

A review of the program and effectiveness of “mainstreaming the digital revolution” at the University of Melbourne

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***Abstract:** During 1997-2002, the University of Melbourne committed to a \$12.5 million program of competitively funded grants to rapidly advance curriculum transformation and multimedia development for subjects and courses across the university. Known initially as “mainstreaming the digital revolution”, the program was a vehicle for program renewal, changes in pedagogy and the introduction of information and communication technology. As the program evolved, the categories and criteria for grants became more refined based on experience and the assessment of impact and effectiveness. As the program declined, the emphasis shifted to a devolution of responsibility from central funding of competitive grants to load based funding direct to faculties. Indirect measures of the success of the program do not produce a consistent picture of the impact of the program. It is now evident that there was insufficient attention to evaluation of the program, which may be remedied by a new initiative to assess the learning outcomes generated from the curriculum transformation and multimedia development projects.*

***Keywords:** curriculum, multimedia, evaluation*

Background

Prior to 1996 at the University of Melbourne there was no concerted central program to introduce the new technology of multimedia into subjects and degree programs across the University. Developments were in the hands of the early adopters of the new technology, aided by central and Faculty-based facilities that provided primarily technical support. For example, in the Faculty of Engineering the Engineering Multimedia Unit (EMU) was established as an offshoot of the computer laboratories for undergraduate students. EMU comprised a number of work stations with hardware and software that enabled teaching staff to capture, convert and edit various types of teaching materials, and then compose the material into online resources or CD-based tutorials. Although it is taken for granted today, basic tools such as document scanners, video editing suites and WYSWYG web page editors were not widely available in academic departments in the early 1990s. The single support officer provided assistance with the capture, conversion, editing and composition, but the educational value of the material was largely in the hands of the teaching staff.

Little direct support for teaching and learning development projects was available prior to 1996. The federally funded CAUT program was highly competitive and, often because of a lack of comprehensive knowledge of acceptable pedagogy, applications from the science, engineering and technology disciplines were rarely successful. Multimedia developments were often folded into other projects as a mechanism for display or visualisation, but were

typically not focused on teaching and learning and any use within teaching programs was a by-product of the main aims of the project.

In 1996 the University of Melbourne embarked on an ambitious program to “mainstream the digital revolution” within teaching and learning. The impetus for this program was influenced by many factors, but the main goals were to use the opportunity provided by recent advances in technology to stimulate program renewal across the University and for the University to show leadership in encouraging teaching staff to engage in the development of multimedia materials. At the time it was widely recognised that a relatively small number of teaching staff were developing material using multimedia technology, and generally only within current curricula rather than using the technology to transform curricula.

Other factors in the genesis of the program were the perception that the University might be, in comparison to similar universities, left behind in the development of multimedia and online resources, and the requirement to fulfil the expectations of both staff and students that multimedia and online resources should be a significant component of teaching and learning at the University. Finally, in the absence of a funding program, the development of online material by teaching staff was becoming less viable due to issues such as workload, expected levels of sophistication of the material and the need for specialised skills to take maximum advantage of the increasingly complex development tools.

The Funding Program

As a new initiative, the total funding of \$1 million in 1997 for teaching and learning project development grants was very significant and indicated quite clearly that the University was treating the program to “mainstream the digital revolution” as a serious issue. Although many new initiatives that require substantial funding survive only their first year, the proponents of the scheme were highly successful in maintaining the support of the University. Funding was in fact increased in 1998 to \$3 million and this level of support continued for another two years. Table 1 shows the full breakdown of the funding program from 1997 to the effective termination of the program in 2002.

Funding	1997	1998	1999	2000	2001	2002
Strategic	\$600,000	\$1,000,000	\$180,000	-	-	-
Projects	\$400,000	\$1,500,000	\$2,200,000	\$1,080,000	\$400,000	\$250,000
Pilot/Priming	-	\$420,000	\$275,000	-	-	-
Melb-Monash	-	-	\$100,000	\$150,000	\$100,000	\$100,000
Universitas21	-	-	\$200,000	\$200,000	-	-
Faculty feed	-	-	-	\$1,500,000	\$1,000,000	\$650,000
Misc. support	-	\$80,000	\$45,000	\$70,000	-	-
Total	\$1,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$1,500,000	\$1,000,000
Eng Share (%)	16	11	15	10	23	0

Table 1: Breakdown of funding for teaching and learning project development grants (including the percentage share awarded to the Faculty of Engineering.)

The \$12.5 million funding program was managed by the Teaching and Learning (Multimedia and Educational Technologies) Committee, otherwise known as T&L(M&ET)C. This committee is made up of academic staff with knowledge and experience of teaching and learning or multimedia development, as well as representatives from educational research and

technical support groups. Whilst the terms of reference of T&L(M&ET)C indicate that the main function of the committee is to advise the Academic Board of the University on matters relating to teaching and learning, during 1996-2002 the business of T&L(M&ET)C was dominated by the assessment of project proposals and the management of the program of development projects.

Changes in Priorities for Project Requirements

Applications for funding were initially straightforward, requiring only a project proposal comprising the aims, project description, budget and some ancillary information. Notwithstanding the simple guidelines for applications, the required aims of the projects were quite clear in that the development had to address the transformation of a specific area of the curriculum. Development of a multimedia tutorial, for example, was generally not funded unless it supported a change in the approach to teaching and learning within the subject or course. Transformations to problem based, project based, case studies, virtual worlds or visualisations and collaborative learning approaches were the norm. In the majority of cases the standard mix of lectures, tutorials and practice classes was being used for teaching and any provision or enhancement of alternative learning processes was a significant improvement. The budget for the project could include teaching release for academic staff members in order to plan, design and deliver content, and instructional design, research or technical support staff to develop and implement the delivery of the developed material. Although it was not mandatory for the project to produce computer based materials of some form for delivery on CD, in a laboratory or over the Internet, there was a clear expectation that every project would adopt this approach.

As the program of development projects continued, the process became more sophisticated. One of the first changes was the introduction of a multi-stage application process. A preliminary step of expressions of interest was introduced in order to cull project proposals that would not meet the aims of the program, and to reduce the overall number of full applications that T&L(M&ET)C was required to assess and rank. In later years, as the interest in the program increased, the expression of interest round was also used to cull applications that would clearly not be competitive. During the height of the program in 1999, workshops were introduced to refine expressions of interest, especially for new applicants without a track record in curriculum transformation or multimedia development. If funding had continued into 2003, applicants would have also been required to make a presentation of their expression of interest to the committee and the other applicants, in order to incorporate feedback to improve the full application.

The requirements for applications and the subsequent projects also became more detailed and more demanding. For example, applicants were required to identify any relevant resources that could be viable alternatives to their proposal, and explain why such resources could not or should not be used. The impact on staff and student workloads, and on information technology resources within the university, had to be estimated to demonstrate that there would be no significant difficulties encountered. Applicants were encouraged to have a project manager who was from the discipline area, but was not one of the academic staff involved in content delivery in order to improve the management of projects.

However the most important change in terms of teaching and learning was a sharper focus on the rationale, interactivity and the effectiveness of the project. Project applicants were encouraged to identify a learning problem for students that could not be readily addressed by

other possible remedies. The learning problem, rather than general or collateral benefits, then became the heart of the project and a clearly identified problem tended to raise the priority of project proposals. Applicants were also required to nominate a specific subject or course in which the developed material would be used, in order to minimise very general proposals that had less chance of significant use and impact within a curriculum. The number of students in the subject or course, and the proposed extent of use within the subject or course, quickly became a yardstick against which proposals were measured, as T&L(M&ET)C justifiably attempted to maximise the impact of curriculum transformations and the perceived value for money from the program funding.

Experience also showed that in some cases the intent of the project proposal was not realised in the final product, especially in terms of interactivity with and engagement of students. Interactivity and engagement were seen to be and still are one of the most crucial aspects in the success or failure of a multimedia product. To address this issue, applicants were asked to give a specific description of how the material produced by the project would “look and feel” for students, even to the level of detail of providing preliminary storyboards or prototype web pages. Despite these explicit instructions, in many cases the project descriptions were inadequate and the assessment of proposals by T&L(M&ET)C often hinged on the track record and local knowledge of previous work by the applicants.

Effectiveness of completed projects remained the most outstanding issue for the entire duration of the program. Applicants were required to describe how formative and summative evaluation of the project would be conducted and how the learning outcomes would be assessed. It was expected that budgets would generally incorporate a small but significant line item for research support, typically to gather and analyse evaluation data.

With some notable exceptions, evaluation was not done well and in many cases not done at all. Three principal factors militated against the analysis of effectiveness. First and foremost, the project funding was directed primarily to development and, due to the process of annual renewal of strategic initiatives, limited to one year. Any summative evaluation or assessment of learning outcomes by their very nature had to be after the development phase and the deployment into the curriculum, which may be as much as one year after the expenditure of the project funds. Applicants tended to use up all the project funds during the development phase, often because of an under-estimation of the resources necessary to complete the project combined with the administrative impediments to carrying forward funds into subsequent years, and therefore had no remaining funds to carry out any analysis of effectiveness.

Secondly, a thorough summative evaluation or analysis of learning outcomes is an intensive exercise that requires significant amounts of time and resources from both teaching and research support staff. Not surprisingly, T&L(M&ET)C very often received only formative evaluations of projects that concentrated on some or all of aesthetics, design, navigation, basic content and student perceptions, rather than the effectiveness of the material in supporting a curriculum transformation or improving student learning. Finally, the timing was also such that the priority for T&L(M&ET)C was necessarily assessment of the current round of proposals and management of the current set of active projects, rather than evaluation of previous projects that were no longer being funded. Final reports on projects were a condition of the award of the grant, however again the timing was such that final reports were generally submitted at the end of the development phase, rather than after an assessment of learning outcomes.

Changes in Priorities for Funding Directions

As well as totals of funds provided to the program, Table 1 shows the different categories in which projects were invited and funds were allocated. Whilst the reality of the expenditures was sometimes at variance because of transfers and carry forwards, Table 1 shows clearly the intent of the funding program.

Only in the first year of funding were there just two categories. The aim of strategic projects was to fund teams of academics and developers to make a major impact on a group of subjects or a course within a sub-discipline area. Just a handful of strategic projects were funded in 1997, but all had significant resources at their command based on budgets of \$150,000 at maximum. Most of the projects employed more than one full time developer for the year of funding, along with substantial funds devoted to time release for teaching staff. In addition, at least partly due to the newness of the program and the enthusiasm of the team leaders, the projects tended to draw a commensurate component of in-kind contributions from other teaching staff and external advisors. In contrast, “standard” projects had more limited funding, up to \$40,000 and later increased to \$50,000, and were expected to transform the curriculum within a single subject, either for the subject as a whole or for part of the subject. Standard projects were framed to allow one developer to be employed for the year of funding and, with the direction of a sole academic or a small team of teaching staff, design, develop and implement a multimedia resource.

The request for and award of \$3 million to the program for 1998 generated a review of the types of and conditions for projects, and consequently spawned a new category. The strategic category was retained but with a reduced proportion of total funding under the assumption that the number of possible strategic projects was limited. More funding was allocated to non-strategic projects as, based on the limited experience of one year of the program, these were seen to be more feasible and more effective, as well as having a greater demand in terms of numbers of applicants. In retrospect this may not have been a good decision, as the perceived problem of poor management of the large teams associated with strategic projects may have been better addressed by insisting on non-academic project managers. As noted previously, this requirement was adopted, or at least encouraged, for all projects some years later.

Pilot and priming project grants were added as the new category in 1998. These grants were introduced to attract teaching staff with little or no track record in curriculum transformation or multimedia development to engage in a low budget project to gain some experience. With limits on the budget set at \$5,000 and \$10,000 respectively, pilot and priming grants were intended to have a large component of staff development and the funds were expected to be used for teaching release or technical support. There was also an expectation that successful projects in this category would lead to applications in subsequent years for a standard project, so the pilot or priming grant had to be framed to allow for this possibility.

A further request for and award of \$3 million in 1999 again generated a review of the project categories. The allocation to strategic projects was again reduced, and used primarily for continuations or completions, on the basis that strategic projects were not well managed and slow to complete. The vast majority of the funds were allocated to projects due to the success of the category and the demand from teaching staff. Pilot and priming grants were continued

but with a reduced allocation due to low demand and low levels of innovation in this category.

Two new categories were added to take advantage of shared development costs, shared experience and the stimulation of collaborative work on curriculum transformation and multimedia projects. The Melbourne-Monash protocol agreement was used to establish the Melbourne-Monash Collaborative Courseware Development Grants program, with equal financial contributions from the two universities. Project grants were awarded with the additional conditions that applicants had to show that common curriculum areas were being addressed and the project included genuine collaboration between the teams at the two universities. In most years a pool of \$200,000 was available, leading to the award of 5 to 8 grants with a maximum funding of \$50,000 (more recently increased to \$60,000) for each project in order to provide technical support, project management support and teaching release.

Also in 1999, a category for Universitas21 project grants was introduced. This stemmed from the leading role that the University of Melbourne had taken in establishing and supporting this group of co-operating international universities. Whilst the main focus of the group was on student exchange and internationalisation, collaboration on projects would be beneficial due to shared development and the opportunity for shared learning experiences by students. Indeed, the theme of many projects in this category was collaborative learning by groups of students from two or more universities. The extra imperative in 1999 was the intention by the University to purchase WebCT as a centralised learning management system, chosen largely because the majority of Universitas21 universities were already using this software. Subsequent events turned the University away from WebCT, but this was not an impediment to the collaborative development in any case. The limitation that did affect projects in the Universitas21 category was that no other university in the group had a similar internal grants program. In all cases the partner university could provide only an in-kind contribution, leaving the bulk of the development cost with the University.

By 2000 it was clear that the initiative to provide central funding for curriculum transformation and multimedia development was losing momentum. Although \$3 million had been requested and granted, the central University administration was clearly indicating that other priorities, particularly a capital works program for new buildings, would soon take precedence. The review of categories in this instance commenced a devolution process from the centralised funding to a Faculty responsibility for the program of development. The strategic and pilot/priming categories were discontinued, the funding allocation to projects was reduced and the bulk of the funds allocated to Faculty “feeds”. Faculties were allocated a proportion of the funds according to teaching load and were expected to use the money to support local programs of small projects and staff development initiatives.

Faculties were required to submit strategic plans and operational reports to indicate the intended aims and then the outcomes of the expenditures of the allocated funds. Some faculties concentrated on staff development programs whilst others devoted all the funds to programs of small project grants, not dissimilar to the pilot and priming grants in concept and aims. The level of innovation in the Faculty programs tended to be lower and in many cases was tantamount to simply establishing an online presence for a subject. This was justified by the emphasis on staff development and the much increased level of expectation for projects. What was once innovative in 1997 was now considered to be well established, if not routine, because of the greater expertise of technical staff and the more sophisticated software tools at

their disposal. In anticipation of Faculty feeds continuing, some faculties established or expanded centralised multimedia units in the faculties (BMU, 2003), whilst in some cases the responsibility was further devolved to departments within the faculties.

During 2001 and 2002 the funding to the entire program declined as expected. Project funds and Faculty feeds diminished and the Universitas21 program was terminated. Both the collaborative categories were plagued by delays due to necessity for agreements on intellectual property to be in place before funds were made available. Some projects did not commence until 18 months after the applicants were notified of the success of the application, and then staff changes, management problems and annual budget cycles all combined to reduce the chances of successful development work being completed on schedule. The Universitas21 program was severely affected, but the termination in 2001 was also due to a low priority within the reduced overall allocation of funds. Corporate knowledge of and expertise with the requirements for intellectual property agreements accumulated with time and experience, so that delays for later projects were minimised. The Melbourne-Monash collaborative program has out-lived all other categories and continues into 2003 whilst all the other categories are no longer funded by the University of Melbourne. At the completion of the program, over 230 competitive projects had been funded and more than 500 individual subjects had been affected by curriculum transformation or the integration of multimedia materials.

The Spectrum of Projects

As noted previously, the general range of projects within the University embraced transformations to problem based, project based, case studies, virtual worlds or visualisations and collaborative learning approaches (Talmat, 2003). Within the engineering disciplines, the concentration was primarily on visualisations and simulations of complex problems to enhance the standard teaching practices of lectures, tutorials and practice classes (FacEng, 2003). In general, teaching staff identified learning problems associated with the inability of students to understand the relationships between theory and either real world problems, design issues or case studies. The sample of different project titles within the engineering disciplines shown in Table 2 demonstrates that most projects were within this general category. There were no projects within engineering that directly adopted Internet facilitated collaborative learning (Johnston *et al.*, 2000) or transformed a subject or course to an immersive problem based environment (Keppell *et al.*, 2001).

The scope of the projects within the University also varied dramatically. At one end of the scale there were tutorials to be used in a single two hour laboratory class that were richly illustrated and highly interactive. At the other end of the scale there were general resources, usually on CD, that could be used as background material throughout a subject, a group of related subjects or an entire course. Some of these latter types of projects were later developed into commercial CDs (MUP, 2003). This range of scope was also reflected in the projects within the engineering disciplines (FacEng, 2003).

Year	Discipline	Project Description	Delivery
1997	Computer Science	Self-paced introduction to programming	Unix lab
1998	Chemical	Chemical process analysis simulations	PC lab
1998	Mechanical	Simulations for beam design	PC lab
1999	Geomatics	Survey network simulation	Internet
1999	Mechanical	Virtual interface for robot control	Internet

2000	Computer Science	Animation of computer algorithms	Internet
2000	Electrical	Virtual instruments for electronics	Internet/PC lab
2001	Civil	Visual tutorials for concrete design	Internet
2001	Geomatics	Case studies for integrated systems	Internet/PC lab

Table 2: Sample of projects funded within the engineering disciplines.

Measures of Success

The success or failure of the program has been measured, or has been attempted to be measured, in many ways. In the absence of a systematic evaluation of the projects in the various categories, the success of the program must be judged against other, readily available criteria.

As far as engineering is concerned, one somewhat superficial measure of success is the number of grants awarded. The last row of Table 1 shows the percentage of funds awarded to applicants from the Faculty of Engineering in the competitive categories of the program. Engineering is reckoned to be 10% of the University by a number of different types of comparative data, such as numbers of undergraduate and postgraduate students, and total number of staff. If 2002 is ignored as an unexplained anomaly in an otherwise consistent track record, then engineering was quite successful at obtaining grants.

A more significant measure of success, and one that can be applied to both the University as a whole and engineering as a faculty, is the extent of use. Measurement of penetration was mandated by inclusion of teaching quality objectives in the strategic plan for the University, in concert with the program of funding. The primary measure of penetration was the inclusion in 1998 of two new questions on the subject evaluation forms filled out by students at the end of every semester. The first question queried the use of multimedia for the subject, whilst the second queried the use of the web. There has been and still is an unresolved debate about whether students fully understand and appreciate these terms, but nevertheless the trends in the responses should be indicative of whether the program of grants was having any significant effect on the student experience. The results of the evaluations are shown in Table 3. Data for the University as a whole and Engineering as a Faculty are shown for comparison. Note that in 1998 and 1999, only part (a) of each question appeared on the evaluation forms to assess the frequency of subjects with multimedia or web material. The part (b) of each question was added in 2000 in order to obtain more detailed information from students on their assessment of the quality of multimedia and web material where it was provided.

Year	1998	1999	2000	2001	2002
	Eng Uni	Eng Uni	Eng Uni	Eng Uni	Eng Uni
7a: Multimedia regularly included (% yes)	33 34	51 42	33 28	31 29	30 30
7b: Multimedia helped learning (1-5 rank)			3.7 3.8	3.8 3.8	3.8 3.8
8a: Web regularly included (% yes)	44 38	62 50	44 31	50 35	49 38
8b: Web helped learning (1-5 rank)			3.8 3.9	3.8 3.9	3.8 3.9

Table 3: Results of student evaluations of subjects 1998-2002.

Overall trends in the data for the University and the Faculty are not clear, although ignoring the apparent anomaly in 1999 would suggest that there is generally no change or even a small decline in the use of multimedia and a small increase in use of the web for engineering subjects over the period 1998-2002. The anomalous data in 1999 may indicate the changing perceptions of students with regard to what constitutes multimedia and the web, and therefore reduces the usefulness of the survey data.

Year	1998	2000	2002
Low level use (Any computer based teaching)	70	75	85
Medium level use (Involvement in projects)	34	37	50
High level use (Interactive multimedia tutorials)	-	-	20

Table 4: Results of surveys showing the percentages of teaching staff in the Faculty of Engineering assessed at various levels of use of multimedia 1998-2002.

A second measure of penetration is the use of multimedia by teaching staff. This information is based on surveys carried out throughout the University or within faculties on a biannual basis to address requirements of the strategic plan for the University. Use of multimedia is broken down into three categories, with the lowest level being any development or use of computer based teaching, the medium level being some involvement in curriculum transformation projects or staff development, and the highest level being development or use of sophisticated, interactive multimedia tutorials.

The trends in survey data for teaching staff clearly indicate increasing levels of knowledge of and experience in curriculum transformation and multimedia development, regardless of whether this was the result of involvement in funded projects or targeted staff development initiatives. The data also supports the contention that, compared to other faculties, teaching staff in the Faculty of Engineering have a high level of involvement in computer based teaching. By way of contrast, in 1998 it was estimated that, on average across the entire University, only 18% of teaching staff had any involvement in medium level use of curriculum transformation and multimedia development. By 2002 the average had risen only a few points to 26%.

The final measure of success is a student assessment of multimedia produced by funded projects. In 2000, a survey of undergraduate students was undertaken to identify whether subjects and courses that had multimedia material integrated into the curriculum as a direct result of projects funded by the program had an impact on student perceptions and satisfaction with the teaching and learning (James, 2000). Students filled out questionnaires and a comparison was made between a targeted sample of students who were using well designed, well integrated multimedia material, and a random sample of students who had little or no use of multimedia. The results were positive in the sense that students taking subjects with integrated multimedia material had significantly higher levels of satisfaction with their teaching and learning at the University. There was unambiguous evidence from the survey that students in subjects with integrated multimedia were experiencing new ways of learning, benefiting from improved information availability, and enjoying greater flexibility of access. Notwithstanding concerns that the survey did not and could not evaluate

learning outcomes, the result is strong support for the effectiveness of projects funded by the program.

Evaluation and the Future

The results from the measures of success described in the previous section are not consistent and do not constitute a definitive evaluation. Clearly, a formal and comprehensive evaluation is desirable to make a reliable assessment of the effectiveness and impact of the \$12.5 million funding program for curriculum transformation and multimedia development during 1997-2002. The broad focus of an evaluation plan should be on monitoring student outcomes in relation to the use of multimedia in teaching and learning and the goal of enhancing the quality of the overall student experience at the University of Melbourne.

However, the specific objective would be to determine in which ways the use of information and communications technology (ICT) is influencing the student experience and addressing known teaching and learning issues such as identified through the Course Experience Questionnaire (CEQ) and other sources of data. The evaluation should provide critical data as part of a feedback loop linking the experience with ICT in teaching and learning with the objectives for teaching and learning. It is vital for the evaluation to be integrated, as appropriate, with other sources of evaluative information such as student feedback on the quality of teaching, University graduate surveys, and the CEQ.

More than one methodological approach is necessary to ensure a reliable evaluation. A single University-wide, 'macro' evaluation approach, whether by student survey or an alternative methodology, will miss the fine-grained detail that is essential in understanding the precise nature of the changes taking place in teaching and learning. Equally, relying on the evaluative efforts of individual staff or project teams alone may not provide a suitable University-wide perspective or adequately address the question of whether the University is achieving its teaching and learning goals.

For these reasons, the University is considering an evaluation plan with three components, which are described below.

University-wide impact study

University-wide study of the integration, impact and effectiveness of ICT in teaching and learning will be designed to measure trends in student usage patterns, study habits, levels of satisfaction and perceived learning benefits. It is likely it will involve a cross-University student survey combined with an assessment by an external or independent consultant. The first component is likely to be similar to the student survey discussed in the previous section (James, 2000), whilst the analysis by an independent consultant is likely to be similar to a review of ICT granting processes at the University of Melbourne conducted after the second year of the funding program (Taylor, 1998).

It is essential that this component clearly addresses the overarching objectives and priorities for the use of ICT in teaching and learning. This component will require the establishment of an agreed conceptual framework and set of priority evaluation questions. It is not its purpose to evaluate individual ICT projects and should be conducted independently and at arms' length from project teams.

Ongoing collection and monitoring of reported ICT project outcomes

A continuous collation, review and synthesis of publications and reports of ICT in teaching and learning carried out across the University is designed to enhance the monitoring and dissemination of evaluation techniques and findings across the University. It will provide a detailed and contemporary profile of project character, evaluative techniques and findings across the University. This dataset will allow the University to investigate key issues, refine teaching approaches and disseminate new knowledge. At the same time it will draw together data that will assist in developing a comprehensive assessment of trends and outcomes. Work needs to be done to consolidate a review process, identify appropriate sources of data and develop an online database instrument accessible to staff. This work has already been partly completed by an initial review (Fritze, 2002), however this survey of papers and reports on projects must be expanded and updated on a continuous basis.

Supported evaluation case studies of targeted ICT projects

Twenty annual evaluation case studies of ICT projects and the preparation of a summary report on integration, impact and effectiveness will provide detailed analyses of representative ICT projects implemented in curricula across the University. Each ICT project will act as an evaluation case study that will be carried out through the close collaboration between an independent staff member, development teams, subject coordinators, and other appropriate stakeholders. Each case study will be reported independently. In addition, a summary across all case studies will be prepared to reflect the broader findings on the impact of ICT at the University and to guide future ICT developments. To this end, an evaluation framework, criteria and set of methodologies will be developed to investigate project-specific learning processes and outcomes. While the framework and methodologies will necessarily be flexible to accommodate the twenty case studies, similar criteria and methodologies will be used across case studies, thus allowing for the generation of consistent themes in the eventual summary report. The approaches developed in this component will constitute a suite of permanent evaluation and staff development resources.

Conclusions

The University of Melbourne program of “mainstreaming the digital revolution” injected \$12.5 million into more than 230 competitively funded projects during 1997-2002. There is little doubt that the program was successful in changing the pedagogy of and integrating multimedia into many subjects and courses across all faculties. The program was also responsible for dramatically raising the awareness and expertise of staff in curriculum transformation and multimedia development through involvement in projects and staff development initiatives. The projects were also successful at improving student satisfaction with their teaching and learning, as well as providing alternative learning methods and improved access to learning materials. However, more analysis is required to assess the full impact of the program, particularly the effect of the projects on learning outcomes.

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