Dovetailing pedagogical and technical support with evaluation

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Abstract

A joint effort was made by three universities in Hong Kong to implement and promote web-assisted teaching and learning in a university context over the period 2002–2005. This effort, the e3Learning Project, promoted web-assisted teaching by serving 109 teachers during the period. The project not only provided developmental and technical support but also made a great effort to introduce the new technology to staff, explaining to them the potential of web-assisted teaching, helping them to realize their e-learning needs and assisting the evaluation of their e-learning attempts. The project adopted a 'multi-expertise' team 'process-based' support model. This paper details the mechanisms that the project employed: first, to make possible a close working relationship externally between the development team and the teachers; and, second, to create an effective team organization internally to allow high productivity and quality. These mechanisms seem to have been a great success, and simple production statistics and teacher responses are reported in order to illustrate this point.

Introduction

Academics in higher education in Hong Kong are working in a technology-mediated teaching environment, and all the institutions have infrastructures that allow wired or wireless access to their own intranets and to the Internet. Many academics therefore choose to use the Web environment to host their teaching materials. However, it is less common to see academics

venture into tapping the potential uses of the Web in university programs, except for those who are innovative or who are involved in web-based master programs. A study conducted in 2004 at the Chinese University of Hong Kong illustrates that eLearning in the university is still largely at the early stage and eLearning is not a popular teaching and learning strategy (McNaught, Lam, Keing, and Cheng 2005). Only about 45% of the undergraduate and postgraduate courses offered at the university in the 2003–04 year where the enrolments were greater than 10 students had a supplementary online site, and also the Web was mainly used for content delivery.

Although there is this growing expectation by students, Amundsen *et al*. (2004) noted that some academics are uncertain where to start because the teaching environment has changed well beyond what it was like when they started teaching. Barriers to adoption have been studied by Hannan and Silver (2000) across five universities in the United Kingdom; they reported that 47 out of 89 interviewees perceived learning technologies to be a threat to their professional practice, and they worried about their ability to use these technologies; some were antagonistic to the change, while others reported a lack of support from senior managers. Furthermore, Bonk *et al*. (2004: 59) have pointed out that academics commonly used the Web environment to 'facilitate course administration and registration procedures' and have argued that it might not necessarily be used to enable learners to 'foster student reflection, metacognition [awareness of the learning process], interdisciplinary learning, collaborative knowledge building or higher-order thinking'.

In assisting academics venturing into new practice, Barlow (1995) pointed out the need to involve them in projects. This type of professional development activity is directly related to faculty members' interests, so by engaging in them, academics have opportunities to share their experiences and network with those who have common interests across the university.

When inviting academics to embed the Web for learning and teaching, it is necessary to lower the initial technical barrier by providing some degree of technical support. However, it is equally important to persuade academics to employ sound pedagogical strategies with the Web, so other types of support are needed: introducing the new technology to staff, explaining to them the potential of web-assisted teaching, helping them to realize their e-learning needs, and assisting the evaluation of their e-learning attempts.

This paper elaborates on a model that has demonstrated this mix of support to academics through the e3Learning (**e**nrich, **e**xtend, **e**valuate learning) Project, which was funded by the University Grants Committee (UGC) of Hong Kong from October 2002. This joint-institution project received HK$3.5 million from the UGC, and the three universities involved were the Hong Kong Polytechnic University (PolyU), the Chinese University of Hong Kong (CUHK) and the City University of Hong Kong (CityU). More details of the project can be found on the project website: http://e3learning.edc.polyu.edu.hk/. The core project team members were experienced in supporting academics in the use of technology because they had been involved in an earlier UGC-funded project, the three-year, HK$6.7 million Megaweb Project (James and Hodgson 2001), which supported over 130 teachers across 20 departments in PolyU (more information: http://megaweb.polyu.edu.hk/).

This new project accomplished a considerable range of new and challenging tasks. The development team supported over 130 sub-projects, which were mostly about using the Web to supplement conventional courses, between October 2002 and December 2004, and the majority of the evaluations were completed by May 2005. Over 500 initial consultation meetings were conducted with over 100 staff across the three universities. Of the 62 key teaching academics, 30 (48 percent) were returned clients who had experienced the support provided by Megaweb or e3Learning, while twelve were involved in new sub-projects, eight had renewed ideas, and ten had further refinement from the current sub-projects. These websites are well designed in both content and presentation. However, academics may not be

able to manage the design and development single-handedly, so support is necessary. While academics may perceive the need for technical support, embedding technology in teaching and learning requires reframing the teaching and learning approach. The e3Learning Project was meant to be not only an IT technical support but also a comprehensive educational support for e-learning.

This project adopted a ‘multi-expertise’ team ‘process-based’ support model. The ‘multi-expertise’ of this project was comprised of a project manager, who understood the potential for applications of learning technologies and was good at liaising with stakeholders across disciplines in university; four web developers, who were very competent in web design and web programming and were capable of conducting further research and development with technology; an eLearning pedagogical advisor, who was very familiar with knows well the educational theories and their application in various disciplines; and an evaluation officer, who was very skillful in conducting interviews with students and teachers, designing customized questionnaires, compiling reports, and communicating key findings with the project leader and the co-supervisors of the project. The ’process-based’ support included different services provided during the stages of planning, development, implementation, and evaluation of a sub-project.

Academics received ‘multi-point support’, including technical training workshops, one-on-one meetings, and face-to-face support (Crawford 2003: 10). Academics had a number of opportunities to discuss their concerns and acquire skills when adopting good practice with technologies in teaching. The model involved a systematic schedule of work (the sub-project lifecycle), which begins with the submitting an eLearning sub-report proposal and ends with the handing of evaluation results back to the academics. The model also involved various processes to better relate project team and academics (team–academic processes) and also enable effective distribution of labor between project team members (team internal processes). These processes ensured that developmental and pedagogical needs and concerns were

adequately communicated and instantiated. The sub-project lifecycle and the processes are elaborated below.

Sub-project lifecycles

A proposal compiled by an individual academic or from a staff team member teaching in the subject/program would be processed by the e3Learning Project as a sub-project. Each sub-project had its own lifecycle: planning, design and development, implementation, and evaluation. The different stages of the lifecycle of a sub-project with types of support are shown in Figure 1.

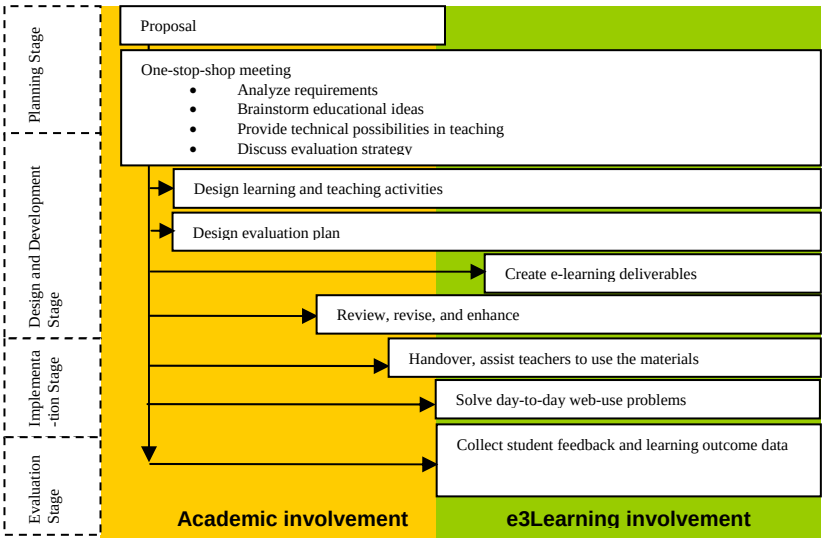

Figure 1 Lifecycle of a sub-project

During the planning stage, academics received educational advice, particularly on types of online activity. If an academic had brief ideas, the initial meeting (one-stop-shop meeting) provided the opportunity to brainstorm ideas. It was particularly useful for the academic to see concrete examples done by other academics from the same or different departments in this meeting. From viewing practices in different departments, they could generate new ideas for their current or new sub-project. On the other hand, some academics came with concrete proposals. The development team would then explore the technical feasibility of production or suggest modifications if the ideas were not within the scope of development.

By knowing how technology was embedded in a subject/program, an academic had the opportunity to discuss types of data of collection with the evaluation officer to find out perceptions of students and effects on student learning. The evaluation officer would then suggest a tentative evaluation plan. In the design and development stage, technical officers first created the prototype of the e-learning material for academics' feedback. Modifications and enhancements were then made so that the final deliverable could best be aligned with good educational practice. In the implementation stage, technical officers demonstrated the use and features of the final deliverable to the academic. A customized user guide might be produced to document complicated procedures. All essential files, including the user guide, were passed to the teacher, who was encouraged to seek in-time advice for emerging issues. In the final stage, the evaluation officer carried out an evaluation in consultation with the academic.

Team–academic processes

Hodgson and Lam (2004) noted the importance of communication between stakeholders to ensure that the web development both met the requirements of the academics and fully utilized the potential of the Web. The workflow of the e3Learning Project, as depicted in Figure 2, is a highly client-centered model. It has the advantage of enabling frequent exchanges between academics, and the development team seems to be an excellent solution to the situation: academics can accurately inform the team of their needs and hand over their course content for development, while the team has the chance to fully explain the strategies of using the Web in teaching and learning, and later the delivery of finished products for constant monitoring.

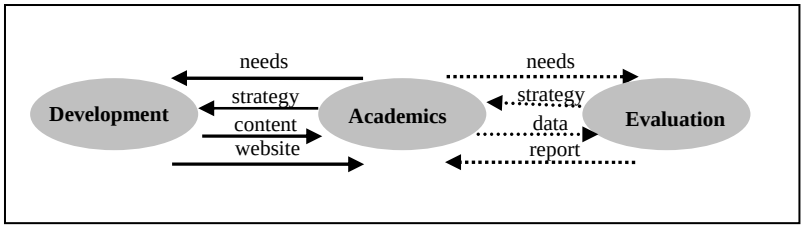

Figure 2 Development and evaluation support processes

As academics have different experiences in their teaching and different levels of competence in embedding the Web in their teaching, a wide variety of different types of educational ideas are used with the Web. Besides, academics from different disciplines have different needs, different approaches to teaching, and different manners of presenting teaching materials. For example, staff from the Department of Nursing and Health Sciences may want students to develop reflective practice for student nurses. They may therefore want to have a website that allows students to construct their learning experiences and reflect on their practice. On the other hand, staff from the Department of Applied Biology and Chemistry Technology may want their students to acquire problem-solving skills and be engaged in the interactive process through programmed problems in the websites. Unsurprisingly, staff from the English Department may want their students to have more opportunities to listen to native speakers speaking in recorded audio scripts that are accessible from websites while students practice oral presentation skills in face-to-face tutorials. To match these needs, the development team, with its technical talents and specialties, provided appropriate advice and assistance in designing the learning activities.

The evaluation team provided evaluation strategies based on the purpose and intended learning outcomes of the subject matter and the evaluation areas that academics were interested in. Having gathered collective feedback during the whole process, a report was drafted and then sent to the academic when each sub-project was completed. The provision of pedagogical advice, support from a team of experienced technical staff and the feedback mechanism through collection of student feedback and learning outcome data formed the

bedrock of support for all sub-projects. The multi-expertise team process-based support thus created a two-way educative process between academics in an informal learning community (Oliver 2002).

Team internal processes

Team members who have different roles in a project are of prime importance in the provision of high-quality and effective services. As Figure 3 shows, the project leader in this case worked closely with the project manager and the evaluation officer to identify academics with a diversity of needs and also oversaw the progress of all sub-projects across the three universities. Progress on sub-project production and evaluation was monitored through a project website that housed all the documents, including the monthly production process, evaluation action plan, and evaluation reports of each sub-project.

The project manager managed a development team to support website production. The technical team consisted of members who had capability in both web design and web programming and knowledge of current technological developments. Typically, they were assigned to sub-projects that matched their skills and expertise at the initial meeting with the academic. They provided technical ideas in line with the needs expressed in these meetings. The project manager, the assigned technical officer, and the academic would then agree an action plan, an evaluation plan, and a production timeline.

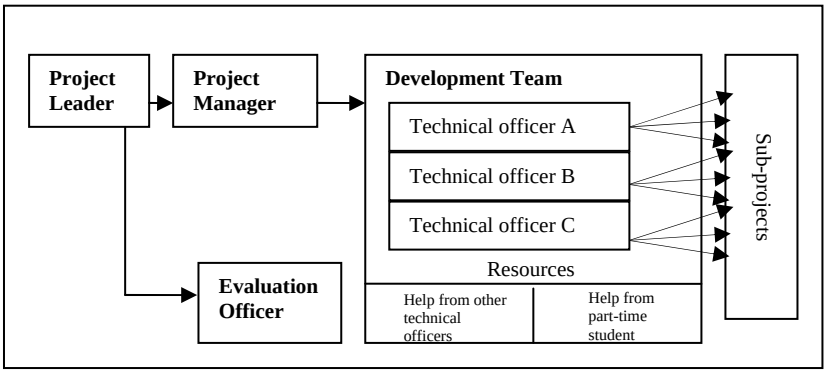

Figure 3 Team internal processes

After the initial meeting, the technical officer maintained contact with the academic, collecting the materials required for production, selecting the appropriate development tools, seeking their comments on prototypes, and preparing the final version before handing over the website. While each technical officer had different capabilities in web programming or web design, they were encouraged to provide mutual support in their specialties. The development team was housed in an open-plan office so that they could seek advice from team members. The ease of exchanging ideas increased production efficiency and subsequently enhanced the quality of services.

The team met monthly, and the technical officers reported the progress of each sub-project under their supervision. On the one hand, they took the opportunity to provide peer feedback to the deliverables under development. The feedback became the catalyst for quality improvement. On the other hand, the team members shared experiences and ideas to tackle any technical or personnel problems in order to speed up the development process. For instance, the project manager would need to remind academics about the terms of agreement if they had made no progress with their sub-projects for a few months or had made unexpected demands on the development officers. Overall, technical officers kept the project manager in the communication loop when a sub-project reached a situation that required advice, which could be a milestone that needed the project manager to review the materials produced.

In order to serve the three universities despite limited human resources, student helpers were employed and supervised by the officers to help with production. Some of the recurring tasks, such as data entry, template modification, and resource gathering, could be allocated to these helpers. Some helpers who had acquired compatible skills and who had a demonstrable sense of responsibility were invited to tackle more challenging tasks, such as program debugging

and website structure development. In some cases, student helpers were involved in developing ideas for the learning activities because they had gone through the difficulties in learning the subject matter. Given the input from both academics and students, the design of 'products' was better aligned with the students' level of understanding.

Evidence of success

The websites produced achieved quite extensive influence in the teaching and learning at the three universities concerned. As of the end of the project, 70 sites had been evaluated as having been actively used to assist course teaching. The total number of visits (readings from counters set on the front page) amounted to 67,744, which indicates a high frequency of use. From the websites that had site logs, 4,951.29 was found to be the average access per semester per website. However, accessing websites is not the only indicator to demonstrate the impact. How the content was designed and how students were engaged with the contents in a way that enhanced the quality of learning were more important.

Of the sub-projects that were supported, almost all primarily had teaching notes and presentation materials uploaded to the websites. However, the types of teaching material extended from textual documents to photographs, audio clips, video clips, and useful links to the Web, depending on the subject matter. When designing learning activities through the Web, the goal is not merely to replicate face-to-face instructional experiences but to create new activities that will stimulate learners to take charge of their curiosity and critical thinking (Wagner 1994). Some academics chose to design cases that simulated the authentic working environment to allow students to discuss, debate, and reflect on the cases through the Web. Students in Hong Kong are typically quiet in class. There are few opportunities for learners to interact with each other in mass lectures. Oliver (2000: 157) noted that it is important to instill a sense of 'intellectual curiosity' into learners so that they are better prepared for and

self-directed in the learning process. By embedding learning activities through the Web, students have an open environment to interact freely.

A number of academics participating in the sub-projects valued the importance of engaging students in the learning process. A study by Baldwin *et al*. (2000) reported that most faculty members identified learner engagement as a key reason for bringing learning technologies into their programs. Engagement is defined in terms of a student's 'psychological investment' in learning (Newmann 1992, cited in Bates and Poole 2003: 37). Students will be prepared to spend more time and effort studying the subject matter when they are thus engaged. The level of awareness of student engagement is increasing, and the approach in teaching is changing progressively as a result. These changes in practice were drawn from ideas from academics' initiatives, learning outcome data, and feedback from students. Some projects made progressive changes with better use of pedagogical applications, while others made major changes. Here are some examples:

- Staff A had never used a website for teaching before. However, she was keen to have her students practice reflection while they were going through their university courses. With support from the development team, a website was set up for her. Although Staff A was apprehensive about using technology, she felt confident enough to communicate with her students through the Web in addition to face-to-face meetings. Her students were better engaged in their learning through individual reflection. In fact, they were motivated while they could share their valuable experiences and felt supported when sharing their anxiety with peers through the online forum during the first placement in the clinical setting.

- Staff B had years of teaching the subject through lectures and tutorials and always enjoyed the process of having individual consultations with students. While she found it difficult to get her students to raise questions in class and also faced the issue of

increasing class size, she made efforts to learn what the Web could do for her teaching. Although she had very low confidence in using the Web, she was very pleased to see her students posting questions to the online forum after it had been set up by the development team. Undoubtedly, the medium can cater better for students who are shy and/or those who are not confident to raise questions in class.

- Staff C had used a website designed by Megaweb four years ago, and the materials had been retained. She lacked the skills to revise them and continued to reference them when she was teaching. However, she was leading a new master program that had finally been approved from the Senate, so she approached the e3Learning Project to ask for technical support in constructing websites for all subjects in the program – the core subjects were taught by professors from different countries. Although there was a face-to-face taught component, communications between the professors and the part-time students were meant to be followed through the websites. Furthermore, the students were required to document all their work in e-portfolios across the years of study. The development team assisted in setting up the websites and prepared the user guide for students in creating the e-portfolio. Subsequently, students could review their progress in a program through multiple pieces of coursework and by reflecting on their strengths and identifying areas for improvement.

- Staff D had a lot of experience in teaching but had no experience with the Web. She selected appropriate CD-ROMs as a resource in her teaching. However, the class size had increased threefold in the last year. Thinking about the types of activity conducted in both mass lectures and tutorials, interactions between students were still limited, so she started to think about using the Web. Based on the textual materials, the e3Learning development team developed a series of interactive online activities.

Students then had extended and multiple opportunities to practice and received immediate feedback through programmed activities after class.

- Staff E had made use of the website created by Megaweb to present her teaching materials and often encouraged her students to participate in this type of computer-mediated communication. The development team was involved only in redesigning the look and feel of the website for her. She was competent enough to update the content herself. She used to spend a lot of time responding to almost all inquiries from students. Having discussed with her how to maximize the opportunities for students to be engaged in their own discussions, she changed from being an active 'speaker' to become an active 'facilitator' and encouraged her students to respond to inquiries from one another. These students became more independent of the facilitator and more supportive to their peers in the online community. Furthermore, to give her students wider exposure to international experience, she arranged a network with a university in Korea, which provided an opportunity for her group of students to interact with those in Korea through the asynchronous online environment. Both groups had wider cultural exposure when learning the subject matter.

- Staff F also had a website created by Megaweb with comprehensive teaching notes for a few years. The only change that he did was to alter the look and feel of the website; he hardly revised the content or had any online discussion with students. Later, he wanted to put a few cases on the website and have his students discuss the cases in the online forum. He approached the e3Learning development team and discussed the idea. The team helped to script the cases with appropriate audio effects and photos. Although only 5 percent of the assessment mark was allocated to the contributions, the majority of the cohort participated in the discussion, and the staff member also regularly joined the discussion. Subsequently, it affected how he organized face-to-

face tutorial discussions. As students made discussions through the Web, the staff member referred to what was discussed and had time to discuss more issues in tutorials. Students being interviewed in the focus group reported that they welcomed both the online and face-to-face discussion.

- Staff G had a website constructed by Megaweb with teaching materials and examination papers with answers from previous years. He had students with diverse needs. Despite his efforts in assisting his students to learn how to learn, he had not received favorable feedback from his students through the standardized questionnaire on evaluation of teaching performance a few years earlier. He then approached the e3Learning Project and discussed how he could improve when the cohort had different entry levels to study in the subject. The evaluation officer and the development team held focus group meetings with students who had gone through the program and explored the topics that students had experienced difficulties with. The following ideas were generated: (1) design simulation to explain abstract concepts; (2) produce interactive exercises that illustrate steps and hints in solving problems; and (3) design a game to help students to master the basic concepts. As this sub-project placed greater demands on the development team, the team co-designed with student helpers who had skills in graphic design and programming to create a website with a variety of learning activities.

- Staff H had a subject website, but he wanted to embed crossword puzzles to encourage students to engage while studying the subject. However, students do not always work in front of computers, although they can easily access the Internet on campus or at home. The sub-project extended the application of the Web to mobile devices like personal digital assistants (PDAs). Students could download the applications to their PDAs and try the puzzles anywhere. The results of the puzzles

could be transmitted when they accessed the Internet. Tracking student use through PDAs was not well developed at the time of developing the PDA activities. Evaluation results showed that the puzzles were not popular among the students in the first try-out due to a lack of promotion and technical difficulties. The technical staff had a plan to strengthen the system and introduce the games to students in the coming teaching term. One year on, he had more ideas for supporting student learning. He thought of designing cases in which students had to work in groups. Each group would be required to conduct both peer and self-review. The development team assisted in setting up the links to relevant resources and time for release of the cases on the website and assigning groups to the activities. As for the attempt to use the Web to deliver and administer case-based teaching, the results were promising. Student data was collected through surveys, and students' writing of reflective journal at the end of the course. A focus group meeting was also held with 11 randomly chosen students out of the 83 students in the course. In general, the students appreciated the online case-based discussion activities and found them useful. Nevertheless, there were challenges. For example, students found the workload very high even with the web organization. Experience of this try-out has been recorded in Mohan & Lam (2005).

These cases illustrate that academics made changes in their teaching practice when given appropriate support across the period. There were a number of good examples that it is not possible to illustrate fully in this paper. Although many of the academics who were supported through the project maintained conventional practice, some academics were more innovative and were prepared to take bigger risks in attempting new approaches in their teaching. Some started to redesign the curriculum with some online components; as discussed earlier, some involved their students in various types of online activity. With technical and pedagogical

support, academics could venture into alternative teaching strategies that provided students with further engagement in learning.

Through the process of support, academics had opportunities to put educational ideas into practice and thus expressed their appreciation that they had the benefit of:

1. reducing the technical burden to create the materials systematically on the Web;
2. converting some conventional presentations in lectures to interactive learning tutorials;
3. creating an open environment for students to interact with one another and place additional value on the conventional method; and
4. managing a much larger class.

On the other hand, students were exposed to an environment in which they were challenged to:

1. manage the initial technical barrier, especially for part-time students;
2. develop new technical skills for those who were involved in developing digital presentations;
3. provide purposeful feedback to peers in the online forum;
4. be critical of what they learned;
5. respect different perspectives during discussions; and
6. develop independence when they were given greater responsibility in the learning process.

On the whole, the impact of the project cannot be measured from isolated incidents. Because development and evaluation support was provided, academics who used the service generally commented favorably on it. The evaluation also generally showed improved levels of satisfaction in student learning by both academics and students.

Limitations of the project

The way in which technology is used in education is not simple, and good innovative practice seems to be grounded in support for technical development and educational advice with evaluation. In celebrating the success of good practice with technology, there are limitations in providing support through a funded project. Since embedding e-learning in conventional programs in Hong Kong is still perceived as adopting innovative practice, this project worked with committed academics who were prepared to make a change. However, the majority of academics are still comfortable with the conventional teaching approach, and the teaching process itself remains unchanged. Although the mass of adoption is growing in one university, the pace of adoption is still slow in two of the three. Support has been provided to a low proportion of the academic population.

On the other hand, the project team established a rapport with academics who were involved in the project type of professional development activity. By establishing a trusting and supportive relationship with academics, the project team was well received in this e-learning community. The barriers to new technology seem to be coming down. More academics have taken on this challenge – and with less resistance when development and evaluation support is readily provided. However, commitment from academics is not guaranteed. While the teaching load is growing heavier, academics have not had any time release when involved in additional demands at work. Pressed for time, a number of sub-projects were maintained with minimal changes for subsequent year cohorts.

Apart from pressure of time, a lack of commitment can be due to the pressure of research output. Like many research-led universities in the world, research output is still the key indicator for contract renewal or promotion in Hong Kong. Some sub-projects (5 percent) were withdrawn from one university because their progenitors' contracts had been terminated. Being enthusiastic and innovative in teaching is not enough to secure a position. Other sub-projects (7 percent) were committed to other research projects or were pursuing doctoral studies. The expectation of creating new knowledge in higher education is universal. This

raises the issue of alignment of university policies and strategies with government initiatives. Despite the support provided through government-funded projects, the enabling factors lie in the priorities set and recognition of effective and innovative teaching in the university.

Furthermore, as the project provided highly client-based support, and the processes were based primarily on individual initiatives, there is no clear evidence that this can influence departmental culture or have an impact on institutional policies. Despite some academics having good insights into the application of technology in teaching, neither their experiences nor the resources developed were widely shared within and between institutions. While other academics may spend much time and effort developing resources in the same disciplinary area, it seems that 'reinventing the wheel' is well rooted in universities. Is this an issue of individualism in the culture, a matter relating to copyright, or a product of competition within and between institutions?

While the Hong Kong government can improve the technical infrastructure in universities over a short period, there are problems when employing short-term, project-based support for academics in higher education in order to achieve long-term government policy – developing a knowledge society. As the project came to the final phase, the experience and expertise of the project team was not retained, and the project team was disbanded. The rapport established also came to an end. The gap for academics mastering pedagogic and technical skills and knowledge in e-learning remains wide.

Conclusion

There is a call for deep collaboration between institutions from the University Grants Committee in Hong Kong. The purpose is not simply to economize on operating costs, although the government has been under enormous pressure to tighten the budget in higher education. There is much to learn and share between universities. This joint-university project had the opportunity and benefits created by combining the expertise from three institutions

and thus supported academics effectively. While cultivating a boundary-free collaboration, each institution achieved synergetic outputs.

Providing support in e-learning appears to be essential, whether academics are new to its integration or not. As a bottom-up approach in supporting academics to integrate technology into teaching, it achieved the goal of instigating good teaching practice. While this project did accomplish its goals in supporting academics in the design and development of educational websites and collected feedback useful to them, it also started e-learning momentum in the universities. To embed effective and innovative practice in learning and teaching with technology, there is a need for 'joined-up' technical and pedagogical support (Oliver and Dempster 2003: 151). The multi-expertise team process-based support model can clearly provide a painless challenge to academics and offer a fast feedback loop on innovative practice. However, academics may need to seek support from different sources in an institution and to embrace learning technologies through continuing to learn in a collaborative process (Oliver 2002). Although the project has come to an end, it can serve to provide a bedrock framework for an effective e-learning support model that institutions can adopt in central support centers or distributed through faculty-based support units.

However, to promote the integration of e-learning in higher education, wider and more concerted efforts are required. McNaught and Kennedy (2000) indicate key factors, including the alignment of policy, culture, and support in individual institutions. Despite the fact that universities are competing for government funding, the mix of expertise of team members cultivates a heightened spirit of a boundary-free learning community between institutions, of which this project celebrates fruitful results through deep collaboration. Balancing the optimum deployment of resources and the continuing pursuit of new knowledge in higher education, it is time for senior management to take further action in universities to review the current systems and decide on the steps needed to create an optimum environment for embedding e-learning into university teaching.

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