.

He subsequently presented this project at an Engineering Education conference in Adelaide in 1999, where he met Associate Professor Holger Maier from the University of Adelaide. Professor Maier was immediately impressed with the teaching approach, particularly in the way that it encouraged active learning, and also enabled learning to be put in context. Drs McLaughlan and Maier began a collaboration which has continued until 2005, and included staff from the University of Sydney, Sepang Institute of Technology, Malaysia, and the University of New England.

In order to further develop the collaborative project, Professor Maier received a teaching development grant of \$10,000 which was largely used to fund travel between institutions to hold meetings of the team, and to develop the documentation required. McLaughlan et al (2001) estimate that this phase involved two people months for the design and adaptation to the software. Rather than use the same software developed by Vincent and Shepherd, the team made use of the Learning Management System at UTS,

known as UTSONline, powered by *Blackboard*. The University of Adelaide now hosts the simulation, also using *Blackboard*.

Over the next couple of years, the Mekong e-Sim continued to run every year across multiple institutions. The simulation took place over a period of four weeks, during which time students were engaged in a process that was similar to that originated by Dr Vincent. Some changes have been made to the original process:

- students are given a handbook on the simulation;
- online quizzes are offered in the first weeks to motivate students; and
- students were initially assessed using both critical learning incident journals, and a debriefing task.

McLaughlan et al (2001) report that the simulation (Mekong e-Sim) was very time consuming for staff, involving approximately two hours per day of administration over the course of the simulation. At the completion of the simulation, they also reported increased workloads in terms of marking the assessment items, leading them to abandon the critical learning incident journals component of the assessment. Greater responsibility for student support and assessment is now undertaken by staff at each of the institutions involved.

It is worth noting here that the students participating in the simulation were enrolled in three different subjects:

- an Engineering subject *Technology Assessment* at UTS;
- a Geography unit *Asia-Pacific Development* at the University of Sydney; and
- *Environmental Engineering II* at the University of Adelaide and Sepang Institute of Technology, Malaysia.

The Mekong e-Sim project has had significant recognition in the receipt of national and international awards:

- The 2001 Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) award for the 'Exemplary use of electronic technologies in teaching and learning in tertiary education – best web based project';
- The 2001 Pearson Uniserve Science Teaching Award; and
- The 2002 Commonwealth of Learning Award of Excellence in Distance Education Materials.

Dr McLaughlan has published eleven book chapters, refereed journal and conference papers about online role-play simulation, with five arising from the Mekong e-Sim. His colleague, Professor Maier has published eight co-authored publications related to the use of role-play simulations in teaching and learning in refereed journals and conference proceedings. He was appointed to the position of Associate Dean (Teaching and Learning) in his faculty during 2004 and reports that although a range of criteria were used in the decision to appoint him, he believes that the success of the simulation played a role. He believes that the University of Adelaide has provided him with significant personal recognition and support in that he:

- received the 'Stephen Cole the Elder Prize for Excellence in Teaching' in 2002;
- was nominated for the 'Australian Awards for University Teaching', 2003; and
- has been invited to give seminars at this university on the simulation.

Professor Maier reports that the Deputy-Vice-Chancellor is very aware and supportive of the simulation, that the campus newspaper has published articles about it, and that the central teaching and learning unit recently became interested in supporting the use of simulations in teaching, and has invited Professor Maier to present his work at internal forums.

As a result of his presentation at one of these forums, an academic from the Department of Clinical Nursing (Ms Sheila Kavanagh), became interested in the use of simulations and has now developed a

simulation called 'Through the Fire' which is now run within the Graduate Diploma in Nursing Science (Burns Nursing). There has also been interest from the South Australian Water Authority in conducting a simulation around emergency responses.

Along the way, there have been, and soon will be, changes to the nature of the original Mekong e-Sim collaboration. In 2003, the content of the subject involved in the simulation at the University of Sydney changed, and the simulation was no longer relevant so that institution withdrew from the collaboration. Two of the academics involved have however, gone on to develop further simulations.

The content for the relevant subject at UTS will also change in 2006, so that 2005 is expected to be the last year that UTS students will participate.

At the University of Adelaide, there appears to be a strong commitment to continue and extend the simulation (Mekong e-Sim). Resources have been committed to producing video clips of news events for inclusion in the simulation, audio narrated presentations, and high quality images which provide the all important context for the simulation. All of these additions were recommended by students in their responses to the regular evaluations.

Despite this commitment, Professor Maier feels that, at this point, were he to leave the University of Adelaide, the simulation would not survive.

## Use in a different context

### Secondary Schools

In New South Wales, a number of schools have recently been participating in the role-play simulations as a direct result of a series of teachers' of conversations with Dr Vincent about the success of his work in this area.

The first school-based simulation was conducted in 2001 with students taking the Arab-Israeli conflict option for year 12 Modern History in two Sydney public high schools. In 2002, the simulation was run for year 11 students only, and in 2003, they were joined by a third school.

One of the first teachers to see the potential of the simulations was Ms Dulcie Miltiades, who 'wanted to give kids a greater understanding of what is happening in the Middle-East'. Although teachers can be enthusiastic in their teaching, and can make use of excellent text-books on the subject matter area, she believes that the simulations provide an opportunity for the students to play out roles and actually 'take on what is happening'.

Since the initial secondary school simulation conducted in 2001, the simulation process has undergone continual evolution to ensure its success in the secondary school context. Prior to the commencement of the simulation, students attend an all-day information session at Macquarie University where they:

- hear a briefing on the events that have taken place in the region from 1948 onwards, and on all the roles that will be involved in the scenario, after which groups of 3 students are allocated a particular role;
- learn to use the specialist simulation software;
- receive the scenario at the conclusion of the briefing session (from 2005).

The simulation itself then takes place over three weekends and two school weeks. This is less than the original time period allocated of three full weeks, but the reduction in time was thought necessary because of the 'consuming nature' of the simulation. In common with reports of the operation of the simulation in higher education, Ms Miltiades reported that students were participating in the simulation 'all the time – during their lunchtimes, evenings, and even at 2am there have been kids logged on'.

At the conclusion of the simulation period, students meet face-to-face at a 'Peace Conference', which is used to de-brief the experience, and students typically dress in the role of the character they have been playing.

Students are assessed mainly on the quality of the messages they send during the simulation and on their participation in the final conference, although some consideration is given to the quantity of messages sent.

The Department of Education and Training is positive about the educational value of the simulations, in particular the way in which they facilitate students' understanding of different points of view. They have developed guidelines for the conduct of the simulation in the secondary school context, in recognition of the inherent differences between students in secondary as opposed to tertiary contexts. Parents must give permission for their children to participate, and must be comfortable for them to play roles which might include those of terrorist groups, and sometimes religious groups which may well hold views which are very different to their own. There are also guidelines relating to the preparation and de-briefing of students.

The simulations are no longer being offered at two of the original schools, for a range of reasons, including the transfer of participating teachers to other schools, and a change in Modern History options offered. However, the Macquarie ICT Innovations Centre, a collaborative initiative between the NSW Department of Education and Training, and Macquarie University, has supported the development of the simulations for schools over the past four years, and has recently made them more widely available to schools. The response has been so great, that Dr Vincent has decided to run two separate simulations during 2005, when four new schools join one of the original schools in the simulation.

It should also be noted that the DET guidelines stipulate that schools may only participate in the simulation when it is run in conjunction with the Centre for Middle East and North African Studies, Macquarie University, and the Macquarie ICT Innovations Centre.

Once again, the success of the simulations seems to be directly attributable to the enthusiasm of a small number of dedicated individuals, without whom the simulations would almost certainly not have commenced, nor been adapted for secondary school use. It is clear that Ms Miltiades has been instrumental in the success of the simulations within schools, and has spent many hours of her own time in these activities, with little or no external recognition for her efforts. She also acknowledges the Macquarie ICT Innovations Centre, without whose support she doubts the simulations would have continued.

### **Fablusi Pty Ltd**

This commercial organisation markets a role-play simulation generator that was developed after many years of experience in conducting role-play simulations at the University of Melbourne and elsewhere.

The partners in the company are Mr Linser (whose work has been mentioned earlier) and Mr Ip, who initially met when Albert was a PhD student at the University of Melbourne.

The basic pedagogical design of the role-play simulation generator is based on Dr Vincent's original set-up. Mr Linser however, made some changes based on a theoretical model of Dynamic Goal Based Learning (Naidu, Ip, & Linser, 2000) which he developed, focused on the goals that students formulate.

One of the issues encountered in the past by teachers has been the significant amount of time needed to set up the simulation, both in terms of conceptualising the scenario and roles, and in terms of the physical setup using a range of technologies. Mr Linser reports that prior to development of the software, it typically took him a minimum of five full 8 hour days to create the website needed for a simulation. Now however, Mr Linser reports that 'the Fablusi Lite software enables a teacher (who already has all the information required, is familiar with the software and already knows what they want to do) to create a simulation in 5-20 minutes (depending on complexity).'

Most of the company's clients are in the higher education and training sector within Australia and overseas. One of their recent customers for example, is the United States Army who is using it for their higher level officer training. However, their marketing strategy is shifting to focus on the corporate world, as they have found, as have many other organisations, that higher education has little funding which can be used for such activities.

### Learning designs project

In 2000 the Australian Universities Teaching Committee commissioned a project entitled 'Information and Communication Technologies and their role in Flexible Learning' which aimed to assist academics to create high quality, flexible learning experiences for students by:

1. identifying high quality learning designs used in higher education;
2. selecting those suitable for redevelopment in the form of reusable software, templates and/ or generic guidelines; and
3. developing those reusable resources and making them accessible from a central web site.

After an extensive review, role-play simulation was selected as one of the high quality learning designs to be showcased. The project website <http://www.learningdesigns.uow.edu.au><sup>10</sup> includes a description of role-play simulations, and a number of case studies (including the Middle-East Simulation), with guidelines and advice on how academics might go about designing and running them.

### Other projects

The authors are aware of other role-play simulations which have been based on or influenced by the Vincent model. For example, the First-Fleet Simulation developed by Professor Sandra Wills from the University of Wollongong is well known to many educational developers. Professor Wills was working at the University of Melbourne at the same time as Dr Vincent, and, in her then role as Director of the Interactive Multimedia in Learning Unit, she provided support to the original simulation. She subsequently used the idea herself to design and develop her own project, and promoted this work at the University of Wollongong, and in the Learning Designs Project.

A detailed review of every simulation is beyond the scope of this project, however a broad cross-section of projects has been included here.

### Outcomes for learning and teaching

All of the interviewees talked about the significant learning experience afforded for their students through their participation in the simulation. When interviewed, students typically make comments such as 'I will never look at a news report in the same way again', and 'you surprise yourself with how much you know rather than if you were reading books, or studying for an exam'. One of the school-based teachers referred to a conversation with the parent of one child who, speaking about his daughter who had lost interest in school, said 'you have no idea – that simulation got her interested in school again and I will be forever grateful'.

Evaluation of the simulations has consistently supported the perception of the high degree of student motivation in using this project. In fact such is the commitment of time to the simulations from many students, that some academics and teachers have expressed concern for students' work in other subjects, leading one academic to restrict the number of messages a role can post, in the hope that this might limit the time the students spend on it. In their evaluation of the *Securities Market Regulation* simulation, Freeman and Capper (1998) found students appeared to be 'more deeply immersed in the web based role simulation than is usual for other tasks', spending an average of 17 minutes per session when engaged in self-assessment activities, 10 minutes for interaction and information gathering sessions via the Learning Management Session, and 27 minutes on the role play.

The learning gains from the simulation have been more difficult to measure, and one interviewee commented that this had been the only failure of the project (ie the difficulty of measuring learning). Others have conducted evaluations of learning, with quite similar findings.

In the Middle-East simulation at Macquarie University students were found to have

- 'developed a sophisticated understanding of the complexity of Middle East politics;
- learned how to work effectively in a team; and
- gained confidence in the use of information and communication technologies' (Alexander & McKenzie, 1998)

In *Securities Market Regulation* the evaluators reported finding evidence of 'quality learning in the interviews'. This included students' 'understanding of the complex pressures at work on regulators and market participants' and students coming to 'understand the limitations of the two main paradigms in practical contexts' (Freeman & Capper, 1998).

Similarly, evaluation of the Mekong e-Sim has found that:

- 91% of students perceive that the experience has helped them develop an awareness of multiple perspectives on natural resource decision making and development issues
- 70% believe it contributed to the development of negotiation, and communication skills; and
- 94% of students believed it assisted their development of knowledge about organisations in the region <http://www.learningdesigns.uow.edu.au/exemplars/info/LD42/index.html>

The common thread through these evaluation results is the evidence that student develop a deeper understanding of the complexity of a range of situations. There would also appear to be value in the ways in which participation in the simulations can foster the development of group or team skills.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### Perceptions of enabling and constraining contexts

#### Encountering the idea

The first step in the dissemination of this innovation was the opportunity for academics to encounter the role-play simulation approach. For the projects discussed in this case study, this opportunity occurred in the following situations:

- visiting an overseas institution and observing simulations during a period of sabbatical leave;
- an opportunity to hear about a role-play simulation
  - at a university-wide forum (at least four of the example projects in this case study heard about simulations in this way);
  - at a discipline-based conference on education;
  - as a tutor in subject which is using simulation;
  - in conversation with the original innovator.

It is of interest to note here that none of the people interviewed for this case study reported having encountered the idea of role-play simulations from websites. This is of interest because of the number of grant applications which state that websites will be developed in order to assist in the dissemination of the project. However it may be the case that, having encountered the idea from other forums, websites (such as the AUTC-funded Learning Design Project) will prove to be of value to adopters in informing their planning for simulations and in supporting their subsequent development of the simulations.

#### The decision to adopt

Having encountered the idea, academics who chose to take up the idea appeared to do so because they believed the simulations:

- were engaging and a fun way to learn;
- would lead to a deeper level of understanding of the subject content;
- provided an opportunity for students to
  - encounter complexity and ambiguity;



- engage in active learning in a more authentic environment than is otherwise possible;
- develop an enhanced understanding of different points of view by 'stepping into someone else's shoes'.

### Who were the adopters

The adopters of the role-play simulations in this case study were all individual academics who were sometimes joined by one or two others who either had complementary skills, or were teaching in a similar area.

### What was adopted

The academics described in this case study adopted the 'process' aspects of the project, but not the 'product' (the software developed to manage the simulation). For the latter, academics were able to use whichever Learning Management System was available within their own institution, or a commercially available system such as Fablusi. In the early 1990s there were frustrations with the technical problems encountered, but these have now, by and large, been solved.

Although all interviewees adopted the basic Vincent 'process', it is significant that they were able to make changes to aspects of the simulation as they saw fit. This is significant, because the facility to make changes to existing innovations is often mentioned in the literature as an 'enabling feature' of innovation dissemination. It is also rarely the case that 'product' innovations can be modified to suit particular contexts.

This project could also be seen as a 'radical' rather than an 'incremental' innovation, since it involves a very different approach to teaching.

The project can be viewed through the lens of Roger's (1995) five characteristics of successful innovations:

1. **relative advantage** – every person interviewed for the case study expressed the view that participation in simulations was a superior way for students to learn about the subject content, than reading books and listening to lectures;
2. **compatibility** – the authentic learning experience which included complexity, and understanding different points of view was compatible with the interviewee's views about high quality learning;
3. **complexity** – the complexity of the project was acknowledged by interviewees, but was not noted as a particular problem beyond the time commitment required, although it may well prove to be the case for those who subsequently chose not to continue the simulations once the innovator had left the department or university;
4. **trialability** – this was not a feature of the simulations, as trialing the simulation is not possible;
5. **observability** – the strongly positive student reactions to the simulation are not only observable, but in several cases was the sole factor contributing to an individual's decision to adopt the simulations.

### The innovation experience

A number of common experiences characterise the interviewees' experience of conducting the simulations. The first is described as the intrinsic reward of teaching using simulations. Every person interviewed for this case study expressed enormous enthusiasm for the high quality learning experience they perceived had been afforded for students through their participation in the simulation, and they mentioned specific examples of very positive student feedback in almost every interview.

The second common experience was the very great time commitment involved in planning, developing, assessing and evaluating the simulation. None of those interviewed mentioned workload allocations which recognised this, and hence the time commitment inevitably encroached upon other aspects of an academic's responsibilities.

Interviewees also noted the voluntary time commitment made by students, most of whom became so engaged in the learning experience that they devoted significantly more time to participation than was sometimes thought desirable, causing concern about their progress in other subjects.

All of the academics whose work has been discussed in this case study have been successful in publishing their project in refereed journals (both national and international), and/or book chapters and/or conference proceedings. More recently, Dr Vincent has commenced negotiations to co-author a text-book on Middle East Politics, and plans to integrate the role-play simulation in that.

There are other areas, where there have been divergent experiences and these are discussed below.

## Recognition and reward

For some, adoption of the role-play simulations has been a career-limiting move, with at least two of those interviewed failing in bids for promotion or other recognition, attributed at least in part to a less than adequate research output. Both of these academics report a significant overhead of time in planning, running, evaluating and redeveloping the simulations. This has resulted in little or no time remaining for research, aside from the educational research opportunities afforded by the projects. There are exceptions to this of course, and Professor Maier (one of those who was promoted) for example, reported continuing his discipline-based research including the supervision of 10 PhD students.

## Support

There was some evidence of commitment by middle and upper management although it was by no means universal. Although this was to some degree necessary in order to obtain resources needed to start-up and maintain the simulations, it did not appear to be sufficient to ensure the simulations' longevity.

In a similar vein, support from the central teaching and learning unit was valued, but again did not ensure the longevity of the simulations

## Policy

There have been few obvious attempts to institutionalise the simulations, although there are signs this might be about to change. At the University of Adelaide, discussions are about to take place about the ways in which the simulations in general, might be linked with the strategic plan. Dr Maier believes that the development of graduate attributes might be one way of making links between the university's teaching and learning plan and the simulations.

## Sustainability

From the evidence gathered in this case study, it would appear that the use of role-play simulations in teaching is essentially the domain of enthusiastic individual (or small groups of) academics. When they leave the department or university, the simulations do not continue, probably because of the significant individual commitment involved. There was one example in this case study where not only did the simulation continue despite the departure of the original innovator, but it was also used in other subjects within the department. However, when the person who took over ownership of the simulations from the original innovator himself also departed, the simulations appeared to have ceased.

It would appear however, that the individual academic either creates another simulation in a new context or has the intention of doing so, so the idea of innovation process survives, even though its particular application within a particular subject does not.

## CASE SUMMARY

This project is one of few of the original CAUT grants to continue to be used more than 10 years after it was originally awarded, and to have been disseminated, not only to other disciplines and universities, but also to the schools sector and more recently to the US military.

The original CAUT grant upon which this case study was based, was awarded to further improve the effectiveness of the role-play simulation by 'developing an integrated computer system to manage all of the communication involved...' (CAUT, 1993; p18). Using the definitions of innovations discussed earlier in this report, this could be regarded as a 'product' innovation. This product has, not surprisingly, changed considerably since 1993 and even in 2005 has a new interface. Although the grant stated that 'the system will be developed in such a way that it is not only useful for our Middle East politics simulations, but simple to adapt for any other courses where this teaching method is appropriate', this has not, by and large, occurred. Each university has either used proprietary software available within its own institution (such as WebCT and Blackboard), or they have developed their own software, or used one of the commercially available packages (such as Fablusi).

What has in fact been the more highly valued has been the 'process' aspect of the innovation. This refers to the design of the simulation which includes students (or groups of students) taking on the role of a person or organisation.

The appeal of the simulation for teachers and academics appears to be the way in which the simulations are thought to engage students.

By and large however, the perceived success of the role-play simulations has been dependent on a small group of very enthusiastic teachers' generosity in spending significant periods of time in the design, development, running, and maintenance of the simulations. When these academics leave the university, the simulations are rarely continued (although there are the odd cases where this has happened) in the original context, although the innovation often moves with the individual to the next context.

The nature of this kind of innovation is perhaps such that it has a 'saturation point' beyond which its continued dissemination might not be desirable. Were it to be used in every subject for example, the current enthusiasm and time commitment from students may well dissipate. Rather, students may be better served through occasional opportunities to participate in this kind of learning experience as appropriate to the particular course of study.

If this case study were to be viewed through the lens of Coburn's (2003) work on scaling up an innovation, it could be seen to have been successful on at least three, if not all, of her four criteria:

1. **Depth** – the simulations have resulted in a significant change to teaching approaches that go beyond the simple development of 'teaching materials' to support a deeper approach to student learning.
2. **Sustainability** – there are many levels at which this case study could be analysed in terms of sustainability. On the one hand, the innovation has continued in at least 2 different universities for a significant period of time (10 years in one, and 8 years in another). However, when the original innovator leaves, the simulation invariably ceases in that context, but appears to be carried into the next.
3. **Spread** – there is clear evidence from this case study that there has been a significant increase in the number of simulations being conducted. There is also evidence that the simulations have spread to sectors other than higher education, and that that spread can be traced back to the original Vincent and Shepherd simulations.
4. **Shift in reform ownership** – 'ownership' of the simulation can be seen to have shifted to the adopter in the sense that each has made the simulation their own, through both minor and major modifications to the process and products used to conduct them in different contexts.

# AN@TOMEDIA™: A NEW @PPROACH TO MEDICAL EDUCATION: DEVELOPMENTS IN ANATOMY

## Originating location

Australia, University of Melbourne

## Type of case

Resources: commercialised multimedia CD-ROMs

## Funding

1996 Committee for Advancement of University Teaching (CAUT): "Interactive Anatomy: computer guided dissection", University of Melbourne. Project Leaders: Dr Norman Eizenberg, Mr C Driver \$48,805  
1997, 1999 and 2000 University of Melbourne Teaching and Learning (Multimedia & Educational Technology) Committee (Talmet) grants  
Funding has also been obtained through sales and licencing of the product under a commercial arrangement

## Reason for choosing the case

an@tomediam™ was chosen as a case study because:

- It is a rare example of a multimedia project which commenced with CAUT funding and has continued, been expanded and is being successfully commercialised;
- It has been disseminated to both universities and medical professionals;
- It illustrates a combination of team capabilities and intellectual property management which have enabled commercialisation;

## PROJECT/IDEA DESCRIPTION

### Origin

The project originated from Dr Eizenberg's longstanding interest in improving student learning in Anatomy. He conducted research which revealed that students perceived their existing textbooks to afford learning of anatomical description but not of principles. This led to him designing print-based materials which supported deep approaches to learning by linking anatomical details with clinical perspectives (Kennedy, Eizenberg and Kennedy, 2000). When the CAUT grant was obtained, he and the team were able to develop a multimedia approach to more fully realise their vision.

### Aims

The project aimed to improve learning and teaching in Anatomy through developing high quality, detailed multimedia resources which offered multiple perspectives on anatomy and could be engaged with at a range of levels. an@tomediam™ was designed to link anatomical knowledge and clinical applications and enables learners to engage in multiple ways which suit their learning needs. It can be used independently or integrated into any Anatomy syllabus.

### Design and activities

an@tomediam™ was designed to address learning difficulties in both discipline-based and problem-based medical courses. Discipline-based courses were seen as focusing on the detail of anatomy but without necessarily drawing out the important principles which could be applied. With problem-based learning,

students draw on selected anatomical information to solve problems but can again miss out on principles and an overall understanding of the discipline.

Project team members described an@tomediam<sup>TM</sup> as a complete, comprehensive work that covers every perspective on anatomy. It integrates perspectives which would usually be offered in 12 types of Anatomy books, offering both body regions and systems perspectives and including detailed dissections and multiple types of imaging. It also enables learners to experience variation in normal human anatomy. Learners can explore layers of images, or can respond to questions which encourage them to look at the images and relate the features of the image to theoretical ideas. Answers to the questions focus on explanations which subsume descriptions rather than descriptions alone. The interactivity in an@tomediam<sup>TM</sup> allows the learner to go to wherever they want, rather than following particular instructional pathways. An early version of one of the modules was evaluated with students, tutors and experts, mostly medical educators. The results informed further developments and the team also noted the need to provide guidance for tutors and educators on how the resources could be used.

The an@tomediam<sup>TM</sup> project is ongoing. The eventual aim is to produce nine modules, one introductory and eight focusing on particular regions of the body. As at the beginning of 2005, the introductory module on General Anatomy and modules on the back, abdomen and thorax have been completed. A module on the pelvis is nearing completion and dissection for four of the five remaining modules is complete. The project team has four core members and the website lists almost 50 people who have been involved in development.

### Dissemination

Dissemination activities commenced in the last five years with self-publishing of the CDs and promotion through international conferences and direct to medical students. The project has been presented at both conferences for medical professionals and education and educational technology specialists. Evaluations of the project were reported in educational technology journals (Kennedy, Eizenberg & Kennedy, 2000; Kennedy, Kennedy & Eizenberg, 2001).

The team has been particularly pro-active in seeking dissemination opportunities. They visit universities to promote an@tomediam<sup>TM</sup> when they travel or go to conferences. Also, an arrangement between the team and a commercial company provided further funds for the project and resulted in distribution of CDs to medical specialists.

### Further funding and commercialisation

The project has been going for nine years. Following the CAUT grant, the team were successful in gaining funding from the University of Melbourne to continue the project. Early in development, the team negotiated an intellectual property agreement with the University of Melbourne in which IP and profits are shared between the university, the department and the project team. The team set up a company, Anatomedia Publishing Pty Limited, and a website <http://www.anatomedia.com>. The project is now largely self-supporting, with money from sales flows back into further development. Individual CDs and site licences are sold, with information available via the website.

### Adaptation and embedding in other contexts – examples

At the university of Melbourne, an@tomediam<sup>TM</sup> is used within a problem-based medical course in a range of ways: to support students' problem-based and self-directed learning; to assist students to prepare for and revise anatomy practicals and tutorials; as a lecture resource; and for formative assessment (Kennedy et al, 2001). It is also used as a resource by students in their clinical years and by postgraduate medical and surgical students.

At some other universities, it is used mainly as an independent resource. For example, adopter A became aware of an@tomediam<sup>TM</sup> when a member of the team gave a seminar about it at her university. The Head of Department supported the acquisition of a site licence and it was installed in a student computer laboratory. Students use an@tomediam<sup>TM</sup> independently. Adopter A commented that the material in an@tomediam<sup>TM</sup> went well beyond the learning needs of undergraduates and it would be equally useful for

postgraduates. She was sufficiently impressed with the design of the materials and the enthusiasm of the team leader that she chose to spend a study leave in Melbourne contributing to the project.

an@tomeia™ is also used by medical practitioners, including GPs and specialists. After presentation to the Royal Australian College of General Practitioners (RACGP), it was accepted as a resource which could be used within their quality assurance and continuing professional development program. Using an@tomeia™ CD-ROMs counts as a Category 1 active learning module activity, with each module counting for up to 15 points. (GPs are required to accumulate 130 points over 3 years to maintain recognition.) It was reported to have had some take-up for this purpose. A spokesperson for the RACGP program noted that GPs could use An@tomeia™ to revise and extend their own knowledge and as a patient education resource. It could be particularly useful for rural GPs. The RACGP had also used it as a demonstration resource for international medical delegations as the images and standard terminology readily crossed language barriers.

## Outcomes for learning and teaching

### For students

As with any well designed resource, the effectiveness of an@tomeia™ in improving learning will depend on how it used by individual learners and, in the case of university courses, how it is implemented in the curriculum. As a project developer commented:

Learning can be limited by having poor resources and materials, but the potential of good learning materials can also be unrealised if teachers are unable to use them effectively.

At the University of Melbourne, an@tomeia™ is integrated into and supports a problem-based learning program. Early evaluations focused on students' perceptions of learning from an@tomeia™ particularly in relation to aspects intended to afford deep approaches to learning. Students agreed that an early module of an@tomeia™ helped them to comprehend and organise their knowledge of anatomy, understand anatomy from multiple perspectives and interpret anatomy rather than simply describing it. They rated the layering of images and ability to highlight structures as particularly valuable aspects of the module. Over 90% of students wanted their own copy of an@tomeia™ with 53% indicating that they would like to use it in study groups. An observer noted that pairs students frequently discussed key aspects of the representations of structures while they were using the program (Kennedy et al, 2000).

The other university adopter we contacted was making it available as an independent learning resource, and it could be described as embedded and supported in the student computer laboratories but not as embedded in the curriculum. Outcomes had not yet been evaluated at that site.

### For teachers

Tutors who evaluated An@tomeia™ saw it as a valuable resource to support students' learning before, during and after practical sessions. As postgraduate medical students, they also perceived it to be a useful resource for their own revision (Kennedy et al, 2000). Specialist medical practitioners were reported to value the level of detail shown in An@tomeia™.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### Professional relevance

The professional relevance of an@tomeia™ to GPs, medical specialists and other health professionals has greatly increased the market for this resource. It can be labelled as a resource accepted by the RACGP for its QA & CPD program and this may increase its appeal to students. Professional relevance also means that papers on an@tomeia™ can be presented at professional conferences. Conference attendees are referred to the website, and this has resulted in some individual sales and site licences.

## University support for project development

The University of Melbourne has provided multiple forms of support for the project. It made a strong investment in seed funding for multimedia development, enabling the project to gain additional funding and its Department of Anatomy and Cell Biology (see below) have consistently supported the project. The University also has an expert multimedia unit (Courseware Development Services) which has worked closely with the project team from anatomy, enabling the project to respond to both advances in ways of looking at anatomy and advances in technology. A team member described 'a terrific cultivating environment at the university' enabling the project to 'draw on experts from all specialties' both medical and technical.

The project is highly regarded by the university and has received considerable publicity from the university media.

## Intellectual property arrangements

The University of Melbourne approach to intellectual property is seen as progressive and knowledgeable, creating agreements that have encouraged project creators to have a positive and proactive approach to commercialisation. The team and the university negotiated a multimedia IP agreement in 1996, the year that the project commenced. The breakdown of royalties was based on costs, including the developers' time, the resources and grants provided by the Department and University.

The University of Melbourne is notified of adoption of site licenses of the program at other universities.

## Departmental support for development

The Department of Anatomy and Cell Biology in which the project team is based is perceived to have consistently supported the project and its developers, with colleagues other than the co-authors contributing specialist expertise and in the provision of equipment and facilities for dissecting, photography and digital imaging.

In addition, a number of affiliated hospital departments and institutes have collaborated on the project to ensure material is up-to-date.

## Support for implementation and embedding

At the University of Melbourne, programming staff from the University's multimedia unit provide technical support to install it in student computer laboratories.

Adopters at other universities require funding support from their Departments to purchase individual or site licences. The program also requires adequate levels of computer equipment in student laboratories and technical support for installation. One potential adopter noted that lack of computers with appropriate graphics capability several years ago had hindered adoption in her university, but that this situation had now changed and adoption may be reconsidered.

## ENABLING AND CONSTRAINING FEATURES OF THE PROJECT/IDEA

### Team capability

Adopters typically found out about an@tomed<sup>TM</sup> through visits from or presentations by team members. The enthusiasm and determination of the team members was seen as the major reason for the project's success so far. The team enjoys working on the project, seeing it as 'a creative outlet' and describe themselves as perfectionists in their approach.

The team members all have expert understanding of anatomy from multiple perspectives, including clinical (medical and physiotherapy), forensic and radiologic perspectives. Apart from that, they have very complementary sets of skills. The team leader has a strong and longstanding interest in student learning

and awareness of learning research. Other team members have the precise dissection, model-making and artistic skills necessary for the images, three-dimensional rotating videos and overlays in the product.

Various members of the team are also noted to have strong awareness of business, legal, IP, accounting, publishing and marketing issues. The team also sought business advice. They entered in and won the Melbourne Uni entrepreneurs' challenge, run by the Melbourne Business School, which involved creating a business plan and working with a mentor who had both a business and University background. They were finalists in the global entrepreneur's challenge in Singapore. This helped them to build a very good business and marketing plan and identify the strengths and weaknesses of their approach.

### Quality of the resource

The very high quality of an@tomedica™ is perceived to be the key to its adoption. There are many other anatomy products but these were not seen as having similar levels of complexity and detail or as embedding multiple perspectives. A developer commented that 'it can only be done 100% well. If it's 99% well it's useless.' For example, the dissections are extremely detailed and precise, taking up to 20 hours per frame to create. Quality was achieved through keeping a committed team together for a long period time. The perceptions of high quality were confirmed by Adopter A, who had spent time with the project team and was impressed by the commitment and detailed work which went into the product. Her previous perception that the product was relatively expensive had changed as a result of seeing how it was developed.

an@tomedica™ won the Best CD Project award at the ASCILITE Awards in 1999, and the Best General Multimedia category at the 21st annual Australian Teachers of Media (ATOM) awards in 2003. A review in *The Lancet* (Marusic, 2004) also praises the quality of the work.

The trade off for this quality is time. It is estimated that 100,000 hours of work will have gone into the product by the time the nine modules are complete.

You're not going to stop short of making it the ultimate educational resource. ... you couldn't do it very fast.  
(project developer)

The time taken to create the resource is perceived to have inhibited the extent of adoption. A developer commented that 'most people that see it think that they'll get it, but maybe when all the modules are complete.' As the team are both the creators of the product and the main marketers, completion will take several more years. A developer commented that they were 'not doing it for profit, but primarily to create an excellent resource'. Advice to others was to 'not make business decisions too quickly, because investors might want to come on board early but this could compromise the quality and integrity of the product.'

### Adaptability

Although the [An@tomedica™](#) program cannot be adapted by users, it was designed for use in a range of different ways, both independently and with teacher-facilitation. The range of possible users, from students to medical specialists, was considered from early in the project. It affords learning from both types of perspective (systemic and regional) that are most commonly adopted in designing medical curricula. A developer noted that 'it's rare to find a resource which integrates both.' It was also designed to address perceived 'gaps' in student learning resulting from both didactic and problem-based courses. It uses the Terminologia Anatomica, an internationally agreed standard for anatomical language, enabling it to be used anywhere in the world. (The developers note that the main language inconsistencies now are between English and American usage and spelling.)

an@tomedica™ is not specific to medical curricula, although it includes large amounts of medical material. Its design enables it to be used for learning anatomy in other health science courses or disciplines where a knowledge of anatomy would be useful. Developers and adopters also noted that it could be useful in countries where dissection was not permitted for cultural or religious reasons.



## CASE SUMMARY

The an@tomedica™ project illustrates a range of features of relevance to the dissemination and adoption of commercialisable products:

- an@tomedica™ is a high quality product which is underpinned by an understanding of student learning in the discipline and addresses learning needs in a way which had not previously been possible;
- it was designed with multiple possibilities for use in mind;
- the developers have taken a pro-active approach to promoting an@tomedica™ to potential users;
- the development team has or has had access to the range of capabilities necessary for development and commercialisation;
- the University and Department at which development took place provided a supportive environment for development and commercialisation;
- intellectual property arrangements were negotiated early in the project.

# MATHEMATICS VIDEO RESOURCE SERIES

## Originating location

University of Technology, Sydney. Australia

## Type of case

Resources: a series of videos and accompanying print materials

## Funding sources

The project team has made a series of videos, commencing in the early 1990s. Examples include:

*Combinatorics – the art of counting: a multimedia package for open learning.* CAUT 1993 Peter Petocz and Leigh Wood \$45,000

*Mathematical Modelling - Applications of Functions and Calculus - \$43,800 CAUT 1994 Leigh Wood and Peter Petocz*

## Reason for choosing the case

This case was chosen because:

- it illustrates a successful model of developing and disseminating teaching and learning video resources, exemplified by the series of videos and accompanying materials;
- it provides an example of CAUT funded project outcomes which have been widely disseminated.

## PROJECT DESCRIPTION

### Origin

The developers made a list of mathematical areas that were perceived to be important because students had difficulty in learning them and there was a lack of suitable learning resources.

### Aims

The aims of the videos were to:

- improve learning and teaching in difficult areas of mathematics;
- enable students to see how real world problems are solved using mathematics, focusing on the process of coming to solutions as well as the mathematics;
- engage students through bringing the outside world into the mathematics classroom.

Some videos had additional aims, for example the Mathematical Modelling video was designed to appeal to students in the life sciences and economics, including female and mature-aged students in particular.

### Design and activities

The videos were designed to 'challenge students in a different way' from the textbooks or existing 'instructional' resources. The design of the videos differed from 'chalk and talk' videos as they were more motivational, emphasising why students should learn Mathematical ideas as well as what the ideas were. The topics chosen were important areas of Mathematics which were difficult to learn and often unpopular to teach. The videos were built around a series of scenarios which illustrated applications of the key topics in the real world.

The developers had considerable expertise in Mathematics, Mathematics education and developing learning resources but also recognised the need for professional video production expertise. They

worked in conjunction with professional producers from OTEN education for some of the videos and from other production companies for others.

The development process began with scripting the videos then evaluating the scripts with students and teachers before production. The developing videos were then evaluated prior to completion by taking clips out to the target audiences, students and teachers, to see how they responded. Students often preferred different clips from the teachers. In these cases the developers focused on the students' feedback, as they were the intended learners. It was acknowledged that the teachers buy the videos but could be convinced if there was evidence of value to students. After the first three videos, the team did further research, sending someone to visit schools with clips of three of their videos and two others to seek responses on how the videos helped the students to learn.

### Dissemination activities

The developers went to a number of Mathematics and Mathematics education conferences and presented papers on the design of the videos. They also presented and published papers on how to use video in Mathematics teaching (for example Petocz & Wood, 2001) as this was relatively rare at that time. (An adopter commented that it is still uncommon.) A developer noted that 'we did go to all the likely groups who would use it, so that was quite successful.'

The videos have been sold through OTEN and are on the product catalogue of the Australian Association of Mathematics Teachers. There is also a UK distributor. More than 2000 copies of the best selling video have been sold, and more than 500 of the least successful. (A video producer note that these numbers are high for educational video.) The videos have been purchased by universities, TAFE, libraries and schools. The developers were concerned about having people use the videos rather than making a profit from them, so costs were kept low. They do not get royalties from sales. They do get emails from people wanting to sell them and requests from librarians wanting to put clips online for various users.

### Adoption, adaptation and embedding examples

The videos can be used in a variety of ways in different contexts. One of the developers, a Mathematics lecturer, uses them in lectures both to motivate students and engage them in thinking critically about the mathematics and problem solving approaches illustrated in the scenarios. They are also part of an assessment task in which students need to compare and analyse three videos of their choice, not all from the series, and reflect on what and how they've learning from each one.

An adopter who teaches in Mathematics Teacher Education uses the videos to help students to learn about using video in Mathematics education.

### Outcomes for learning and teaching

Students in both the original and adoption contexts find the videos engaging. find the videos effective and discuss them in their other Engineering classes.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### The disciplinary education community providing dissemination channels

The Mathematics education community crosses boundaries between the higher education, TAFE and school sectors, facilitating awareness of resources suitable for use across sectors. There are international and national Mathematics education conferences, journals and email lists.

The project developers used existing organisations, such as OTEN and the Australian Association of Mathematics Teachers, to promote and distribute the videos. The organisations and the AAMT resource catalogue were well known and used by the intended adopters. This approach to distribution was seen as a sensible one for academics who have the expertise to develop good resources and present papers on them but not the time or resources to market them. As one of the developers noted

I'm not a marketing person. Most academics are completely overwhelmed with stuff to do anyway. ... A lot of times you're working in a profession, with a professional association. And I think these are the way to go to disseminate these resources.

### **The value of external grants**

The CAUT grants were seen as serving two distinct purposes. They provided the money to enable the videos to be made, and they also signified that such projects were valued externally.

The grants give you an excuse to do the project. Nobody in the university is going to give you the money to do it. ... It is at least saying someone else values this even if your Department or the people around you are writing papers, someone else is recognising it as a worthwhile activity and is giving you money for it.

## **ENABLING AND CONSTRAINING FEATURES OF THE PROJECT/IDEA**

### **Meeting an identified and common need**

The videos were perceived to 'fill a hole', as they focused on topics which were unpopular to teach and difficult to learn and for which there were no suitable resources available. 'Where the stories worked well and there was an identified need, the videos sold very well'. The developers were conscious that there had to be a strong need within the Mathematics teaching and learning community in order to justify making videos. They were in touch with what was already available through participating in national and international conferences and getting resource lists or catalogues from international professional associations, and now access Mathematica resources and the UK Maths and stats subject centre.

### **The quality of the resources and reputation of the developers**

The resources were perceived by the adopter that we interviewed as being of high quality, underpinned by the developers' scholarly understanding of Mathematics and Mathematics education. He commented that the reputation of the developers meant that he would be likely to automatically purchase any other videos that the team produced.

### **Provision of supporting materials for teachers**

The videos and print resources include materials which assist lecturers and teachers to implement them in ways which are effective for students.


### **The user-focused approach taken to development and dissemination**

The videos were developed with other users in mind, with a developer noting 'You've got money for doing it. You really just want other people to use it.' This influenced the evaluation approach, involving testing with students and teachers and also influenced the approaches to intellectual property and costing. The developers allow others to use clips and use them as part of other resources where this is possible.

### **Intellectual property issues as constraining alternate uses**

Digital rights management issues are currently constraining the possibilities for use of the video materials. The developers would like to be able to transfer the videos to DVD or make scenarios available for download over the web but have been advised that this would mean renegotiating the rights with the actors. The costs are perceived to prohibit this option. This could be seen as an artifact of the timing, but use of resources in different media is a point which needs to be considered in future resource-focused projects.

Copyright was noted as an issue in a book produced by the developers (Wood and Petocz, 2003) which has been requested by staff from other universities but contains some copyright journal articles. This is managed by sending out soft copies so that other institutions' libraries can make the articles available.



Commenting on this process, one of the developers noted that ‘a problem with dissemination is that people produce something and they don’t want it changed. . . . You shouldn’t be too precious about your stuff.’

## CASE SUMMARY

This case illustrated a range of features which encouraged the small scale developments to be distributed and used widely:

- there was a focus on addressing known and very common teaching and learning needs in ways which were not addressed by existing resources;
- the academic team were experienced in developing learning resources and in making best use of the expertise of production staff to create engaging products;
- there was consideration of the potential adopters of the videos, teachers, the beginning of the projects and awareness of their needs and typical teaching approaches;
- the resources were evaluated with teachers as well as students during the development phase;
- attention to building user awareness and understanding of ways of using the videos in classroom situations;
- making use of disciplinary organisations with existing expertise to market and distribute the resources to the desired users after project completion;
- the price of the videos was low and designed to encourage maximum use rather than profitability.

# GENERATING PUZZLEMENT: STRATEGIES FOR ENGAGING WITH ELECTRONIC SIMULATIONS

## Originating Location:

RMIT University.

## Type of Case

Staff development aimed at re-use of existing simulations.

## Website

<http://www.puz.rmit.edu.au>

## Funding Source

CUTSD, approx \$90,000.

## Reason for choosing this case for a profile

This project was chosen because of its specific focus on learning-focused re-use of existing project outcomes.

## PROJECT DESCRIPTION

The project originated with the project leader's awareness that interesting electronic simulations had been developed by weren't taken up by others. She had devised an educational approach to using a particular simulation and thought it was transferable. The aim of the project was to work with university teachers on developing strategies for using simulations in ways which were valuable for students learning, then make available the results to academic developers so that they could pick up the model and use it. The project background on the website notes that:

The project was informed by a set of assumptions about learning and teaching centering on the potential for transformative learning of getting students to feel puzzled. These assumptions were developed in the form of a model – the Puz model – of teaching and learning.

The developer noted that 'if you're going to use an expensive simulation, it must be because you want to change students' understanding in some important way'. Simulations typically focus on important concepts or ideas, and the project was designed to enable teachers to set up situations where students are likely to predict something in the simulation but find an unexpected result.

The project involved two phases. In the first phase, the developer invited lecturers to participate in workshops. Lecturers needed to have already found a simulation that they would like to use. Funding of \$2,000 was provided to each participant to develop a useful approach that they could use in relation to simulations and were required to go back and share the approach with their colleagues.

There were two workshop series, which involved participants in readings, discussions and collaborative work. The aim was for participants to identify the critical insight that students needed to have from using the simulation and develop an approach which enabled students to experience that insight. The project developer and participants acknowledged that this was a difficult process. Teachers needed to learn to use the simulations differently and to focus on things that students wouldn't expect. Most achieved this and reported that students gained insights from the simulations that they weren't getting before.

In the first workshops, participants did not necessarily value collaborating with others from different disciplines. The developer reported that the second workshop series was more effective because of a greater focus on what participants could learn from each other. They focused more on the structure of

the learning situation which was generalisable across subject areas. Teachers could also see there was a common issue of getting students to engage.

Of four participating lecturers who were contacted about the project, all were still using what they had learned. Some reported that it had influenced how they thought about other aspects of teaching, such as the kinds of questions they asked in lectures. Three were still using the simulations. One had changed areas but reported that they were still influenced by the model.

The second phase of the project used materials from workshops and the 'Generating Puzzlement' model which was developed to create a website which was used by 20 academic developers from around the country. The aim was to disseminate the approach. The developer noted that about 12 of the developers engaged with the approach and talked about actively using it in their work, although many noted that it had similarities with other approaches with which they were familiar. Another eight or so had some involvement.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### The developer's focus on dissemination and reuse

The project originated with the developer's interest in dissemination and concerns about the lack of educationally valuable reuse of existing resources. There was a perception that the thinking behind existing simulations was not necessarily made explicit, and that teachers may need support to use these resources in ways which might engage students in transformative learning experiences.

### A generalisable model

The Generating Puzzlement approach to using simulations focused on engaging students in particular kinds of thinking. This model was generalisable across disciplines.

### Provision of staff development support

Teachers were perceived to need the thinking time and support to develop effective approaches to using simulations which had been developed by others. The workshops embedded student learning focused understandings of teaching within the focus on effective use of the simulations. For at least some teachers, the effects on their thinking about teaching went beyond the project context.

### Provision of small amounts of funding to support adaptation

The project developer noted that funding was required to 'support the thinking time involved in adapting the simulation' and to 'authorise' the use of that time. Requiring participants to present their approaches to their colleagues also provided legitimacy to the activity.

## CASE SUMMARY

This profiled project illustrates the following features:

- the value of small amounts of funding to legitimise and support the adoption and adaptation of innovations in new contexts;
- the value of staff development support for teachers in thinking through the possible ways of implementing innovations developed elsewhere, in order to improve student learning outcomes;
- the influence on reuse of an academic developer with an interest in the issues of dissemination and an interest in improving student learning through the effective reuse of existing resources.

# ENHANCING TEACHING-LEARNING ENVIRONMENTS IN UNDERGRADUATE COURSES (ETL)

## Originating Location

University of Edinburgh, University of Coventry, University of Durham, UK.

## Type of Case

Research-based collaborative learning environment focused project.

## Website

<http://www.ed.ac.uk/etl>

## Funding Source

The Economic and Social Research Council Teaching and Learning Research Programme, a coordinated research initiative supporting projects from 2000 to 2008. (<http://www.tlrp.org/>)

## Reason for choosing this case for a profile

Although this project was still in progress at the time of selection, it was chosen because:

- it uses a research-based approach to enhancing undergraduate learning environments;
- it involves collaboration between the research team and academics in four (originally five) subject areas;
- it has produced a range of outcomes from new conceptual frameworks and methodological tools to processes for enhancing changed learning environments;
- communication and dissemination approaches involve disciplinary, academic development and research communities.

## PROJECT DESCRIPTION

The overall aim of the project was to 'explore ways of strengthening undergraduate teaching-learning environments so as to improve student engagement and high quality learning' (ETL Project Progress Report, 2003). The project focused on specific subject areas. Originally five were proposed: electronic engineering, cell and molecular biology, business economics, history, and media and communication studies. Staff changes in departments of media and communication studies meant the discontinuation of work in that subject, although a report outlining developments was written.

The project was designed in three phases. Phase 1 involved the development of conceptual frameworks and data collection instruments for use in subsequent phases. Activities included a literature review, analysis of Teaching Quality Audit reports from departments related as excellent in the selected subject areas, interviews with staff from the departments and consultations with subject advisers and representatives from the relevant Subject Centres. A project website was also established.

Phase 2 focused on data collection and analysis. Firstly, baseline data was collected from chosen course units using student questionnaires and focus groups, interviews with staff, field notes and course documents. The results were analysed by the research team and an extensive report was prepared for course teams. The research and course teams then agreed on initiatives to enhance the teaching-learning environments in the chosen contexts. These were implemented, then the data collection process was repeated. A further extensive report was prepared and delivered to course teams. In total, 27 first or final year course units in the selected subject areas from 13 partner departments were involved in this phase. The project was responsive to differences between subject areas. As a developer noted:



One of the things that I think was very interesting about the project is that there was a different strategy for each of the subject areas. ... It's collaborative and they have different needs and different ways of doing things.

Phase 3 focuses on outputs and dissemination, and commenced in parallel with the other phases. Specific activities identified for this phase include the development of guidelines for implementing changes in teaching and learning environments and workshops and seminars for both academics in the selected subject areas and academic developers.

### Dissemination approaches

Dissemination activities have been ongoing. A project team member noted that

We have to see dissemination to a variety of end users, particularly practitioners and policy makers, as something that we're concerned with throughout the project, not something that happens at the end or after it

The team gave presentations on the project from very early in its life. One downside to this approach was noted, in that early dissemination of the project's plans and ideas resulted in requests for tools and project findings long before these had been developed.

The project team recognised a wide range of 'end-users' for different outputs of the project. In addition to academics in the subject areas of the project, identified users include senior institutional managers, educational developers, members of relevant professional associations and national advisory bodies, policy makers and the educational research community.

The project has already produced a wide range of disseminable outputs, for example:

- constructs which extend across subject areas such as ways of thinking and practising (WTPs) in the subject areas and constructive alignment (CA), which has been substantially reconceptualised from Biggs' (1999) formulation. In addition, there are subject-specific constructs such as threshold concepts and delayed understanding;
- research-based tools for collecting data about learning and teaching environments;
- processes for analysing and identifying desired changes in learning and teaching environments;
- a very large number of project reports and papers.

These outputs have been or will be disseminated to users via conference papers, workshops, collaboration with the relevant Subject Centres and the project website. The website has been actively promoted, in particular by distributing bookmarks promoting the URL. Project team members report that the website is highly valued by users, in particular for being an up-to-date record of the research ideas and progress of the project. Users have confirmed that view. The website provides links to 27 project conference papers and publications, the project proposal and four reports, video clips of experts discussing theoretical constructs and information about upcoming events. There was reported to be a high level of awareness of the project in the higher education research community and a growing awareness in the relevant subject communities.

## ENABLING SYSTEMS FOR ADOPTION/ADAPTATION AND USE

### Engagement with external agencies

The project proposal specified an extensive communication and dissemination plan, which included active consultation and engagement with departments, institutions and organisations including the Subject Centres, the funding body and national associations. The plan was seen as a model of best practice by the funding agency.

Members of the project team have been active in presenting at educational research conferences and disciplinary conferences and symposia, particularly those organised by the Subject Centres. Substantial numbers of further workshops and symposia are planned.

## Collaboration between researchers and course teams: enabling and constraining features

The project was an extremely complex one, as it involved collaboration between the project team and a substantial number of departments in the selected subject areas. Contract agreements were negotiated between the team and the departments involved, and departments were given a small amount of money to support their participation. Establishing effective working relationships between the research team and teachers in the selected course units was time consuming and required sensitivity to the different contexts and the establishment of trust between the researchers and collaborating teachers. The researchers were particularly conscious that the negotiated course changes reflected issues that course teams saw as important, even though this sometimes meant not implementing changes that the researchers saw as most significant or exciting. It was noted that change was often subtle and incremental.

The project team noted a range of constraints on the ongoing involvement of departmental and course teams in the project. These point to some general features which create barriers to significant course reinventions. Staffing changes meant the discontinuation of the project in media and communication studies departments. There were also a range of constraints to the extent of course changes which were possible in some units, due to issues such as departmental restructuring, changes in resourcing or pressures from the RAE.

## Research and scholarship issues

For the core project team, the project is research which counts within the field of higher education. Participating teachers in the subject areas are able to co-publish with the project team members, and some have already done so. A team member noted that interest in co-publication varied and was to some extent affected by whether the teachers saw themselves as primarily on a teaching track or teaching-only contract. For those whose career was focused on disciplinary research, educational publications could be seen as a 'distraction'. Also, participating teachers were promised anonymity, and co-publication would threaten the anonymity of some who preferred to remain that way.

## Project continuity

The project team's approach to analysing and enhancing teaching and learning environments is complex and requires a high level of scholarly understanding. Team members were conscious that support was required for others to be able to implement the approach in new contexts. The team planned to create implementation guidelines and to run workshops to educate academic developers and teachers. However, a team member expressed a concern that they may continue to receive support requests for which no ongoing funding was available. For example, they had already received requests for assistance with analysis from people who had used their questionnaires.

## SUMMARY

This profiled project illustrates a range of features which are relevant to the dissemination and adoption of projects aimed at achieving significant improvements in student learning:

- the value of collaborative research which considers the specific characteristics of learning and teaching environments in different subject areas;
- the complexity of such research and development and the need for it to be well supported within participating departments and course teams;
- the value of engaging in dissemination in parallel with development;
- the impacts of contextual features such as changes in departments and staffing and pressures for research on participation in projects which require teachers' time and commitment, whether educational research or innovation;
- the importance of considering the range of potential users of project outcomes and the diversity of potential outcomes which might be adopted by different groups of users.

## 4. ADOPTION, ADAPTATION, IMPLEMENTATION AND EMBEDDING OF INNOVATIONS: THEMES FROM THE CASE STUDIES

This chapter summarises, on the basis of the case studies, common themes in relation to four of the questions of interest explored in the case study projects:

1. why teachers and other adopters/implementers of projects chose to adopt, adapt and implement the innovation, in terms of the perceived and actual features of the innovation and the ways in which the teachers became aware of, and were initially engaged with it;
2. how these ideas, projects and processes were adapted, implemented and sustained by teachers, academic departments and/or institutions in new contexts. This will include the changes in practice and understanding which were necessary for this to happen, and the ways in which these were facilitated and supported, including information and other supports made available by the innovation developers;
3. how teachers, students, academic departments and institutions have been affected by the implementation of the innovations;
4. the systemic conditions, including features of the external and institutional contexts and forms of support or professional development, which facilitated project dissemination then adaptation, implementation and sustainability in the new context, or the conditions which created barriers or constraints.

The fifth question, concerning funding schemes and support structures, is addressed in the following chapter.

### WHY DID ADOPTERS/IMPLEMENTERS OF PROJECTS CHOOSE TO ADOPT, ADAPT AND IMPLEMENT THEM?

Adopters' descriptions of their initial experiences of projects included three main components: encountering the project; initial engagement and further exploration. The following points are based on the descriptions given by adopters of the case study projects in relation to those particular projects, and by both developers and adopters in relation to the adoption of innovations in their own teaching.

#### ENCOUNTERING THE PROJECT

Adopters most commonly described how they encountered projects or other teaching ideas through some form of personal contact. This could have been initiated by actions of the adopter, for example through participating in a conference session because they were interested in that topic or subscribing to a particular email list. It could also have been initiated by a colleague or a departmental leader, for example, some adopters had been asked or told to be involved in an innovation. In relation to this, it needs to be pointed out that the adopters that we interviewed were willing rather than unwilling. Unwilling adopters are addressed in the section on implementation of departmental and curriculum innovations later in this report.

Typical ways in which the adopters found out about projects included:

- discussion with a colleague;
- participation in a workshop or seminar about the project itself or the key issue on which the project was based (for example PDP or Embedding Learning Technologies);
- participation in a conference session about the project or a session in which the project was showcased as an example, often followed up by personal contact with the presenter;;
- email from the project developer, which may have been in the form of an invitation to participate;
- discussion with people in particular organisational positions such as Heads of Department, faculty or departmental learning and teaching directors, academic developers, learning technologists or librarians.

Less commonly, adopters became aware of projects or ideas through printed materials such as conference papers or journal articles. Catalogues and materials distributed by professional associations or publishers were also mentioned as sources of some ideas.

Very few adopters described becoming aware of projects or other teaching ideas through specific project websites, with the exception being people who came across them serendipitously while searching the Internet. Websites of some projects, for example ETL, National Center for Case Study Teaching in Science and the AUTC learning designs project were seen as useful for following up on the project or accessing its resources, but not as enabling the initial encounters with the project.

When asked about finding out about teaching ideas or innovations in general, a few interviewees mentioned the websites of the UK Subject Centres or Uniserve Science which act as combinations of repositories, clearinghouses, networks and brokers for information. These interviewees had all had previous contact with these organisations, such as through being contacted by their staff or participating in a workshop or conference.

No interviewees spontaneously mentioned finding out about projects or teaching innovations in general through learning object repositories. When asked specifically about use of these repositories, only one interviewee, a learning technologist, reported accessing these sites but could not recall making use of the ideas found there. One email respondent commented that there was 'not a good data base available' and two interviewees commented that there should be a good clearinghouse for finding resources. Neither appeared aware of the databases that were available.

## INITIAL ENGAGEMENT: PERCEPTIONS OF ASPECTS OF RELEVANCE

Adopters' descriptions suggested that when they encountered the project that they ultimately adopted, they almost immediately perceived it to have **aspects of relevance** to their personal teaching and learning interests and/or to their students or their teaching situations. Several adopters commented that an innovation 'just seemed right' or 'just clicked'.

The focus of adopters was not necessarily on all of the innovative aspects of the project as perceived by the developer. The perception of aspects of relevance was a relation between the adopter's prior experiences, interests and understandings and perceptions of their situations and the features of the project, so could be brought about in a number of different ways, often in combination:

- prior personal interest in and understanding of the teaching and learning ideas underpinning the project, such as PDP (RAPID), case studies (National Center for Case Study Teaching in Science), role play (online role-play simulations);
- appreciation of the scholarly quality of the project, based on their prior knowledge of the subject matter or the expertise of the project developers. Examples of this in the case studies included appreciation of: reflective action research approaches to professional development (EFFECTS); the combination of theoretical discussions of anatomical systems and regions with practical and clinically relevant dissection and imaging (an@tomedia™); the reputations of the project developer(s) in the discipline (fIRST, EFFECTS, ETL, Mathematics videos);

- perceptions that the project would improve learning or enable particular kinds of learning outcomes for the intended participants, whether this was students or staff. This was the case for most projects, and was also a very common reason given by respondents in relation to why they adopted innovations in their teaching in general;
- perceptions that the project offered different and valuable ways of learning and teaching compared with those typically or previously used (Generic Capabilities, Generating Puzzlement, National Center for Case Study Teaching in Science, Role-play simulations);
- perceptions that the project would solve problems in teaching and learning, such as high failure rates in particular subjects (SI), difficulties with student motivation (National Center for Case Study Teaching in Science), lack of availability of equipment for experiments (Generating Puzzlement);
- a personal interest in innovation (EFFECTS);
- the project products fitting a particular niche for resources or materials that the adopter recognised and for which other resources were not available, not suitable or not known to the adopter, for example resources for courses on postgraduate supervision (fIRST), resources for developing students' information literacies (PILOT), discipline-specific online resources for PDP (RAPID). an@tomedia™ also fitted this category, being seen as a resource which General Practitioners could use for CPD or for patient education.

Initial engagement could sometimes turn to lack of interest. The most common reason given for this was that a potential innovation had not been evaluated with students (or staff if they were the intended learners). One interviewee commented:

If it hasn't been tested with the students you don't know whether it's going to work – whether they can identify with it. (project developer, Aust)

Perceptions that projects had aspects of relevance to adopters were encouraged by early and frequent interactions between the developer and potential adopters. Two-way participative processes in which developers sought feedback on their ideas and encouraged involvement of others in piloting or evaluation of products enabled potential adopters to feel some ownership of the outcomes and hence be more likely to adopt and implement them.

## EXPLORATION

Perceptions of relevance created points of engagement with the project, which were then explored in more detail. Adopters needed to become aware of how the project outcomes could be used or adapted and to perceive that implementation of the project was possible in their own situations. Exploration was often facilitated through further contact with the project developers, one-to-one or in workshops or seminars, and in projects like EFFECTS or National Center for Case Study Teaching in Science occurred concurrently with adoption and adaptation.

Even in the case of resources, exploration was often seen as quite time consuming:

If you're going to use a resource you have to put in quite a bit of time and effort to review it and see how it's going to fit into your context. And you don't want to review too many – you don't have time. There are a lot of duds out there. (project developer)

Recommendations from respected colleagues, the reputations of the developers and presentations or papers containing evaluation results assisted some adopters in deciding what to review, or even what to purchase sight unseen.

## HOW WERE ADAPTATION, IMPLEMENTATION AND EMBEDDING FACILITATED AND SUPPORTED IN NEW CONTEXTS?

The case studies illustrate the ways in which different types of projects required different approaches to adoption, adaptation and implementation and therefore different kinds of support for the process. It is important to note that all of the case study projects enabled adaptation of one kind or another, and there were different ways in which this was supported. While adaptation and implementation often went hand in hand, embedding is a different matter and often required wider support from colleagues and from leaders within academic departments. In some cases, innovations were still critically dependent on the presence of a particular individual.

Some aspects that encouraged and supported adaptation and implementation were common across a number of the case study projects. These included:

- the adaptability of the project outcomes to different contexts;
- pro-active support and enthusiasm by the project team leader and or project manager or similar individual. This was credited by many adopters with initiating, further encouraging and supporting their engagement with and adoption of or participation in the project;
- well-managed consultative and/or collaborative forms of development, in which potential adopters were involved from the beginning or close to the beginning of a project. This often meant that project development and adaptation to different contexts were occurring in parallel;
- support materials such as case studies and exemplars which illustrated different forms of implementation;
- workshops or more formal development programs provided by the project developers or academic developers;
- availability of other project-relevant forms of implementation support, either from the project team or the institution, which could include availability of learning technology or technical support;
- funding to support the adaptation and implementation process, either from the project itself or the adopting institution.

There were other features that varied between forms of adaptation and implementation. The patterns of adoption, adaptation, implementation and embedding patterns of the case study projects showed differences along three dimensions:

- **the extent of adaptation:** adoption of a resource; adaptation of a resource; re-invention of a process or idea; or collaborative innovation and implementation;
- **the extent and focus of change necessary for the adopter(s):** additional use of a resource; change in practice; change in practice and ways of thinking;
- **the breadth of the implementation context:** individual or a single subject; departmental or a whole course; institutional.

There were typical patterns of these dimensions that suggest implications for the designs of projects and the forms of support that favour adaptation and implementation. Some projects were also adapted and implemented in different ways in different contexts, making use of different forms of project support.

### ADOPTION AND USE BY INDIVIDUALS

In implementation patterns which involved adopting and using a resource at an individual level, the extent of additional change in practice was largely within the control of the individual. For some adopters, ease of use of the resource and time saving were important factors in adoption. This resulted in a range of different kinds of uses, for example use of computer-based simulation packages in lecture demonstrations

instead of or as well as having students use them in laboratory sessions. These uses may or may not have been intended by the original developers. Implementation of this kind was supported by combinations of:

- resources which were designed to allow multiple forms of use, rather than being an 'instructional package'. For example an@tomedica™ was designed for use in both problem-based and more traditional courses, in courses which favoured different approaches to teaching anatomy, across different disciplines and as an independent learning resource;
- information or guidance on ways of using the resources, such as in fIRST, was seen as helpful for enabling adopters to become aware of additional forms of use that they may not have thought of themselves;
- information or guidance on ways of integrating the resource into the curriculum could generate additional ideas for use, in particular ideas for effective ways in which students could be engaged with the resource;
- in the case of individual use of computer-based resources such as RAPID, technical support from either the project team or the local IT support service.

## ADAPTATION AND IMPLEMENTATION BY INDIVIDUALS

Implementation patterns which involved adaptation or reinvention of a process or idea by individuals involved changes in practice and, for some adopters, changes in ways of thinking. Implementation often required more support. Adopters needed to see ways in which they could implement the innovation in their own contexts. Adaptation and implementation were supported by combinations of:

- case studies and exemplars of use of the process or idea, which enabled adopters to explore and compare different options and forms of implementation;
- information and guidance on ways of going about the re-invention, including briefing manuals, which were appreciated by some adopters and used selectively by others;
- 'training' and workshop sessions, such as those for Supplemental Instruction and National Center for Case Study Teaching in Science, which were strongly appreciated by some adopters but perceived more critically by others;
- consultation or collaboration with others who had implemented the process or idea, either through workshops or one-to-one support or advice;
- professional development workshops or courses, such as those provided in typical EFFECTS programs. These were valued by adopters to the extent that they supported their particular goals and interests and time was available to support participation;
- where changes in ways of thinking were potentially needed in order for the process or idea to be adopted, project developers typically required adopters to participate in workshops and other activities. In these cases, collegial discussion and opportunities to encounter and reflect on new ideas in the workshops were seen as valued, whereas prescriptive approaches were not;
- small amounts of funding, which served the function of 'authorising' the implementation of the innovation and the time spent in doing so.

This adaptation and implementation pattern meets more of Coburn's (2003) criteria for the scaling-up of innovations than does individual adoption. There is greater depth and shift in ownership of the innovation. Sustainability was more dependent on the nature of the innovation. If the implementation required considerable work each semester to maintain it within a subject, as in the case of role-play simulations, there was a dependency on the individual implementer. Embedding was more likely to occur when removing the innovation would be more time consuming or expensive than leaving it in place, such as in some SI implementations, or when colleagues had bought into the innovation and were likely to continue supporting it.

## ADAPTATION AND IMPLEMENTATION ACROSS A COURSE OR DEPARTMENT

For implementation patterns which involved extensive adoption, adaptation or re-invention across a course or department, such as the implementation of graduate attributes based curricula or the implementation of RAPID across a department, implementation was encouraged by combinations of:

- strong departmental leadership of the implementation, often involving participative ownership of the implementation by people in formal leadership positions;
- effective consultative processes within the department over a sufficient period of time;
- collaboration between the adopters/implementers and those who had previously implemented the innovation; and/or
- involvement of adopters in prototype implementation and evaluation of the resource, process or idea as part of the development process;
- funding to support the adaptation or implementation. Funding from the project typically supported the practical resourcing of the implementation and gave it external authority in the university. Funding from within the university was perceived as giving internal authority to the activity and increasing staff perceptions that the activity was valued;
- departmental awareness that the project was aligned with the requirements of a professional body or association.

Innovations which involved this adaptation and implementation pattern typically met all of Coburn's (2003) criteria. Implementation involved reinvention, which became sustained once the changes had been fully integrated into the curriculum and supported, or at least accepted, by the majority of staff in a department. Leadership of the innovation was critical. Spending time on building ownership of the innovation, for example the embedding of graduate attributes in a curriculum, was well worth it in terms of implementation and sustainability. Embedding was also favoured by changes in policies and systems which were aligned with the innovation, for example course accreditation policies which demanded a graduate attributes-based approach to the curriculum. One very experienced interviewee, in commenting on changes in teaching innovation over the past decade noted:

The other thing that's changed I think is that people's understanding about the embedding process. The trick is to build it into regulations and systems so it can't fall over.

## BARRIERS TO ONGOING SUPPORT FOR DISSEMINATION AND IMPLEMENTATION

Dissemination and/or implementation activities which required ongoing maintenance or support from a project team were seen as inherently problematic when projects came to a conclusion. When funding ran out, staff employed for the project moved on to other things taking project knowledge with them, and permanent academics were expected to then devote their time to new activities. One exception to this was in cases where the project teams stayed together because more funding was sought or became available for the original project (eg an@tomedia™) or the team obtained funding for further projects (eg RAPID).

These barriers can be reduced where another agency assumes responsibility for ongoing dissemination and brokering work after project completion, as in the case of the HEA Subject Centres or the National Centre for Case Study Teaching in Science.



## HOW WERE STUDENTS, TEACHERS, ACADEMIC DEPARTMENTS AND INSTITUTIONS AFFECTED BY THE IMPLEMENTATION OF THE CASE STUDY INNOVATIONS

The case studies illustrate a range of impacts which this small group of innovations has had on teaching and learning at a number of levels. As the case studies indicate, the impact of an innovation was not necessarily related to whether implementation was by the developer in the originating context or an adopter in a new one. It was more strongly related to how the innovation was implemented.

Overall, the range of impacts on **students** of the projects included:

- improved success rates in subjects;
- development of teamwork skills;
- for SI leaders in particular, development of leadership, teamwork and facilitation capability;
- perceptions of increased alignment within the learning environment accompanied by improvements in approaches to learning;
- development or enhancement of critical thinking and problem solving skills;
- development of the capacity to reflect on their own personal and professional skills and development needs;
- development of discipline related graduate attributes;
- increased ability to structure and interpret subject matter;
- changed understandings of subject matter;
- changed understanding of alternative perspectives and worldviews;
- increased flexibility of learning;
- increased satisfaction;
- increased interest and motivation.

Few negative impacts on students were noted. One exception was a reluctance by some students to engage in more interactive or reflective forms of learning, however this was typically a minority view if changes were well implemented. Another possibly negative impact was increased workloads in projects such as role-play simulations which were so motivating for students that they spent large amounts of time on the activity.

Impacts on **teachers** included effects on their teaching or understanding of teaching such as:

- improved understandings of ways of implementing C&ITs in teaching;
- changed understandings of teaching and learning, through implementing approaches such as C&ITs, SI, Graduate Capabilities or RAPID;
- changed understandings of assessment;
- changed teaching practices, through implementation of case based teaching, SI, recommendations from the ETL process etc;
- increased efficiency of teaching, for example through introduction of SI;
- increased enthusiasm for teaching;
- increased satisfaction through observing the effects of innovations on students;
- creative satisfaction.

Positive professional or career related impacts on teachers included:

- building of collegial networks;
- increased contact with colleagues from other disciplines;

- invitations to present innovations at other institutions or in conferences;
- academic promotion;
- teaching awards or teaching fellowships;
- a reputation as a good teacher or innovator within an institution, nationally or internationally (which may or may not be accompanied by formal recognition);
- scholarly publications on teaching innovations;
- research grants related to teaching innovations.

Negative impacts experienced by some teachers included:

- lack of promotion or delays in promotion;
- lack of recognition of the work by colleagues;
- lack of support from Heads of Department or Deans;
- increased workloads, although sometimes these were balanced by increased satisfaction.

Impacts on **institutions and departments** included:

- the introduction or further development of graduate attributes-based curricula and accompanying policy changes, accompanied by improvements in teachers' capabilities for implementing such curricula;
- introduction and embedding of a PDP system for students which in some cases is beginning to spread more widely in the institution;
- embedding of C&ITs in curricula and in some cases development and embedding of C&IT support systems which were not previously present;
- changes in policies related to C&ITs;
- enhancement of existing programs or creation of new programs for postgraduate supervision development;
- reduction in student failure rates due to introduction of SI;
- availability of a system to support the development of students' information literacies;
- perceptions that the institution's reputation had been enhanced by a particular innovation (often without formal recognition of the innovator).

At the institutional level, evaluation evidence related to learning often focused on existence of a change in the learning environment which had the potential to bring about improvements in learning rather than to institution level evidence of impacts on students' learning. The introduction of SI was an exception, having evident impacts on students' success in their subjects.

# INSTITUTIONAL AND EXTERNAL INFRASTRUCTURES AND SYSTEMS WHICH SUPPORT OR CONSTRAIN DISSEMINATION, ADOPTION, ADAPTATION, IMPLEMENTATION AND EMBEDDING OF INNOVATIONS

In terms of institutional contexts, many adopters reported more perceived barriers than supportive features, but they were generally barriers to **colleagues'** participation in or adoption of projects rather than their own. Essentially the same features of institutional contexts were described as supportive by project developers and adopters of projects or ideas. These supportive features included those which encouraged or supported the adoption, implementation and embedding of particular projects as well as features which were seen as generally supportive of teaching innovations:

## SUPPORTIVE AND PROACTIVE LEADERSHIP OF TEACHING AND LEARNING

Leadership which supported and valued the implementation of an innovation was seen as critical for innovations to be implemented and sustained beyond the level of an individual. All levels of leadership were seen as important, from the Vice Chancellor down. Good leadership at the departmental level, including that of Heads of Department and co-ordinators of courses, was seen as particularly important if an innovation was to become embedded:

No matter how great their institution's learning and teaching strategy may appear to be on the surface and no matter how many people they have their educational development unit, unless you have genuine 'buy' in a senior level as well as middle management and in terms of the practice of those delivering on the ground, there's always going to be something missing. It's always going to be superficial to some extent. (HEA interviewee)

Indicators of supportive leadership reported by the interviewees ranged from the long term funding of a large teaching development grant scheme in a university, to such apparently small actions as a PVC chairing project advisory committee meetings or Deans regularly attending teaching and learning forums.

Other indicators of institutional leadership were seen in aligned systems of strategic initiatives, teaching and learning policy, quality systems, professional development support, reward systems and funding. These were seen as supporting particular innovations as well as creating a general overall climate where teaching and teaching innovation was valued. Interestingly, this systemic alignment was reported from four institutions (three Australian and one UK) including three which were strongly perceived to be research-focused. In each case, it was attributed to leadership and valuing of teaching from the senior management of the university.

Provision of internal funding to support the adaptation and implementation of innovations was seen as providing resourcing but also as indicating the institutional valuing of projects. This gave an incentive and authority for the leaders of innovation or reinvention project to involve others in the project. Funding was seen as particularly useful where it supported departments directly in projects which had been initiated by them in response to their needs and to institutional strategic priorities. An interviewee who had been extensively involved with Institutional Teaching and Learning strategies in the UK commented:

I think that in the main the most successful institutional learning and teaching strategy has been to increase dissemination pull. The people talk about where they want to get to and what they're trying to do, they recognise a shared need for something and they organise themselves to get it. It's more that way around. So probably the most successful strategies are those that are very devolved and most of the activity happens in faculties or departments rather than centrally.

This kind of approach is evident in the QUT large teaching development grants scheme, which funded the project on Embedding Graduate Capabilities in core units Law and Justice Studies.

Collaboration between faculties and departments, either for joint development/ reinvention and implementation of projects or for sharing of experience and implementation processes between departments was seen as desirable for institutional dissemination and dependent on a spirit of co-operation between leaders in the relevant areas.

## **EFFECTIVE SUPPORT AND ADVICE FOR ADAPTATION AND IMPLEMENTATION**

A number of developers and adopters were assisted by effective and integrated support for professional development, technology implementation and evaluation. In some cases this involved specialist advice on aspects of the project such as running workshops, change management or evaluation. In other cases it involved academic developers working alongside project developers on the project. Some interviewees commented in particular on the value of academic developers or other staff who know the implementation context well and can work with staff within it while also bringing in perspectives from the wider institutional and external contexts.

Formal courses on teaching and learning or on the development and implementation of teaching innovations were valuable for a number of reasons. They typically enabled sharing of ideas between participants. They often enabled participants to experience innovations as learners and evaluate and reflect on them from this perspective. They also enabled participants to engage with frameworks, such as the EFFECTS framework or action research approaches, which support the scholarly exploration, implementation and evaluation of teaching ideas and innovations. These forms of engagement can also facilitate participants' awareness of student-focused ways of understanding teaching and learning.

Facilitative rather than bureaucratic processes and expert advice on dealing with intellectual property, including copyright requirements, were seen as essential by a number of project developers and adopters.

## **EVENTS AND OTHER PROCESSES WHICH ENABLED ACADEMICS TO SHARE IDEAS AND MAKE CONTACT**

Events such as Teaching and Learning conferences or forums which recognised innovations and allowed innovators/project developers to showcase and share their ideas were seen as useful, but with their value depending on the degree of participation. They were perceived to be valuable, and to signify valuing of teaching by the institution if there was public involvement (or at least attendance) by academic leaders including senior management, Deans and Heads of Department. If attendance by academic leaders was noticeably lacking, participation was seen as limited to the enthusiasts.

Workshops and seminars for sharing, showcasing and discussing teaching innovations, including both internal events and those involving guest presenters from other universities were generally valued but needed to be used strategically because of the pressure on academics' time. They achieved the greatest participation in departments when they supported ways of working on initiatives to which departments were already committed.

## **PERCEPTIONS OF VALUING, RECOGNITION AND REWARD FOR TEACHING**

Perceptions that teaching would be rewarded and recognised contributed to an overall climate in which staff were more likely to be involved in, or at least not opposed to, teaching innovation. A number of respondents noted that their institution's promotions criteria had changed relatively recently to give greater recognition to teaching, and some developers and adopters did perceive that their involvement in a project would assist their own promotion. However, this was far from a majority view and almost all respondents perceived that research was more strongly valued.

### **Encouragement for involvement in projects**

Some adopters felt that the work involved in adaptation was more likely to be recognised if the adaptation and implementation of an innovation in a new context was viewed by the department or institution as 'innovation' in its own right. Seeing something as an innovation appeared to legitimise the time spent on adaptation.

Several interviewees commented on the value of small amount of funding for encouraging curriculum innovation and adaptation of innovations. The value was not necessarily seen in the amount of money itself, but in the perception that it signified valuing of the activity and legitimised spending time on it.

### **Encouragement of dissemination activities**

Perceptions that dissemination-related activities such as running workshops about an innovation, sponsoring and guiding its wider adoption in an institution or promoting it across institutions were recognised as service appeared to legitimise the time devoted to these activities.

Interviewees' capacity to write and publish more widely on their development or use of innovations was encouraged by perceptions that scholarly publications on teaching and teaching innovations were recognised by the institution as research, or as scholarship of teaching which counted for promotions processes affected some.

## **PERCEIVED BARRIERS AT THE INSTITUTIONAL LEVEL**

When adopters described other projects that they had not adopted, it was evident that initial perceptions of relevance could be readily outweighed by adoption or implementation blocks. Potential adopters may still be favourably inclined towards a project but perceive blocks within their departments or institutions. The following were particularly common blocks.

### **High workloads and lack of time**

These did not appear to affect the adopters' enthusiasm for projects or their adoption of projects which only relied on the investment of their own time. Both the original developers and the adopters of the case study projects tended to be enthusiastic about teaching and learning and willing to put in much extra time, even to the detriment of their career advancement.

High workloads and lack of time did affect adopters' perceptions of whether their colleagues would be involved in projects and, in the case of EFFECTS, their willingness to engage in scholarly reflection and dissemination processes beyond initial implementation of a technology. As such, they posed significant barriers to the wider take-up and embedding of many projects.

### **Lack of valuing of and rewards for teaching and teaching innovation**

Lack of perceived valuing of teaching was attributed to factors including lack of recognition and rewards, lack of acknowledgement in workload formulae of the time taken for curriculum development and change and lack of valuing of teaching in promotions criteria. Again, these did not appear to act as barriers for the innovators or adopters that we interviewed, but it was perceived to discourage wider participation by colleagues and limit the likelihood of embedding.

In the interviews, we identified a number of academics with national, and in some cases international, reputations for their teaching innovations who had not been promoted within their own institutions or whose promotions had been delayed. Responses to this varied. The reactions of those who had applied and been unsuccessful, or who had been discouraged by others such as Heads of Department, ranged from bemusement and resignation to anger and disillusionment. These reactions did not appear to discourage them from engaging in teaching innovation, as this was a major source of satisfaction, but did appear to discourage some from continuing to disseminate and promote new ideas amongst their colleagues. Some had moved universities in order to achieve promotion or work in a more supportive

environment. A couple of interviewees noted that the failure of innovators, particularly teaching award winners, to achieve promotion was perceived by their colleagues as clear evidence that teaching was not valued, despite promotion criteria which indicated otherwise.

Promotion was also perceived by some to be a two-edged sword. A small number of our interviewees had intentionally not sought promotion, either because additional responsibilities would take time away from them continuing to work on their project or because they were concerned that promotion would lead to resentment by their colleagues. Colleague resentment was noted as an experience of Swedish grantees in Johnstone's (2001) review of grants awarded by the Committee for the Renewal of Undergraduate Teaching. It is a particular issue for the wider dissemination and adoption of appropriate innovations within departments, as perceptions of resentment can lead to the innovator being less inclined to share ideas with colleagues.

### Lack of support for teaching and teaching innovation by academic leaders

Perceptions that teaching and teaching innovation were not supported or recognised by academic leaders were also common. It is important to note that academics' **perceptions** of recognition, for example in workload calculations or promotions processes, are not necessarily in line with the wording of institutional policies. Support for teaching or for particular innovations at the departmental level appear to have a particularly strong influence, if we consider the comments of some of our interviewees:

It's one thing for an individual to be committed. It's another thing for the individual to be able to sustain that commitment in a changing institutional context. So there certainly have been cases of people who've been told very firmly by a new Head of Department or new VC 'Don't get involved with that. That's a waste of time. That's not something we want to support' or, less directly, that their workload has changed in such a way that they haven't been able to devote time to the activity. (project partner)

Immediate academic leaders such as Heads of Department and course co-ordinators could create blocks to the implementation of innovations across team-taught subjects or more than one subject. Examples of blocks included not acknowledging implementation time in workload formulae, not allowing teaching or other time release, or demanding the production of certain numbers of research articles per year and not counting those related to teaching innovations. Typically this resulted in an innovation which had the potential for wider use, such as the embedding of learning technologies in subjects, not spreading past the enthusiasts in a department.

### Policy blocks

Some policy blocks related to academic workloads, such as counting teaching loads only in face-to-face hours or not recognising curriculum development or innovation in workload allocations. They could also relate to course accreditation or quality assurance or improvement policies and procedures which were not aligned with the innovation or each other. A common example is where graduate attributes need to be stated for course accreditation and are included in some course level quality assurance measures but subject level quality assurance systems focus on teacher performance or student satisfaction.

### Technical blocks

Lack of necessary technical infrastructure, such as equipment or support, or lack of compatibility between an innovation and the software systems supported centrally by an institution were blocks to the wider spread of some innovations. In addition, the technical support services within universities can either favour the adoption of particular innovations or make it extremely difficult. Several interviewees made comments along the lines that 'our technical information services are pretty conservative and not user-oriented'.

This set of barriers was largely consistent with the barriers to implementation of projects and their 'replication' at other institutions noted in the review of the FIPSE comprehensive program:

- institutional policies at odds with the project;
- resistance to change within the administration;

- resistance to change within the faculty or staff;
- lack of sufficient resources (e.g., time, facilities, equipment, materials, or funding);
- turnover of key project staff;
- challenges using technology. (Berger and Kirshstein, 2004, p.25).

## RELATIONS BETWEEN SUPPORTIVE FEATURES AND BARRIERS

It is interesting to note that the absence of some barriers does not of itself support the adoption, implementation and embedding of innovations, nor does the presence of some support systems. The institutional system needs to include both the supporting features and an absence of the key barriers for innovations to become widely adopted, implemented and embedded. For example, appropriate technical infrastructure might be present but it will not be used to support widespread innovations if these are blocked by inappropriate workload policies and leadership which does not value or support teaching innovation.

## DISCIPLINARY SYSTEMS WHICH SUPPORT DISSEMINATION AND ADOPTION OF INNOVATIONS

Disciplinary communities have traditionally focused around shared research interests and epistemologies, and it is relevant to note that Becher and Trowler's (2001) revision of Becher's classic *Academic Tribes and Territories* still pays relatively little attention to teaching and learning. However a growing number of mechanisms can enable aspects of the dissemination, adoption and implementation of good teaching practices and innovations within disciplinary groups. One broad approach involves linking to and making use of existing networks, groups and associations within disciplines. A second, which will be described in the next chapter, involves setting up organisations for this purpose. The previous CAUT clearinghouses, including Uniserve Science which is still in existence, were one attempt to achieve this. It has been more fully realised in the UK through the Higher Education Academy subject centres. This section explores some of the approaches noted by our interviewees.

## DISCIPLINARY OR OTHER SPECIAL-INTEREST EDUCATION GROUPS AND NETWORKS

Discipline-based and other special interest groups, email lists, conferences and informal networks were all mentioned as ways in which project developers 'spread the word' about their projects and potential adopters find out about them. For example, the fIRST consortium project has largely spread through the involvement of members of the Deans and Directors of Graduate Studies (DDOGS) network and presentations and workshops at the Quality in Postgraduate research conference, and to a lesser extent through the network of Academic Development Unit Directors. Project leadership by members of the DDOGS group and regular feedback from the group have been important in ensuring that the project meets common needs across institutions.

Like the DDOGS group, networks of disciplinary leaders can be an important source of ideas for projects which meet needs across a discipline and a way of disseminating ideas and sharing resources. Deans' Networks exist in many disciplines, and more recently groups of Associate Deans, Teaching and Learning have been formed. For example, in Business, a Dean's Network was initiated as result of the AUTC project in Business and subsequently created a learning and teaching network comprising senior disciplinary academics with teaching and learning responsibilities.

Existing discipline and other networks create ways in which project developers can regularly engage with their communities from the beginning of a project. Two-way engagement between these networks, innovators and funding agencies is also likely to be useful. For example, it was suggested that the Carrick

Institute could assist the networks' work through a range of activities such as Carrick presentations at network meetings (such as the recent presentations by the Carrick planning director at the Business Network meetings), provision of advice related to network priorities or updates of completed projects in the disciplines, resources or new funding opportunities. Conversely, the networks could assist the Carrick Institute through identifying common priorities which could inform commissioned projects or identifying suitable members of disciplinary reference or peer review groups. One suggestion which was made is that it may be useful to have an annual conference for networks, focusing in part on generic issues such as obtaining feedback on proposed projects, sharing current practice across disciplines or brainstorming solutions to current challenges, and in part on providing opportunities to address issues within individual disciplines.

## PROFESSIONAL AND DISCIPLINARY ASSOCIATIONS

Alignment of a project to the requirements, priorities or interests of relevant professional bodies may assist in dissemination and take-up in a number of ways. Teachers and students in a discipline may be more interested in a resource which is seen as linked to professional requirements. Close links with professional and accrediting bodies provide incentives, or in some cases external imperatives for institutions to participate in particular initiatives. Relevance of a project to professionals, as well as to students or academics, enables presentation at professional conferences and broadens the potential pool of adopters.

The dissemination and adoption of several case study projects was assisted through links with professional or disciplinary associations and organisations. The possible links varied across disciplines and types of projects. Links were of several kinds, and while they applied to particular cases in this study, they constitute possibilities which could be considered by other project developers:

- Papers presented at professional association conferences were used to raise awareness and develop understanding of products among professionals who might use them, as well as among academics who might attend these conferences. Adopters reported that papers on the educational design and ways of implementing products were helpful for making judgements about the value of adopting and implementing them. Interviewees in general reported that professional or disciplinary education conferences or education strands in conferences were important ways in which they became aware of new teaching ideas and innovations.
- Use of professional association promotion and distribution channels to sell products, for example the Mathematics videos are sold through the catalogue of products distributed by the Australian Association of Mathematics Teachers. A number of interviewees reported that they become aware of innovations through catalogues or similar distributed through professional associations. Linking up with existing distribution systems saves the time and resources of the developers while benefitting the association.
- Explicit linking of relevant project products to the continuing professional development requirements of professional bodies can achieve several benefits. For example, the recognition of an@tmedia™ by the RACGP as an approved activity which counts towards continuing professional development requirements, encourages some adoption by GPs. It also was reported to give the project further authority amongst professionals. In the case of RAPID, the explicit linking to the requirements of the CloB in the UK was perceived to build credibility amongst staff and students there and was noted by the adopters as an important factor influencing their adoption and implementation of the system.
- In the case of EFFECTS, the conceptual framework developed in the project formed the basis for a program accredited through a relevant professional association.
- In the case of projects related to graduate attributes, such as the ATN project, professional or disciplinary reviews or requirements of professional bodies acted to encourage implementation in some departments but were not a necessary condition.

Some issues were raised by interviewees in relation to raising awareness of projects through professional society and academic disciplinary conferences. It was noted that some disciplines do not have educational special interest groups or educational strands in their conferences, creating barriers for those seeking to present scholarly papers about their innovations. Also, several professional associations were



reported to have strict guidelines preventing paper presenters from using the conference to promote products for sale. This was not seen as a barrier to scholarly papers on the educational design or implementation of products but did mean that interested purchasers needed to follow up the product through other channels.

## CROSS-DISCIPLINARY SYSTEMS

While disciplinary communities facilitated dissemination of particular kinds of project outcomes within themselves, they typically did not facilitate cross-disciplinary dissemination. Agents which were described as taking on cross-disciplinary roles at the national level included:

- Higher Education Academy advisors working on national initiatives in the UK, such as employability or widening participation. The work of the advisors includes making links across institutions and projects, typically through building communities of interest. These communities enable the sharing of ideas between people working on similar project areas and reduce the potential isolation of individuals within institutions.
- Higher Education Academy advisors working with FDTL projects, whose roles included making links between projects and between projects and other initiatives. Prior to 2004, these roles were undertaken by the National Co-ordination Team (NCT). This will be discussed in more detail in the next chapter, in relation to the FDTL scheme.
- Higher Education and academic development associations and communities of interest, such as HERDSA in Australia, SEDA in the UK and the Improving Student Learning community. Like disciplinary associations, these have conferences, email lists, websites and other activities which enable communication within the community.
- Senior academic developers and academic development units whose expertise involved them in consultancies, cross-institutional work and producing resources which were used across the sector. The Oxford Centre for Learning and Staff Development was noted as a particular UK example of a unit which worked in this way.

Within institutions, academic development and related staff were seen as having important roles as information brokers. Approaches to enabling the sharing of information about teaching innovations and good practices, often facilitated by these brokers included:

- organising institutional events, such as teaching and learning conferences or workshops, particularly where these enabled innovators and adopters to showcase and share their ideas with others;
- facilitating informal networks of staff interested in particular topics or themes, such as online learning;
- informal conversations, often with an element of serendipity.

Some UK interviewees noted a need for projects to develop better connections with members of institutional communities, in particular academic development staff, who could facilitate the adoption and implementation of innovations across institutions.

Wherever you have a subject centre, or a subject focus then there is a real issue about how do you engage with the local staff developers. Because you're saying the staff developed [through the subject centre] can be a conduit and a focus. Well they can be if they're used in that way and if they are provided with information that they can process. But ... I doubt we've done enough to educate institutional staff developers on either what's going on in terms of some of our programs such as [project] or indeed to present it in a form that would allow them to transfer it in to other parts at their institution. I think we've typically seen our target audience as being an essentially subject link going through the subject centre rather than a broader one going through the staff development community. (UK project developer)

Connections between disciplinary and cross-disciplinary communities are necessary to maximise the potential for relevant innovations to spread across the sector.

## NECESSARY EXPERTISE FOR DISSEMINATION AND IMPLEMENTATION

The successful dissemination and implementation in new contexts of projects relies not only on dissemination agents but also on the availability of particular combinations of understandings and skills in the development and implementation contexts. These capabilities may exist within the project team and/or may be supplemented by support from specialists from within or outside the particular institutions. For example, in the UK context, the National Co-ordination Team constituted a sources of expertise which could be drawn on by project teams.

### CHANGE AGENT CAPABILITY

Institutional or departmental implementation and embedding of projects such as graduate attributes or RAPID are dependent on the presence of staff who are able to act as change agents in departments or institutions, including reading institutional contexts and identifying barriers and ways of overcoming them. Change agent roles were sometimes taken by staff with formal teaching and learning leadership positions in departments, such as Associate Deans or similar, sometimes by Teaching Fellows and sometimes by academic development specialists who were part of project teams or consultants to faculties or departments. In some cases, innovations were limited in their scale of impact because adopters did not have the necessary understandings and skills to read the context appropriately and bring others on board.

Quite often people who are engaged in projects are not sufficiently experienced, or sufficiently senior to understand how their institution works. And still less how other institutions work. So I think there is a lack of what I'd typically term political astuteness. They don't know how to make things happen in their institution. (academic developer, UK)

### STAFF DEVELOPMENT CAPABILITY

Many of the case study project developers recognised the need for potential adopters to be supported while they engage with the project and explore possibilities for adapting and implementing it in their contexts.

People who are going to take something on board aren't going to have it thrust on them. They want opportunities to talk about it and investigate it with others . . . It needs to be more than presented to them. They need proper workshops and challenging to step outside their comfort zones . . . if the outcome is going to be transferability between institutions or even between disciplines. (Aust project developer)

Forms of support included formal training sessions along with project development approaches which proactively engaged potential users from the beginning of the project, often through participative workshops and meetings. Providing these effectively also requires particular capabilities, for example staff development skills and understandings that institutional contexts may vary a great deal and require different forms of adaptation and implementation.

### SPECIFIC PROJECT CAPABILITIES

In addition to specific change agent and academic development skills, project teams needed access to the skills and knowledge necessary to develop the project effectively. A wide range of necessary capabilities was described by the interviewees, including project management, evaluation, team management, meeting skills, marketing, legal skills for dealing with intellectual property, technical skills, financial management and project administration. Some, such as project and team management, were required within the project team. Others could be provided by specialist consultants provided these were available within the institution or from other organisations.

One of the attributes most frequently described as present in the teams of projects which had spread widely was a proactive enthusiasm and desire to reach out to and communicate with potential adopters in the university community. This did not need to be characteristic of all team members, but one person in the team usually needed to have this capability. Usually it was either the project leader or project manager. A number of academic interviewees noted that they did not personally have all the skills, or perhaps the time and inclination, to engage in the ongoing proactive dissemination and collaboration which was characteristic of a number of the case study projects.

You make it very explicit that you regard the ability to manage a project and effectively to manage the dissemination of that project or the sharing whatever, you're looking for a recognition of the importance of this. You're looking for a track record, a willingness to address this and you're also looking for development programs that will encourage and monitor and support all of that. (HEA interviewee)

Finding suitable project staff is crucial, but difficulties in finding and retaining staff and sources of expertise often hindered the successful development of projects as well as their dissemination. In the case of FDTL projects, some interviewees noted that transfer funding components of successful projects could fail because key staff had already left, or the transfer funding amount (typically 10% of the original funded amount) was not enough to continue their employment for the transfer period.

## TECHNICAL CAPABILITY

Projects which use technology obviously require technical competence, but they need to have team members or advisors who have adequate knowledge of the technology landscape beyond the development context. The possibility of project dissemination and adaptation can be hindered from the start if a project chooses a technology which is not commonly available when a common technology would have been possible. The following story was a case in point:

[a granting body] was approached by a small institution saying we've been developing online resources for staff on things like [topics of common interest] and we'd like these available across the sector. ... And I've become aware of this and I'm interested in that area so I've had a series of interesting emails and telephone conversations with these people. My concern is basically about how can you offer stuff to the sector that the sector will adopt. There's clearly a need, many institutions have a very explicit requirement to provide [topic] training to all their staff so in many senses its the ideal thing to go for, all staff need it and need it now. ... So in a sense if you can't make this work then you almost can't make anything work ok? So I ask if I can look at the materials and they come and I said well ok they were alright, but I've got two questions. One is how do I adapt the materials for my use? How do I do it? And that prompted me to ask 'How did you produce these materials in the first place?' and the answer comes back they produced them using [software] which is probably a piece of software you've never heard of. Not a piece of software I've ever heard of, none of my learning technology colleagues have ever heard of it.

The interviewee noted that the materials in question could have been equally well produced using hypertext markup language (html), which would have enabled easy adaptation in any institutional context. The choice of technology was seen as the responsibility of both the project team, and the funding body reference group which lacked relevant technical expertise:

You've had a group of enthusiasts who don't understand the sector who have been subjected to scrutiny by people who are technically naive and have allowed something to go ahead that they shouldn't.

## SCHOLARLY UNDERSTANDINGS OF TEACHING AND LEARNING

In addition to the project development, staff development and change agent capabilities described above, particular understandings of teaching and learning are required to develop and implement projects aimed at teaching and learning improvement. The successful project developers and adopters interviewed for the case studies almost without exception described what they were doing in ways which suggested student-focused understandings of teaching and learning.

As noted in the literature review and case studies, teachers whose understandings are primarily teacher focused may fail to see the point of implementing peer mentoring projects like SI, PDP systems like RAPID or graduate attributes based curricula, or may be unable to implement them successfully. Academic

development that assists teachers to develop student focused understandings of teaching and learning in the process of exploring and implement projects may be necessary.

Scholarly understandings of teaching and learning are also necessary to inform the ways in which projects are implemented in the curriculum, for example through using well-known principles such as those of good teaching (for example Ramsden, 2003) and constructive alignment (Biggs, 2003). Apart from improved implementation, scholarly understandings could pre-empt much reinvention of the wheel, such as the repeated 'discovery' of the importance of assessment to students.

## SUMMARY

Adaptation and implementation of project outcomes in new contexts were encouraged by a system which included the qualities of the projects themselves, the ways that adopters were supported to engage with and implement projects, and features of the institutional, disciplinary and cross-disciplinary contexts in which projects were disseminated and implemented.

Adopters perceived that the projects that they adopted and implemented:

- offered different and valuable ways of learning and teaching, or would enable particular kinds of learning outcomes, or addressed common resource needs or solved common problems;
- had recognisable scholarly qualities;
- provided evidence that they worked or were likely to work with the intended learners;
- were adaptable, either in themselves or in the ways they could be implemented;
- provided support for their adaptation and implementation.

Adoption, implementation and embedding in new contexts were supported by:

- collaboration and cascade models of project development;
- features built into the project products, for example cases, exemplars and other resources;
- workshops and other face-to-face activities;
- provision of small amounts of funding to adopters to support implementation.

Adaptation implementation and embedding the curriculum and departmental levels additionally required:

- strong leadership of the innovation;
- effective consultative and collaborative processes to build staff support;
- policy alignment;
- implementation funding.

Aspects of institutional systems which supported dissemination, implementation and embedding of project outcomes included:

- supportive and proactive leadership of teaching and learning;
- events, activities and information brokering which facilitate the sharing of ideas;
- support and advice for adaptation and implementation, including academic development support and advice on intellectual property;
- perceptions of valuing of teaching, including recognition and rewards.

Institutional barriers included:

- high workloads and lack of time;
- lack of valuing of teaching;

- lack of leadership support;
- policy blocks;
- technical blocks.

Disciplinary systems which supported dissemination and initial engagement with projects included:

- disciplinary education special interest groups;
- networks and professional and disciplinary associations.
- The relevance of some project outcomes to professional communities outside the university favoured their wider adoption and implementation.

Cross-disciplinary agents and activities which supported dissemination and initial engagement with projects included:

- national level agencies, such as Higher Education Academy advisors in the UK;
- higher education associations and communities;
- academic developers and consultants working across institutions.

Capabilities were seen as necessary to enable dissemination and implementation of innovations intended to improve teaching and learning include:

- the capacity to act as a change agent;
- staff development capabilities;
- specific project capabilities;
- scholarly understandings of teaching and learning.



## 5. FUNDING CONDITIONS AND INFRASTRUCTURES RELATING TO TEACHING AND LEARNING INNOVATION, DISSEMINATION, ADOPTION AND EMBEDDING

National, institutional, disciplinary, and more local systems create the contexts within which innovation, dissemination, adoption and embedding occur. This chapter focuses on the aspects of these systems which support, or conversely constrain the likelihood of dissemination and successful adoption, by using information from the case studies and from other sources.

It addresses the fifth point focused on in the case studies and the study as a whole:

5. where innovations were funded, the approaches to funding, reporting and support for the innovation which encouraged dissemination, adaptation implementation and continuation.

### FINDINGS FROM ANALYSIS OF THE INTERVIEWS

On the basis of the interviews and project bid documents, where available, a range of features were seen to facilitate aspects of dissemination and take-up of teaching innovations and ideas. General features of the context outside the university which facilitated aspects of dissemination and adoption, from the developers' and/or adopters' perspectives were:

- alignment of projects with national strategic priorities or initiatives, which encouraged interest from other institutions and created the potential for showcasing at conferences related to these initiatives;
- alignment of projects with common institutional or disciplinary needs, for example those identified in quality assurance and audit findings or reviews of disciplines. This provides an incentive for collaboration on areas of common need or adaptation and implementation of commended practices in new institutions;
- well managed collaborative arrangements or consortia between universities which facilitate effective collaboration.

The following points specifically related to funding schemes appear to facilitate **dissemination** and **adoption** through to **implementation**:

- availability of funding to support engagement of others in the adoption, implementation and further development of existing innovations rather than only the development of new ones (for example RAPID, National Center for Case Study Teaching in Science, Generating Puzzlement, SI);
- funding criteria which required developers to pay strong attention to the dissemination and take-up of projects and devote an adequate percentage of the budget to these activities;
- encouragement of effective forms of consultation and collaboration prior to and during project development, supported by guidance on effective collaboration;

- support for project developers for the design and planning stage of projects prior to funding, including guidance on project management, evaluation, dissemination and collaboration;
- staged bidding, with support for applicants to improve their applications between stages and create firm contractual arrangements for collaboration between institutions and linkages between the project and agencies like the subject centres which support dissemination;
- links to national organisations, such as the HEA Subject Centres, which can facilitate continuing dissemination activities by playing networking, brokering and information sharing roles and facilitating contact between projects and potential users, and can facilitate implementation by sharing information about ways of doing this effectively.

It was more difficult to discern any features of granting schemes which facilitated the **embedding** and **sustainability** of case study projects in their sites of implementation. Embedding of projects which went beyond resource usage appeared to depend critically on either ongoing commitment by departments or institutions or the extent to which removing the innovation from a context would take too much time or add to costs.

Projects which developed websites in order to continue to make their outcomes available faced issues of site maintenance and updating once the project funding ceased. This maintenance was not supported by external agencies and in most cases relied on the ongoing goodwill of hosting institutions and project staff, if these remained with the institution. While granting schemes or the UK Subject Centres typically maintain databases with information about projects, we did not find evidence of schemes supporting project maintenance per se. In fact, in many cases the institution which received the grant is expected to be responsible for supporting the project after completion.

## ANALYSIS OF THE GRANTING SCHEMES

At the national and interdisciplinary level, support for teaching and learning innovation is mostly provided by national funding bodies and, in the US, charitable trusts such as the Pew Charitable Trusts. A number of schemes, listed in chapter 2, were reviewed with a particular focus on features which are related to dissemination and takeup of funded projects. Differences between selected granting schemes related to a number of themes, of which the following appeared particularly significant:

- criteria and processes for grant funding, including the types of projects which are funded and any requirements for dissemination or collaboration;
- support for grantees before grants are awarded and while projects are in progress;
- support for dissemination during and after project completion, including integration of the funding scheme with other initiatives and organisations focused on improving teaching and learning.

### CRITERIA AND PROCESSES FOR GRANT FUNDING

Granting schemes vary in the focuses of their funding, from supporting largely individual innovation projects to directly supporting adaptation or dissemination to supporting collaborative efforts aimed at the transfer of successful practice across institutional or disciplinary contexts. Particular areas of difference are:

- what is funded, from innovation to specific schemes aimed at transfer to new sites or users;
- how dissemination expectations are articulated in the criteria;
- whether the focus is on funding individuals, institutions or collaborations of various kinds;
- the timeframes for projects;
- the amount of funding available to grantees.

The balance between different focuses is clearly challenging for some schemes, particularly those such as CAUT, CUTSD and the AUTC which had relatively small amounts of funding available.



In the US, the FIPSE comprehensive program provides substantial funding for innovation projects through its comprehensive program. (The program did not offer grants in 2005 but is expected to resume in 2006). An overview of the program notes that it 'encourages *bold thinking and innovative* projects' as well as supporting 'dissemination of proven innovations' (FIPSE, <http://www.ed.gov/programs/fipsecomp/index.html>). FIPSE has a particular category for dissemination projects within its comprehensive program and 99 grants are listed within this program on the grants database. A sampling of projects indicated that they vary substantially in their timeframes, with some being up to four years and their levels of funding, from just over \$US100,000 to more than \$US 600,000. Their focuses also varied substantially, from dissemination of innovations aimed at learning of particular subject matter to more substantial institutional reforms. The 2004 review of FIPSE noted that their dissemination grants were the most common source of funding for the 'replication' of projects originally funded by FIPSE, but that funding was not necessary for some projects to replicate (Berger and Kirshstein, 2004).

In the UK, the Fund for Development of Teaching and Learning (FDTL) was substantially modified following an evaluation of phases 1 and 2 which showed limited dissemination of project outcomes. Changes have been made to both the types of projects funded and the emphasis placed on dissemination. The FDTL funds both individual and collaborative projects, with the former eligible for up to £75,000 over two years and the latter £250,000 over three years. The evaluation showed that dissemination had been particularly limited for projects which had focused on interests specific to a particular institution, or produced products for which there was not a genuine need across the sector. The criteria for FDTL 3 were changed to target innovations related to the subject priorities identified in quality audits as well as general national priorities. Institutions were only eligible to be lead applicants in a consortium if they had been assessed as having demonstrated high quality in the relevant area of teaching and learning, but were encouraged to collaborate with institutions that have received lower assessments, in an explicit attempt to encourage transfer of good practice. The most recent phase, FDTL 5 marks a minor shift, still placing strong emphasis on audited subject priorities and generic priorities, but also acknowledging the possibility of funding innovative projects which fell outside these areas.

Phase three of the FDTL and subsequent rounds have an explicit focus on dissemination and take-up. The aims of FDTL 3 were to 'stimulate developments in learning and teaching' and 'secure the widest possible involvement of institutions in the take-up and implementation of good practice' and a primary focus was to 'disseminate and where possible embed good practice in learning and teaching, as identified in the QAA subject overview reports, throughout the higher education sector' (HEFCE 1999/48, section C). (These aims remained for FDTL 4 and 5.) Consortium applications were encouraged, and advice on creating manageable consortium arrangements was available from the National Co-ordination Team (NCT, addressed in more detail in following sections). Applications from individual institutions were only eligible if they demonstrated:

- genuine innovation (this must have already taken place);
- very high levels of institutional support (including some matched funding );
- a clear and considered strategy for dissemination and transfer to other institutions.(HEFCE 99/48 Section C)

The criteria for assessment of applications for FDTL 3 stated that projects should have a clear dissemination strategy, emphasising communication and use:

This strategy should show how the project outcomes will be communicated to other providers and how these providers will be encouraged to use them. Projects should consider how widespread dissemination could be undertaken through the subject centres in the LTSN. (HEFCE 99/48 Annex J)

Dissemination was also a specific line item in the application budget template and advice on dissemination was included in the guidance notes on submission, as follows:

As suggested by the FDTL evaluation report, expressions of interest should distinguish between:

- dissemination for awareness - publicity, publications, conferences, web sites, demonstration workshops
- dissemination for understanding - consultancy, workshops with the active engagement of end users

- dissemination for implementation - working alongside end-users and helping them to use the ideas and embed them into their departments and courses
- continuation of activity beyond the funding life of the project. (HEFCE, 1999, 99/48)

The invitations to bid for FDTL 4 and FDTL 5 also included these statements, but with further information being included in each round. For example, FDTL 5 guidelines advise that dissemination strategies need to be comprehensive but also 'targeted and realistic' (HEFCE, 2003, 03/46).

Evidence from our UK interviews suggests that the levels of dissemination, or versions of them, are well known to project teams and academic developers. These statements were perceived to have the advantage of prompting applicants to consider the purposes of different forms of dissemination from the end-users' perspective rather than only that of the project team.

Projects also typically devote a substantial proportion of their budget to dissemination activities, which might include running project workshops and visiting potential users at their sites. In the case of RAPID, 20% of the overall budget was for dissemination and this did not include the substantial staff time spent on dissemination related activities. The strong emphasis on dissemination in the FDTL is supported by explicit links between the FDTL and the Higher Education Academy Subject Centres which provide support for dissemination activities and can also support applicants in planning dissemination strategies. For example, the guidelines for FDTL 5 require applicants to provide evidence that they have made a formal arrangement with the Subject Centre.

The FDTL offers the possibility of 'transferability' funding to projects which have been successful in achieving their outcomes and present an appropriate proposal for transferring these outcomes to either institutions or disciplines which have not previously been involved with the project. Information about the effectiveness of this approach suggests that it can double the spread of a particular initiative, but can also be problematic as key project staff may have left the project or have plans to leave at the end of the initial three years.

A further UK example of explicit funding agency strategies to encourage dissemination comes from the ESRC's Teaching and Learning Research Programme (TLRP). The program focuses beyond dissemination, placing particular emphasis on program communication and impact, with an emphasis on collaboration and reinvention in new contexts. The guidelines for Phase III state:

Successful Phase III applications will go beyond simply spreading awareness of the research through dissemination and communication activities in the hope that this will rub off on policy and practice. Rather, the Programme is looking for imaginative project communication proposals which are:

- **Collaborative** and **Iterative**, exchanging ideas between researchers, policy-makers and practitioners. The aim is to foster an environment where all can contribute and where awareness / use of research evidence are routine and central to both policy and practice.
- **Interactive** and **Constructive**, because researchers are just one set of participants. Projects need to work with a wide range of partners, to make the whole greater than the sum of the parts.
- **Transformative**, to get the best of both basic and more applied research into improved policy and practice. This means transforming research evidence to generate practical outcomes / products.
- **Customer focused** and **Distributed**, since without demand from practice and policy communities impact will inevitably be sub-optimal. Projects must be prepared to share 'ownership' of their work and welcome its re-invention for particular circumstances. (ESRC TLRP, 2002, [http://www.esrc.ac.uk/esrccontent/researchfunding/tlp\\_phIII-spec.asp](http://www.esrc.ac.uk/esrccontent/researchfunding/tlp_phIII-spec.asp))

Team members from the ETL project, funded through the earlier Phase II of the program, noted that the requirements for ongoing dissemination and collaboration had become stronger, but that the guidelines in their phase meant that:

We have to see dissemination to a variety of end users particularly practitioners and policy makers as something that we're concerned with throughout the project not something that happens at the end or after it. And that also the research itself is supposed to be conducted with a degree of collaboration and it's not a completely equal relationship in the sense that there are certain research imperatives but it's in dialogue with end users. (project team member)

Analysis of the case studies and other interviews conducted as part of this project strongly suggested that wider project adoption and use is favoured by granting guidelines and criteria which:

- give clear descriptions of what will be funded and provide funding for both the creation of innovations and the adaptation and implementation of existing innovations in new contexts, including new institutional settings or new discipline areas;
- expect grantees to consider and involve potential users from the early stages of project development;
- require grantees to engage in multiple forms of dissemination and/or collaboration activities with potential users and in particular to go beyond one way dissemination;
- require grantees to devote an adequate proportion of the budget to these activities;
- provide budgets and timeframes which are adequate to enable effective evaluation, consultative dissemination and/or collaboration within the project;
- encourage or require linkages to other organisations, such as the Subject Centres, which can support dissemination initiatives, including those which happen after project completion.

## SUPPORT FOR GRANTEES BEFORE GRANTS ARE AWARDED AND WHILE PROJECTS ARE IN PROGRESS

Some funding agencies provide substantial support for grantees throughout the bidding process and the lifetime of the grant. Approaches include:

- staged bids prior to the awarding of funding, where successful stage 1 bidders are provided with support to develop their second stage bids;
- taking a programmatic approach, in which projects are grouped together as part of a common program and expected to participate in program development activities;
- linking projects with specialist staff from the funding agency or a related organisation set up for this purpose.

Several schemes use these approaches in combination.

### Staged bidding prior to funding

The FDTL, FIPSE and PEW schemes all have staged bids for funding, with up to three stages involved. Stage 1 typically involves shorter proposals and applicants who make it past that stage are then given time and support to prepare their proposals for later stages. This provides opportunities for applicants to receive advice and assistance to address bids in which the development, dissemination and adoption of a good idea may be hampered by poor project and/or dissemination planning.

In the case of the FDTL, successful stage 1 applicants are funded for up to £1000 to participate in a two day seminar to assist them in preparing their stage 2 bids. The seminar places strong emphasis on dissemination plans. Applicants whose bids do not take advice on board may be asked to return the seminar funding. A former NCT leader commented that support and advice prior to funding paid off very effectively in the improvements that were made to projects:

We held the event, we were able to provide free consultancies that people would send draft bids to us and we'd say 'I can see a way of developing this aspect of your project' and they'd say 'thank you very much'. ... It got to the point that by the time people were submitting their second stage bid, they were at the stage that they would have been in six or seven months into the project previously. When they'd had support to develop their project plans they were actually getting it sorted before they started. The kind of thing we used to have to do once people got the money, we didn't have to do anymore because they sorted it in their plans. So that developmental process while they were bidding had a huge impact, and it worked much better like that because at that point they were very flexible because they'd do anything to get their hands on the money. Whereas once people get the money they start suddenly being very conservative. (former NCT team leader)

As noted in the literature review, the Pew Grant Program in Course Redesign had a three stage bidding process addressing campus and institutional readiness for participation in the program (stage 1), course

readiness (stage 2) and project planning (stage 3). Stages 1 and 2 involved the completion of readiness checklists which included criteria seen as critical for determining the project's success. Workshops were offered to support applicants who had been successful in stage 2 to prepare their stage 3 proposals.

### Support for grantees during the project

Several of the UK and US granting schemes provide support to project grantees once they have been funded, in addition to simply monitoring the progress of the project. FIPSE allocates to each project a program officer who can provide help with project planning and evaluation as well as holding a required annual meeting with the project director.

In the UK, a National Co-ordination Team (NCT) was set up to provide support for FDTL and TLTP3 project grantees. The role of the team included soft monitoring of projects, advising grantees on aspects of project development including evaluation and dissemination, and development of links between separate projects. Project monitoring, linking and advisory activities became part of the Higher Education Academy in 2004. An interviewee from the Higher Education Academy noted:

The NCT more than anything else provided a massive added value component for the funding council's money.

### Programmatic approaches

Programmatic approaches situate particular projects within wider programs with particular aims, provide support to project teams as part of the program group and can take responsibility for program level dissemination activities during and after program completion. For example, The Pew Grant Program in Course Redesign <http://www.center.rpi.edu/PewGrant.html> was a three year program aimed at using technology to improve quality and reduce costs in large enrolment first year courses. The program had total funding of \$US 6 million over three years and from this funded projects resulting in 30 course redesigns. A pilot phase involving fewer institutions produced support resources and examples which were made available to applicants in later phases. The program also supported collaboration between participants throughout the life of the projects, through a range of processes including workshops and briefings as well as a resource website and email list. Lessons learned from the project are made available through the program website and publications (for example Twigg, 2003).

In the UK, JISC supports projects as part of its strategic development programmes. For example, within a broad program on e-learning, there are four program areas, including e-learning pedagogy and e-learning innovation. An earlier program included a focus on plagiarism and supported four projects on specific topics. A JISC representative described the ongoing support for projects involved in programs as follows:

I'm afraid we don't fund projects. We fund people to participate in our programs by doing projects. So when somebody gets funding to do a project they are now a part of the program. ... What that institution now has to do is participate in a program ... We run workshops. We run program meetings. We run consultation activities and they're just expected to sign up. For a program meeting I offer them two places and I expect them to fill them. Some come and ask for more, some make excuses and only send one, but I think usually you need two people because there's a certain element of what we're doing which is really about program management, project management type things - that's looking at the dissemination, evaluation type things that are going on. Then there's other aspects which are usually technical or have a particular specialist function that are going on so you need at least two people for the project to actually participate in what we're doing to look at it from those two viewpoints

## INTEGRATION OF A FUNDING SCHEME WITH OTHER TEACHING AND LEARNING DEVELOPMENT AND SUPPORT INITIATIVES

The recently formed Higher Education Academy (HEA) in the UK exemplifies the integration of activities aimed at improving the student learning experience in higher education. It integrates the FDTL with advisors, Subject Centres which facilitate disciplinary dissemination and adoption, thematic areas which facilitate cross-disciplinary work, teaching fellowships, accreditation, support for research and evaluation and a resource database. The Academy marked a bringing together of a series of previous initiatives, including the Teaching Quality Enhancement Fund (TQEF), the Learning and Teaching Support Network

(LTSN) and the Institute for Learning and Teaching. The following section focuses on the TQEF, and a later section focuses on the LTSN subject centres.

The Teaching Quality Enhancement Fund was created in the UK following the Dearing report (1997) and a review of the FDTL after its first two phases. It integrated the funding scheme with institutional and individual schemes aimed at improving teaching and learning. The phrase 'joined-up thinking' was mentioned by a number of UK interviewees in relation to these developments. The three major strands of the TQEF focused on different aspects of the higher education system related to innovation and improvement in teaching and learning.

- At the institutional level, the Institutional teaching and learning strategies strand focused on the delivery of strategies designed to improve teaching and learning including support systems for teaching and teaching innovation.
- At the discipline level, which includes cross-disciplinary work, the Fund for Development of Teaching and Learning, supported development projects. This strand in particular linked to the Learning and Teaching Support Network (HEFCE 1999/20) (now the Higher Education Academy Subject Centres) which plays an important role in supporting dissemination, brokering, networking and information provision within discipline (subject) areas.
- At the individual level, the National Teaching Fellows Scheme rewarded good teachers and enabled them to undertake a personal teaching development project.

A National Co-ordination Team, funded by the TQEF, supported these activities and provided links between these different strands through a range of activities.

The aim of the Institutional Learning and Teaching strategy program was to make it possible to achieve change in institutions by creating appropriate mechanisms for the development and sharing of good practices and innovations across disciplines and by removing infrastructure blocks (Gibbs, 2004). It was expected that all institutions would have learning and teaching strategies in place, and funding was aimed at implementation activities, including 'extending existing activity or generating new activities, and to encourage other institutional resources to be directed at delivering institutional learning and teaching strategies' (HEFCE 1999/48, Section B). Institutions were also encouraged to link their strategies to their corporate plans and to national priorities.

To support institutions, the NCT produced a series of good practice guides for Institutional L&T strategies and ran regional workshops for senior managers, all workshops being scheduled three to four months prior to the submission date for funding applications. Funding was available to all English Higher Education institutions provided they submitted an appropriate application, with indicative funding shown in the original program document (HEFCE 99/48 Annex G). Six years on, many of the changes and activities initiated under the institutional scheme have been embedded in the institutions, with examples being departmental teaching and learning co-ordinator positions, teaching fellowships (mirroring the national scheme), teaching innovation or development grants and mechanisms for sharing teaching ideas and practices. Many of the 'infrastructure blocks' which constrained innovation and dissemination have also been reduced.

The disciplinary strands acknowledged the importance of the disciplinary communities in the academic world. They sought to encourage development and sharing of teaching innovations and practices within disciplinary communities. The FDTL has been discussed above, and the LTSN will be discussed in detail further on in this report.

The National Teaching Fellows Scheme provides fellowships for excellent experienced teachers, 'rising stars' and excellent teachers in the area of learning support. To support the National Teaching Fellows scheme, the Higher Education Academy, and formerly the NCT, runs an induction workshop event which has the aims of enabling fellows to make links with others who have similar project interests and get started effectively on the projects. Activities during the event are also designed to assist fellows to make connections more broadly as many have connections with FDTL projects and/or Subject Centres in their disciplines and are undertaking projects on topics which cross disciplinary boundaries. The NTF scheme also fosters international linkages, for example it has built a link with the Carnegie foundation and

encourages fellows to put aside some of their award funding to participate in the Carnegie scholars symposium.

Aspects of the FDTL process and the Teaching Fellows Scheme have been adapted by institutions and incorporated into their learning and teaching strategies. An interviewee from the Higher Education Academy commented:

It's very interesting when processes and procedures are easily adaptable and can be emulated by institutions. So, say you've got something like national teaching fellowship scheme, it works brilliantly when that model can be picked up and adapted and used and in some cases used exactly the same in an institution in order to generate the kind of nominations and individuals that you would want to promote. Ditto I would say with projects. What we've seen actually through this research was that some of the most effective models for institutions have been almost directly scaled down from the national scheme you know the way in which say small project based initiatives are funded and assessed and the means that they use to ensure that they're implemented. (HEA interviewee)

An equivalent observation could be made about the impact of CAUT, CUTSD and AAUT activities in Australia. Following the introduction of these schemes, more institutions introduced teaching development grants and teaching awards than had previously been the case. The activities of the Carrick Institute may similarly have a flow-on effect within institutions.

## INFRASTRUCTURES WHICH SUPPORT DISSEMINATION AND ADOPTION OF INNOVATIONS

### UNISERVE SCIENCE

Uniserve Science was one of the original CAUT clearinghouses. It was originally part funded by CAUT and part funded by the University of Science. It has been continued through the goodwill and commitment of its directors, Associate Professor Mary Peat and Associate Professor Ian Johnston, and through funding support from the College of Sciences and Technology at the University of Sydney and self-funding activities.

The clearinghouses began at a time when the web was not strongly used. The initial Uniserve Science focus was national, and the team tried to develop contacts in each university around Australia and maintain communication with them via email and print-based materials. The initial pool of contacts was voluntary. They were sent flyers and newsletters to disseminate within departments. This happened to varying degrees, with some people being very active and responsive and others not appearing to distribute anything. There was a newsletter, but it was difficult to get people to write for it because it was not refereed. It has now been replaced by information on the web and at one stage also a repository for materials produced through CAUT projects. Developers sent materials in but nobody borrowed them. They also actively went out to people and collected their reports, made them available and told others about them.

Uniserve Science continues to serve aspects of its original brief, such as publicising materials on the web and making links between innovators and potential users. The website is updated and maintained. They see themselves as facilitating things happening between other people.

Nationally, Uniserve runs a two-day conference each year, which includes a first-year experience day. Themes for the conference are based on feedback from participants. Refereed, unrefereed and poster papers can be presented. The conference used to be more 'show and tell', but papers now need to be scholarly so that innovation papers need to be supported by literature and appropriate forms of evaluation. Refereed papers were introduced in response to the push for increased research in universities in general, but not all universities recognise them for the purpose of DEST reporting. The move towards more scholarly papers also means that the participants in the conference have changed, from people who only wanted to innovate and network to those who are more concerned with research

into teaching. The conference also provides facilities for groups, such as the AUTC Physics project team, to meet before or after the main event. The conference is designed to be financially self-supporting.

Uniserve Science now works extensively on curricula at the School level, in conjunction with DET. The work is supported by the university on the basis that better school science education will lead to better students coming into university science. They also give workshops for school teachers, for example on investigative teaching. Materials are also provided on the Uniserve website.

Internationally, Uniserve Science collaborates with the Physical Sciences and Biological Sciences Subject Centres in the UK and the Swedish Council for Renewal of Higher Education to produce CALLaborate, a set of articles which comes out twice each year. Staff from Uniserve also teach in a program at a university in Thailand.

The original level of funding, \$60,000 per year, was seen as too low to support the range of activities. It paid for educational technology support but did not allow for admin support, which has been provided by the directors. Directors have always worked in a voluntary capacity and have done a considerable amount of work to raise funding to keep Uniserve Science going. There is perceived to be inadequate funding to allow for higher levels of proactive work, such as travelling to give workshops or going to more conferences to promote collaboration.

Interviewees who participated in the activities of Uniserve Science were supportive and perceived that it met a need for networking and exchange of ideas between members of the Science community with an interest in teaching and learning innovation and research. The website was used as a source of ideas for teaching. One interviewee commented that there was a tendency for the conference to be 'preaching to the converted' but more outreach work into departments was seen as not practical with the resources available. The continuing existence, level of activity and benefits of Uniserve Science were seen as due to the commitment and enthusiasm of the directors.

The work of Uniserve Science is seen as having been responsive to the science communities rather than directed from the top. The directors perceived that there could have been more support, direction or recognition from CAUT. Essentially the clearinghouses had been seen as a three year pilot that then ceased. Initially there were planned to be meetings between representatives from the different clearinghouses but there was perceived to be too little money for this to happen on a regular basis. Of the original five clearinghouses, only Uniserve Science survives. Lack of clarity of expectations, lack of centralised infrastructure for the clearinghouses before they were set up and underfunding are likely to have contributed to this outcome.

## THE HIGHER EDUCATION ACADEMY SUBJECT NETWORK

The HEA Subject Network has been focused on in particular for this report as it was described, both by staff and executives of the HEA and a number of other UK interviewees, as an important agent for dissemination and take-up of teaching ideas and innovations within the disciplines. Three of the four UK projects that we profiled as case studies had links to the relevant Subject Centre. The fourth, EFFECTS, did not focus on specific disciplines and much of its work took place before the network was formed. While the scale and funding of the Network is not within the scope of the Australian higher education sector, there are some lessons which can be learned, particularly concerning ongoing support for the dissemination of funded projects and alternatives to traditional clearinghouse models.

The HEA Subject Network consists of 24 Subject Centres (SC) located in universities across the UK. The network commenced in 2000 under the name Learning and Teaching Support Network (LTSN) with the SCs, a generic centre and a central executive, but was built on previous centres which had supported the use of C&ITs in teaching. The original invitation to bid document was sponsored by all four UK funding agencies and described the purpose of the LTSN as follows:

The purpose of the LTSN is to promote high quality learning and teaching in all subject disciplines. It will support the sharing of innovation and good practices in learning and teaching, including the use, where appropriate, of communications and information technology (C&IT). (HEFCE, 1999)

[http://www.hefce.ac.uk/pubs/hefce/1999/99\\_20.htm](http://www.hefce.ac.uk/pubs/hefce/1999/99_20.htm)

An external evaluation in 2002 recommended continued funding of the LTSN (Department of Educational Research, Lancaster University, 2002). A further external evaluation, conducted in 2004 (CSET, Lancaster University & IET, Open University, 2004), strongly commended the LTSN, noting that:

The LTSN punches above its weight in terms of the resources available for direction, management and activities. In this sense, it can be seen as excellent value for money (p. 6)

The HEA assumed responsibility for the network and Subject Centres in July 2004 and commissioned a review focusing on their future roles, funding, network structure, monitoring and evaluation and relationships inside and outside the Academy (HEA, 2005a). The review recommended that SCs should continue to be part of the Academy with continued funding until 2010. The network is highly regarded within the Academy:

They've had a big impact at different levels now and have a lot of positive reports from so many different people. It's been very impressive. (HEA interviewee)

## Roles and activities of Subject Centres

The roles of SCs are focused strongly on networking, collaboration, brokering and sharing of good practice. SCs are encouraged to be responsive to the needs of their disciplinary communities, but within a common framework of functions and activities. The roles have become more clearly defined since the commencement of the network, reflecting the evaluations and the collective experiences of the network to date.

An early 2005 invitation to tender for a new centre (Higher Education Academy, 2005 [http://www.heacademy.ac.uk/news/news\\_2208.htm](http://www.heacademy.ac.uk/news/news_2208.htm)) lists 24 sets of activities under the general headings of:

- Information and advice resource, which includes collecting, reviewing, maintaining and distributing information on good teaching practices, issues and resources, maintaining a website and linking to other resource databases;
- profile and awareness, which includes communicating and promoting the SC's activities to the relevant disciplines and to universities and the higher education sector more widely;
- engagement with the discipline, which includes networking, creating two way communication links within and outside the discipline and engaging in regular face to face activities;
- brokerage/collaboration/leadership, which includes developing effective relationships with other elements of the higher education system, such as the recently formed centres for excellence in teaching and learning, and assisting and brokering expertise to assist disciplines to engage with pedagogic research and current issues.

In engaging with the disciplines, SCs are expected to build networks which include Heads of Department and others with formal responsibility for teaching and learning, along with institutional staff such as academic developers and learning technologists.

Individual subject centres have developed patterns of activities which are seen as appropriate for their particular discipline communities, although there is considerable commonality. The evaluation of the LTSN (CSET, Lancaster University & IET, Open University, 2004) reports on five case studies which were chosen to focus on the trajectories of typical clusters of activity used by the Subject Centres. Each cluster was seen as embedding a particular underlying change strategy and was exemplified by the work of a particular centre. All activity clusters have a focus on enabling dissemination and take-up of good practices and ideas.

The clusters and implicit change strategies were:

1. events and workshops, embedding a change strategy focused on the need for professional development of staff;
2. development projects, embedding a change strategy based on the idea of developing and sharing knowledge of practice through discipline-based pedagogic research;



3. web-based support, embedding a change strategy based on access to information to make the 'daily working practices of academics more effective and efficient' (p. 49);
4. network development, embedding a change strategy based on networking, 'active initiation and direct engagement' (p. 55);
5. publications, embedding a change strategy based on communication and dissemination in particular discourse communities.

All subject centres run events and workshops, adding up to a very large number across the network. The 2004 *Subject Centres Prospectus* (LTSN, 2004) lists 308 workshops, 44 conferences and 165 other events run in 2002-3, with 13,500 attendees. A further 2000 attendees were involved in 159 departmental events. In the evaluation report, the event activity cluster was illustrated by the case of the Geography, Earth and Environmental Sciences SC (GEES). Key activities include three-day workshops for new lecturers in the disciplines, workshops which are offered to Departments and an annual conference. The GEES Departmental workshops focus on both disciplinary needs and central policy issues, are tailored to the particular Department and run on site to encourage participation.

In addition to running their own annual conferences, SCs also link to events run by related organisations such as professional associations. One of our interviewees commented that the numbers of conferences and other events had grown substantially and that as an alternative:

We would always tell people to use the subject centre and use existing networks as well. ... What we've done at the subject centre is tried to sort of piggy back on the events of other organisations and get a slot or get a strand or whichever and make sure that we're there but we're not turning people away from what they would otherwise be doing. (SC staff member)

Most SCs also have a scheme for funding small development projects. The 2004 *Subject Centres Prospectus* (LTSN, 2004) noted that 288 were funded across the network in the previous year. This strategy was illustrated in the evaluation report by the work of the Physical Sciences SC, which offered individual and collaborative small grants. Grantees must make the project outcomes freely available to the SC which disseminates them in ways that it sees as appropriate. Other SCs place similar conditions on their schemes. One of our interviewees commented:

There's not very much that we set down in stone but the one thing that we do set down in stone is that anything you provide must be made available through us to everybody else. And we deliberately choose projects where that's more likely to happen. That's one of the main criteria we have. We tend not to fund things that are institution specific. (SC staff member)

Some SCs focus on funding projects aimed explicitly at wider sharing and use of good practices and innovations, as in this example from the Psychology SC:

Projects should typically aim to bring into wider use exemplary or innovative techniques, methods or materials already developed for local use within departments. However, some 'pump-priming' funding might be available for new projects. The maximum funding for any one project will normally be £5,000.

A challenge for development projects, mentioned by two of our interviewees is ensuring that they are scholarly and make use of research which is already well known in the higher education community, while also being recognisable and relevant to the disciplinary community. Another of our interviewees talked about how they now handle this in their subject centre:

Last year we received 26 applications for our mini projects and we only funded five. We could have funded more, but it was felt that only five were of high enough quality. And sometimes people submit something to us ... thinking that they're doing something special and in fact other people have been doing it for years but you don't want to put down that, that sort of enthusiasm. ... One of the things we do with the teaching awards anyway and also the mini projects is try and give them good feedback as to why we've not funded them, try and make some suggestions of how they might resubmit the bid. (SC staff member)

All Subject Centres have websites which describe their activities. The design and content of the sites vary considerably across SCs, but major site sections typically focus on activities such as Events, Publications, Resources, Projects and Contacts. The web-based support strategy was illustrated using the Economics SC, which provides a wide range of resources, including a teaching handbook, good practice showcase, assessment banks, peer-reviewed journal, guides to textbooks and software and links to other resource sites. Web resources were seen as integrated with other aspects of the SC's activities. Other SCs include

different forms of web activity, for example Information and Computer Sciences has a link for Learning Objects and a message board with Frequently Asked Questions.

All SCs also maintain networks of contacts with academics in departments. In the evaluation report, this activity cluster was illustrated by the Hospitality, Leisure, Sport and Tourism SC, which had created a set of networks including institutional partners, discipline liaison officers and departmental contacts. Institutional partner representatives and liaison officers are formally contracted to the SC and funded for proportions of their time in order to engage in agreed activities, largely based around two-way communication and information sharing. The former director of the LTSN, now part of the HEA executive, noted that clear contracts which defined the roles and expectations were the key to the success of these types of roles. Other SCs have developed similar, but less extensive arrangements.

In addition to these formal arrangements, SCs also play brokerage and collaborative roles and maintain contacts with disciplinary or professional associations and other bodies relevant to their subject areas. The prospectus (LTSN, 2004) notes 200 collaborative activities with subject associations and professional bodies, 251 links with external projects and over 350 special interest, working and network groups operating over the previous year.

All SCs produce publications of various kinds, including newsletters, journals and briefing papers. This strategy was illustrated in the evaluation report by the English SC, which produces newsletters, a bulletin, a report series and has recently commenced a 'Teaching the New English' book series. Staff from the SCs we visited noted that, despite electronic communications, printed publications were still seen as important for raising awareness and getting things into academics' hands. The SC for Engineering noted that a publication on theories of teaching and learning had proved unexpectedly popular with Engineering academics.

In addition to these activities, subject centres also have the responsibility of linking with and facilitating the dissemination activities of FDTL projects in their subject area. They may also advise members of their disciplinary communities on applications for central funding, as one of our interviewees noted:

We were involved in (FDTL) phase 5 and we did offer quite a pro-active support service for people who were bidding. We ran two events for people that wanted to bid and we looked at individual bids and advised them on specifically on the dissemination part but equally just to have somebody else looking over what they were planning in the context of the bigger picture which is quite often what people when they're bidding don't have ... that bigger picture of everything else that's been done at the same time. So that's what we can provide and we did do it and it worked. I mean we got seven projects funded in FDTL 5. (Subject centre staff member)

This approach is perceived to lead to improved dissemination activities and to better formulated applications for projects which are less likely to be replicating things that have already been done elsewhere. Successful projects, funded both by the SCs and the FDTL, are then linked into other SC activities. Staff from the SCs that we visited also emphasised that their roles included promoting the outcomes of projects, maintaining project information and/or resources in their databases and acting as brokers of project information after project funding had ceased.

## Impact of the Subject Centres

HEA interviewees and the external evaluations of the LTSN report that the network has had a considerable impact on dissemination within the disciplines and to some extent more widely. Both external evaluations involved questionnaire surveys to Heads of Departments and course leaders from departments across the range of disciplines, followed by intensive interview-based case studies of five SCs. The 2004 questionnaire revealed a very high level of awareness, with 85% of respondents having heard of the LTSN and 79% being aware that there was a Subject Centre for their discipline. These figures were similar in 2002. More than half of the 2004 respondents (59%, compared with 49% in 2002) reported that the Subject Centres had an impact on the work of the Department, with 39% reporting that the contribution was important or very important (CSET, Lancaster University & IET, Open University, 2004).

In analysing the activity cluster case studies, the evaluation report (2004) focuses in particular on dissemination and impact elements. For each cluster, the report distinguished impacts on: practice,

Figure 2: Stages of impact model used for the evaluation of the LTSN (CSET, Lancaster University & IET, Open University, 2004)

Description	Suggested indicators of impact of LTSN-sponsored innovations
Those who have engaged at any of levels 1-6 now spread the word within own HEI or subject community.	Clients have disseminated ideas derived from LTSN. On questioning they link this activity to some LTSN contact.
Those who have engaged at any of levels 1-5 now spread the word within own HEI or subject community.	Clients have disseminated ideas suggested by LTSN. On questioning they link this activity to some LTSN contact.
Evidence of limited adaptation/adoption of new practices. The adoption/adaptation enhances the original.	Clients have adapted and/or adopted ideas suggested by LTSN. On questioning clients trace this activity back to some LTSN contact.
As a result of an LTSN sponsored action, clients are considering the likely impact of taking up new practices; planning how to adopt/adapt; exploring difficulties.	Clients have taken up and perhaps appraised ideas (in the form of ideas from website, conferences, meetings, publications) and explored difficulties etc. On questioning they associate this activity with some LTSN contact.
Contact with LTSN through an activity or request for support.	Clients have had contact with the Generic Centre or other LTSN staff, colleagues associated with an LTSN activity, named LTSN contact.
Knowledge of LTSN role. Knowledge of LTSN activities.	Clients can describe the LTSN's role with some fidelity.
Recognition of LTSN.	Clients say that they have heard of the LTSN.

curriculum and policy; pedagogy, reflection and culture; wider orbits of influence; the student experience. Seven levels of impact were distinguished, as shown in Figure 2.

All five clusters of activities were reported to have encouraged evaluation and exploration of ideas in the area of practice, curriculum and policy, with some evidence of adoption and adaptation and dissemination at the departmental level. However, a distinction was drawn between engaged strategies which 'prioritise active initiation and direct engagement with the subject community' (p. 72-73) and passive strategies. The former, implicitly including events and networks and to some extent development projects, were seen as having stronger impacts on practice, curriculum and policy as well as impacts on pedagogy, reflection and culture, a greater likelihood of impacts at the institutional as well as departmental level and a greater likelihood that there was some evidence of impact on students' learning experiences. The importance of pro-active face to face contact and network building was emphasised in both of the SCs that we visited:

We try to go to different universities as well because you always get more academics from the host university inevitably than you do anywhere else and it's all part of making good links with departments and we do occasional departmental visits as well. Our academic advisor and other staff will go and meet with Head of Department or go to a staff meeting and just to promote the work of the Centre. And you know I think one of the things that we've learnt is that face to face contact is more valuable than anything really. So somebody going to actually meet people telling them what you do is far more effective. I mean we send newsletters out and all sorts of things but there's nothing like fact to face contact (Subject centre staff member)

The SC staff that we interviewed also strongly emphasised that they saw their activities as integrated and complementary, with more passive strategies such as web resources and publications complementing more proactive work:

I think to make it work, to get value for money from things you have to try and make them work in different ways. So for example the projects that we fund are a good example of that actually, if somebody's doing a project on a topic that relates to the publication ... we ask them to write something for that publication and equally if we were running an event on a particular theme and their topic relates to that we'll ask them to present the projects that we're doing. ... It's quite hard to differentiate the activities really because they are all joined up and we see them all as being a way of building the network rather than stand alone products if you like. (Subject centre staff member)

## Structure and management of the Subject Centre Network

The HEA subject centre network and earlier LTSN have a two level management structure. At the centre of the network is an executive with a co-ordinating, strategic and management role across all of the centres. In the first years of the LTSN, the executive took a strong role in educating SC directors and managers on strategic and operational planning with a focus on desired outcomes. All SCs were and are still required to produce a three year strategic plan and a detailed one year operating plan and budget. The process was more strongly centrally managed early on in the network and is now more 'light touch'. A strong effort was also put into building the SCs into a genuine network from the beginning, through regional senior management groups, cross-disciplinary working groups focused on particular policy issues and groups for SC staff with similar roles, such as web developers. Some additional money was also given to collaborative efforts. The HEA continues to run regular development events for SC directors and managers, with an increasing focus on cross-disciplinary dissemination and collaboration.

A senior HEA executive with responsibility for the SCs emphasised the need to be clear about the expectations of SCs. Experience over the past five years meant that a current tender for a new SC gave much more specific guidance on issues such as the nature and terms of reference for the advisory board, the necessary characteristics of the director, operational models, funding and management and monitoring (HEA, 2005b).

It was emphasised that there is a need to balance the autonomy and responsiveness of SCs with some common features and clear systems to facilitate efficiency across the network. As the current SCs were based on earlier centres, it has taken some time to develop common systems across the network. For example, there is still a working group attempting to achieve inter-operability of the resource databases of different SCs. If an SC network or similar was to be set up from scratch, it was strongly recommended that common systems across centres should include strategic planning frameworks, evaluation systems, common terms of reference for advisory boards and interoperability of the resource databases. At the same time, SCs were seen to work best when given autonomy in their activities, including the ways they engaged with their disciplinary communities and the appearance and features of their websites.

Subject Centres vary in their structural arrangements, with some physically located at one university site and others over two or more partner sites. We were advised that one successful model is where a SC has a core location and a number of experienced commissioned or part-time academics at other sites with clearly defined and contracted roles and expectations.

Leadership, good management and staffing are important in the success of SCs, to the extent that the overall number of SCs was strongly influenced by the need for each SC to have a critical mass of staff in order to maintain its activities. A typical SC has a core team of 5 full-time equivalent staff. The reputation and seniority of the director are seen as critical, so directors usually have a part-time role with the SC as well as a senior academic role, such as Dean or Associate Dean Teaching and Learning or equivalent, in one of the SC's discipline areas in the host university. In many cases there are Associate or Deputy Directors, often from disciplines or partner universities which differ from those of the Director. Other staff usually include a full-time centre manager, an administrative assistant or secretary and a fractional or full-time person with responsibility for IT and the website. In addition, many SCs have academic discipline liaison officers and some have one or more discipline-focused educational developers. In addition, many SCs have research, policy or project development staff who work on both core activities and externally funded projects.

All SCs have advisory boards, which typically comprise members of the disciplinary communities covered by the SC and members of related professional bodies. The current tender (HEA, 2005b) notes that boards should have an independent chair and also include representation from students and cognate SCs.

## Funding

An overall budget of £5.2 million per year was allocated to support the 24 Subject Centres for the first three years from 2000, with a further £1 million per year to support a Generic Centre and a program director and co-ordinator. Two sizes of subject centres were defined, according to the number of institutions teaching students in the particular discipline. Standard Centres, of which there were 10, were allocated a maximum of £180,000 per year each. Large Centres (14) received a maximum of £240,000 per year each. The level of funding has grown as the range of activities and expectations of the network has expanded, although the functions of the former Generic Centre have now been folded into the overall work of the HEA. Currently the SCs have core funding of £360,000-£400,00 each to fund their range of activities. In addition, many obtain additional funding from projects and from other organisations which recognise their value in reaching academics.

Continuity of funding is also seen as important, particularly for developing and maintaining staff capability. The current assurance of five years future funding is seen as enabling more certainty in activity planning than the early two year commitments.

## Implications of the Subject Centre Network model for the Australian context.

HEA executive staff strongly commended the Subject Centre Network as a model for other countries looking to improve the dissemination and use of good practices and innovations aimed at improving teaching and learning:

I think the subject centre model is directly applicable to other countries I can't see any reason why it wouldn't work as long it works in an environment where academics are academics and they're interested in scholarship and research and all the other things that academics are interested in. They'd have to be encouraged to become fascinated in applying some of those ideas in a scholarly way to improving teaching and learning. But they are prepared to do it if they're supported and encouraged and given the right kind of reward for it. I can't see that that model wouldn't work elsewhere, including Australia. (HEA executive)

The Subject Centres were also widely seen as an enviable model by Australian interviewees who had contact with them and/or used their resources. There appear to be two broad implications for the Australian system: whether it is possible to adapt aspects of the model to the local context; and how it might be possible to develop linkages with the existing UK network in ways which might generate benefits on both sides. On the latter point, HEA staff expressed a strong interest in developing their international links.

While there is an obvious disparity in funding, and differences in higher education policy and contexts and teaching innovation history between the UK and Australia, not to mention country geographies, elements of the Subject Centre model appear particularly valuable for encouraging dissemination and take-up of teaching innovations. The integration of engaged approaches, such as networks of departmental contacts, events which are held in different regional areas and active brokering of information within and outside disciplinary communities, with more passive approaches such as websites and resources is likely to be considerably more successful than passive approaches on their own. This integration goes well beyond the notion of a clearinghouse. Creative consideration should be given as to how this integrated approach could be made possible.

The discipline-based nature of the SCs is perceived to have enabled them to be responsive to their communities and develop approaches consistent with their disciplinary cultures. However the initial number of SCs in the UK was based on a balance between disciplinarity and funding availability. It may be possible for the model to work with considerably fewer SCs covering a wider range of disciplines in the Australian environment as there are far fewer institutions than in the UK.

## SUMMARY

General features of the context outside the university which facilitated aspects of dissemination and adoption, from the developers' and/or adopters' perspectives were:

- alignment of projects with national strategic priorities or initiatives;
- alignment of projects with common institutional or disciplinary needs, for example those identified in quality assurance and audit findings or reviews of disciplines;
- well managed collaborative arrangements or consortia between universities.

Wider project dissemination, adoption and implementation is encouraged by granting schemes which:

- involve staged bidding for funds, with support for applicants between stages, to ensure that funded applications meet specified dissemination requirements;
- give clear descriptions of what will be funded and provide funding for both the creation of innovations and the adaptation and implementation of existing innovations in new contexts, including new institutional settings or new discipline areas;
- expect grantees to consider and involve potential users from the early stages of project development;
- require grantees to engage in multiple forms of dissemination and/or collaboration activities with potential users and in particular to go beyond one way dissemination;
- require grantees to devote an adequate proportion of the budget to these activities;
- provide budgets and timeframes which are adequate to enable effective evaluation, consultative dissemination and/or collaboration within the project;
- provide support for grantees, which may include professional development for project team members, individual advice and 'soft monitoring' of projects during development;
- take programmatic approaches which link projects under common themes and provide common support activities;
- encourage or require linkages to other organisations, such as the Subject Centres, which can support dissemination initiatives, including those which happen after project completion.

Profiles of Uniserve Science and the Higher Education Academy Subject Centres point to the importance of providing infrastructures which can support the dissemination, adoption and adaptation of project outcomes. A range of lessons can be learned from the Subject Centre model. These include:

- the value of an approach which integrates engaged forms of support, such as events and network development, with more passive forms of support such as those offered by web-based repositories. Roles and activities of the Subject Centres which support the dissemination and adoption of innovations include:
- collecting, reviewing, maintaining and distributing information on good teaching practices, issues, resources and projects through a range of approaches including websites, links to other resource databases and printed publications;
- funding small development projects, supporting applicants in developing bids for larger granting schemes and, in some cases, housing the development of funded projects;
- active networking and creation of two way communication links within and outside the discipline. Networking includes liaising with Heads of Department, Faculty teaching leaders and nominated departmental contacts within institutions as well as with professional and disciplinary organisations;
- regular face-to-face activities such as workshops, conferences and other events;
- brokerage, collaboration and leadership, which includes developing effective relationships with other elements of the higher education system, and brokering expertise to assist disciplines to engage with pedagogic research and current issues.

- clear and common expectations, management structures and systems, evaluation and reporting procedures and technical standards for websites and databases need to be defined prior to the commencement of any network involving one or more centres;
- discipline-based centres need to have sufficient autonomy to respond to their communities while operating within a common framework;
- funding needs to be adequate to provide sufficient staff and resources to support an integrated set of activities;
- leadership is crucial. Directors of centres need to have the reputations and seniority necessary to ensure centre credibility and network with institutional, departmental and external leaders.

Serious consideration should be given to:

- whether it is possible to adapt aspects of the Subject Centre model to the Australian context;
- ways in which it might be possible for the Carrick Institute to develop linkages with the existing UK Subject Centre network in ways which might generate benefits on both sides.





## 6. FURTHER ISSUES AND RECOMMENDATIONS

This project aimed to illuminate the ways in which innovations in teaching and learning are disseminated, adopted, adapted and implemented and then sustained in new contexts in higher education. It sought to do so by examining the issues of dissemination and adoption through the perspectives of developers, adopters, academic developers and representatives of agencies which fund or support dissemination and adoption.

### ISSUES RAISED ABOUT DISSEMINATION

The investigations reported here have raised number important issues about dissemination which we believe need to be considered in relation to making decisions on strategies for encouraging dissemination and take-up of innovations. These issues are:

- What does dissemination mean?
- What can or should be disseminated from projects and how can these aspects be disseminated?
- What forms of consultation and collaboration facilitate adoption, adaptation, implementation and embedding during and after project completion?
- How can intellectual property be effectively managed to the benefit of developers, adopters and adapters?
- How can dissemination, adoption, adaptation, implementation and embedding of innovations be more effectively valued?

These issues will be discussed before moving on to consider recommendations arising from these issues and the previous chapters.

### WHAT IS MEANT BY DISSEMINATION?

A range of different meanings of dissemination were described by interviewees in this study, are present in the literature and are evidenced in the activities described by project applicants and grantees under the heading of dissemination. This section describes this range of meanings, based on these sources, highlights the key differences between them and outlines their potential consequences for funding agencies seeking to maximise the impact of project funding.

#### Understandings of dissemination described by the interviewees

From the interview data for this project, we identified three broad sets of understandings, reflecting different focuses on the nature, timing and purposes of dissemination.

##### Dissemination as distributing project products or information

The first set of understandings focused on dissemination as a one-way process in the project developers provided information about the project or distributed project resources. Dissemination was typically seen as something which happened after the project was completed, and was an end in itself. It was successful once project information or products had been made available or distributed. For example, one interviewee commented:

the main aspect of dissemination of the project ... was to have a website where the products of the project could be disseminated.

Another interviewee (an adopter of a project) described dissemination as getting project products 'off the shelves'.

This understanding of dissemination is implied in project proposals in which applicants describe their intended dissemination strategies as creating a project website and creating publications with no specific reference to the intended recipients of these forms of dissemination or their intended outcomes. As one interviewee noted

Good teachers are expert at dissemination in the classroom but not telling people broadly. Experts in the field write papers that three people read. Traditionally academics aren't worried about dissemination, rather than that the paper is out and three other people know about it. (project adopter)

### Dissemination as a means to the end of particular outcomes

A second set of understandings focused on desired outcomes. Dissemination was seen as a means to an end. Within this set were three understandings which were distinguished according to the breadth of the intended outcome of dissemination. The first saw on the desired end being that other people would use the outcomes of the project.

It's about being used more than being available. Being available is not being disseminated. If people have just got it but aren't using it then it's not being disseminated. (project developer)

The second described the desired outcomes as the spreading and embedding the impact of projects or activities:

The word dissemination is a bit unfortunate in that it implies passivity, being thrown about like seeds. But obviously the measure of success is going to be how many of these seeds grow and flower. So realistically dissemination has to be more active than that, and depending on your circumstances, more focused and funded. Then you're really talking about embedding in the sense of making more widespread the impact. Embedding has two elements - one is that it spreads out its effect, the other is that it becomes more permanently lodged where it is. (project partner)

The third view described the desired outcome in relation to broad ranging change in universities. One interviewee spoke of dissemination in terms of seeking to maximise the impact of a particular project on change in universities:

It's the wrong word really. What we're talking about is revolution. ... It was about how are we going to change things. Dissemination isn't a very helpful label for that. There was an implicit agenda of change. ... How were we going to change our universities? How can we maximise our impact? (project partner)

### Dissemination as an ongoing two-way process

A third set of understandings saw dissemination as involving an ongoing consultation which is an inherent part of project development. The focus of this understanding is on the processes which are seen as necessary to engage people with the project. One intended outcome is that they will assume some ownership of the project as it develops so that use becomes more likely. One project developer described a need to have something to present as part of a consultation, but emphasised that consultation should happen from early in the project, not just when a final product was available:

Dissemination is part of the process. It's not the end point. ... Its an ongoing process of consultation and you do need a paper, you need a product that you can take out and present to people and get their opinion of, but I think ... If you spend two and a half years developing something that you think is great and six months disseminating it, A, it won't be great, and B, no one will be interested because what you're not involving them. Spend six months putting your framework together and even if you think 'this is dodgy' you'll know that its dodgy much more than the people you're talking to or they will see what's wrong with it in ways you could never imagine and then the next six months will be that much more productive. (project developer)

With this view, activities such as conference presentations are seen as opportunities to seek feedback on the project as it developed and to make contact with people who might be interested in further involvement.

A former member of the NCT emphasised the need to begin consulting, or collaborating with others even before a project started:

When I was going around talking to people but dissemination and what it was about I would say 'What you have to do is link up with all the people who might potentially get anything out of this very early on and understand their world, where they're coming from. You'll probably discover that half a dozen of them have already got solutions that are better than yours before you've even started. ... But the main thing is that you'll understand that their context is different and also their problems are different from yours. The most useful outcome from your project isn't a thing, but a variety of kinds of things that fit different situations in different ways that match to context, so that people can see what it would look like ... Your understanding of how that will work will develop over time provided you keep working with these people.

There were multiple aims to this, such as ensuring that there was a need for a project, that the developers understood how the project outcomes could be able to be used in different ways in different contexts and that potential users also understood how they could adapt and use aspects of the project outcomes in their contexts to change and improve teaching and learning.

As can be seen from the quotes, it was very typical for interviewees who described dissemination in more ongoing process or outcomes-focused ways to contrast this with more passive views of dissemination as making project information or products available. The word 'dissemination' was seen by a number of interviewees as the wrong term for describing processes intended to bring about outcomes involving educational change.

### The significance of variation in understandings of dissemination

Different understandings of dissemination are likely to relate to different approaches that project grantees take when attempting to 'disseminate' their projects. This inference would be consistent with findings from research on teaching and learning, showing connections between teachers' understandings of their subject matter and how they go about teaching it (Martin, Prosser, Trigwell, Ramsden, and Benjamin, 2000), teachers' conceptions of teaching and their approaches (Prosser and Trigwell, 1999) and students' conceptions of learning and learning approaches (Van Rossum and Schenk, 1984).

The connection between understandings and approaches was also evident in our study of successful projects. Almost none of the case study project developers that we interviewed expressed understandings of dissemination which were limited to one-way provision of information or product distribution. They made use of strategies such as journal articles or websites and saw these as important, but these were not the limit of their dissemination activities and were not seen as the primary dissemination strategy for raising awareness and developing ownership in the potential user community. The range of activities that they engaged in reflected broader understandings of dissemination and typically included interactive workshops, going out to where potential users were and interacting with them and involving users in collaborative and evaluative work from the beginning of the project.

The difficulty with one-way passive dissemination strategies is that they appear to be less likely than more engaged, interactive strategies to result in awareness of the project, let alone adoption and implementation of aspects of the project. Almost all of the project adopter/implementers interviewed for this project said that they had found out about the adopted project through some form of personal contact, such as being told about it by a colleague, participating in a workshop or hearing about it at a conference and then following it up.

When asked how they would typically look for and find out about teaching innovations or ideas that they used in their teaching, the few who spontaneously mentioned websites mentioned those of the UK Subject Centres and the AUTC Assessment, Teaching large classes and Learning Designs projects, which they had heard about from other sources such as workshops or presentations. This observation echoes the findings of the review of FIPSE projects in the US.

Interestingly, very few of the replicating respondents learned of the project initially from published materials or Web sites, despite how commonly projects used these venues to share ideas. Two people mentioned learning about the project from publications; however, each case was atypical. One person received a project's materials after complaining to a textbook sales representative about textbook quality. Another person learned of a project by reviewing an article prior to its publication. Only one person learned of a project after discovering the Web site during an Internet search. (Berger and Kirshstein, 2004, p.36)

As was discussed in relation to the case studies in chapter 3 and the characteristics of granting schemes in chapter 4, funding agencies appear to be able to influence the ways in which applicants view dissemination in relation to their projects. Criteria which request that applicants consider 'how will you disseminate the project outcomes?' appear to encourage a view of dissemination as a one-way distribution activity which occurs after the project is finished and final 'outcomes' are available. This view was seen as one which was often difficult to overcome, but was critical to address before rather than after funding was given. A former NCT leader from the UK recounted an instance of what can happen when it is not addressed up front:

There was a project at [university x] in the first round and we'd spent about 18 months trying to get them to understand what the initiative was for. That it was about dissemination. And eventually this guy said 'you mean we're supposed to be helping other people to get better', and I said 'yes, that's right' and he said 'why would we want to do that?' And he was in the research, competitive research, keep it to yourself launch on an astonished world at the end tradition. That kind of stuff.

When funding agencies require and support users to develop ongoing process and outcomes focused dissemination and engagement approaches, broader adoption and implementation are more likely to happen. As an interviewee from the Higher Education Academy noted:

Essentially if I could pick one success factor for towards implementation of project based work in HE it would be the integration or amalgamation of dissemination work and development work whereby you have an inclusive, genuinely inclusive, genuinely collaborative development process where stakeholders groups, if you don't mind me using that term, your colleagues are brought on board and are genuinely consulted. Not just told how it's going to be ... You need a project manager who listens and who is proactive but also responsive. And these people are brought on board as early as possible so that their issues are listened to ... have the opportunity to really engage in dialogue and discussion. It doesn't have to go on forever but where they become part of the development process, they do develop a very strong sense of ownership of not only the project materials and the project goals but of the project processes. And without that kind of participation it kind of becomes hollow effectively and we've seen many instances of that.

It is recommended that the Carrick Institute consider these differences in the meanings of dissemination in the design of their granting scheme criteria and design criteria which encourage ongoing process and outcomes-focused approaches to dissemination. They could, for example, require applicants to specify:

- the intended users of their project outcomes, and the range of outcomes which could be adopted and implemented by different groups of users;
- how they would enable each group of intended users to become aware of the relevant outcomes and learn how to make use of them effectively;
- how they would engage with intended users and obtain their feedback during project development;
- how they would evaluate the impact of their project outputs within the intended user communities during and following project development.

## WHAT ASPECTS OF PROJECTS CAN BE DISSEMINATED AND ADOPTED?

The case studies illustrated a range of aspects of projects which could be disseminated and taken up in different ways by different communities. These included:

- learning and teaching resources, such as the mathematics videos and [an@tomedia™](#), both of which were being used in different ways by different groups of users. While the products in themselves could not be adapted, they were designed in ways which enabled their use to be adapted to context;
- research outcomes, in the form of theoretical concepts or ideas, such as the concept of 'ways of thinking and practicing' developed in the ETL project, or the concept of a 'learning design';
- tools, such as the questionnaires developed in the ETL project;
- particular learning designs, such as online role-play simulations;
- case studies and exemplars of practice, noting that the production of these may be done by both developers and adopters;

- processes for implementing particular resources which might have wider implications, such as ways of implementing rapid which are relevant to personal development profiling systems in general, ways of designing questions to generate puzzlement in students, ways of using patient case histories to help students to experience theory from contexts, or ways of using video in mathematics classrooms;
- processes for designing and implementing particular kinds of learning activities, such as case studies in science;
- processes for investigating, implementing and evaluating changes to teaching and learning environments, such as those developed in ETL and EFFECTS;
- processes for developing, managing and evaluating projects and designing effective collaboration and dissemination approaches.

Developers of the case study projects typically described an explicit awareness of the nature of many of these different disseminable outcomes of projects, either through prior awareness which was built into the project design or through becoming aware and seeing opportunities during the course of the project. Some also appeared aware of different ways in which these aspects could be adopted and implemented by different users.

Project developers need to productively consider the different ways in which different types of project outcomes may be most appropriately disseminated, and the different communities which might be addressed by these activities. For example, research outcomes could be appropriately disseminated to other researchers through the recognised research channels of conference papers and publications. However, dissemination of research outcomes to practice communities may be most effective if mediated through discipline-based academics with research interests in teaching and learning, formal courses on teaching and learning, involvement in action research projects or through academic development staff working alongside academics in the disciplines.

In considering the most appropriate forms of dissemination for different kinds of outcomes, project developers need to consider that one-way approaches, such as websites, are useful as repositories but typically do not enable adopters to find out about or initially engage with project outcomes.

The Carrick Institute could also consider the forms of project outcome which might best be disseminated through a central agency or agencies, and the communities which might be addressed through particular dissemination activities. For example, information on processes for developing, managing and evaluating projects and designing effective collaboration and dissemination approaches could be effectively disseminated through building them in to funding guidelines, developing resource guides and facilitating professional development activities for grant applicants and project teams.

## CONSULTATION, COLLABORATION AND COMMUNITY BUILDING

Analysis of the case study projects and other interviews suggested that successful projects fell somewhere on a continuum which ranged from:

- project development with consultation and feedback from potential adopters at particular stages, followed by distribution of products;
- consultative development, in which potential adopters were involved in the piloting and evaluation of preliminary outcomes during development;
- consultative development in which potential adopters were involved in all stages from the conceptualising of the project products to their implementation;
- collaborative development followed by cascading;
- innovation development and evaluation at a single site followed by development and implementation of a support infrastructure for community building and an ongoing community of interest around the innovation.

The extent of consultation or collaboration and the timeframe over which project activities take place have significant impacts on the likelihood of successful dissemination and adoption.

The last category, which includes the Supplemental Instruction and National Center for Case Study Teaching in Science projects are examples where proven innovations were funded to achieve broader adoption and implementation. (In the case of SI, it is interesting to note that adopters have frequently received funding for implementation, either through their institutions or through granting schemes.) Both of these innovations have been developing over a very extended period of time which has enabled the development of extensive support systems and international communities of interest. Dissemination and adoption at these scales cannot be expected within short timeframes, particularly not the timeframes that funding agencies typically allocate for project completion or that might characterise typical evaluations of the impact of projects.

Experienced former leaders of the National Co-ordination team, HEA staff members and experienced academic developers emphasised that they warned project leaders against trying to be too ambitious in collaborative projects. The likelihood of success of collaborative projects was seen as strongly related to the purpose of the collaboration, the way that the collaboration is managed and the number of collaborators.

Several interviewees gave examples of ineffective collaborations which had been put together on paper but where the purpose of the collaboration and the ways in which partners would work together had not been defined. One experienced academic developer commented:

It's not mine, but I wish I came up the phrase 'Collaboration is temporary suppression of mutual loathing in pursuit of government funding.' All too often you do get projects that are put together in the understanding that you have to have a collaborator.

Clearly defined models of collaboration and requirements for clear and agreed expectations between collaborators can help to overcome this problem. It was noted that some funding schemes require collaborating partners to submit contractual agreements setting out the contributions of each partner.

One effective form of collaboration was the cascade model, such as that used by EFFECTS in which a smaller number of partners then each worked with one or two others. In this model, it was desirable for the initial partners to represent a range of different types of institutions in order to gain experience with a range of institutional implementation conditions. For example, in the Australian context, this might include a research-focused university, a university of technology and a regional university. Each type of university could then cascade to similar others or use the experiences of their partners to work with others which were geographically local. The cascade model was perceived to work best with no more than five initial partners, with fewer being desirable. A very experienced interviewee commented:

Usually if people talk to me at the planning stage I'd say 'Be less ambitious, be realistic about what's manageable here. It's cheap and easy to produce a book or a website. You can do that, but if you want change on the ground be realistic about just how much time it takes and what a limited number of partners you're actually going to be able to support. And plan to do it so you've got enough time for each of them and they've got enough time to work with you. Don't spread your money too thinly, otherwise it won't happen'. (former NCT leader, UK)

A second effective model involved a strong lead institution, perhaps with some forms of support from a second institution, with collaboration facilitated through managed processes of engagement and consultation. The RAPID project followed this model, involving collaborating institutions in trialing and evaluating a prototype of the system, building their feedback into the project design and implementation guidance, supporting them to engage in implementation and continuing to engage with them.

In commenting on this type of model, our experienced interviewee noted:

There's an assumption sometimes that projects that have a lot of collaborating partners, where all are equal partners in the project, are a good idea. ... even quarter of a million disappears very quickly when you've got 10 partners.

Whereas one successful model is where there's one central institution but the collaboration is very much managed. There's a lead institution, and there are others that are doing the learning and then the implementing later on rather than all being expected to simultaneously participate in a development. ... (former NCT leader, UK)

Like the cascade model, an advantage of this model was that the lead institution and the implementation partners had the opportunity to compare different contexts for implementation and learn about the forms of implementation which would work in these different contexts. This process develops the understandings necessary to create implementation guides, including exemplars and case studies relevant to different kinds of contexts.

Whether a project was to be consultative or collaborative, experienced developers and funding agency interviewees emphasised the need for consultation on projects to begin as early as possible, preferably in the bidding stage. The aim is to ensure that the proposed project will be of interest to people other than the initiator, that it actually does represent an innovation or good practice within the discipline or context for which it is intended and that the project design acknowledges the different contexts in which it may be adopted and implemented.

In relation to collaboration and consultation, the Carrick Institute may wish to consider:

- providing different categories of grants to reflect different models of consultation and collaboration, including individual grants, grants to lead institutions with a set of consultation partners and collaborative grants;
- providing guidelines and support for applicants in developing effective collaborations;
- requiring collaborative projects to provide documented evidence of the role and responsibilities of each partner in the collaboration.

## INTELLECTUAL PROPERTY

The case study projects represented a range of approaches to intellectual property issues. The developers of the successful projects were typically very clear about their approach to intellectual property and had considered the issues from relatively early on in the project. Differences in approaches typically related to the attitudes of the project developers, the nature of the project outputs, whether these were products or ideas, and the sources of funding involved. Particular differences were noted in:

- whether project 'products' were made freely available to all, freely available to some users or sold at subsidised or commercial rates;
- whether intellectual rights were assumed to be protected by academic conventions, protected by general copyright or similar statements or protected by more formal sales or licencing agreements between developers and users;
- the extent to which adaptation was explicitly permitted or prohibited in various ways, or was not mentioned in any copyright statements.

Interestingly, regardless of the approach, justifications typically included a desire for widespread dissemination and use of the project products or ideas.

At one end of the spectrum were projects which took an informal, academic approach, making materials available to all, with the assumption, often unstated, that their colleagues in the academic community would acknowledge the originators of resources according to traditional academic conventions. For example, the ELT project website gives a link to a materials page with the following commentary:

These are materials designed to support professional development in embedding learning technologies. These have been produced by institutions participating in the ELT award, in the spirit of building a shared understanding of practice. Staff and educational developers are welcome to re-use these materials in their own workshops or ELT programmes. (<http://www.elt.ac.uk>)

For a number of developers, this approach was seen as highly desirable as it was based on traditional academic values of knowledge sharing and acknowledgement of intellectual ownership, and was perceived to encourage good practices and programs to spread more widely across institutions. This approach was typically taken by projects in which the primary source(s) of funding were public and project 'products' took the form of documents or websites which provide sources of ideas, processes and resources.

Some interviewees, both developers and adopters, noted cases of projects where IP arrangements sought to balance free use and adaptability with protecting possible commercial potential. For example, the RAPID project uses a licencing system in which RAPID is distributed for free to HEIs covered by HEFCE and DENI, as required for two years under the FDTL. (Free licences had also been given to professional associations not covered by the FDTL, in order to encourage use.) The licence permits users to adapt the skills statements and criteria for skills achievement, but not the back-end programming of the system. The aims of this approach were to allow the system to be adapted for different disciplines and curricula, but to retain ownership of the core functionality for the project team so that future commercialisation was possible if desired.

At the more commercial end of the spectrum were projects where a product was sold to intending users with copyright protection. Some examples, like the Mathematics videos, could be described as semi-commercial in the sense that funding of the development allowed the product costs to be kept low. In the case of an@tomedia™, the developers sold individual copies and site licences for use of the product, putting the resulting profits back into further development. Prior to commencing any sales, the developers negotiated a clear legal agreement on intellectual property rights and royalty entitlements between themselves, their Department and their University. The university was seen as progressive in its approach to intellectual rights and as having the expert knowledge necessary to negotiate such arrangements.

As with those who took a free sharing approach, those who went down the commercial path were also concerned about making their products as widely used as possible, and perceived that commercialisation would enable them to gain the funding necessary to ensure the desired quality and completion of the product, when public funding was a small proportion of what was required.

While the case study projects had largely dealt successfully with intellectual property issues, for many interviewees the area was seen as contested and problematic. A number of issues were raised that create potential barriers to the dissemination and take up of project outcomes and are therefore likely to be of concern to funding bodies such as Carrick. The following section discusses these in no particular order.

- Some interviewees commented that their institutions were becoming increasingly competitive as the proportion of government funding declined and universities were expected to raise increasing amounts of revenue from external sources. In this environment, some institutions were perceived as being protective of resources or approaches which might give them a competitive advantage, particularly when institutional funds had been committed to their development.
- Some interviewees (not necessarily case study project developers) reported difficulties in gaining good advice on intellectual property, in particular copyright, in relation to teaching innovations. A few perceived that their university's resources or procedures appeared primarily focused on commercialisable research outcomes and appeared to be unsuitable or unavailable to those involved in teaching innovations, particularly where these were not for profit.
- Some interviewees noted a lack of clarity over ownership of IP between the original developer and the adapter in the cases of adapted resources or ideas which might have commercial potential, particularly when the adaptation had been significant.
- While developers of projects which had received public funding were generally clear about the expectations of their funding bodies, for example sharing within their own national higher education systems, sharing across international boundaries of non-commercialised products or activities was more problematic. Interest from adopters outside the country of origin may result in case-by-case sharing arrangements, but these were generally not seen as scalable. Free trade agreements may add to this complexity.
- Sharing across different educational sectors was also seen as problematic in some cases, particularly where a funding body restricted its funding to one particular sector.
- A number of interviewees referred to cases in which digital rights issues limited the ability of developers to make resources more widely available or to update them for new technologies. The fIRST project is unable to include online links to journal articles in its bibliography, despite requests from users, because the resources are accessible across institutions. The Mathematics video series cannot be converted easily to DVD, because this would require going back to the original actors and purchasing the rights to do so, a cost which was not affordable.



A number of different approaches have been taken to resolving IP issues in research and in other development and innovation fields and combinations of these could be considered in relation to teaching innovations.

In the case of publicly funded research, the ARC, NHMRC and AVCC, with other organisations, developed and support The *National Principles of IP Management for Publicly Funded Research* ([http://www.arc.gov.au/pdf/01\\_01.pdf](http://www.arc.gov.au/pdf/01_01.pdf)). These require each institution to develop a policy within these principles to assist researchers in managing IP in order to 'maximise the national benefits and returns from public investment in research' ([http://www.arc.gov.au/grant\\_programs/national\\_ip.htm](http://www.arc.gov.au/grant_programs/national_ip.htm)). The ARC does not share in the ownership of, or benefit from, any IP resulting from its grants. The Carrick Institute and Institutions could examine the extent to which these existing IP policies could apply to, or be adapted for, teaching innovations for which commercialisation might be the best method of ensuring widespread dissemination and use.

In the case of some teaching innovations, the main 'product' is a smaller-scale software or media resource or a website with resources which may or may not require adapting to be implementable across different contexts. In these cases, more appropriate models of IP acknowledgement might be found in the processes used by initiatives such as Open Source (<http://www.opensource.org>) and Creative Commons (<http://www.creativecommons.org>). Both OSI and Creative Commons are global community organisations which encourage free availability and sharing of resources with attribution to the originators.

Open Source Initiative (OSI) is a non-profit organisation which encourages software developers make the source code of their software available to others to use or adapt, in return for users sharing their adaptations with the Open Source community. The OSI website provides a range of model licences, including an Academic Free Licence which includes a requirement for attribution.

Creative Commons uses a similar model, focusing on online media including digital video, music, images and websites, including blogs. Its licences allow originators to specify the extent to which they will allow adaptation or commercial use of the original item. The website also acts as a searchable repository of resources available under Creative Commons licencing.

During the time of preparation of this report, there have been significant changes in the development of intellectual property regimes which are expressly designed to facilitate dissemination, sharing, and a new interpretation of intellectual property rights in content. Perhaps the best known internationally of these is Creative Commons, although an interesting innovation, AESharenet exists in the VET sector in Australia. Both are concerned, particularly in educational settings, to minimise or eliminate copyright blockages (including those generated simply by confusion), to the dissemination of content.

It is important to understand that the Creative Commons concept is firmly based on the notion of acknowledging intellectual property, but departs from existing copyright licensing concepts in expressly providing standards based conditions under which material is to be shared, attributed, re-used, and so on. Some universities in Australia are currently reviewing the possible application of such an approach to material generated by students and staff in learning and teaching contexts.

Importantly, DEST, through its Systemic Information Infrastructure process has been developing policy positions on improving open access to the outputs of publicly funded research, for which the same 'rights sharing' intellectual property framework could apply, and has also drafted policy statements on open access in the research context.<sup>11</sup>

In the case of innovations involving a process or idea, such as Role-Play simulations or EFFECTS/ELT, the normal processes of academic acknowledgement may be adequate, although developers may wish to include Creative Commons type licence statements for resources made available via the web.

Given the issues of IP and the diversity of approaches taken by the successful case study projects, it is recommended that both the Carrick Institute and individual institutions:

<sup>11</sup> The assistance of Tom Cochrane (QUT) in preparing these paragraphs is acknowledged.

- examine their approaches to intellectual property in relation to teaching developments and innovations to minimise the blockages that IP difficulties create for the widespread dissemination and uptake of teaching innovations;
- provide advice which enables potential grantees to consider appropriate options for IP management before seeking funding, including options which enable appropriate adaptation of their innovations to suit the needs of different contexts. For the Carrick Institute, advice could take the form of information briefing notes, such as those provided by the FDTL.

## VALUING, RECOGNITION AND REWARD FOR INNOVATION, ADAPTATION AND IMPLEMENTATION.

### Valuing of scholarly innovation compared with research

Lack of departmental support for teaching innovation, lack of time and lack of recognition and rewards were attributed by many interviewees to a common cause. There was a strong and widespread perception that research was more strongly valued than teaching and that this inhibited teaching improvement and innovation.

If career motivation is all in favour of research, you're beating your head against a brick wall no matter what else you do. ... if you're talking about the broad population of academics it's only the minority who are going to put any time into teaching innovation because it's just not in their interests. (UK interviewee)

There are more staff with enthusiasm to do something than will actually do something because they just feel so time restricted. ... It's a combination of feeling overloaded by teaching and partly the ever present demand to do research work for promotion. Most people are caught between those demands. (UK interviewee)

The same types of comments were widespread in both the Australian and UK contexts. They were made equally by interviewees from both older, research-focused institutions and newer universities. Although some respondents from both types of institutions noted that the culture was shifting to place greater value on teaching while still valuing research, others, particularly from some newer universities, felt that there was an ongoing shift towards increased valuing of research.

National assessment systems were seen as creating pressures to engage in more research and publication and reduce time spent on teaching. The RAE in the UK and the DEST Research quantum in Australia were perceived to discourage the participation of many academics in any teaching development and innovation that would take time away from research. In many cases, these systems, in particular the RAE, were not seen as valuing scholarly publications on teaching innovations.

There was a strong feeling by our interviewees that publications based on genuine scholarship in teaching should be valued to the same extent as publications based on disciplinary research. In addition, some interviewees felt that scholarly innovation products which have been extensively adopted and implemented by peers should be accorded legitimate status as peer reviewed academic outcomes.

### Valuing of innovation compared with adoption and adaptation

Even if teaching innovation was perceived to be valued, adoption of an innovation which had been developed elsewhere was not necessarily perceived the same way, even when it required substantial reinvention in the new context. The most common perception of the valuing of adaptation was:

There may well be credit for you in your institution having an FDTL project and being a leader and it may contribute for instance to your nomination for a national teaching fellowship. There's really not that much mileage for you in your institution to take somebody else's idea and implement that. Where's the credit in that? Unless the process is made a very easy one for you and typically isn't. (AD UK)

Less commonly, but more positively from the point of view of the dissemination and adoption of implementations was the following response to whether adaptation was valued:

This is the question of what's innovation. The way we use it is 'it's innovative in their department'. It might have been done in many other places but if it's never occurred in their department, at this university in this subject then we'd call that innovation. Otherwise we'd have none at all (laughs) (project partner).

Both the literature review and the interviewees indicated considerable ambiguity around the notions of innovation and adaptation. As discussed in the literature review, applicants typically make their own interpretations of what might be expected by funding bodies and write their applications accordingly. The Carrick Institute needs to take this on board, providing clear descriptions of how it interprets terms such as 'innovation' and 'adaptation' for the purposes of funding, and how it distinguishes between eligible and non-eligible applications

## SUMMARY

The project has raised a number of issues which are important in understanding and addressing dissemination and take-up of innovations and which, along with the other findings from the case studies, inform a range of recommendations

- Dissemination has a range of different meanings, as exemplified in the literature and the responses of our interviewees. Understandings of dissemination which focus on the use or impact of innovations or on the ongoing processes of engaging users are more likely to lead to take-up than understandings which focus only on the distribution of products or ideas;
- Each project may have a range of aspects which could be disseminated, from products to processes, tools or conceptual ideas;
- Different kinds of projects might lend themselves to different kinds of collaboration. Large scale collaboration might be less effective than collaboration involving fewer institutions at a greater level of depth;
- There are a number approaches to dealing with intellectual property, but for any given project the approach needs to be clear and to acknowledge academic contributions to the work;
- Scholarship of teaching outcomes need to be valued in institutions, and this should consider both publications and scholarly innovations in themselves;
- There are issues of defining innovation compared with adaptation and implementation or reinvention. It needs to be acknowledged that all of these may require support, including time and funding.

## RECOMMENDATIONS

The findings of the project lead to a large number of recommendations directed towards more effective dissemination, adoption, adaptation, implementation and embedding of project outcomes. In the following sections, recommendations are directed towards the Carrick Institute, Institutions, Discipline groups and Project developers.

### FOR THE CARRICK INSTITUTE

**Types of projects** recommended for funding include:

- projects aimed at adapting and implementing successful innovations in new institutional and/or disciplinary contexts, in addition to well designed innovation projects;
- projects which integrate aspects of institutional development, staff development and learning and teaching innovation, as well as for projects which might fall into one or the other of these categories;
- projects based on priorities determined by the Carrick Institute, for example those based on National priorities or known sector needs identified through previous projects;

- individual projects and collaborative projects, funded through separate granting pools with a greater proportion of the total funds available for collaborative projects;
- within the definition of collaborative projects, those involving a lead institution and a set of consultation partners, collaborations involving a small group of partners and cascade models of collaboration. Desirably, provide the same maximum amount of funding for consultative or collaborative projects, to encourage whichever form of project design is most appropriate for achieving wider implementation of the project outcomes.

In relation to **collaborative and consultative projects**:

- provide adequate funding and timeframes projects, to enable them to engage appropriate project management staff to support the collaboration. A minimum of \$200,000 over two years is suggested;
- require collaborative projects to provide documented evidence of the role and responsibilities of each partner in the collaboration, either at the final bidding stage or within the first year of funding.

In relation to **application processes**:

- provide clear guidelines for applicants that describe what the Carrick Institute interprets as the meaning of 'innovation' and 'adaptation and implementation' projects and how these are distinguished from projects which are regarded as the normal business of a university;
- develop a staged bidding process;
- provide feedback and support to short listed applicants at each stage, to enable them to develop their applications further and in particular to:
  - develop well-designed evaluation and adoption-focused dissemination plans. The Carrick Institute could create a framework to support the development of these plans;
  - clarify and where possible formalise the intellectual property arrangements for the project;
  - formalise collaboration arrangements between institutions.

In relation to the **criteria for assessing applications** for funding, include criteria which:

- emphasise scholarship, particularly in project design and evaluation;
- emphasise effective evaluation (as described above);
- require adequate proportions of the budget to be devoted to project management, evaluation and dissemination;
- require applicants to consider approaches to dissemination which engage potential users throughout development and are focused on the intended adoption, implementation and embedding of project outcomes. For example, applicants could be required to describe
  - the intended users of their project outcomes, and the range of outcomes which could be adopted and implemented by different groups of users;
  - how they would enable each group of intended users to become aware of the relevant outcomes and learn how to make use of them effectively;
  - how they would engage with intended users and obtain their feedback during project development;
  - how they would evaluate the impact of their project outputs within the intended user communities during and following project development.

Develop mechanisms for providing **guidance, advice and support to applicants** on a range of critical issues including:

- project management and team management for projects;
- forms of consultation and collaboration and their management;
- effective approaches to evaluation for different types of projects;
- approaches to enabling the dissemination and wider adoption of project outcomes. Guidance and advice should acknowledge the range of meanings and purposes of dissemination, the different

types of project outcomes which can be disseminated adopted and implemented, and the different groups of potential adopters of these outcomes;

- budget planning, including providing budget templates and advice;
- intellectual property and copyright issues.

In relation to **intellectual property**:

- develop and communicate a clear position in relation to the ownership of intellectual property for projects supported and partially supported by Carrick Institute funding.

In relation to the **continued dissemination of project outcomes** following project completion:

- develop an infrastructure to support and continue dissemination, adoption and implementation of project outcomes after projects are completed, using both engaged and passive strategies;
- consider ways in which aspects of the Higher Education Academy Subject Centre model could be creatively adapted in order to be implemented and sustainable in the Australian context;
- develop formal links with the Higher Education Academy and the Subject Centres, in particular considering ways in which such links could benefit both sides and avoid replicating in Australia work which has already been done in the UK context;
- develop effective two-way linkages with existing discipline-based and cross-disciplinary organisations to promote awareness of the Carrick Institute and relevant funded projects and to inform priorities for new projects.

In relation to **alignment between granting schemes and other aspects of the higher education context**:

- consider developing alignment between granting schemes and aspects of the expanded teaching awards scheme, for example to reward activities which foster the dissemination, adaptation and implementation of project outcomes which improve teaching and learning;
- consider developing alignment, where appropriate, between the funding of institutional or integrated projects and the criteria for the Learning and Teaching performance fund, for example to enable the scaling-up of good practices from institutions.

## FOR BOTH THE CARRICK INSTITUTE AND INSTITUTIONS

In relation to **valuing, recognition and reward for teaching innovation**:

- develop mechanisms for enabling scholarly publications on teaching development and innovation to be counted for the purpose of any research assessment exercise, and provide advice on these mechanisms to relevant organisations;
- develop mechanisms for enabling scholarly innovations to be subject to formal peer review processes and recognised as works of scholarship for the purposes of research assessment. One way to achieve this for scholarly products could be through implementing the recommendations of the previous EIP study (Taylor and Richardson, 2001).

In relation to **leadership of teaching**:

- provide or facilitate participation of academic leaders in professional development aimed at fostering awareness and skills and encouraging the sharing of good practices related to transformative leadership and valuing of teaching and teaching innovation. Activities should include academic leaders at all levels but in particular Heads of Department.

## FOR INSTITUTIONS

In relation to support for teaching innovation, adaptation and implementation:

- recognise in workload allocation formulae the time taken to engage in teaching innovation, including the adaptation and implementation or reinvention of innovations developed in other contexts;
- recognise scholarship of teaching outcomes, such as publications and conference papers focused on scholarly teaching and teaching innovation as well as scholarly products, in promotions criteria and in performance management plans for academics;
- provide small scale grants to:
  - support pilot projects intended to develop ideas for possible funding by the Carrick Institute schemes;
  - support the adaptation and implementation of effective innovations that have been developed in other contexts;
  - support scholarship in teaching activities designed to build the conceptual frameworks or designs for projects which could be supported by the Carrick Institute schemes;
- provide sources of institutional support and advice for applicants, in particular on evaluation and intellectual property;
- ensure that there are clear arrangements for managing the intellectual property of projects which are partially funded by the institution, and ensure that any such IP arrangements enable widespread dissemination and use of project outcomes;
- encourage the development of cross-institutional networks and a small number of events to facilitate sharing of good practices across the institution;
- recognise and support the brokerage and professional development roles played by academic development staff and encourage projects in which academic developers work alongside or provide advice to project teams;
- encourage participation of academic staff in formal teaching and learning courses and other development activities aimed at sharing good practices and developing the skills and conceptual understandings necessary to develop, evaluate and disseminate projects effectively;
- ensure that project developers who receive funding to support time release are able to do so, or receive equivalent release from other duties (for example administration).

## FOR ACADEMIC DEVELOPERS

- provide responsive support to project teams on issues such as evaluation and dissemination;
- ensure that formal courses on teaching and learning:
  - embed some innovative approaches so that teachers can participate in them as learners;
  - enable teachers to share good practices and innovations;
  - support teachers in developing student-focused understandings of teaching and learning necessary for engagement in teaching and learning improvement;
  - encourage scholarly approaches to teaching development and, where possible, the production of scholarship in teaching outcomes;
- facilitate the brokering of information about innovations across the university.

## FOR PROJECT DEVELOPERS

In addition to developing projects which effectively address the criteria and conditions described above, it is recommended that project developers:

- consider the range of possible methods that might be adopted for involving potential users from the beginning of a project, for example:
  - collaborative development by a strategically selected group of partners;
  - consultation with potential users at various stages of the process, from initial project design to prototype evaluation, pilot testing and cascading to others;
  - involvement of potential users in needs analysis related to the intended project;
- provide support for adopters to engage in the learning necessary to adapt, implement and evaluate the project outcomes effectively, for example through
  - implementation guides accompanying the project;
  - provision of case studies and exemplars of implementation;
  - provision of support or training workshops or other events;
  - provision of consultancy support and services from the project team;
  - consultative and collaborative forms of development which enable potential adopters to learn and inform project development;
- consider the range of potential adopters of the project and use appropriate methods for engaging with them, such as through links with disciplinary or cross-disciplinary organisations.





## 7. REFERENCES

- Alexander, S., & McKenzie, J. (1998). *An Evaluation of Information Technology Projects for University Learning*. Canberra: Department of Employment, Education, Training and Youth Affairs.
- Arendale, D. (1993). Foundation and theoretical framework for Supplemental Instruction. In D. C. Martin & D. Arendale (Eds.), *Supplemental Instruction: Improving first-year student success in high-risk courses*. 19-26. Retrieved May 2005 from <http://www.tc.umn.edu/~arend011/Sltheory93.pdf>
- Arendale, D. (1994). 'Understanding the Supplemental Instruction Model'. D.C. Martin & D. Arendale (Eds.), *Supplemental Instruction: Increasing achievement and retention*, 11-22, San Francisco, CA: Jossey-Bass, Inc.
- Australian Research Council. *National Principles of IP Management for Publicly Funded Research*. Retrieved May 25, 2005 from [http://www.arc.gov.au/grant\\_programs/national\\_ip.htm](http://www.arc.gov.au/grant_programs/national_ip.htm)
- Bain, J.D. & McNaught, C. (1996). Academics' educational conceptions and the design and impact of computer software in Higher Education. Paper presented at the 3rd Interactive Multimedia Symposium, Perth WA, January 21-25.
- Bain, J.D., McNaught, C., Mills, C. & Luekenhausen, G. (1998). Understanding CFL practices in Higher Education in terms of academics' educational beliefs: Enhancing Reeves' analysis. Paper presented at the ASCILITE conference, Wollongong, December 14-16.
- Bates, T. (2000). *Managing technological change: strategies for college and university leaders* (1st ed.). San Francisco: Jossey-Bass.
- Bauer, M. (1997). Resistance to new technology and its effects of nuclear power, information technology and biotechnology. In M. Bauer (Ed.), *Resistance to new technology: nuclear power, information technology and biotechnology*. Cambridge ; New York: Cambridge University Press.
- Bennett, S., Lockyer, L. & Agostinho, S. (2004). Investigating how learning designs can be used as a framework to incorporate learning objects. In R. Atkinson, C. McBeath, D. Jonas-Dwyer & R. Phillips (Eds), *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* (pp. 116-122). Perth, 5-8 December. <http://www.ascilite.org.au/conferences/perth04/procs/bennett.ht>
- Beetham, H., & Bailey, P. (1999). *EFFECTS Guidelines for Collaborating Institutions*. EFFECTS Project Document.
- Beggs, T. A. (2000). *Influences and Barriers to the Adoption of Instructional Technology*. Retrieved 5 March 2005 from <http://www.mtsu.edu/~itconf/proceed00/beggs/beggs.htm>
- Berger, A. R., & Kirshstein, R.J. (2004). *Review of the Fund for the Improvement of Postsecondary Education (FIPSE) Comprehensive Program*. U.S. Department of Education.
- Biggs, J. (2003). *Teaching for Quality Learning at University*. Buckingham: SRHE and Open University Press.
- Bourner, T., Cooper, A., & France, L. (2000). Action Learning Across a University Community. *Innovations in Education and Training International*, 37(1), 2-9.
- Bowden, J., Hart, G., King, B., Trigwell, K. & Watts, O. (2000). *Generic Capabilities of the ATN University Graduates* A report from the Australian Technology Network January 2000 Retrieved May 2, 2005 from <http://www.cit.uts.edu.au/ATN.grad.cap.project.index.html>
- Bower, B. (2001). Distance education: facing the faculty challenge. *Online Journal of Distance Learning Administration*, 4(2).
- Boud, D., Brew, A., Browne, M., McKenzie, J., Pearson, M. & Wissler, R. (2000). *Proposal for a university consortium for Supervision development resources*. Workshop presented at the Quality in Postgraduate Research Conference, Adelaide, April.
- Burdett, J. (2003). *A switch to online takes time: academics' experience of ICT innovation*. Paper presented at the Interact, Integrate, Impact: Proceedings of the 20th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education, Adelaide, December 7-10.
- Burmeister S. (1996) Supplemental Instruction: An Interview with Deanna Martin, *Journal of Developmental Education*, (20)1.

- Burton, I., & Haines, C. (1997). Innovation in Teaching and Assessing Mathematics at University Level. *Teaching in Higher Education*, 2(3), 273-293.
- Butler, D. L., & Sellbom, M. (2002). Barriers to Adopting Technology for Teaching and Learning. *Educause Quarterly*, 25, 22-28.
- CAUT. (1993a). *1995 National Teaching Development Grants, Guidelines for Applicants*. Committee for the Advancement of University Teaching.
- CAUT. (1993b). *Improving University Teaching, 1994 National Teaching Development Grants*. Canberra: Committee for the Advancement of University Teaching.
- Christensen, C. M. (1997). *The innovator's dilemma: when new technologies cause great firms to fail*. Boston, Massachusetts: Harvard Business School Press.
- Christensen, S. & Cuffe, N. (2002). *Graduate Capabilities In Law: QUT Teaching and Learning Development Large Grant Project Report*. Faculty of Law, QUT, Internal document.
- Coburn, C. (2003). Rethinking Scale: Moving Beyond Numbers to Deep and Lasting Change. *Educational Researcher*, 32(6), 3-12.
- Collins, F., & Lynch, J. (2001). *ICT education and the dissemination of new ideas: Channels, resources and risks*. Paper presented at the Australian Association for Research in Education, Melbourne, Victoria, Australia.
- Collis, B., & Moonen, J. (2001). *Flexible learning in a digital world. Experiences and expectations*. London: Kogan Page.
- Cummings, R., Phillips, R., Tilbrook, R., & Lowe, K. (2005). Middle-Out Approaches to Reform of University Teaching and Learning: Champions Striding Between Top-Down and Bottom-Up Approaches. *International Review of Research in Open and Distance Learning*, March.
- Dempster, J., & Deepwell, F. (2002). *A review of successful project approaches to embedding educational technology innovation into institutional teaching and learning practices in higher education*. (Study funded by the LTSN Generic Centre): Centre for Academic Practice, University of Warwick.
- Doskatch, Irene. (2000), Information Literacy in the Libraries of the Australian Technology Network (LATN), *The International Association of Technological University Libraries News (IATUL)*, 9, 3-4.
- Drummond, I., Nixon, I., & Wiltshire, J. (1998). Personal transferable skills in higher education: the problems of implementing good practice. *Quality Assurance in Education*, 6(1), 19-27.
- Dutton, W. H., Cheong, P. H., & Park, N. (2004). An Ecology of Constraints on e-Learning in Higher Education: The Case of the Virtual Learning Environment. *Prometheus*, 22(2), 131-149.
- Dynan, M. B., & Clifford, R. J. (2001). Eight Years On: implementation of quality management in an Australian University. *Assessment & Evaluation in Higher Education*, 26(5), 503-515.
- Elton, L. (2003). Dissemination of Innovations in Higher Education: a change theory approach. *Tertiary Education and Management*, 9, 199-214.
- Effective Framework for Embedding C&IT Using Targeted Support (EFFECTS): EFFECTS Case-studies. Retrieved May 11, 2005 from <http://www.clt.soton.ac.uk/effects/casestudies/>.
- ETL Project (2003) Project Progress Report for Year 3. Retrieved February 15, 2005 from <http://www.ed.ac.uk/etl/publications.html#projectpubl>
- Evans, T., Nation, D., Renner, W., & Tregenza, K. (1999). *CAUT in the act: how teachers have used the Committee for the Advancement of University Teaching Development Grants to initiate 'flexible learning'*. Paper presented at the Open, flexible and distance learning: challenges of the new millennium: collected papers from the 14th Biennial Forum of the Open and Distance Learning Association of Australia, Geelong, Victoria.
- Freeman, M., & Capper, J. (1999). Exploiting the web for education: An anonymous asynchronous role simulation. *Australian Journal of Educational Technology*, 15(1), 95-116.
- Freeman, M. & McKenzie, J. (2002). SPARK: a confidential web-based template for self and peer assessment of student teamwork: benefits of evaluating across different subjects. *British Journal of Educational Technology*, 33, 551-569.
- Fullerton, H., & Bailey, P. (2001). *EFFECTS Final Report*. Retrieved May 20, 2005 from <http://www.elt.ac.uk/ELT%20documents/EFFECTS/finalreport.pdf>
- Gibbs, G. (2004) Personal communication.

- Gibbs, G., Holmes, A., & Segal, R. (2002). *Funding innovation and disseminating new teaching practices*. Milton Keynes UK: NQEF National Coordination Team.
- Granovetter, M. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78, 1360-1380.
- Gray, K., & McNaught, C. (2001). *Evaluation of achievements from collaboration in a learning technology mentoring program*. Paper presented at the Meeting at the Crossroads. Proceedings of the 18th Annual Conference of the Australian Society for Computers in Learning in Tertiary Education, Melbourne.
- Hall, G. E., George, A. A., & Rutherford, W. L. (1986). *Measuring the stages of concern about an innovation: a manual for use of the stages of concern questionnaire*. Austin: Research and Development Centre for Teacher Education.
- Hall, J. (2003). *EFFECTS Transferability Funding Project Final External Evaluation*. Retrieved May 26, 2005 from <http://www.elt.ac.uk/ELT%20documents/EFFECTS/contevaluation.pdf>
- Harvey, J., & Oliver, M. (2001). EFFECTS external evaluation. Retrieved May 26, 2005 from <http://www.ilt.org/effects/downloads/effects-evaluation-report.pdf>
- Hannan, A., & Silver, H. (2000). *Innovating in higher education: teaching, learning, and institutional cultures*. Philadelphia, Pa.: Society for Research in Education & Open University Press.
- Hicks, O. (2004). Composite Report on Projects Funded Through the Australian Universities Teaching Committee 2000-2003. *Report commissioned by the Australian Universities Teaching Committee* Canberra: AUTC. Retrieved 27 May, 2005 from [http://www.autc.gov.au/projects/completed/comp\\_projects\\_proj\\_funded\\_AUTC\\_2000-2003.htm](http://www.autc.gov.au/projects/completed/comp_projects_proj_funded_AUTC_2000-2003.htm)
- Higher Education Funding Council for England (HEFCE) publication. (1997). *Report on Phase I of the Evaluation of the UK Pilot Site License Initiative*. Retrieved 26 May, 2005 from [http://www.hefce.ac.uk/pubs/hefce/1997/m3\\_97.htm#summary](http://www.hefce.ac.uk/pubs/hefce/1997/m3_97.htm#summary)
- Higher Education Funding Council for England (HEFCE) (1998). TLTP Phase 3: Funded Projects. *Outcome of bids for funding under the Teaching and Learning Technology Programme* Retrieved 26 May, 2005 from [http://www.hefce.ac.uk/pubs/hefce/1998/98\\_20.htm](http://www.hefce.ac.uk/pubs/hefce/1998/98_20.htm)
- Higher Education Funding Council for England (HEFCE) publication. (1999). *Learning and teaching support network (LTSN): Invitation to bid for funds for subject centres*. Retrieved May 26, 2005 from [http://www.hefce.ac.uk/pubs/hefce/1999/99\\_20.htm](http://www.hefce.ac.uk/pubs/hefce/1999/99_20.htm)
- Higher Education Funding Council for England (HEFCE) (2001). FDTL phase three funded projects. HEFCE 01/50 Retrieved May 26, 2005 from [http://www.hefce.ac.uk/pubs/hefce/2001/01\\_50.htm](http://www.hefce.ac.uk/pubs/hefce/2001/01_50.htm)
- Ho, A., Watkins, D., & Kelly, M. (2001). The conceptual change approach to improving teaching and learning: An evaluation of a Hong Kong staff development programme. *Higher Education*, 42, 142-169.
- Housego, S. & Freeman, M. (2000). Case studies: Integrating the use of web based learning systems into student learning. *Australian Journal of Educational Technology*, 16 (3), 258-282.
- Janszen, F. (2000). *The Age of Innovation: making business creativity a competence, not a coincidence*. London: Prentice Hall.
- Johnstone, R. (2001). A Commitment to learning: the Swedish council for the renewal of higher education, Evaluation Report. *National Agency for Higher Education*. Retrieved May 20, 2005 from <http://web2.hsv.se/publikationer/rapporter/2001/isbn91-88874-75-3.pdf>
- Kelly, B. A., & Gardiner, R. (1994). *Student peer mentoring: An effective strategy to promote student learning*. Paper presented to the Twentieth Annual National Conference of the Higher Education Research and Development Society of Australasia (HERDSA) Australian National University, 6-10 July
- Kemp, D. (1999). *Knowledge and Innovation: A policy statement on research and research training*. Canberra: AGPS. Retrieved March 16 from <http://www.dest.gov.au/archive/highered/whitepaper/default.asp>
- Kennedy, G., Kennedy, D. & Eizenberg, N. (2001). Integrating Computer Facilitated Learning Resources into Problem-Based Learning Curricula. *The Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*, 3 (1). Retrieved May 16, 2005 from <http://imej.wfu.edu/articles/2001/1/02/index.asp>
- Kennedy, D., Eizenberg, N., & Kennedy, G. (2000a). An evaluation of the use of multiple perspectives in the design of computer facilitated learning. *Australian Journal of Educational Technology*, 16 (1), 13-25

- Kenny, J. (2002). Managing innovation in educational institutions. *Australian Journal of Educational Technology*, 18(3), 359-376.
- Kenny, J., & McNaught, C. (2000). *Promoting Quality Outcomes in Higher Education Using New Learning Technologies: Processes and Plans at RMIT*. Paper presented at the Proceedings of the 17th Annual Conference of the Australian Society for Computers in Tertiary Education, Coffs Harbour, New South Wales.
- Kift, S. (2002). *Harnessing Assessment and Feedback to Assure Quality Outcomes for Graduate Capability Development: A Legal Education Case Study*. Paper presented at The Australian Association for Research in Education, Brisbane, Queensland.
- Kinder, J., Fardon, M., & Yasmeen, S. (1999). *Offline or online? A simulation exercise in a first year international politics unit*. Paper presented at the 16th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education, Queensland University of Technology, Brisbane.
- Knutel, P. G. (1998). *Adoption of an Innovation: The Process through Which Faculty Decide Whether to Use Instructional Technology*. Unpublished PhD thesis, University of Michigan.
- Laurillard, D. (2002). *Rethinking university teaching: A conversational framework for the effective use of learning technologies*. London: Routledge.
- Levine, A. (1980). *Why Innovation Fails*. Albany, NY: State University of New York Press.
- Lines, R. (2000). *Teaching with Technology: The Space between Strategy and Outcomes*. Retrieved May 20, 2005 from <http://ultibase.rmit.edu.au/Articles/online/lines1.htm>
- Linser, R., & Ip, A. (2002). *Beyond the Current e-Learning Paradigm: applications of Role-Play Simulation (RPS) - case studies*. Paper presented at the e-Learn 2002 AACE Conference, Montreal, Canada.
- Loughborough University (2003). FDTL project 34/99 RAPID 2000 Final Report. Retrieved 26 May, 2005 from [http://rapidprojects.lboro.ac.uk/RAPID2000FinalReport\\_July2003.htm](http://rapidprojects.lboro.ac.uk/RAPID2000FinalReport_July2003.htm)
- Lueddeke, G. R. (1999). Toward a Constructivist Framework for Guiding Change and Innovation in Higher Education. *The Journal of Higher Education*, 70(3), 235-260.
- Lueddeke, G. R. (2003). Professionalising Teaching Practice in Higher Education: a study of disciplinary variation and 'teacher-scholarship'. *Studies in Higher Education*, 28(2), 213-228.
- McCarthy, J. (2001). Integrating library services into the elearning environment at Queensland University of Technology, *AARL*, 32 (3), 1-12.
- McKenzie, J. (2001). Variation in ways of experiencing change in teaching, the development and use of learning technologies and the likely consequences for student learning. In Rust, C. (Ed.). *Improving student learning: Improving student learning using learning technology*. Oxford: Oxonian Rewley Press.
- McKenzie, J. & Alexander, S. (2004). *Review of Teaching and Learning Development Grants. Project commissioned by the Queensland University of Technology*. Sydney: UTS.
- McLaughlan, R., & Kirkpatrick, D. (2001). Peer Learning Using Computer Supported Role Play Simulations. In R. C. a. J. S. David Boud (Ed.), *Peer learning in higher education: Learning from and with each other* (pp. 141-155). London: Kogan Page.
- McNaught, C., Kenny, J., Kennedy, P., & Lord, R. (1999). Developing and Evaluating a University-wide Online Distributed Learning System: The Experience at RMIT University. *Educational Technology & Society*, 2(4).
- McNaught, C., Phillips, R., Rossiter, D., & Winn, J. (2000). *Developing a Framework for a Useable and Useful Inventory of Computer-facilitate Learning and Support Materials in Australian Universities (Evaluations and Investigations Programme)*. Canberra: DEETYA. Retrieved 27 May, 2005 from <http://www.dest.gov.au/highered/eippubs1999.htm>
- Maddocks, A. (2001). *Recording Achievement in Construction: Developing and Implementing the RAPID Progress File*. Centre for Recording Achievement. Retrieved May 26, 2005 from [http://www.recordingachievement.org/Case\\_Studies/cs\\_detail.asp?sid=49](http://www.recordingachievement.org/Case_Studies/cs_detail.asp?sid=49)
- Maddocks, A. & Wright, B. (2004). The RAPID Progress File: A Tool to Facilitate Work Placements in Built Environment Disciplines. *CEBE Transactions*, 1 (1), 39-47.
- Martin, D.C and others. (1977). *The learning centre: A comprehensive model for college and universities*. Kansas City, MO: University of Missouri.
- Martin, D.C & Arendale, D. (1993). Foundation and theoretical framework for Supplemental Instruction. In D. C. Martin & D. Arendale (Eds.), *Supplemental Instruction: Improving first-year student success in*

- high-risk courses*. (2nd ed), 41-50. Retrieved May 26, 2005 from <http://www.umkc.edu/centers/cad/si/sidocs/datheo93.htm>
- Martin, E. (1999). *Changing academic work: Developing the learning university*. Buckingham UK: SRHE and Open University Press.
- Martin, E., Prosser, M., Trigwell, K., Ramsden, P. & Benjamin, J. (2000). What university teachers teach and how they teach it. *Instructional Science*, 28, 387-412.
- Martin, E., Trigwell, K., Prosser, M. & Ramsden, P. (2003). Variation in the Experience of Leadership of Teaching in Higher Education. *Studies in Higher Education*, 28(3), 247-259.
- Marton, F. & Booth, S. (1997) *Learning and Awareness*. Mahwah NJ: Lawrence Erlbaum Associates.
- Marton, F., Hounsell, D., Entwistle, N. (Eds) (1997). *Experience of Learning - implications for teaching & studying in higher ed*. Edinburgh, Scottish Academic Press.
- Marusic, A. (2004). Lancet Review: an@tomedia™ *The Lancet*, 363 (9404), p. 254.
- Miller, D., Oldfield, E. & Bulmer, M. (2004). Peer Assisted Study Sessions (PASS) in first year chemistry and statistics courses: insights and evaluations, *Uniserve Science Scholarly Inquiry Symposium Proceedings*.
- Moses, I. (1988). *Academic Staff Evaluation and Development*. St Lucia, Brisbane: University of Queensland Press.
- Murray, M. H. (1997). Better learning through curricular design at a reduced cost. *Journal of the American Society of Engineering Education*, 1-5.
- Murray, M. H. (1999). *SI Down Under: Australian Innovations in Real and Virtual Classes*. Paper presented at The National Supplemental Instruction (SI) Conference, University of Missouri Kansas City, May 1999.
- Naidu, S., Ip, A., & Linsler, R. (2000). Dynamic Goal-Based Role-Play Simulation on the Web: A Case Study. *Educational Technology & Society*, 3(3).
- Newton, R. (2003). Staff attitudes to the development and delivery of e-learning. *New Library World*, 104(10), 412-425.
- Nord, W. R., & Tucker, S. (1987). *Implementing routine and radical innovations*. Lexington, Mass: Lexington Books.
- Olson, E. M., Walker, C., & Ruekert, R.W. (1995). Organizing for Effective New Product Development: The Moderating Role of Product Innovativeness. *Journal of Marketing*, 59(1), 48-62.
- Pajo, K. (2000). *Individual characteristics and the adoption of technology in distance education*. Paper presented at the International Distance Education and Open Learning Conference, Adelaide, South Australia.
- Papert, S. (1997). *Looking at Technology Through School-Colored Spectacles*. Retrieved May 26, 2005, from <http://www.papert.org/articles/LookingatTechnologyThroughSchool.html>
- Peacock, J. (2002). *The QUT Information Literacy Framework and Syllabus: walking the talk*, Proceedings of the Lifelong Learning Conference, Central Queensland University, Yeppoon, Queensland Australia 16-19<sup>th</sup> July 2002
- Pearson, M. & Brew, A. (2002). Research Training and Supervision Development. *Studies in Higher Education*, 27(2), 135-150.
- Petocz, P. & Wood, L. N. (2001). The whole picture - Video and mathematics learning. *Australian Senior Mathematics Journal*, 15(1), 40-55.
- Potgieter, B. (2004). *Exploring leadership and organisation for change and innovation in higher education*. Paper presented at the Proceedings of the 2004 Annual International Conference of the Higher Education Research and Development Society of Australasia (HERDSA), Miri, Sarawak.
- Prosser, M. & Trigwell, K. (1997). Perceptions of the teaching environment and its relationship to approaches to teaching. *British Journal of Educational Psychology*, 67, 25-35.
- Prosser, M. and Trigwell, K. (1999). *Understanding Teaching and Learning: The experience in Higher Education*. Buckingham: Open University Press.
- Ramsden, P. (2003). *Learning to Teach in Higher Education*. London: Routledge.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.
- Schiller, N. (2004). personal communication from Ciurzck, (2002) *Project Development Report*.

- Schoepp, K. (2005). Barriers to Technology Integration in a Technology-Rich Environment. *Learning and Teaching in Higher Education: Gulf Perspectives*, 2(1).
- Schofield, A., & Olson, A. (2000). *An Evaluation of the Committee for University Teaching and Staff Development (CUTSD) Initiative*: Australian Universities Teaching Committee.
- Scott, G. (1999). *Change matters : making a difference in education and training*. St Leonards, N.S.W.: Allen & Unwin.
- Simpson, N. (2000). *Studying innovation in education: the case of the ConnectEd project*. Paper presented at the Conference of the Australian Association for Research in Education, Melbourne, December 4-7.
- Slowey, M. (1995). Reflections on Change - Academics in Leadership Roles. In M. Slowey (Ed.), *Implementing Change from within Universities and Colleges*. London: Kogan Page.
- Stokking, K. M. (1996). Dissemination and Utilization of Knowledge and Innovations. In T. P. D. P. Ely (Ed.), *The International Encyclopedia of Educational Technology, Second Edition* (pp. 269-273). Oxford: Pergamon.
- Strauss, A. & Corbin, J. (1998) *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks: Sage Publications.
- Surrey, D. W. (1997). *Diffusion Theory and Instructional Technology*. Albuquerque, New Mexico: Paper presented at the Annual Conference of the Association for Educational Communications and Technology (AECT).
- Taylor, P., & Richardson, A.S. (2001). *Validating Scholarship in University Teaching: constructing a national scheme for external peer review of ICT-based teaching and learning resources*. Canberra: Department of Education, Training and Youth Affairs.
- Tidd, J., Bessant, J. R., & Pavitt, K. (1997). *Managing innovation: integrating technological, market, and organizational change*. Chichester, West Sussex, England ; New York: Wiley.
- Tolley, H. (2004). *Evaluation Report: Students' Experiences of Using the RAPID 2000 Progress File: A Case Study of Project Evaluation and of Progress File Implementation*. Retrieved 26 May 2005, from [http://rapidprojects.lboro.ac.uk/RAPID2000EvaluationReport\\_April2004.htm](http://rapidprojects.lboro.ac.uk/RAPID2000EvaluationReport_April2004.htm)
- Tornatzky, L. G., & Fleischer, M. (1990). *The Processes of Technological Innovation*. Lexington, Massachusetts: Lexington Books.
- Twigg, C. (1999). *Improving Learning and Reducing Costs: Redesigning Large-Enrollment Courses*.
- Van de Ven, A. H., Polley, D. E., Garud, R., & Venkataraman, S. (1999). *The Innovation Journey*. New York: Oxford University Press.
- Van Rossum, E.J. & Schenk, S.M. (1984). The relationship between learning conception, study strategy and learning outcome. *British Journal of Educational Psychology*, 54, 73-83.
- Vincent, A., & Shepherd, J. (1998). Experiences in Teaching Middle East Politics via Internet-based Role-Play Simulations. *Journal of Interactive Media in Education*, 98(11).
- Ward, K. (2004). *Invented Everywhere: In Pursuit Of A Dissemination Strategy That Works*. (electronic copy supplied to the authors)
- Westera, W. (2004). On strategies of educational innovation: Between substitution and transformation. *Higher Education*, 47, 501-517.
- Zhao, Y., & Frank, K. A. (2003). Factors affecting technology uses in schools: An Ecological Perspective. *American Educational Research Journal*, 40(4), 807-840.
- Zimitat, C. (2005). Personal communication with author, April 26.

# APPENDICES

## APPENDIX 1: SAMPLE INTERVIEW SCHEDULES

### Sample interview questions for project developers

We're interested interviewing you because of your involvement in ... (name of project or idea), which appears to have been picked up and used in some other contexts

Can you please briefly describe how you use ... in your context

Where did the idea come from originally?

What were your original aims in developing/introducing this project/idea?

Probe: for the developer, for students

To what extent have these aims been realised?

What costs and benefits have there been for you overall in developing and implementing this project/idea?

How have you tried to disseminate the project outcomes/idea?

Probe for formal processes and informal processes

Probe for what they mean by dissemination

Can you give some examples of things which you think contributed to others adopting and implementing the project/idea in their contexts?

What was involved?

Why do you think this was successful?

What costs and benefits have there been for you in disseminating the project/idea?

What (if anything) would encourage you to disseminate it further?

What would discourage you?

How does your institution recognise and reward

development of a teaching innovation

dissemination

adaptation and implementation of an innovation developed elsewhere

How do you become aware of innovations or ideas that you adopt?

What would encourage you to adopt or adapt and implement something which had been developed by someone else?

What would discourage you from doing this?

What do you see as being necessary to encourage wider dissemination and use of teaching innovations?

Do you know of other academics who have adopted your project/idea in their contexts? Would you be happy to give us their contact details?

### Sample interview questions for project adopters

We're interested interviewing you because of your involvement in implementing ... (name of project or idea) in your context, as this is a project/idea which appears to have been picked up and used in a number of different contexts

Can you please briefly describe how you use ... in your context

What did you need to do to adapt it and implement it in your context?

What was required? How much work did this involve?

How was this supported or assisted?

What were your original aims in implementing this project/idea?

Probe: for the respondent, for students

To what extent have these aims been realised?

What costs and benefits have there been for you overall in implementing this project/idea?

How did you first become aware of the idea/project that you implemented?

What did you want or need to know about the idea/project before you decided to implement it?

How did you find these things out?

What (if anything) would encourage you to disseminate the idea/project further?

Probe for what they mean by dissemination?

What would discourage you?

How do you usually become aware of innovations or ideas that you adopt?

What would encourage you to adopt or adapt and implement something which had been developed by someone else?

What would discourage you from doing this?

How does your institution recognise and reward

development of a teaching innovation

dissemination

adaptation and implementation of an innovation developed elsewhere

What do you see as being necessary to encourage wider dissemination and use of teaching innovations?



## APPENDIX 2: ACRONYMS USED IN THIS REPORT

AAUT	Australian Awards for University Teaching
ALT	Association for Learning Technology
ANZIL	Australia/New Zealand Institute for Information Literacy
ARC	Australian Research Council
ASCILITE	Australasian Society for Computers in Learning In Tertiary Education
ATN	Australian Technology Network of Universities
AUTC	Australian Universities Teaching Committee
AVCC	Australian Vice-Chancellors' Committee
C&IT	Computing & Information Technology
CAL	Copyright Agency Limited
CAUT	Committee for the Advancement of University Teaching
CBAM	Concerns-Based Adoption Model
CEBE	Subject Centre.
CloB	Chartered Institute of Building
CSU	California State University
CUTSD	Committee for University Teaching and Staff Development
DEETYA	Department of Employment, Education, Training and Youth Affairs
DfEE	Department for Education and Employment
DENI	Department of Education for Northern Ireland
DEST	Department of Education, Science and Training
DET	Department of Education and Training (NSW)
DDOGS	Deans and Directors of Graduate Studies
EFFECTS	Effective Framework for Embedding C&IT Using Targeted Support
ELT	Embedding Learning Technologies
ETL	Enhancing Teaching and Learning Environments in Undergraduate Courses
ESRC	Economic and Social Research Council
FDTL	Fund for Development for Teaching and Learning
FIPSE	Fund for the Improvement of Postsecondary Education
fIRST	for Improving Research Supervision and Training
GEES	Geography, Earth and Environmental Sciences (Subject Centre)
HEA	Higher Education Academy
HEFCE	Higher Education Funding Council for England
HEI	Higher Education Institution
HERDSA	Higher Education Research and Development Society of Australasia
ILT	Institute for Learning and Teaching
IT	Information Technology
JISC	Joint Information Systems Committee
LATN	Libraries of the Australian Technology Network
LTSN	Learning and Teaching Support Network (which became the Higher Education Academy Subject Centres) UK
NCT	National Coordination Team, UK
NHMRC	National Health and Medical Research Council
NSF	National Science Foundation
NURAPID	New RAPID
OSI	Open Source Initiative
PASS	Peer Assisted Student Support
PDF	Professional Development Framework
PDP	Personal/Professional Development Profile
QUT	Queensland University of Technology
RACGP	Royal Australian College of General Practitioners
RMIT	RMIT University
SC	Subject Centres
SEDA	Staff and Educational Development Association
SI	Supplemental Instruction



TLRP	Teaching and Learning Research Programme
TLTP	Teaching Learning and Technology Program
TQEF	Teaching Quality Enhancement Fund
RAPID	Recording Achieving for Professional and Individual Development
UMKC	University of Missouri-Kansas City
UniSA	University of South Australia
UOW	University of Wollongong
UTS	University of Technology, Sydney
VUT	Victoria University of Technology