Tools and techniques for scenario based e-learning for New Zealand tertiary students: Prototype to adoption

Terry M. Stewart
Institute of Natural Resources
Massey University, New Zealand

This paper describes the development and delivery of an e-learning project whose outputs were made available to all government-funded tertiary institutions in New Zealand. PBL-Interactive is an authoring and delivery tool for scenario-based learning and Challenge FRAP is workbook software which can both guide and capture process in student assignments. The existence of well-developed prototypes of these programs meant that important support material (examples, guides, tutorials etc.), along with awareness and training workshops before and after the project, could be undertaken within the short timeframe of 18 months. The project fulfilled all its objectives, but barriers remain to wide-scale uptake within the recipient institutions. These constraints to adoption, which are likely to be relevant to many e-learning initiatives, are discussed.

Keywords: problem-based scenarios, scenario-based learning, workbook software, adoption barriers, PBL-Interactive, Challenge FRAP, e-learning, implementation, New Zealand eCDF project

Introduction

The New Zealand Tertiary Education Commission (TEC) is responsible for leading the New Zealand government's relationship with the tertiary education sector, and for policy development and implementation. From mid-2003 to mid-2007, TEC administered a series of competitive short-term grants from a fund called the "e-learning Collaborative Development Fund" or eCDF. The overall aim of the eCDF was to "improve the tertiary education system's capability to deliver e-learning that improves education access and quality for learners", through the development of tools, techniques and guidelines which could be used by all institutions in that sector. A second aim was to "help achieve the co-operative and strategic implementation of e-learning in tertiary education organisations". Outputs of the projects were to be freely available to government-owned tertiary educational institutions (TEIs).

The author won and managed one of these eCDF grants, which involved developing and deploying two pieces of educational software. These were interactive tools, designed to assist with case-based or scenario-based learning. Full descriptions of these tools are available from the reference sources given in the text, so this paper focuses not so much on the tools themselves, but more on the development and deployment process required to make them usable to the e-learning community, within the scope of this project. It concludes by reflecting on uptake by the recipient institutions, and what is needed to truly embed this technology within TEIs.

Background

The author has been developing scenario-based learning authoring and presentation software since the late 1980s commencing with a program called DIAGNOSIS (Stewart, 1992). In this early version, the program allowed a user to interact with a diagnostic scenario similar in style to a text-based "adventure game" (Lebling, 1980) although pictures could also be shown.

In these scenarios students played the part of a plant diagnostician. Using the software they could explore the environment, (which invariably contained sick plants), ask questions of other characters, such as growers and managers, and conduct diagnostic tests. Misleading clues abounded. They then had to provide a diagnosis, a justification and a recommendation. A separate "builder" program allowed tutors to easily author scenarios without programming.

Although not defined in the literature at the time, this paradigm this software supported has come to be known as Goal-based or Scenario-based Learning (Schank, 1997, Schank et al, 1994), and is commonly employed many training situations both to motivate learners and allow them to "learn while doing".

Collaboration with Centre for Biological Information Technology (CBIT), at the University of Queensland, Australia through the 1990s saw a Windows-based version of the program produced, called DIAGNOSIS FOR CROP PROBLEMS (Stewart *et al*, 1995. Stewart and Galea, 2006). This program was made available to other plant protection teachers worldwide.

DIAGNOSIS FOR CROP PROBLEMS was tailored for one subject domain i.e. Plant Health. However, from this work, a team lead by the author independently developed a similar, more generic authoring tool called CHALLENGE, a program similar to DIAGNOSIS FOR CROP PROBLEMS but which had the potential to be used any subject domain (Stewart and Bartrum, 2002). When it was found that some teachers preferred to give the scenario editor to students to record their project work, a derivative of the software was written for the latter purpose and called Challenge FRAP (Form for Recording the Analysis of Problems) (Stewart *et al*, 2007).

As work was slowly being carried out on CHALLENGE from 2002-2004, CBIT had independently developed a generic interactive scenario authoring and delivery tool similar in function called PBL-Interactive (PBLi) (Anonymous, 2007). Although still in development, its delivery system was server-based and the program had other features, like a new interface and more advanced pre-requisite functionality, which were improvements over CHALLENGE. When the eCDF project proposal was being developed in 2004 therefore, it was decided to use PBLi in place of the original CHALLENGE as an authoring tool for interactive scenarios.

The eCDF project then, aimed to develop the PBLi prototype and Challenge FRAP to a level where they could be used by others, and also provide example lessons, training materials and other resources to assist in program use. Once completed, these outputs would then be made available to publically-funded TEIs

Methods and outputs

As mentioned in the introduction, details of PBLi and Challenge FRAP can be found elsewhere (Anon, 2007, Stewart *et al*, 2007). Consequently, this section only discusses the development process from prototype to deliverable product and production of associated materials, in terms of the eCDF project.

The project ran from 1st June, 2005 to 31st December, 2006. It consisted of the phases below.

Institutional awareness

At the start of the project, it was felt necessary to expose prototypes of the software being developed to the wider New Zealand tertiary education e-learning community. Doing this would assist not only in gaining a wider perspective with regard to features and functionality, but also help with implementation. People are more likely to adopt or promote new tools in education if they have had a role in developing them. At the very least, they gain some familiarly. It also gave the project team a personal rapport with e-learning facilitators in the other TEIs, which would assist with the delivery phase.

To facilitate this end-user input, two duplicate awareness workshops were run at a national e-learning conference (eFest 2005). Workshops took the form of a one-hour seminar introducing the tools, followed by another 1-1.5 hours where participants had an opportunity to construct an example lesson with the PBLi prototype by following a step-by-step guide. The eCDF project plans were also outlined to participants.

Institutions were personally invited to send one representative (usually an e-learning facilitator) to the workshops. Thirty one people attended representing 26 institutions, the balance being made up from private training establishments. Feedback on the proposed project was gained from these participants by way of informal discussions and a questionnaire which participants were asked to fill in after the workshop. From the results of this questionnaire, it seemed the goals of the eCDF projected were understood and there was general agreement that the tools seemed useful in a tertiary learning environment.

A project website at was also set up at the start of the project, so institutions could follow developments during the project's lifecycle (see below)

Program development

Both PBLi and Challenge FRAP existed as useable prototypes prior to the commencement of the project. The first task involved development of specifications for the final programs. Required functionality was discussed and finalised with the programming team. Ideas for some of the functionality also arose from the workshops mentioned above. Once agreed upon, the programmers then worked on these enhancements, providing installation files for testing when required.

As with most software development, specifications were tweaked during this development life-cycle as new ideas arose and/or some desired features proved too ambitious.

The larger of the two programs, PBLi, was tested with a cohort of students at Lincoln University during March-April 2006. Not only was the stability and usability of the program (particularly the interface) tested, but also the educational benefits of engaging students in interactive scenarios was also explored. In general, tutor and student response was positive. However, the results of this trial stressed the need for these kinds of lessons to be strongly embedded into the curriculum to be most effective (Gossman *et al*, 2007).

Exemplar PBLi scenarios

Exemplar scenarios were considered important PBLi supplements, which would assist teachers to use the software. Not only would the scenarios demonstrate the software and different approaches, they could also act as templates for teachers to amend and adapt for their own courses. Fifteen subject areas covering a wide range of disciplines were identified, and experts in each of these subject areas were sought. In the spirit of collaboration, and again, with a view that uptake is easiest if there has been some local contribution to development, these experts were sought from institutions across the sector. In the end, 16 scenarios were developed, using staff from six separate institutions (Appendix 1).

Scenario development gave some insight into the planning and the process required for this activity. These tips and techniques were outlined in the training manual and a spin-off publication (Stewart, 2006). It was a creative process, which involved formulating teaching objectives and assessment methods and then developing a scenario script with a "plot" and "characters". Scenario planning was most effective when carried out at face-to-face meetings with the expert, using a whiteboard to sketch out locations, objects, people, reports, tests and tasks. Once a schema was developed, drafts of the scenarios were produced in the authoring tool (PBLi Builder) for the expert to check.

Challenge FRAP did not use scenarios as such, but two real examples of both a student exercise and tutor template were included with the software to aid understanding.

Training materials and graphic materials

The production of training materials was an important part of the project. These were produced over a six-month period by the project manager, and consisted of two manuals designed to teach people how to use the software in their teaching. Tips and techniques came from the author's own experience and the relevant academic literature. Also produced was a step-by-step tutorial on scenario development, outlined both in the PBLi manual and by way of a *Camtasia* narrated screen-grab video.

Graphic resources

It was recognised at the planning phase that one constraint to a tutor who may wish to use these software tools was a lack of bundled copyright-free icons which represented common locations and tasks. These could be obtained from various places (the Web, commercial CD-ROMS etc.) but such collections were unlikely to have a consistent design style. Consequently, a graphic designer was engaged to produce icons for both PBLi and Challenge FRAP over the lifetime of the project. These were included both in the exemplar scenarios and example lessons, and as items in a separate library for tutors to use for their own scenarios.

Website

As the project involved a number of collaborators, it was felt necessary to develop a project website (http://pbl.massey.ac.nz), so that all interested parties could view progress. People could subscribe to this site, and receive regular updates. It helped with building a community of participants. This website was also used to deliver outputs at the end of the project.

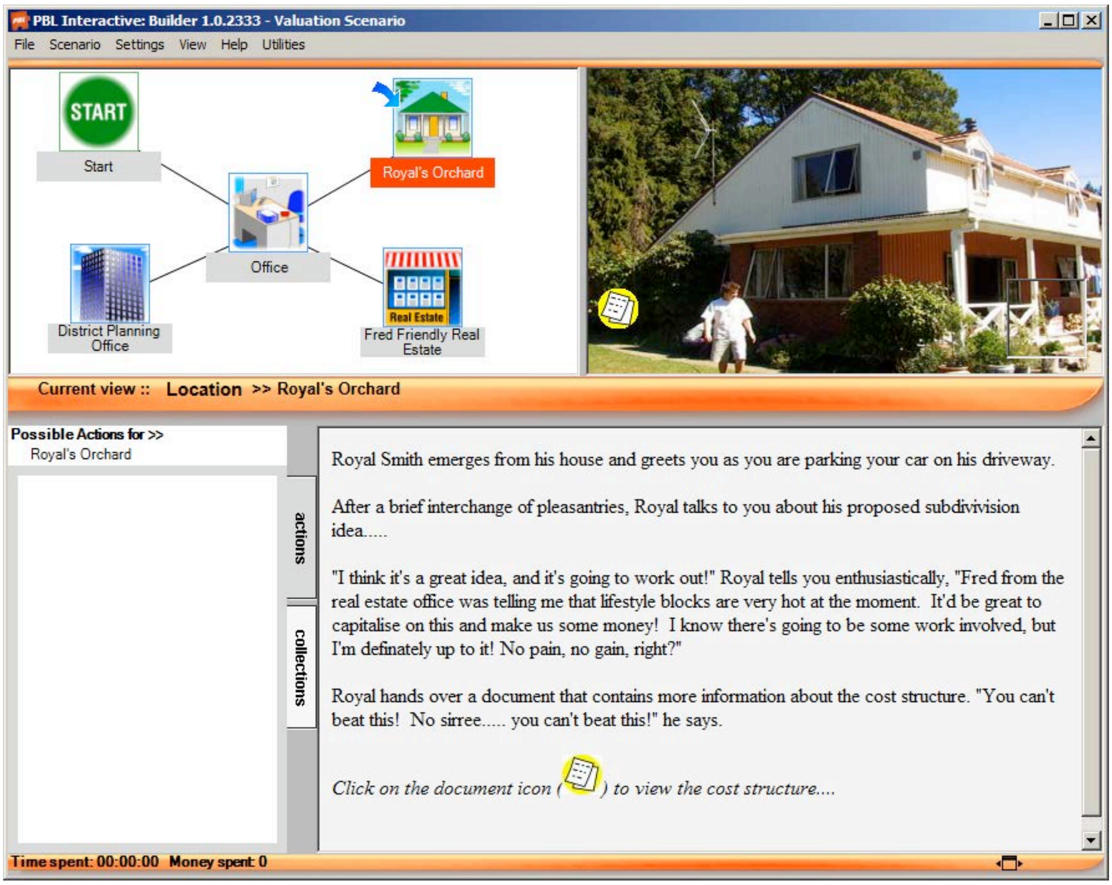

Figure 1: Part of the PBLi commerce exemplar scenario in the PBLi client-based player

Delivery of outputs

As the outputs were nearing completion, arrangements were made through the Chief Executives or Vice Chancellors of each of the TEIs to hold a seminar and/or workshop at all 33 eligible institutions. During the visit, a "Kit" containing hard-copies of the manuals and a CD-ROM containing the software and other resources was presented to the head librarian (Figure 2). Either a seminar (1 hour) or a seminar/workshop (2 hours) was given to familiarise interested staff with the software and concepts. Workshops involved participants first being shown a PBLi scenario, and then constructing a simple version of this scenario themselves in the authoring tool, using a step-by-step guide. Raw material for the exercise such as graphics, icons and text were provided.

These events were normally facilitated by the chief e-learning facilitator within the institution and the staff who attended were generally subject teachers courseware designers and/or e-learning facilitators.

The Kits were registered at the New Zealand National Library and so had an ISBN number for easy cataloguing. Staff could check these kits out and freely copy the CD-ROM (which also contained electronic versions of the manuals) for their own use. In addition, 20 copies of the CD-ROM were given to seminar and workshop participants for their own use. If the participants were less than 20, the remainder of the CD-ROMS were left with the visit facilitator.

It was also decided to make the CD-ROM available over the web. Any staff member of one of the TEI's could register on the project website for a download and receive authentication details. They could then download zipped copies of the CD-ROM directories.

Follow-up survey: Measuring uptake

When the outputs were delivered, there was general enthusiasm for the tools amongst those who attended the seminars and workshops. However, embedding the tools into institutions so they are used regularly requires more than just an enthusiastic reception so in order to measure both use and possible barriers a web-survey was conducted in late May, 2007 amongst seminar and workshop attendees. This survey has yet to undergo comprehensive analysis but the preliminary results appear below.

Forty-six people responded to the survey which was approximately 18% of the total attendance. First people were asked if they had explored the tools beyond the Seminar/Workshop and if not, why not. Twenty one people had not explored the tools post-seminar or workshop. The reasons are scored in figure 3.

Figure 2: Library kit containing the project deliverables

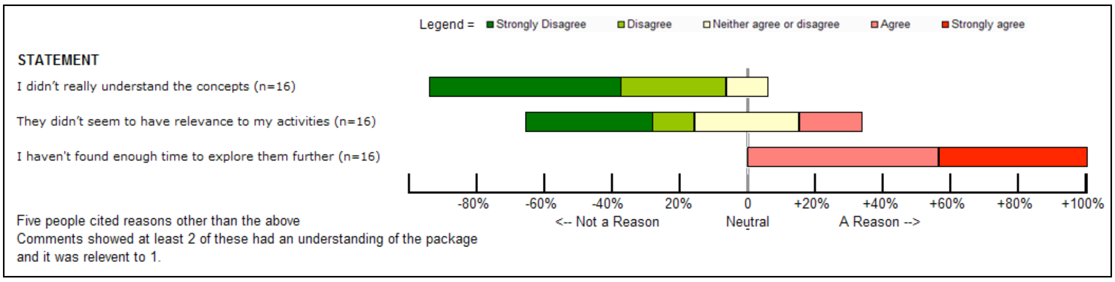

Figure 3: Reasons for not assessing the eCDF package post-workshop/seminar (n-21)

The remaining twenty-five respondents had gone further and examined the tools and support material after delivery. They were asked to indicate possible barriers to adoption from a list. They could also elect to offer "no opinion" on any of the potential barriers, if they felt they had not explored this aspect enough to form an impression. These results are shown in Figures 4 and 5.

These results show that, in the main, attendees could see a use for the outputs in their activities and felt that the software and support materials were adequate for use. However, teacher time (or rather lack of it), compounded by a lack of institutional support, was generally perceived as a significant barrier to adoption. The lack of PBLi integration with common Learning Management Systems with regards to student authentication (i.e., if used within an LMS students need to authenticate twice, once for the LMS and again for PBLi) is also noted as a barrier by some, although many respondents had no opinion on this. The fact that Challenge FRAP was client-based only was also an issue for a proportion of respondents.

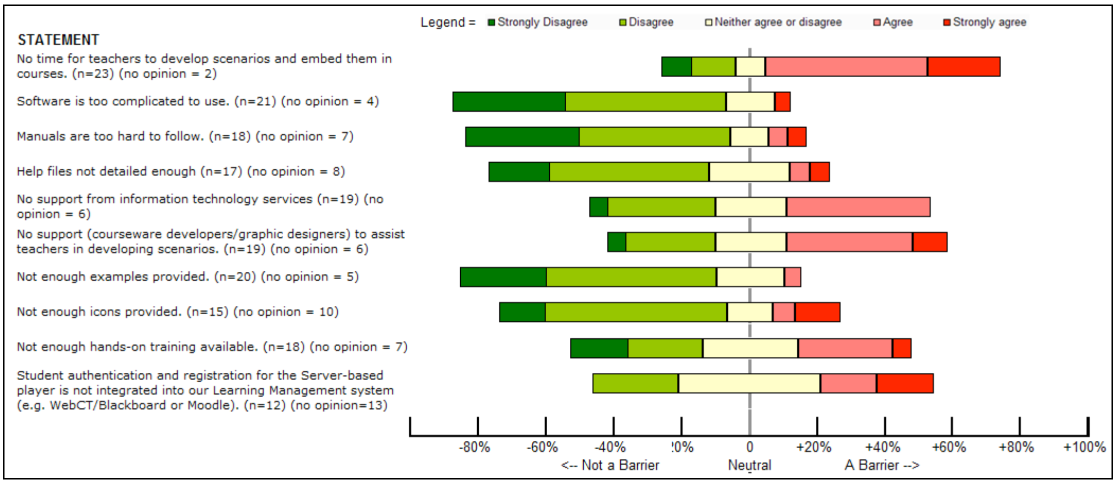

Figure 4: Opinions on barriers to adopting PBL-Interactive for classwork from those who have assessed the software package post-workshop/seminar (n=25)

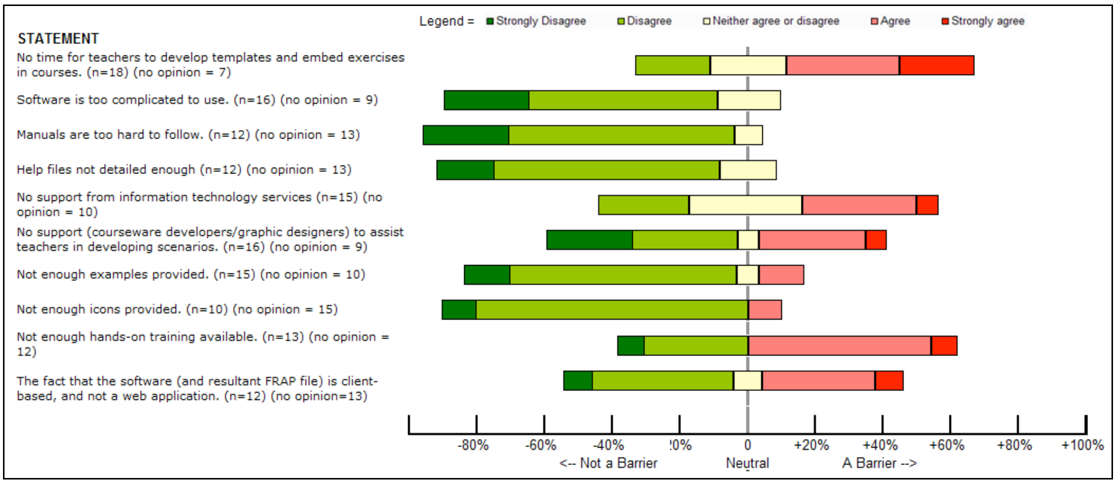

Figure 5: Opinions on barriers to adopting Challenge FRAP for classwork from those who have assessed the software package post-workshop/seminar (n=25)

Twenty three of the twenty five that had further assessed the products felt they would be using, or supporting someone who would be using, both programmes in a course in the future.

Discussion

Was the project a success? In terms of objectives (producing the software, support materials and getting it delivered) the project succeeded. However, as far as the overall aims of eCDF grants are concerned (enhancing the e-learning capability of the Tertiary sector) it is still too early to tell. Uptake of the technologies now depends on the institutions concerned. True success will only come if the tools are actively used within the institutions they have been donated to.

Specific activities and support outputs were included in the scope of the project, in order to maximise implementation. These include teaching examples, many written with staff from other institutions, along with self-directed tutorials and guidelines for class use. Workshops were held at the commencement of the project, allowing interested staff and early adopters to become familiar with the prototypes. Lastly, show and tell-type demonstrations and workshops with the finished products were held at each recipient TEI. These events were attended by institutional e-learning facilitators and interested teaching staff. The post-delivery survey indicates that staff who had examined the material were generally happy with the software and support material, and could see a use for it. Nearly all who responded intended to use it in the future.

However, beyond the enthusiasts, significant barriers to widescale adoption exist. As the follow-up survey indicates the most important of these concerns teacher time, a constraint to technology adoption also identified by Rogers, 2000. “Time” in this context is largely a matter of individual judgement. Everyone has a set amount of time in their workplaces, but how it is prioritised depends on a myriad of factors including the perception of just how long something might take, and the benefits arising from the efforts. It is interesting to note that although a number of seminar/workshop participants could understand the concepts and felt they could use the tools in their courses (and had a CD-ROM with all deliverables on it); they still hadn’t looked at the packages further!

Even for those that had explored the deliverables, embedding a PBLi or FRAP exercise in a course is still likely to be a hurdle. Although the tools are easy to use and no programming is required, storyboarding and planning PBLi interactive scenarios or FRAP templates for lessons takes effort. This is particularly the case with interactive scenarios. The teaching paradigm underpinning interactive problem-based scenarios is very sound but implementation takes a lot more time and trouble than straight information transfer, which in itself can take some time to prepare if its purpose is to educate as opposed to simply providing references. It’s not just the time taken to storyboard an interactive scenario (they do require a creative script of sorts, with characters, places and events), but for the scenarios to be most effective, they are best used as an integrated part of the course as opposed to an “add-on”. Course objectives, method of assessment and sequencing in a course are all issues to consider. Indeed, setting aside any teaching style considerations, e-learning itself raises the complexity of the learning paradigm because the teacher must consider not only the lesson, by also the method, content and delivery systems employed (Hogen, McKnight and Legier, 2006). The potential for “burnout” is a real one! (Hogan and McKnight, 2007).

It is unlikely time-poor tutors will elect to alter their courses to incorporate some of these problem-based tools, unless they are writing new courses. Even then, in order to allow home-grown interactive scenarios to be developed, institutions will need to provide courseware development support. This means personnel skilled or trained in taking a case study, and working with tutors to convert it into an interactive scenario with characters, places, objects and actions; or at the very least, facilitate regular training sessions for tutors so they can become familiar with this process. Such activities take money and resources, which institutions themselves must find. This is not true just for the software in question, but in fact any courseware that is developed using a scenario-based learning approach. The follow-up survey would indicate many staff feel this kind of courseware development and IT support, along with training, is lacking in their own institutions.

Another significant barrier to imbedding the project outputs in institutions concerns PBLi only, but it is one that is relevant to any server-based educational software. Such software nearly always involves student authentication. Nowadays e-learning at an institutional level is usually underpinned by a Learning Management System (LMS), commonly, (in New Zealand at least) BlackboardTM /WebCT™ (http://www.blackboard.com) or Moodle (http://moodle.org/). The LMS can act as a “one stop shop” for student authentication, and has links to class rolls via the enrolment system so that tutors themselves do not have to enter class data or invent passwords.

PBLi has its own management and authentication interface, separate to any LMS. Within the scope of the project, there was not the time or money to explore ways of interfacing student authentication and management with a common LMS. A PBLi interactive scenario can be launched and used from an LMS without a problem by clicking on a link, but students need to authenticate again with whatever username and password the tutor has provided when they move from the LMS into the PBLi environment. Although it is hoped that individuals and departments elect to use the server-based player and manage their own students accordingly, widespread and systemic use (and support) of the software at the institutional level, will require some loose integration with the local LMS or at least the student enrolment system to rationalise student authentication. Not having this integration means someone at department level (most likely the tutor) has to arrange for usernames and passwords to be entered into the PBLi administration interface when it is being set up for a class. This is manageable for smaller classes, but when considering larger classes of 300 or so, the logistics would be a problem. Integration could be facilitated by way of a “plug-in” or an auxiliary program written by the institution to fit into its particular student administrative systems. However, setting this up is no trivial matter. Adding this functionality to PBLi is now being investigated by CBIT.

Recently, a number of studies have looked at the barriers to the integration of technology in tertiary teaching. These studies support some of the points discussed above, in particular regarding the importance of institutional support. Finley and Hartman (2004), in a study examining barriers to the integration of technology into teacher-education courses, found was that one-shot workshops were not enough for teachers to integrate technology into courses. Ongoing and thorough professional development was needed, so people become familiar with the technology and techniques.

Another study by Mahdizadeh *et al* (2007), found that the tertiary teachers surveyed tended to use e-learning environments mostly for communication, course management or presentation while those tools which supported higher-level learning processes such as collaboration tools, interactive modules and simulation programs, were perceived as having less "added-value"! One can postulate that they were perceived as such because teachers were less familiar with how to adapt higher-level paradigms to the e-learning environment, and the use of these tools would require a significant change in teaching style? The same study also found that most teachers wanted to learn about (and have support for) the different functions of e-learning but felt they did not have access to the resources to do so. The functions in question were not identified but they may well have been the more advanced ones mentioned above.

Some authors see the difficulty of using computer technology to foster the higher aspects of learning in university teaching as being due to wider social relations where "the flawed use of technologies is, by and large, a product of the wider "game" of higher education and the strategic interests of those who play it." (Selwyn, 2007).

Conclusion

From a project management perspective, all objectives for the eCDF project were completed on time and slightly under budget. In an academic sense a lot was learned, in particular the "craft" of planning and storyboarding interactive scenarios for use in scenario-based learning.

However, the barriers discussed above are likely to work against the widespread and systemic uptake of the programs outlined in this paper, particularly for PBLi. They are barriers which appear more significant now than at the start of the project. Furthermore, they are mostly generic constraints that are likely to inhibit the introduction of any new e-learning technologies and paradigms within New Zealand (and other) tertiary educational institutions which require teacher input. Champions of such tools should be aware of these constraints, although their existence should not discourage innovation. Given time and effort, barriers can be overcome.

We hope we have supplied enough supplementary resources to allow the tools to be used by at least some teachers. It is hoped that small-scale use will take place, which will gradually lead to increased stakeholder (students and faculty) support over time. If significant, this could persuade administrators to free up monies for teacher release time and/or assistance in courseware development/re-development, using the tools where appropriate.

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Appendix 1: The exemplar PBLi scenarios

Subject Area	**Scenario Description**	**Features**
Earth science	As a geologist, you are called on by a power company to assess a gorge for a possible dam site. Is it suitable?	• Designed to exercise student skill in rock identification and building a geological map. It places this skill within a real-world context • Contains a mastery test part way through the scenario • Use of a red-herring/unforeseen circumstance which provides information that students must make a decision on • At the end of the scenario, students are required to produce a report on the suitability of a site for a dam • Hints are given
Information Technology	You are manning the Help Desk and someone calls you with a printer problem. Can you solve it?	• This exercise is designed to give IT students the feel of a typical helpdesk-type scenario. It shows that relying on someone else to provide information, can cause problems • Involves a phone conversation and a client visit • Uses humour on occasions
Engineering	You are working for an automation company. A processing company calls you about a heat exchange problem. Temperature regulation seems to be a problem. What is wrong and what can be done to fix it?	• This scenario is designed to exercise student skill in identifying control methodology problems in a real world context • Uses a series of small multi-choice mastery tests with feedback to break the scenario up, and focus student thinking • Provides review notes within the scenario before the final assessment • Students are asked to provide a diagnostic report at the end of the scenario
Architecture & Building	You are called in by an organisation in trouble. They have changed the usage of a building and now the local council are upset about possible fire dangers. Can you sort it out?	• A complex exercise, which requires investigation, analysis and decision-making • Time is an important factor • Use of characterisation to add interest

Agriculture	As a young seed merchant representative, a grumpy farmer berates you about "new-fangled ryegrass species" which never seem to work! Who is really to blame?	• A simple, linear diagnostic scenario, designed to be used at the end of a course • Uses a few collectable items, which can be referred to later • A combination of observation and conversation • Uses characterisation to add interest • Reflection and analysis by way of a student report on completion
Environmental Management	A stream has become polluted. How can you tell it's polluted, what is the cause and what can be done about it?	• Demonstrates the investigative pathway an environmental officer might take in investigating a waterway pollution problem • Uses a series of small multi-choice mastery tests with feedback to keep students motivated and focus their decision-making • Students can proceed even if they have not completed the necessary tasks. However, they are then forced to backtrack at the later date if this was the case
Health - Nursing	As a trainee nurse, you are out visiting with Plunket workers. While checking a baby you notice another member of the family appears sickly? What might it be, and should you call a doctor?	• A simple diagnostic exercise, designed to show something that can typically happen in a nursing situation • At the end, students must make a decision and suggest a course of action
Health - Medical	A teacher collapses and is rushed to the emergency ward. As a junior doctor, what's your initial diagnosis and what tests should be done?	• A diagnostic scenario where students proceed step by step, with feedback and reflection after each step • The scenario allows students to conduct a number of clinical tests, with results immediately visible • Students are responsible for keeping their own costs and results records • A mastery test approach is used, where students are prevented from proceeding, until they get the correct answers • Comprehensive feedback is given • Students are asked to compare their selections with those of other experts
Health - Veterinary	A favourite pet appears in poor health. What is wrong?	• A diagnostic scenario where students proceed step by step, with feedback and reflection after each step • The scenario allows students to conduct a number of clinical tests, with results immediately visible • Students are required to recommend treatment, as well as provide a diagnosis
Education	A consortium of schools is considering purchasing advanced "whiteboard" technology and it's up to you to make the decision. Can you do what's best for everyone?	• A challenging exercise, to be worked through with student teams • Issues-based, where conflicting advice and opinion must be sifted through and assessed • Main actions are interviews • Links to a wiki included
Commerce	Your orchard has gone bust and you have to sell up. What should you do to get the best value for money?	• A skills-based scenario, designed to be used through or at the end of a course • Presents conflicting advice/views that the student has to weigh up • Reflection and analysis is by way of a student report on completion, which is not required to be entered into PBLi

Social Work	You are a social worker at a hospital when you are approached by a woman worried about her mother, who has just had a fall. Does the mother need some home help? It's your job to find out.	• A comprehensive skills-based scenario, designed to be used at one sitting • Data is gained from observations and interviews • Small tests are given along the way to maintain the student's engagement and provide feedback • There are opportunities for reflection
Society Law	You gave someone advice at a party. They took that advice, got into trouble and are now considering suing you! Oops! Where do you stand legally?	• This exercise is designed to give Law students an opportunity to investigate a potential case of liability and decide if there is a case to answer • The scenario is broken into two parts. Students are introduced to the scenario, and gather some preliminary information. They are then expected to consult literature to help them come to a decision • Students provide a report at the end of the scenario
Creative Arts	You own a small arts/illustration company. A producer/director team rings you. Hollywood has put out to tender a film proposal, and they want to know if you are interested in joining their team for a bid. However, they need to see how competent you are!	• This exercise is designed to give creative arts students an opportunity to interpret a creative arts requirement in terms of their skill, and also critique the interpretation of others • The scenario is broken into two parts. Students are introduced to the task in the scenario and given an online book. They are required to read this book and summarise it in terms of character/set design, before restarting the scenario and moving on • Critiques of others' interpretation is achieved by multichoice questions
Hospitality and Catering	You own a restaurant and have heard that the inspectors are out and about. Rumours abound that your restaurant is not up to scratch so you send out an inspector of your own!	• An exercise where hospitality students need to assess good (or bad) practices in a restaurant • Observations are made, staff are interviewed and a report is produced at the end of the scenario • The scenario is designed to be taken as a "test". No resources or feedback are provided during the scenario
Horticulture	Doug has an apple problem. This walkthrough will show you how to discover the cause.	• A diagnostic scenario, but designed to be used at the start of a course, to introduce students to a process and show how knowledge is put to use in practice • A walkthrough. There is much opportunity for student reflection but no formal assessment • Extensive use is made of the linked page feature to provide the rationale for tasks and tests • - There is extensive use of video for interviews

Terry Stewart
Institute of Natural Resources, Massey University, Private Bag, 11-222, Palmerston North, New Zealand.
Email: t.stewart@massey.ac.nz

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