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The trial of learning objects: exploring the design and delivery of VTE courses with learning objects

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Australian Flexible Learning Framework

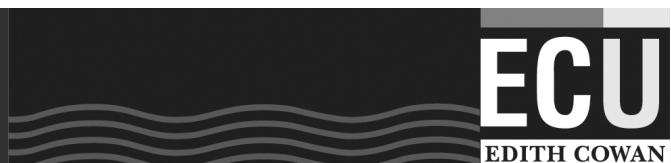
Trials of Learning Objects (Series 7)



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1.0 EXECUTIVE SUMMARY

The purpose of the Trials of Learning Objects (Series 7) was to understand how teachers/trainers were accessing and using the Series 7 learning objects with learners. The Project worked with VTE Practitioners in the re-use and sharing of learning objects (learning objects) to explore the degree to which the current infrastructure supported this form of use and to investigate the factors impeding and supporting the development of effective learning settings using these technologies.

The project involved a number of VTE teachers and provided appropriate technical support to enable them to create online learning environments using learning objects as the fundamental building block. The project explored how learning objects were used to create quality learning settings and sought to discover how best these opportunities might be provided to other teachers in the Australian VTE sector.

The Project team consisted of a number of key personnel:

- Project Manager, Ms Rose Shum TAFE NSW
- Project Mentor, Mr Peter Higgs, TAFE Tasmania
- Researchers, Professor Ron Oliver, Dr Mark McMahon, Edith Cowan University
- 6 VTE teachers, from Queensland, Tasmania and South Australia.
- A teacher mentor, Ms Jo Murray, Pelion Consulting in Tasmania
- Dr Dominic Lou as an expert consultant from e-Works Victoria

Under the guidance and mentorship of Project personnel, 3 trials were conducted among VTE students in discrete units in Queensland, Tasmania and South Australia. This report describes the conduct of the project and discusses the outcomes that were observed through a detailed review of all stages.

1.1 Project Findings

The findings from the Trials of Learning Objects were very positive in relation to the teachers' experiences and their perceptions of the materials and resources they were able to develop. The following assertions have been drawn from the study and demonstrate the ways in which teachers were able to use learning objects and the various technologies in the development of online units of study as well as factors which influenced their use and the quality of the resulting learning resources and settings.

- The use of a stable and powerful content management system provides strong support for designing online learning units using learning objects.
- Repositories need to hold many learning objects to provide teachers with adequate choices to select the resources they require.
- Many learning objects hold strong contextual connections with their original use which can limit their reuse in other settings.
- The use of learning objects appears to have a strong fit with teachers' existing design and development strategies.
- The use of learning objects can discourage the use of task-oriented learning designs.
- The majority of available learning objects tend to be of a tutorial form. There appear to be far fewer content and information learning objects from which teachers can choose.
- The granularity of learning objects can influence their capacity for reuse. Larger objects tend to be less useful than smaller objects.
- Teachers do not appear to be inclined to seek to customise learning objects.
- Teachers would be advantaged by better descriptions of learning objects to aid their discovery and selection.

- Repositories can conceal many of the learning objects that they contain.
- The use of learning objects in designing online settings is a complex task for inexperienced users.

1.2 Implications for Practice

These findings from the Trials of Learning Objects suggest the need for actions in the following areas if the use of learning objects is to become a component of mainstream use of ICT in the Australian VTE sector. The findings suggest the need for, and value of, appropriate actions across a number of discrete areas.

a. The design and development of learning objects

In designing and developing learning objects, the following strategies can maximise the opportunities for their reuse:

- Smaller rather than larger learning objects provide more opportunity for reuse;
- Learning objects that minimise discipline contexts provide greater opportunities for reuse than learning objects strongly tied to contexts;
- Information and content learning objects without any instructional elements provide strong contexts for reuse; and
- Learning objects need to be designed in ways that encourage and support simple and non-technical forms of customisation, to enhance reusability.

b. Assembling and storing learning objects

In developing repositories and collections of learning objects, the following strategies would appear to promote learning object usage:

- Learning objects need to be described accurately and fully with keywords that provide some sense of the scope of learning and the instructional/learning strategies involved;
- Repositories could aid teachers if they were able to provide some sense of the scope and extent of the resources they contain in relation to specific subject and discipline areas;
- Strategies need to be adopted to source more learning objects for inclusion in repositories. The strategies would need to encourage organizations and individuals to share resources and to see advantage in this;
- Repository projects need to include a contribution process that allows teachers and designers to contribute quality assured learning objects to the repositories; and
- A metadata maintenance program and an automated metadata implementation and validation process should be included to ensure metadata quality and integrity for all stored learning objects.

c. Systems to support teacher use of learning objects

In considering the forms of supports needed by teachers to create online settings using learning objects the following strategies emerged as necessary to support further uptake and use:

- Comprehensive support strategies are needed to enable first time users to employ learning objects in e-learning. Uptake and use of learning objects will likely be very slow if the support is not deliberately designed and provided;
- The training support for users of learning objects needs to include strategies in both linking and/or re-packaging/customising resources. This will allow teachers and designers to take smaller parts of learning objects as required;
- Given the increasing opportunity for using learning objects, teachers would benefit greatly from access to learning design templates that support quality learning designs using learning objects;
- Successful uses of learning objects by teachers in all their forms, eg. blended learning, fully on-line etc. need to be publicised to promote this as a mainstream strategy for unit delivery;
- Targeted professional development focusing on design and customisation strategies for novices and intermediate users would seem to be a particularly useful support strategy.

2.0 PROJECT DESCRIPTION

2.1 Introduction

Since 2003 the Australian Flexible Learning Framework has been investing heavily in the creation of quality learning resources. This has included the development of Toolboxes that meet international standards allowing them to be disaggregated easily into shareable learning objects. This has also included the re-packaging of some older Toolboxes to learning object levels for use by VTE practitioners. The shareable function of online and digital resources appears critical for practitioners since it is through this functionality that trainers and teachers can use the learning objects/materials in their own teaching on a variety of Learning Management Systems (LMS) or for simple Web/Online delivery for student use. More importantly, such functionality supports the use of repositories that trainers and teachers can search to acquire learning objects/material for use to develop effective online settings for teaching and learning.

a. Learning objects

The concept of learning objects as reusable digital learning resources is popular and in the minds of a large number of those involved in e-learning activities. There appear many advantages to be gained from being able to reuse digital resources in learning settings and much has been written on the topic of reusability as both a design and development strategy for online learning materials (eg. Downes, 2000). Learning objects have the potential to exert considerable influence on the actions of the vast majority of people associated with e-learning including such stakeholders as:

- administrative and financial personnel who look to benefit from the potential costs savings associated with reusing and sharing learning resources;
- policy-makers who are interested in the legal and ethical implications of copyright and intellectual property among the shared objects;
- instructional designers who need to consider design strategies that facilitate and support sharing and reuse; and
- developers who need to consider appropriate development strategies to ensure interoperability and a capability for use of resources beyond the context for which they are designed (eg. Downes, 2000; Shepherd, 2000).

Apart from the cost savings that stem from reduced development needs, there is also the advantage of being able to provide learners with access to increased levels of resources. When there are ample reusable resources, teachers can select from among those available to choose the most appropriate and the best quality. Reusable resources facilitate the sharing of materials within and between groups, an activity that can only lead to improved outcomes in terms of providing alternative perspectives and a multiplicity of content sources.

b. Facilitating the use of learning objects

Much of the current work with learning objects is seeking to explore and provide the enabling systems and processes to create an outcome where mainstream teachers creating learning environments will be able to discover and locate online resources that can be seamlessly incorporated into the learning environments they are building. When one examines the nature of e-learning and its use in educational settings, there are many factors that potentially limit a number of the goals and aims of the learning object movement. For example:

- Learning resources come in a huge variety of forms and sizes;
- Most e-learning resources are developed and built for personal and local use without regard for reuse beyond the immediate context;
- They are built from a variety of technologies and in a variety of architectures which tend to tie them to particular platforms and operating systems;
- The resources have often been designed for use in a single setting, with hard links and connections that cannot be easily disconnected if the materials are to be used elsewhere; and

- The resources contain references and descriptions from the local setting which could be out of place if the materials were reused.

Much of the current research is seeking to provide solutions to these problems through the development and adoption of standards and guidelines to assist in the design, development and storage of e-learning resources in ways that promote reusability.

c. The collection and storage of learning objects

For teachers to be able to use learning objects, they must have access to repositories and databases where the resources have been collected and stored. A considerable amount of research has been conducted to explore appropriate ways to gather resources, to evaluate their potential for reuse and to effect their inclusion in accessible collections.

Specifications for digital repositories have been an important element in the process to develop standards for learning objects. A digital repository is a collection of digital resources that can be accessed through a network requiring no prior knowledge of the collection's structure. Repositories usually hold many forms of digital resource including their metadata descriptors, although the metadata need not necessarily be stored with the various assets. The specifications for digital repositories that are currently being developed by IMS include object querying and locating functions. Recommended standards include the W3C XQuery (2000), W3C SOAP (2001) the simple object access protocol, and ZOOM (2000), the Z39.50 object oriented model.

Whilst there are now quite serviceable standards for repositories, there still remains the problem of systems and processes to populate the repositories. The inclusion of objects into repositories is limited by such factors as:

- teachers reluctance to share their resources and intellectual property;
- issues relating to the need to assure the quality of resources included in repositories;
- issues relating to technical aspects of the digital resources; and
- copyright and intellectual assurances and protections.

The consequence of these issues is that the vast majority of learning resources that are used by teachers are not available for reuse and repurposing through digital repositories. There is currently only small amounts of resourcing available to teachers in the form of reusable learning objects. Researchers are actively exploring ways to encourage the use of digital repositories among owners of learning objects (eg. Neve, 2003).

d. The discovery of learning objects

Given that there is a large number of learning objects in the public domain, it is important for those which are able to be used, that teachers are able to discover them. In recent years a standard set of descriptors (metadata) has been developed to describe and help identify the content of learning objects (LOM, 2002). The Learning Objects Metadata comprise a wide range of relevant descriptors which are intended to enable learning objects to be accurately described to assist in their choice for reuse. At the same time the metadata descriptors enable objects to be distinguished and provide searchable information about an object's form and content including:

- Descriptive information eg. author, version, related objects etc.;
- Technical data eg. media type, file size;
- Educational data, eg. learning objectives, subject area; and
- Management data eg. copyright and ownership, costs for reuse.

The advantage of the use of standard metadata forms and processes is that people know the language and vocabulary that needs to be used to locate relevant objects. People know the appropriate number and forms of descriptors that should be applied to objects and similar processes can be used to find objects across a variety of storage systems (Agostinho et. al. 2005).

There are many, however, who believe that the metadata processes used to describe learning objects are still flawed. Even with metadata standards, there are still difficulties to be faced in the discovery of learning objects. Often the metadata applied to resources is inaccurate and incomplete and unable to distinguish between resources (eg. Brownfield & Oliver, 2004). Another concern is the lack of data that is attached to learning objects that provide descriptions of their learning attributes (eg. Jonassen & Churchill, 2004). Whilst the metadata provides strong descriptions of the technical aspects of the object, there tends to be very limited information concerning the instructional elements of many of the stored objects and this impedes their potential for discovery and reuse.

e. The application of learning objects

Another important area of inquiry and development in relation to learning objects has been in connection with the application of the objects to appropriate delivery platforms. There has been a huge amount of work undertaken to develop processes and procedures which facilitate the reusability and interoperability of digital learning resources. For example, IMS Global Learning Consortium, ADL, IEEE. This work appears to be removing many of the barriers which have previously limited reuse of learning resources. The work being done to develop the Sharable Content Object Reference Model (SCORM) is a strong case in point. SCORM has been developed by the Advanced Distributed Learning (ADL) initiative and provides a design and development model for learning resources which strongly supports reusability and interoperability.

Given the relatively strong technical nature of this work, whilst it provides technical solutions to issues of interoperability and reuse, it creates problems of its own in relation to the complexity of systems required to support these outcomes. Researchers are continually seeking to develop systems and tools to enable learning objects to be easily assembled by teachers and delivered to students (eg. Lukasiak et al, 2004). A number of studies have demonstrated that even with access to learning objects many teachers lack the technical skills needed to employ the objects into online environments for their learners (eg. Hand, 2004).

f. Designing quality learning experiences with learning objects

A final important educational issue in relation to the application of learning objects into mainstream teaching and learning is the ease with which they can be used to support quality learning. There is an expectation that online environments should be improved with increased access to learning objects. In many cases, the reality is not the ideal. Much of the current research into learning objects focuses on strategies to support discovery and reuse (eg. Verbert & Duval, 2004) more than strategies and processes associated with learning designs and instructional approaches to their use.

Learning objects are typically comprised of decomposed content which is formed into information chunks that can be stored, retrieved, and reused. Current conceptualisations of learning objects are geared towards forms of instruction that are content and information-based. Most learning objects are designed to support quite narrow learning outcomes such as content provision or skills development and exist in the form of small stand alone modules. These forms tend to proliferate as a consequence of the narrow learning designs that characterize most online learning and the current industry standards which have been developed around these forms (Jonassen & Churchill, 2004).

The widespread implementation and use of virtual learning environments (VLE) and courseware management systems (CMS) should provide the technical infrastructure needed to develop effective learning environments using learning objects (e.g., Oliver, Wirksi, Wait & Blanksby, 2005; Harper, Agostinho, Bennett, Lukasiak, & Lockyer, 2005). What is missing for teachers and administrators is appropriate guidance on effective pedagogical practice (Beetham, 2004; Ilomäki, & Lakkala, 2004). While the plethora of technology-supports and digital tools

and resources for learning has garnered strong interest among teachers to employ ICT as a mainstream component of unit delivery, in practice, the provided technology supports and templates encourage less effective approaches to learning. Teachers have been still found to require substantial theoretical and practical guidance in the design of effective e-learning strategies and activities (Littlejohn, 2004).

g. Reusable learning designs

More recently, researchers and developers have attempted to create standards and specifications related to the design of learning environments in an attempt to provide a consistent means for describing them. This work has sought to explore the notion of learning designs as the glue that can bind learning objects into a successful learning sequence. The purpose and place of learning designs in e-learning settings is argued by Britain (2004) through the following assertions:

- It is generally accepted that people learn better when purposefully engaged in some form of learning activity;
- The informed and purposeful application of learning activities can be used to promote learning; and
- It should be possible to reuse learning designs that have been shown to be effective.

The IMS (Instructional Management Systems) Global Learning Consortium which is recognised as the leading force in establishing standards for higher education worldwide has developed the IMS LD (learning design) standard based on the Educational Modelling Language (Koper & Manderveld, 2004)

When coupled with the learning object standard, the IMS LD protocol provides a means for developers to create learning environments that are comprised of reusable learning objects and reusable learning designs. Whilst the existing research provides what appears to be a sufficient means to successfully describe the components of learning designs it is still lacking in its ability to guide teachers in their choice of learning design and learning objects when confronted with the need to plan units of study or learning sessions to achieve particular learning outcomes (Beetham, 2004). A number of researchers continue to explore the opportunities to provide reusable learning designs that will help teachers to create learning environments with the available learning objects (eg. Dalziel, 2003; Oliver et. al. 2003).

h. Learning objects and the Australian VTE sector

Given the context above, it is interesting to note the considerable activity that has been taking place in the Australian VTE sector to promote the development of learning objects and their reuse. The Australian Flexible Learning Framework has for many years supported the Flexible Learning Toolbox Project which resulted in the development of a large number of high quality learning resources built to support reusability in a number of forms (Oliver & Blanksby, 2003). At the same time, the National Flexible Toolbox Project has explored the design and development of a digital repository to store and provide access to Toolbox digital resources (Oliver, Wirski, Omari, Hingston & Brownfield, 2003).

The ability to share digital learning resources in the VTE sector was made possible through the strategic adoption of IMS and SCORM standards in a number of projects.. An important element of this activity was the funding of the design and development of a VTE Learning Object Repository (LORN) Project by the Flexible Learning Framework. This activity enables VTE practitioners to search for and to download learning objects and materials from 4 repositories from one location by what is known as a Federated Search. The LORN learning objects/materials are available free to all VTE practitioners. It is within this context that the current project, the Trials of Learning Objects has been set.

2.2 Purpose of the project

The purpose of the Trials of Learning Objects was to understand how teachers/trainers were accessing and using the Series 7 learning objects with learners. The Project aimed to work with

VTE Practitioners in the re-use and sharing of learning objects to explore the degree to which the current infrastructure supported this for of use and to investigate the factors impeding and supporting the development of effective learning settings using these technologies.

The project sought to involve a number of VTE teachers and to provide appropriate technical support to enable them to create online learning environments using learning objects as the fundamental building block. The project was very interested in exploring how learning objects might be used to create quality learning settings and to discover how best these opportunities might be provided to other teachers in the Australian VTE sector. In particular, the project sought to achieve a number of objectives relating to the implementation of learning objectives for teachers and learners. It sought to:

a. Deployment

- Examine the reasons/factors affecting teachers/trainers decision to utilise learning objects in their teaching programs;
- Identify the conditions to successfully support teachers/trainers in deploying learning objects in their teaching programs including the level and nature of organisational and technical support required;

b. Teachers/trainers

- Examine the pedagogical approaches (method of delivery) employed by teachers/trainers in utilising learning objects in a variety of VTE settings, eg, face-to-face, blended or workplace delivery;
- Identify the integration/sequencing strategies employed by teachers/trainers in using learning objects within their existing training program and teaching plans;
- Identify the skills and/or professional development activities teachers/trainers required to optimise their delivery using learning objects;

c. Learners

- Gauge learners responses to the use of learning objects embedded within the training program, and determine the quality of learning outcomes from a student perspective.

The output from this project was intended to inform the VTE community and possibly the wider education community of the advantages and opportunities of re-using and sharing learning objects and resources based on sound learning design.

2.3 Project Participants

The Project team consisted of a number of key personnel:

- Project Manager, Ms Rose Shum TAFE NSW
- Project Mentor, Mr Peter Higgs, TAFE Tasmania
- Researchers, Professor Ron Oliver, Dr Mark McMahon, Edith Cowan University
- 6 VTE teachers, from Queensland, Tasmania and South Australia.
- A teacher mentor, Ms Jo Murray, Pelion Consulting in Tasmania
- Dr Dominic Lou as an expert consultant from e-Works Victoria.

a. The Project Mentor role

The Project Mentor worked with the participating VTE practitioners. The mentor was previously a Flexible Learning Leader with extensive experience and expertise in the Framework Projects relating to reuse of digital resources.

In this role the Project Mentor provided a number of supports and scaffolds including:

- The production of a kit/training manual for the participants with:

1. background information to the project;
 2. information describing the repository and LMS use to enable the trials;
 3. technology tips in relation to downloads etc.;
 4. how to search for and download learning objects;
 5. how to create a learning sequence that should provide a learning outcome using learning objects;
 6. technology tips in relation to downloads etc.;
 7. intellectual property and copyright tips in regard to intellectual property management for the Learning Sequence; and
 8. guide for implementing the learning sequence for trial.
- The scheduling and conduct of face to face sessions that provided participants with access to the learning object/material assembly area. This same session included training on uploading the content module to a Learning Management System used by the RTO; and
 - The provision of ongoing phone and or video conference support.

b. The participating Teachers

Three groups of teachers volunteered to participate in the Trials of Learning Objects. For the purpose of the report, they are identified as the Tasmanian Trial, The Queensland Trial and the South Australian Trial.

- **The Tasmanian Trial.** This team comprised a single teacher with considerable previous experience. This teacher teaches in Community Services and Health and was launched into the exciting world of flexible learning in 2001 as a Flexible Leader. She feels she is on a continuous pathway of professional development having pursued further study both formally and informally in education, workplace training and assessment, multimedia and online learning. She has facilitated a large number of LearnScope projects and holds a leadership role within her team working with colleagues to design, develop, deliver and evaluate accessible e-learning resources and provide support for learners using WebCT. All learners within her program are engaged in some aspects of e-learning within their field of study. Having experienced the complexities of customising a number of toolboxes she participated in the project to further her interest in learning objects and tools such as The Learning Edge which make assembling of e-learning resources within the reach of teachers without high level skills in IT
- **The Queensland Trial.** This team comprised 3 teachers working in a small company in regional Queensland. The team was experienced in delivering face to face training but this was their first experience in an online learning environment. The team was supported by a mentor in both the development of their online unit and its implementation.
- **The South Australian Trial.** This team comprised 2 people who would participate in the design of the unit with one assuming the teaching role. The teachers operate a very small RTO, with no physical "institute" as such. All training is delivered at the workplaces of clients, or on-line for distant, rural clients. The team typically uses a learning platform that a good number of the younger clients are comfortable with using. Others prefer worksheets and paper-based notes in-between their visits. All the units are on-going, they begin whenever someone is enrolled. The team provides their learning platform as an alternative to traditional learning for those who wish to use it. The team are gradually adding to it, and finding more and more interest in this style of learning. The team operates from a 'home office' in the Adelaide Hills, and have approximately 60 students.

c. Participant Interest and Enthusiasm

The participants completed an entry survey to provide information relating to the scope and extent of their previous skills and knowledge in e-learning and the use of learning objects and digital repositories. The various participants in the project came with mixed skills and experience in ICT and e-learning applications (Figure 2.1).

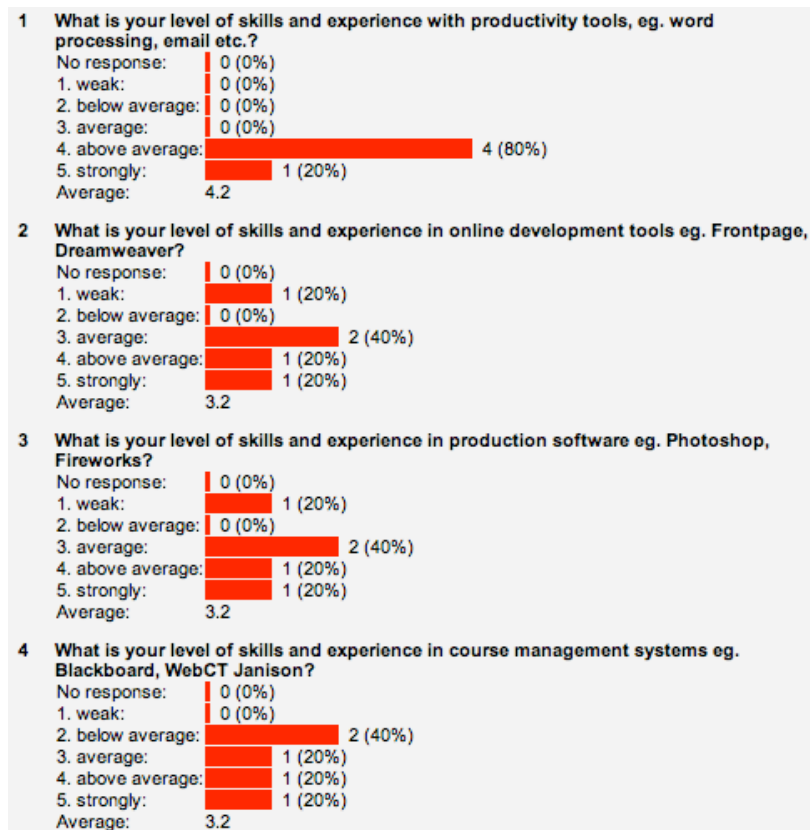


Figure 2.1: Participants' levels of prior ICT experience and expertise

There was limited previous experience among members of the various teams with the design, development and use of e-learning resources in online settings (Figure 2.2).

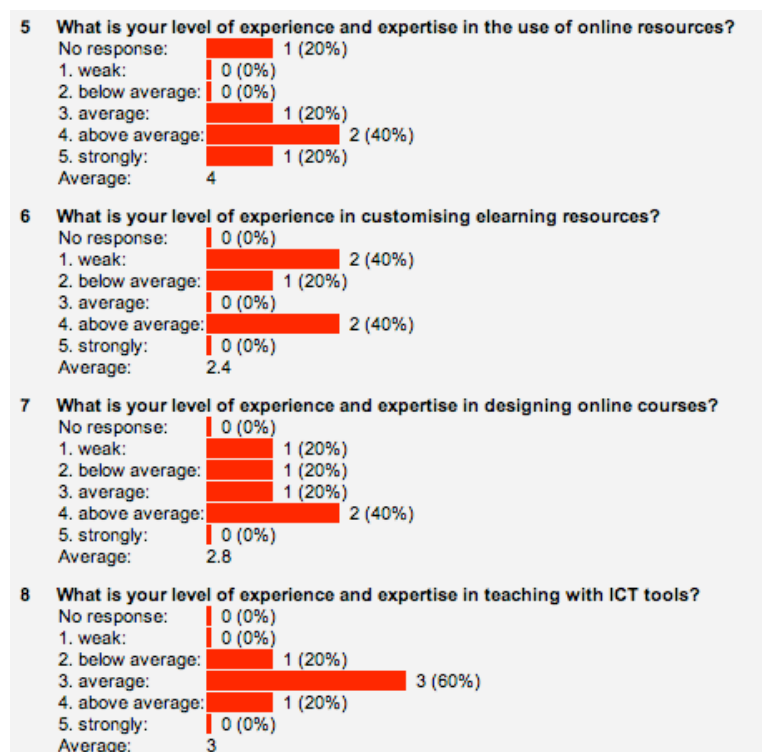


Figure 2.2: Participants' levels of prior experience and expertise with online developments

There were relatively high levels of previous experience with blended learning, limited online facilitation but quite strong supporting infrastructure within the various institutions (Figure 2.3).

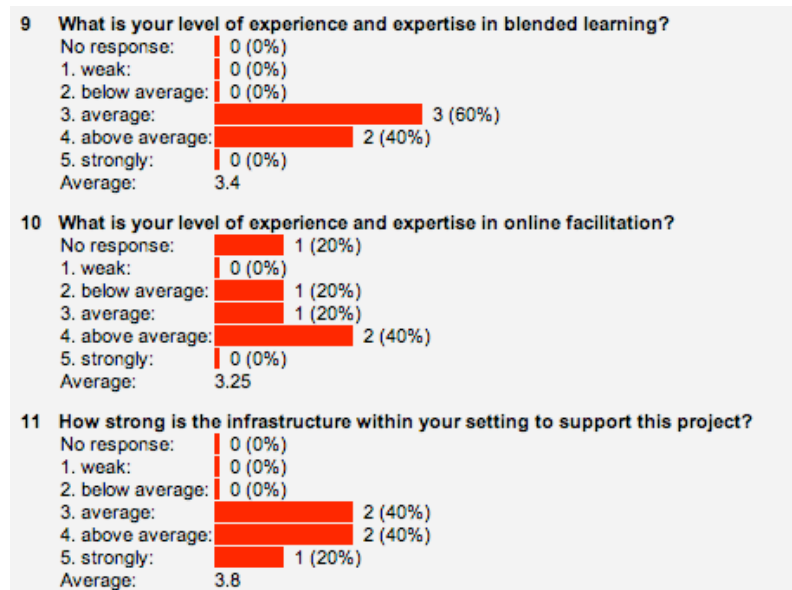


Figure 2.3: Participants' levels of prior experience and expertise in online delivery

Among the groups, there was strong interest in the project and it was seen both as important and valuable to the participants and their organizations (Figure 2.4). Interestingly the participants expressed some concern with the level of technical support they imagined they would be able to call on in their own settings, and indicated that they imagined their learners may have limited technical skills in the use of ICT as well.

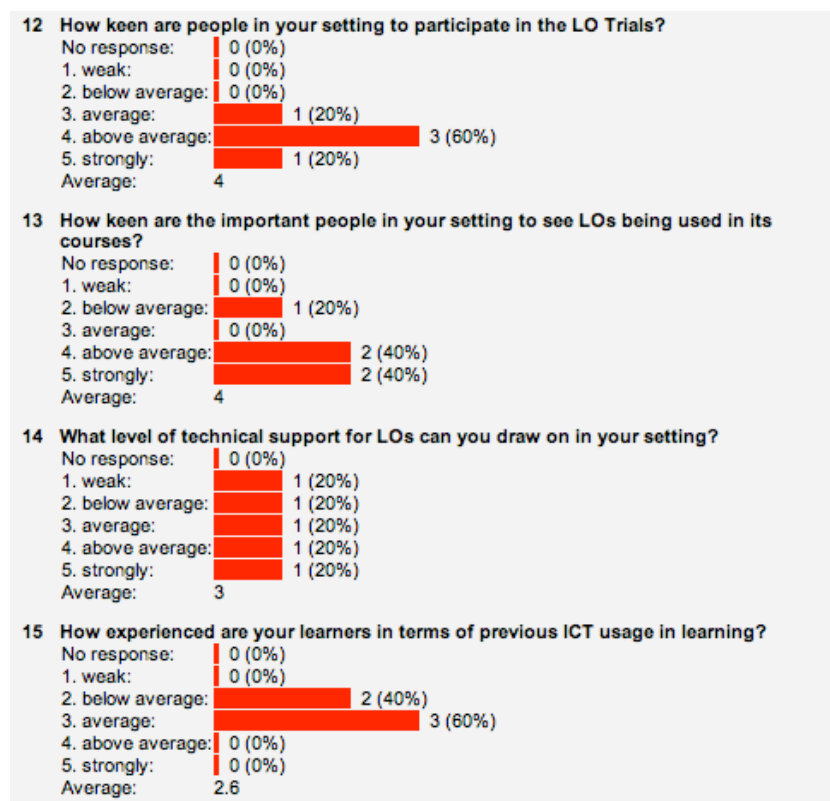


Figure 2.4: Participants' levels of interest and motivation

2.4 Project Technology

All participants were provided with access to The TAFE Tasmania's Repository in LORN. The repository is known as the Learning Edge (TLE). The Learning Edge provides search and retrieval functionality as well as an area where practitioners can recontextualise learning objects and materials and finally sequence them in the Content Module area of the Assembler in preparation for delivery.

The Learning Edge enables users to develop fully conformant resources that can be delivered from the Content Assembler to:

- an IMS/SCORM package for use in any online online delivery setting.
- WebCT, the LMS system in TAFE Tasmania's learning infrastructure. This system was made available to participants during the trial to enable them to work with an LMS if they did not have one available to them.
- import the Content Module into the MOODLE LMS for delivery to their students (Fig 2.5).

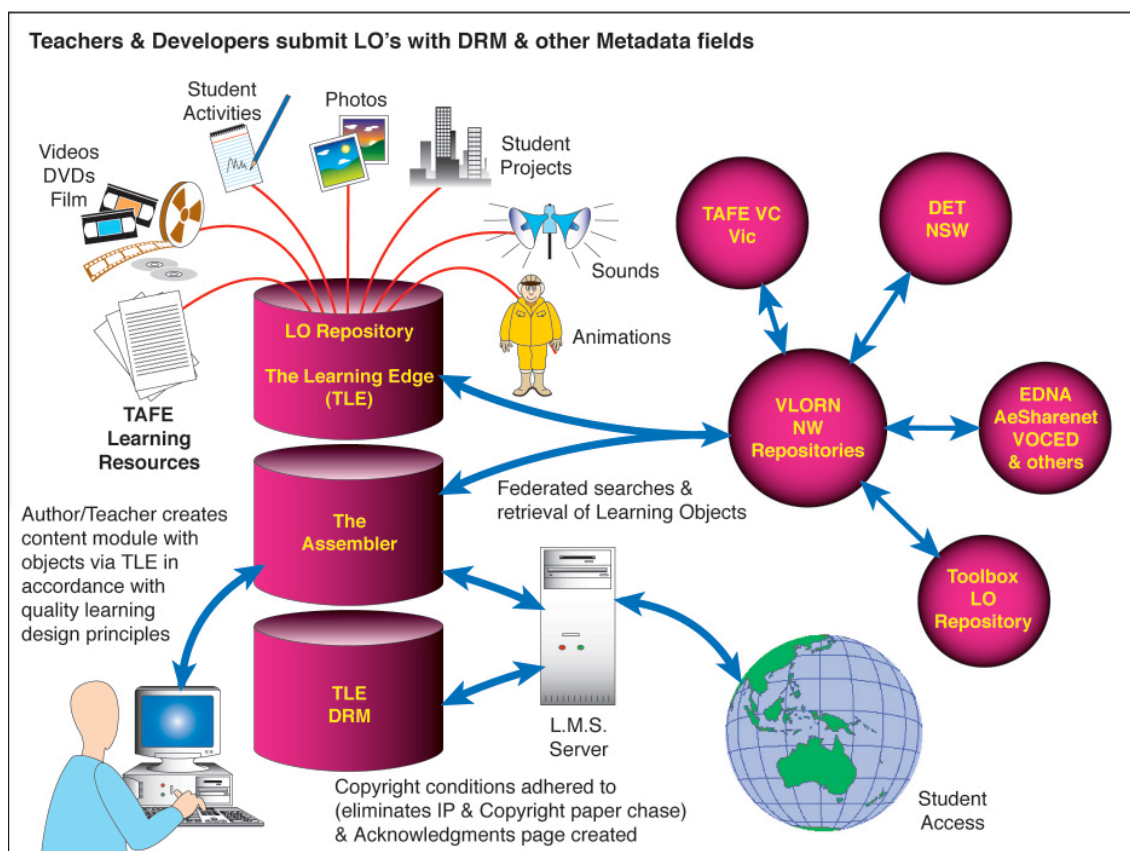


Figure 2.5: Process for developing online unit with The Learning Edge and LORN

2.5 Learning Edge

Within The Learning Edge, teachers are able to reuse existing content from a variety of sources including their own materials and other materials stored and provided by others. The Learning Edge provides the means for teachers with minimal ICT skills to develop comprehensive learning materials for online delivery.

The Learning Edge comprises a number of discrete sections as described below:

a. The Resource Centre

The resource centre is a storehouse of content that can be used within an online unit. It includes

- Parts of toolboxes;
- Compass assessments;
- Flash based simulations;
- Videos and images;
- Links to useful web sites; and
- Teachers can also contribute their own resources in a variety of formats.

b. Federated Search

Searching several different places at once. For example the resource centre can search

- The Toolbox Repository;
- Edna;
- Google; and
- The VTE library catalogue.

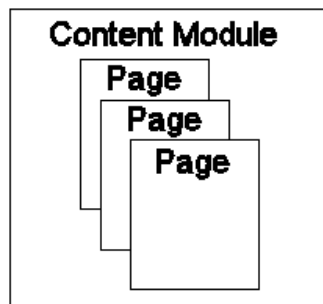
c. Content Assembler

The Content Assembler was originally intended to be a lesson-planning tool, but its designers became carried away and developed it into a more powerful tool for assembling content into comprehensive digital learning resources.

A single web page, word document, PowerPoint document or similar is referred to as a Page. Pages are grouped together into a Content Module. This Content Module becomes a WebCT content module once it's finished and exported.

An example of a resource could be:

- A PowerPoint document giving students an overview of a topic (one page);
- A page of links to Web sites to research the topic more fully (another page); or
- A Compass Assessment Tool saved as a PDF file (another page).



d. Content Modules in WebCT

When Content Modules are completed they can be sent to WebCT. They become a collection of pages with a table of contents and some navigation buttons such as forwards and back. Other WebCT tools that can be included as resources include:

- Discussions;
- Quizzes; and
- Self-tests.

2.6 The Methodology

The Project employed a case study methodology (Miles & Huberman, 1984) to gather data and to report the findings. The data gathering instruments included:

- *The entry questionnaire*, an online questionnaire designed to gain teachers' perceptions of the project and the likely outcomes and advantages completed at the commencement of the project;
- *The learning object usage questionnaire*, an online questionnaire designed to gain instructors' perceptions on the quality of the online setting developed using learning objects completed after the development of the learning settings; and
- *The student questionnaire*, an online questionnaire designed to gain students' perceptions on the quality of the online setting developed using learning objects completed at the end of the delivery of units.

The teachers also completed a number of interview questions through email and observation data was collected during the training and development stages by members of the project team.

The data analysis employed the constant comparative method (Miles & Huberman, 1984; Glaser, 1992) and involved making comparisons between the data collected to explore the patterns and themes that emerged in order to develop assertions from the findings, to draw inferences and to develop meaning conclusions.

Findings are presented in the following sections of the report as three individual case studies describing the conduct of the project.

3.0 CASE STUDY 1.

3.1 Tasmania Trial

This case study describes the learning environment established in the Tasmanian Trial and the associated training and development processes. The Tasmanian Team comprised a single teacher, with extensive prior experience in e-learning design and development.

The teacher in this Case Study came into the project as an interested and willing participant looking to advance her skills and abilities to use learning objects in online learning applications. Table 3.1 provides a snapshot of the expectations and motivations coming into the project. The feedback shows that while the teacher had strong levels of prior experience with the design, development and delivery of e-learning units, there was minimal use of learning objects in this experience. The teacher appeared to have a strong background in training and required little assistance in ICT or instructional design to participate effectively.

The teacher had strong technical support available and was very motivated and looking forward to the learning experience. Interestingly, the teacher perceived a lack of learning objects to be her largest impediment and did not judge issues like her skillset, the technology nor the supporting systems as problematic.

She was a teacher in Community Services and Health who was launched into the world of flexible learning in 2001 as a Flexible Leader. She saw herself on a continuous pathway of professional development having pursued further study both formally and informally in education, workplace training and assessment, multimedia and online learning.

She had previously facilitated a large number of LearnScope projects and held a leadership role within her team working with colleagues to design, develop, deliver and evaluate accessible e-learning resources and provide support for learners using WebCT. All learners within her program were engaged in some aspects of e-learning within their field of study.

Having experienced the complexities of customising a number of toolboxes she chose to participate in the Trials of Learning Objects to further her interest in learning objects and tools such as The Learning Edge, which make assembling of e-learning resources within the reach of teachers without high level skills in IT.

Table 3.1 Entry Survey Responses

Question	Response
1. What has been your previous knowledge and practical experience with design and development of learning objects?	<i>Have developed a number of resources almost ready to be IMS packaged</i>
2. What has been your previous knowledge and practical experience with teaching with learning objects ?	<i>Limited</i>
3. What has been your previous knowledge and practical experience with customisation experience with learning objects	<i>download and customised basic IT LO in 2004</i>
4. What has been your previous knowledge and practical experience with peripheral experience with learning objects? eg. committees, working parties	<i>N/A</i>
5. What has been your previous knowledge and practical experience with use of repositories of digital resources?	<i>Searched repositories - have only found one to day of use</i>
6. What has been your previous knowledge and practical experience with use of metadata for storing and/or searching?	<i>reasonable amount through searching and development of websites</i>

7. How much do you expect the learning objects to support your teaching needs?	<i>heaps i hope - it has been difficult to find resources though we have made use of toolboxes</i>
8. How much work do you think will be involved to develop course materials using learning objects?	<i>how long is a piece of string?! However, what ever time it takes so be it</i>
9. How appropriate is this project to your existing ICT skill set?	<i>perfect, I expect I will be challenged and learn more skills</i>
10. How appropriate is this project to your existing pedagogy skill set?	<i>Perfect</i>
11. How efficient will this be? Will there be a good learning return on your investment of time?	<i>definitely</i>
12. How much do you expect to learn from the project?	<i>heaps</i>
13. How motivated are you to see this project succeed? Do you have the time you need? Will this project put you under a bit of pressure timewise?	<i>exceptionally motivated tight time frames and pressure are an expected part of my role (by me anyway)</i>
14. What forms of technical support will you have at your disposal at your institution?	<i>whatever I need - I have good relations with IT services and Learning media services</i>
15. What are your expectations (how successful do you anticipate your efforts will be)?	<i>Hopeful of finding Lo's that I am looking for and that are good to work with. Some toolboxes are easy to work with and some mainly due to file naming conventions are terrible - I just hope the LO's will make things easier and especially for people without the skills that I have</i>
16. What problems do you anticipate will hinder or limit your success in the Trials of Learning Objects?	<i>not finding the resources that I will be looking for</i>
17. How much is this project being driven by RTO management and how much by your own desire to learn more about Learning Objects?	<i>My application went in due to my desire to be involved</i>

3.2 Development Strategies

In the context of the Trials of Learning Objects, this teacher developed 2 online units for students, Use Business Technologies (UBT) and Occupational Health and Safety (OHS). This report describes the process by which each of these units was developed and run and discusses the outcomes for each separately.

3.3 Use Business Technologies

When the project started, this teacher moved quite quickly to build an online setting using the various tools at her disposal. She did not receive formal training from the Project Mentor, but was able to contact him if the need arose to have her queries answered. She tended to work independently to build the learning setting. The teacher explored the use of the Learning Edge software which is easy to use but limits the user's ability to control the layout with style sheets (css). She therefore chose Dreamweaver, developed a css to provide materials with a consistent look and feel and was able to quickly assemble and organise learning materials with this tool.

The teacher used The Learning Edge, to locate useful resources from the repository and download them. In particular she found a large resource in the Grange Care suite and downloaded this in its entirety. To access the resources in this learning object, it was necessary to open the named folders and find the files relating to the required pages. This part was easy, as files were well named and stored, however, technical assistance was needed to make them work effectively due to a number of poorly named files external to the selected folders. The teacher did not find The Learning Edge as flexible and as powerful as her own development skills suggested it might be.

She commented on the usefulness of learning objects having an organised file structure and how this was a strong support for reusability, self contained folders.

The learning resources that were taken from the Grange Care Toolbox were used in a way that was different to their intended use. The teacher used a number of the nursing activities as contexts for practising technology skills. She created a scenario consistent with the original form of the Grange Care learning setting and required her learners to attend to ICT tasks (as distinct from the nursing tasks). The scenario worked well and the resources were an appropriate form for her.

To complement the resources found on the repository, the teacher discovered a number of Excel and PowerPoint files from other sources and included these as resources in her learning setting. The use of the scenario and the various resources provided an authentic context for learning which was the teacher's intention and planned learning design.

This team developed a unit entitled Use Business Technologies which was incorporated into a WebCT Computer Skills Development resource aiming to provide students studying in Community Services and Health an opportunity to develop appropriate skills in ICT use and applications for their present and future employment.

This unit was from the Business Administration training package. It covered the knowledge and skills required to select, use and maintain business technology. The technology includes the effective use of computer software to organise information and data and office equipment. Use of business technologies for enrolled nurses would include: accessing lab results, using data bases of patient information, obtaining patient results, access and input to nursing care plans, progress notes and ward plans, transfer summaries, discharge summaries, staff rosters, email and searching the Internet.

This unit aimed to provide the knowledge and skills to competently:

- Select and use technology;
- Process and organise data; and
- Maintain technology.

The unit was delivered in a face-to-face mode across five 3 hour sessions at a Tasmanian TAFE Institute. The unit ran with 18 participants, all with varying and diverse prior experience with ICT in their workplace and home settings. The design was such that it could be delivered wholly online as an alternative option.

a. The learning design

The Use Business Technologies unit used a blended learning design that involved a mix of face-to-face instruction with individualised computer-based instruction. The learning design was founded around a series of authentic tasks that formed the basis of the assessment and the learning activities.



Figure 3.1 Computer Skills Development Home Page, incorporating Use Business Technologies unit

This unit was developed using a number of development tools including The Learning Edge and Dreamweaver. The online component was built as a series of activities/resources that learners accessed through a WebCT interface (Figure 3.1).

b. Learning Tasks

A typical workshop in this unit involved the teacher using a face-to-face session to introduce students to the productivity tool being learned (for example, Word, PowerPoint, Excel). The teacher would describe the aims of the authentic activity and discuss with students the ways that it could be tackled.

Students would then use the resources to set about developing skills and completing the tasks. For students with limited ICT skills, the most beneficial course of action was to access the online tutorial relating to the tool being learned. In this setting the International Computer Drivers' Licences (ICDL) suite of tutorials was made available to students. After having completed the tutorial, or the various parts needed, the students would then commence work on the authentic tasks.

Each task required students to complete an activity that mirrored workplace ICT use. Care was taken in the design of the unit to ensure a high degree of consistency between the task and likely workplace applications to ensure authenticity. The organization of the learning process is shown in Figure 3.2, the contents page to the unit.

Homepage > **BSBCMN205A Use Business Technologies**

Institute of
TAFE Tasmania

Community Services
and Health

Computer skills development

Table of Contents

BSBCMN205A Using Business Technologies

- ▼ Introduction
 - About this unit
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- ▼ A quick guide to using WebCT
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 - How do I find my way around the course?
 - What technical support will have have?
 - How do I use WebCT email?
 - How do I use WebCT discussion?
 - How do I use WebCT chat?
 - How do I use WebCT calendar?

Figure 3.2 Use Business Technologies Contents Page

Each week students were required work on learning activities specific to their individual needs, to complete the various parts of the assessment task, and to submit the finished product electronically to their teacher for marking. There was a strong synergy in this environment in learning about ICT to make meaningful use of ICT in the learning setting. The teacher would mark and return the work progressively so students could gain feedback and support as they progressed though the unit.

b. Learning resources

The learning resources for this unit were obtained from a variety of sources. The ICDL tutorials are obvious examples of learning objects designed for reuse and able to provide strong support for this unit. Other reusable resources that were used include:

- Software templates for use with the productivity tools from the Microsoft website; and
- Examples and activities drawn straight from the Series 6 Toolbox Grange Care. The unit used a number of pages taken from this Toolbox and embedded into the Computer Skills Development content. These were accessed as a learning object from the Learning Edge.(This toolbox, as with many toolboxes has been broken down into learning objects and uploaded into the Learning Edge for easy access by teachers).

c. Learning supports

Learning supports for this unit came from a number of planned processes. These included the face-to-face workshops, individual or small group sessions as required and online through:

- WebCT email and discussion;
- Demonstration/practice/learning support in workshops;
- Working with buddies;
- Additional one to one small group learning support sessions by request; and
- Provision of additional class time for private study.

A number of learning supports were drawn from other online toolsets (eg. RonLine <http://aragorn.ecu.edu.au/ronline>) and tailored to the individual needs of this unit. Overall, the design of the unit relied heavily on repackaging and reusing existing materials and repurposing them for the specific needs of the unit.

d. Flexible delivery

There were many places in this unit where flexibility was intentionally planned to cater for the diverse needs of the students. In the first instance, the authentic tasks enabled learners with previous experience to demonstrate their competence without having to work through inappropriate learning materials. At the same time, resources were made available to them to use and choose where appropriate.

For students with minimal previous experience and prior learning, online tutorials provided them with a capacity for independent and self-regulated learning to enable them to develop the necessary skills and proficiencies to complete the authentic tasks. The authentic tasks provided meaningful scenarios to enable these learners to gauge the scope and extent of their knowledge and to undertake the remedial activity needed to adequately meet the unit needs.

The blended learning approach enabled the team to ensure all learners received adequate help and support. Learners were able to gain additional access to tutors if they needed this help. In line with authentic learning principles, students' successful completion of the learning tasks demonstrated competency and achievement of the planned learning outcomes.

One of the strengths of the learning design for students was the flexibility of self pace which also freed up the teachers time to work with individuals. Another was after the induction workshop, attendance was not compulsory. Students not requiring assistance could work off campus.

e. Use of learning objects

The use of The Learning Edge as a means to assemble and manipulate learning objects proved itself to offer a number of useful features. In particular the ability to embed learning objects and to then make small changes enabled the teacher to customise the resources in small ways to give a stronger connection to the planned setting and scenario. It enabled instances of the previous context to be removed.

The unit involved students practising ICT skills in a health industry context. The students had varying levels of ICT expertise. The teacher provided access to tutorial training materials (learning objects) so that students needing to develop their ICT skills could choose the appropriate supports. Students not needing this level of skills development were free to concentrate on the scenario and to demonstrate the competence.

The repository providing learning objects for the project was found to be quite thin in its provision of appropriate resources for this learning setting. The teacher had a concept as to how the teaching could be done and there were not many resources to select from in the repository itself.

The keywords that could be used to search for learning objects were quite broad and did not provide the detail needed to locate precise resources. Once a resource had been found there still

appeared to be considerable work required by the teacher to identify within the resource any pages or items that could be useful.

The use of learning objects and Learning Edge required teachers to have reasonably well-developed ICT skills in the area of Web page development. There were a number of high level skills involved requiring a well formed mental map of the environment and the constituent elements. Teachers with an underdeveloped mental map might find this environment complex and difficult to use effectively.

The teacher commented that some learning objects were found to be less useful than others. For example, learning objects stored as Flash files that only provided *.swf* files and not *.fla*, types had limited capacity to be customised. Such objects found limits placed on their use and reuse due to complexities associated with customisation etc.

3.4 Occupational Health and Safety

The Occupational Health and Safety unit was designed for a broad target audience comprising students from nursing, children services, disability areas, community services and aged care.

The unit cluster covered 2 units of competency:

- CHCOHS301A Participate in workplace safety procedures.
- CHCOHS302A Participate in safety procedures for direct care work.

On completion of the unit: CHCOHS301A Participate in workplace safety procedures would be able to identify occupational health and safety hazards and assess risk as well as following instructions and procedures with minimal supervision.

On completion of the unit: CHCOHS302A Participate in safety procedures for direct care work students would be able to correctly identify the major occupational health and safety hazards, manual handling, together with other hazards that may include dealing with aggressive behaviours and stress. They would be able to assess related risk as well as follow instructions and procedures with minimal supervision and support and be capable of participating and contributing to OH&S management issues.

a. Development processes

The online environment was developed with resources from available repositories. Relevant resources were located in the Infection Control Toolbox and the Occupational Health and Safety NVSC of Volunteering Australia provided Participate in Workplace Safety Procedures materials. The teacher used Dreamweaver as the development tool and used the toolbox template for a consistent look and feel to incorporate additional materials to create the online learning environment which was delivered through WebCT (Figure 3.3).

Course Menu

- Homepage
- Calendar
- Discussions
- eMail
- OHS Course contents
- Help
- Quizzes

Homepage

Occupational Health & Safety

Community Services & Health

Information | OHS Course contents | email | quiz

This unit was developed by and is maintained by TAFE Tasmania. It was last updated in April 2005.

Acknowledgements ...

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Learning design and web development - Helen Houston, graphic design - Sarah Markland,

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Figure 3.3. Occupational Health and Safety Course

In order to maximize the use of the Infection control Toolbox, the teacher used her authoring skills and abilities to disaggregate the myriad of resources from the original setting into a selection of smaller discrete learning modules. The modules could be accessed from the Contents Page and were intended to be accessed sequentially by the students (Figure 3.4). The resulting online unit contained a large number of resources for learners to access.

The unit was delivered in a face-to-face mode across five 3 hour sessions at a Tasmanian TAFE Institute. The unit ran with 20 participants, all with varying and diverse prior experience with ICT in their workplace and home settings. The design is such that it could be delivered wholly online as an alternative option.

LEARNING RESOURCES

Occupational Health & Safety

Community Services & Health

About this unit cluster,
what you need to do and
what you need to know about assessment

- ◆ Workplace health and safety
- ◆ Workplace hazards
- ◆ OHS policies, procedures and instructions
- ◆ Contributing to OHS in the workplace
- ◆ Food handling
- ◆ Infection risks
- ◆ Linen management
- ◆ Managing waste
- ◆ Personal hygiene
- ◆ Personal protective equipment (PPE)
- ◆ Regulatory framework
- ◆ Safe handling of sharps
- ◆ Standard and additional precautions
- ◆ Sterilising
- ◆ Storing and handling sterile stock

Infection Control -

- ◆ Cleaning and disinfecting equipment
- ◆ Cleaning the environment
- ◆ Dealing with blood and other body fluids

Additional Resources

Acknowledgements ...

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Learning design and web development - Helen Houston, graphic design - Sarah Markland.

Figure 3.4. Learning topics and sequence

b. Learning tasks

The unit was planned around two modules each containing a set of topics as shown in Figure 3.4. The learning design that was employed revolved around learners accessing information and completing consolidation activities. The materials were designed to support flexible delivery. For each topic, a quiz was supplied that students needed to complete. Students were encouraged to use the quiz in each section as a means of determining their level of prior knowledge. Through such self-tests, students were able to determine the need for further reading and inquiry and could do this before attempting the quiz a second time as a means of demonstrating competence.

c. Learning resources

The online unit contained a large number of resources due in the main to the scope and extent of the resources in the Infection control Toolbox. The online materials contained resources that were attractive and engaging and which provided access to:

- Quality graphics and images;
- Plentiful descriptions and information;
- Interactive elements designed to engage learners; and
- Quizzes and self-tests.

Most of the materials were used in their original form. In several instances they were embedded into new pages and accompanied by teacher text added during the development stage (Figure 3.5).

The figure consists of two screenshots of online learning resources. The top screenshot is titled 'Workplace health and safety' and features a navigation menu on the left with options like 'Introduction', 'Self assessment', and 'Laws and responsibilities'. The main content area includes an 'Introduction' section with text about workplace accidents in Australia and an 'Important note' section with instructions on how to use the resource. The bottom screenshot is titled 'Food handling' and features a navigation menu on the left with options like 'The importance of correct food handling procedures' and 'Quiz - Food handling'. The main content area includes a 'Preparation' section with a photo of food handlers and a list of food handling processes to check.

Figure 3.5. Online resource forms

d. Learning supports

The resources included a number of supports to aid learners in independent and student-centred activities. The important supports included the quizzes and self-tests that were designed to enable learners to demonstrate and test their competence and to use this information to monitor and manage their own learning (Figure 3.6). The quizzes were taken from the Infection Control

Toolbox and imported into WebCT where there was a greater level of functionality available to the teacher to monitor and record student achievements in the tests.

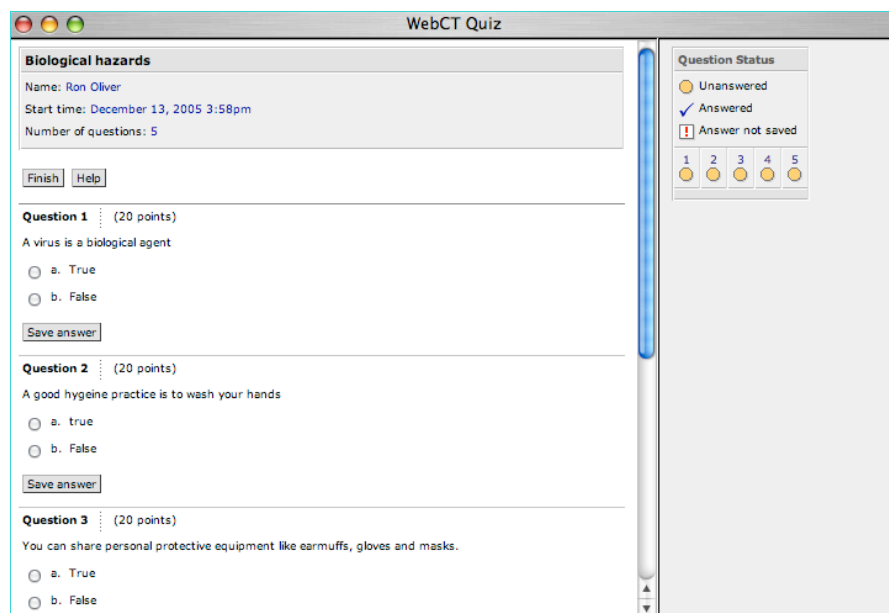
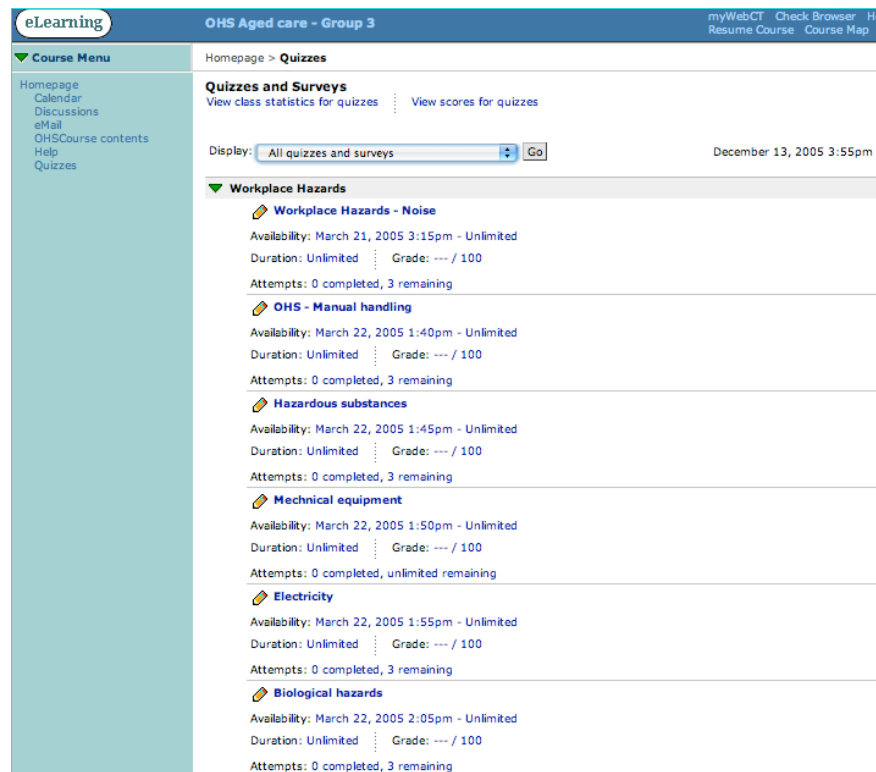


Figure 3.6. Online quizzes

e. Flexible delivery

This online unit was designed to support a flexible mode of delivery among a cohort of students with diverse backgrounds and previous experience. The creation of the unit in a sequential form comprising a series of discrete modules was aimed at providing learners with a broad set of information. The provision of quizzes for self-monitoring and self-checking enabled the

learners to assume some control of the learning experience and to focus on those aspects of the unit that they found themselves needing. At the same time, this format provided a means to focus the learners and to provide purpose and motivation for engaging with the learning settings. The quizzes became an assessable component and students were able to complete each quiz twice, with the latter attempt providing marks that were used towards overall assessment.

This process was found to be very beneficial by many learners who were able to gain recognition for prior learning without having to undergo any special forms of testing or skills demonstration. The learners used the various resources within the topics to address areas of uncertainty demonstrated by results in the quizzes.

f. Learning objects

A number of interesting points arose out of the use of learning objects in this learning setting. In the first instance, there were problems faced with the integrity of some of the learning objects that were used. For example, several of the Flash components of tasks were non-existent in the resources. This appeared to have been caused by the disaggregation of the resources and technical problems with the embedded objects as the resources were placed into the Learning Edge repository. This problem was overcome with technical assistance.

In relation to the OHS (infection control toolbox), quizzes were designed as learning activities and assessed so that students would do them. The teacher wanted to ensure the learners would engage with learning objects given their cost and value. She had difficulty planning assessment tasks that could cover the scope and depth of the infection control toolbox.

3.5 Teacher Responses to learning objects

The teacher in this Trial had substantial skill and expertise in the design and delivery of online learning units but this was the first unit that the teacher had designed and delivered that used learning objects as an underpinning resource element. The survey responses suggested that this teacher found few problems with learning objects and derived considerable design advantage from developing online units without having to put the conventional amount of time and effort into the development of the associated resources (Table 3.2). The teacher commented that the use of learning objects provided several advantages:

- Reduced development time. The use of learning objects provided resources that would have otherwise had to be developed as part of the unit design;
- Stronger learning design. The teacher felt that she could spend more time planning the students' learning experiences instead of developing resources; and
- Richer learning experience. The use of learning objects in the online unit added very strong resources to the setting and provided resources that engaged learners strongly.

The two units that formed part of the trial used a large number of learning object resources from the Learning Edge repository. The resources were easily repurposed for the online units by the teacher. The teacher reflected that her keen skills and expertise were likely way beyond other teachers and she considered them necessary for the successes she achieved with learning objects.

As with other teachers, the difficulties that are expected to confront other teachers looking to design and develop online units using learning objects related to the lack of objects that currently exist. Each of the units developed in this trial had a need for both general and specific resources. The lack of specific learning objects was seen by the teacher as a fundamental shortcoming in the process that would limit the success of others.

Table 3.2 Teacher learning object usage questionnaire responses

Question	Response
1. What problems did you find using the repository to locate Learning Objects and resources for your course? eg. interface is confusing, too few objects, search strings hard to plan etc.	<i>none - I located the Los then downloaded and developed online components using dreamweaver</i>
2. What problems did you face designing an online course using Learning Objects? eg. finding the objects, matching the objects to what you wanted to do, time taken to build an online course etc.	<i>none - I would have had problems disaggregating the Grange Care toolbox because of the dependency of topic folders on other bits outside of the folders that I couldn't recognise. However, because this was done by a tech person and topic folders/learning objects uploaded with all the bits they needed to work this made it easy for me to use</i>
3. What advantages did you derive from the use of Learning Objects in the planning your course? eg. it made me plan ahead, I was able to concentrate on the learning design, , found one or two really good resources etc	<i>I was able to concentrate on the learning design, found one or two really good resources, certainly saved a huge amount of time and provided a level of interactivity that I couldn't develop myself.</i>
4. How have the Learning Objects you used added to the quality of your online course? Added interest to the course, provided really strong resources etc.	<i>really strong authentic resources that engaged learners</i>
5. How many learning objects from the repository did you ultimately use in your course? How many resources from elsewhere? From where did you get the other resources you used?	<i>Course 1: a vast no. of learning objects from the infection control toolbox - available from LE repository. Course 2: One substantial LO from the Grange care toolbox, a number of authentic templates from the Microsoft website and ICDL tutorials bundled together with authentic scenario</i>
6. From your own experiences so far, what problems do you think other teachers will face when planning online courses using learning objects? eg. technical problems, lack of learning objects available, lack of time etc.	<i>I was lucky that I had the technical skills that I have (Dip multimedia). Even still those developed with Flash provided only swf files, not fla files which would have made customisation much more difficult if I had needed to customise I was also very lucky that I found the learning objects that I did - the reason being that I knew the toolboxes were available and that had inspired the development of the online components of courses used for this trial. Searches for useful learning objects for other topics e.g. com</i>
7. What were the most useful elements in the training you received from Peter Higgs? eg. booklet, ideas templates etc.	<i>A succinct overview of the project and guidelines for participants as well as detailed guide to using the LE</i>
8. What impediments do you think still exist that will prevent/impede other interested VTE/TAFE teachers using Learning Objects in their online courses? eg. lack of hardware for students, requires to much bandwidth	<i>Time, motivation to develop skills to use the LE I think there should be a greater expectation that it is used and that all courses include an online component. Teacher inductions (incl sessional trs) should include awareness of the potential of tech to enhance learning and associated training in pedagogy and technology e.g. the LE and WebCT, facilitating online learning</i>
9. What difficulties do you still expect to face when building your next course using Learning Objects? eg. too few resources, using Learning Edge, not enough time etc.	<i>too few resources</i>

10. What strategies will you use when planning your next online course that will enable you to make good use of learning objects? eg. concentrate on the learning design, take more time to find learning objects, get more help etc.	<i>search for learning objects related to topics - then build the learning design around these - thats what I did this time with the Use Bus tech unit - the learning objects contributed greatly to the idea for the authentic scenario that I created - it was pretty exciting really, I always did like story telling! - I looked at all the learning objects a had collected then built my story</i>
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3.6 Student Responses to the Learning Objects and Online Settings

There were seven students who gave feedback on their experiences in the Use Business Technologies online unit. Only one of the students had previous online experience and most were older workers with considerable workplace training and experience (Table 3.3).

The students were generally quite positive about the extent of the resources and their quality compared to resources used in other training settings. The students were also positive about the variety. The students commented that the online unit helped to keep them interested with relevant resources but many felt that aspects of the delivery hampered learning, including download times, broken links in some resources, working with students with less skills and experience, and some repetition in the materials and tasks.

The flexibility of online learning and the associated learning freedoms were cited often as those elements in the setting most preferred. The discussions were also appreciated and valued and some responses suggested students would have preferred even more of them. Suggestions for improvement mainly related to students' learning preferences. Some suggested more instructions, others suggested more variety in the tasks and others would have preferred a more intuitive navigations system.

Table 3.3 Student Responses to the use of learning objects – Use Business Technologies

Question	Response
1. Tell us a bit about yourself. Are you male or female? How old are you? Why did you do this unit?	<ul style="list-style-type: none"> • Female 44 • Female, 54 Part of Nursing Course • Female, 24years old, I'm doing this unit because I'm doing nursing • female, 45 years and its part of my EN course • female, aged 43. • Male 51 years of age This unit was part of the enrolled nursing course • female, 43 years old Cert IV Health(Nursing)
2. Have you done any online learning before? Did you enjoy it last time?	<ul style="list-style-type: none"> • No previous on line learning. • No • No I've never done that before • no • yes at tafe in town a few years ago and at uni. • no • only at tafe this year.
3. What was your impression of the quality of the online resources you were provided in this unit? Were they better in this unit than others you have done?	<ul style="list-style-type: none"> • online resources excellent • -- • I think the online resources were plenty provided by this unit but the thing is I did not know how to use them as my own resources. • nil • they were easier actually, I found the resources available great because at times I got lost abit. • good quality well set out • good

4. What was your impression of the scope of the online resources you were provided in this course? Was there enough? too many/too few?	<ul style="list-style-type: none"> • <i>enough</i> • <i>Enough</i> • <i>impressive</i> • <i>enough</i> • <i>enough resources, maybe too many repetitive tasks in task 2.</i> • <i>enough</i> • <i>there were adequate.</i>
5. What did you think of the variety of the resources you were provided in this course? Do you think the variety was strong or weak?	<ul style="list-style-type: none"> • <i>strong</i> • <i>Strong</i> • <i>strong</i> • <i>sufficient</i> • <i>strong</i> • <i>strong</i> • <i>seemed to be fine</i>
6. In what ways did learning online in this course contribute to the quality of your learning experience? eg. kept your interest, provided you with plentiful resources etc.	<ul style="list-style-type: none"> • <i>interesting</i> • <i>Practical application helped</i> • <i>motivated me that I have to learn more about IT but it will take a time.</i> • <i>made me think very hard on how to do some things</i> • <i>kept my interest, however need more time to complete everything.</i> • <i>KEPT ME WANTING TO KEEP UP WITH THE REST OF THE CLASS</i> • <i>good resources and easy to find.</i>
7. In what ways did learning online in this course diminish the quality of your learning experience? eg. had trouble getting online, the links didn't work, pages took too long to load, it took too long to do things etc.	<ul style="list-style-type: none"> • <i>long time to do things but able to do at own pace, so attribute to no previous experience</i> • <i>Frustration with some pages not downloading on my home computer</i> • <i>Make a few groups which is group of same level of computer skills.</i> • <i>links did not work sometimes, it took too long to do things ,sometimes easier to come into tafe to access computers</i> • <i>task 2 had too many tasks that I felt were repetitive in nature. It would have been good to incorporate some more tasks that related to things like eg, medical terminology to get us used to the learning of it before we started our med. package.</i> • <i>HAD A FEW PROBLEMS WITH MY SET UP AT HOME. DIAL UP SERVICE SLOW</i> • <i>didn't</i>
8. What were the best parts of this online course? eg. the discussions, the freedom to work on your own, the flexibility to learn when you wanted? etc	<ul style="list-style-type: none"> • <i>freedom and flexibility</i> • <i>Flexibility to work at my own pace</i> • <i>Maybe be part of the modern technology world</i> • <i>discussions, flexibility</i> • <i>definitely the freedom to work on my own in my own home to catch up when i had time. (flexibility)</i> • <i>DISCUSSIONS</i> • <i>freedom to work on won at own pace and use of lab when I had free time.</i>
9. In what ways could the online course have been improved? eg. easier to find resources, fewer readings, more interesting readings etc	<ul style="list-style-type: none"> • <i>I did have trouble to find resources but that was me learning my way around</i> • <i>fewer components to some tasks</i> • <i>more instruction for a very beginners</i> • <i>fewer readings, a little more information in text form about some of the tasks,</i> • <i>more interesting readings. Too much reading through the tasks to get to the main point.</i> • <i>FOUND IT OK. A BIT MORE IN CLASS DISCUSSION MAY HAVE HELPED</i> • <i>some of the downloads to use the Grange Home Care were a bit temperamental.</i>

10. How well does what you learned in this course compared to what you have learned in other similar courses?	<ul style="list-style-type: none"> • -- • <i>never stop learning</i> • <i>First time I had done a course such as this</i> • <i>very well.</i> • LEARNED MORE BECAUSE OF INTERACTION WITH OTHER STUDENTS AND TEACHER • <i>Good</i>
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Table 3.4 shows the responses from the two students in the Occupational Health and Safety unit. Both students were older mature-aged students with no previous online learning experience. Both appeared quite happy with the resources and their presentation and variety. The students saw a number of benefits to the learning experience presented by the online format and found no trouble accessing or using any of the technology elements.

They had different views on the strengths of the approach, but both appreciated the flexibility. There were no pressing problems identified and it can be assumed that these learners had very positive and rewarding experiences in the online setting.

Table 3.4 Student responses to the use of learning objects – Occupational Health & Safety

Question	Response
1. Tell us a bit about yourself. Are you male or female? How old are you? Why did you do this course?	<ul style="list-style-type: none"> • <i>Female, 43 years old, and did this as a part of Cert IV Health(Nursing)</i> • <i>male age51 as part of the enrolled nursing course</i>
2. Have you done any online learning before? Did you enjoy it last time?	<ul style="list-style-type: none"> • <i>No</i> • <i>no</i>
3. What was your impression of the quality of the online resources you were provided in this course? Were they better in this course than others you have done?	<ul style="list-style-type: none"> • <i>The quality seemed fine to me.</i> • <i>quality and quantity were both good</i>
4. What was your impression of the scope of the online resources you were provided in this course? Was there enough? too many/too few?	<ul style="list-style-type: none"> • <i>Seemed to be sufficient, though some of the resources were not always available on line.</i> • <i>great resources with enough detail</i>
5. What did you think of the variety of the resources you were provided in this course? Do you think the variety was strong or weak?	<ul style="list-style-type: none"> • <i>Strong</i> • <i>strong</i>
6. In what ways did learning online in this course contribute to the quality of your learning experience? eg. kept your interest, provided you with plentiful resources etc.	<ul style="list-style-type: none"> • <i>Made things easy to access and also improved my computer skills and expanded on my new/little used skills.</i> • <i>kept my interest and it gave me the opportunity to learn from any mistakes made</i>
7. In what ways did learning online in this course diminish the quality of your learning experience? eg. had trouble getting online, the links didn't work, pages took too long to load, it took too long to do things etc.	<ul style="list-style-type: none"> • <i>I didn't have any problems using online learning</i> • <i>had no trouble</i>
8. What were the best parts of this online course? eg. the discussions, the freedom to work on your own, the flexibility to learn when you wanted? etc	<ul style="list-style-type: none"> • <i>Discussion, and being able to work at your own pace and use the labs in spare time.</i> • <i>The freedom to work on my own at my own pace</i>
9. In what ways could the online course have been improved? eg. easier to find resources, fewer readings, more interesting readings etc	<ul style="list-style-type: none"> • <i>Ensuring that all the web sites/resources were available.</i> • <i>found it ok</i>
10. How well does what you learned in this course compared to what you have learned in other similar courses?	<ul style="list-style-type: none"> • <i>This is the first one I have done.</i> • <i>this course gave me more flexibility in that I could check answers and learn by my mistakes.</i>

4.0 CASE STUDY 2

4.1 Queensland Trial

This case study describes the learning environment established in the Queensland Trial. This team comprised three participants, employees of a small company specialising in the delivery of counselling services and training to industry. Their motivation to join the Learning Object Trials came from their interest in developing an online version of a successful training unit developed for face-to-face delivery. An online version was seen as a means to promote the unit and to enable groups outside metropolitan areas to gain access to the unit.

Among the three participants were people with a diverse skills set. All of the participants planned to help to deliver the unit, two as tutors and the third acting in a support role. Responses from the entry survey revealed very limited previous experience with learning objects and digital repositories. There was a high degree of optimism that the use of learning objects would provide strong supports to the development of effective learning materials. The participants recognised that their existing skillsets would likely need to develop considerably but there was general enthusiasm and interest given the opportunities that this new skillset and the technologies might offer them in their line of work.

The participants were all optimistic and hopeful that the project would be very successful and all indicated that they intended to put in what was needed for the success. Among the problems anticipated were technical and financial limitations and the need to use several new tools, including use of the Elluminate platform and Skype. Since this project represented the first foray of the group into online learning, there was some uncertainty in how successful and time consuming online teaching would be and some problems were perceived in relation to time coordination for chats and the quality of facilitation, moderation and communication first time around. It was recognised that some learning objects may need to be customised to make them more suited to the local context. The time the busy people had to offer the project was seen as another potential problem.

The Training Team involved in Learning Objects Trial

a. *The Manager Education & Training and Counsellor.* This participant had over 20 years secondary and tertiary teaching sciences, health and physical education as well as IT previous expertise in teaching online as tutor at JCU in the School of Education. She had previous experience learning online in study towards a Masters of Education. She held various roles in the delivery of the online unit including co-facilitator. Her reasons for participating related primarily to her responsibilities in her employed position plus an interest in e-learning.

b. *The Training Coordinator for the company, across Queensland.* This participant had experience throughout her work history training employees in various skills and at various levels. She was undergoing the Diploma of E-Learning (online) with Tropical North Queensland Institute of TAFE. Her first experience with teaching online had been the commencement of Work Wellbeing Online which began in September 2005. During the pilot for Work Wellbeing Online, she had the roles of being a back-up facilitator and responsible for the administration and coordination of the unit. She participated in chats and forums and sent out all emails to participants. She also took a role in designing and creating resources (online and hardcopy) for the online unit. The reasons she gave for participating in the trial were to broaden her knowledge of learning objects so that she could provide participants with knowledge and learning experiences appropriate to Work Wellbeing Online. Being able to create highly effective learning sequences to incorporate into our online units was seen to benefit all who participate.

c. *The Co-ordinator and Company Owner.* With over 20 years experience teaching in primary schools across all curriculum areas and Reading Recovery and at TAFE in Work Education, this

participant had no previous expertise in teaching online and was completing a Diploma of Elearning at Tropical North Queensland Institute of TAFE. Her role was co-facilitator and her reasons for participating were to develop and facilitate units to assist in promoting and maintaining mentally healthy workplaces by reaching employees who are unable to participate in face to face training or who would prefer to learn online. Workplace Wellbeing aimed to update participants' knowledge and understanding of concepts, values and responsibilities which underlie wellbeing at work issues and the development of healthy organisational cultures. It also sought to empower individuals to make changes that could lead to improvements in the mental health of their workplace. She participated in the trial to find out more about using and customising learning objects that would provide quality activities and information to assist in achieving the above.

Table 4.1 Entry survey responses

Question	Response
1. What has been your previous knowledge and practical experience with design and development of learning objects?	<ul style="list-style-type: none"> • <i>non existent</i> • <i>I have reviewed some learning objects as part of the Diploma of E-Learning but had no practical experience with design and development.</i> • <i>I don't think I have had previous experience of learning objects before recent development of our first online course.</i>
2. What has been your previous knowledge and practical experience with teaching with learning objects ?	<ul style="list-style-type: none"> • <i>non existent</i> • <i>I have not taught with them before.</i> • <i>Before now, little experience teaching with learning objects.</i>
3. What has been your previous knowledge and practical experience with customisation experience with learning objects	<ul style="list-style-type: none"> • <i>non existent</i> • <i>I have no experience with customisation of learning objects.</i> • <i>Little knowledge and experience with customisation of learning objects</i>
4. What has been your previous knowledge and practical experience with peripheral experience with learning objects? eg. committees, working parties	<ul style="list-style-type: none"> • <i>brief</i> • <i>My only experience has been reviewing them in the diploma and for their potential for the TherapyWorks Work Wellbeing course.</i> • <i>Little experience with peripheral experience of learning objects.</i>
5. What has been your previous knowledge and practical experience with use of repositories of digital resources?	<ul style="list-style-type: none"> • <i>weak</i> • <i>None</i> • <i>I have good knowledge and experience with using repositories of digital resources.</i>
6. What has been your previous knowledge and practical experience with use of metadata for storing and/or searching?	<ul style="list-style-type: none"> • <i>none</i> • <i>None</i> • <i>Little knowledge of metadata for storing and/or searching</i>
7. How much do you expect the learning objects to support your teaching needs?	<ul style="list-style-type: none"> • <i>Optimistic and open minded Although I do think our own learning experiential ideas/resources may provide richer learning experiences than the learning objects we have incorporated.</i> • <i>I think they have the potential to provide a medium to high level of support.</i> • <i>I think the learning objects are an important tool to assist with different ways of learning.</i>
8. How much work do you think will be involved to develop course materials using learning objects?	<ul style="list-style-type: none"> • <i>not too much Dev't of course materials is only one aspect.</i> • <i>We have received some support with this so at present it hasn't been a great deal of work but we will need more help in the future.</i> • <i>I believe there will be a substantial amount of work involved to develop course materials because of the lack of experience we have had in the past.</i>

9. How appropriate is this project to your existing ICT skill set?	<ul style="list-style-type: none"> • very • <i>Very appropriate, at present our existing skills using multimedia are limited and we could not produce such quality resources without help and a bigger budget.</i> • <i>I think the project will assist us in improving and expanding our existing ICT skills.</i>
10. How appropriate is this project to your existing pedagogy skill set?	<ul style="list-style-type: none"> • very • <i>As it's important to cater for different learning styles I think it's very important.</i> • <i>I believe the project will definitely expand my existing pedagogy skill set.</i>
11. How efficient will this be? Will there be a good learning return on your investment of time?	<ul style="list-style-type: none"> • not sure • <i>I certainly hope so. After the trial participants' feedback may provide answers to this but I am feeling positive about the responses.</i> • <i>I am hoping that there will be a good learning return on my time investment, as I am already very busy within my workplace as well as completing a Dip of E-Learning.</i>
12. How much do you expect to learn from the project?	<ul style="list-style-type: none"> • A great deal • <i>I have already learnt an enormous amount just from looking at the learning objects and thinking about how they could be used.</i> • <i>I expect to learn quite a bit, unless the knowledge I already possess is much more than currently believe.</i>
13. How motivated are you to see this project succeed? Do you have the time you need? Will this project put you under a bit of pressure timewise?	<ul style="list-style-type: none"> • very Enough time I hope. A little but feeling positive • <i>I am very motivated. Time and pressure could be problems but once the course trial is over in 8 weeks they won't be an issue.</i> • <i>I believe that the project will put another pressure on me and hopefully the time I can spare will be enough for me to learn and for the project to succeed.</i>
14. What forms of technical support will you have at your disposal at your institution?	<ul style="list-style-type: none"> • <i>human resource and online learning mentor Jo Murray</i> • <i>TherapyWorks has a business manager and a training co-ordinator both of whom have good technical skills.</i> • <i>If it's general computer tech support, it will most probably be me, but if it's specifically LO related, it would be from Jo via email, skype etc.</i>
15. What are your expectations (how successful do you anticipate your efforts will be)?	<ul style="list-style-type: none"> • <i>Success will be measured according to how well participants demonstrate learning outcomes and feel supported. I will also look for their promotion of the course and scrutinise their feedback ,e.g.,constructive and meaningful</i> • <i>I expect our efforts to be very successful. I am prepared to have to make changes after the course trial.</i> • <i>I expect my efforts will be successful, as long as I put 100% into the small amount of time I can give to the project.</i>
16. What problems do you anticipate will hinder or limit your success in the Trials of Learning Objects?	<ul style="list-style-type: none"> • <i>technical and financial limitations: use of Elluminate platform and Skype. Time coordination for chats. Quality of facilitation , moderation and communication</i> • <i>After our course trial I am anticipating that customising the learning objects will make them much more suited to TherapyWork's needs.</i> • <i>Definitely time allocated to learn may hinder success.</i>

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17. How much is this project being driven by RTO management and how much by your own desire to learn more about Learning Objects?
- *There is no RTO management involved.*
 - *I am definitely interested in learning more about the learning objects but I would not have known about the trials without our partnership with the RTO management.*

4.2 Training and Development Processes

The participants in this team were guided by two mentors as they built the various learning resources for their unit. Initially, the learning environment was created under the guidance of Ms Jo Murray, an e-learning consultant and online learning expert from Tasmania. Ms Murray visited the team in their premises and helped them to develop the concept for their online unit and to understand how it might be designed and implemented. Ms Murray hosts Moodle on her company server and this LMS was seen as a perfect choice for the unit being developed due to its communication capabilities and learning features.

With Ms Murray's help an online unit using Moodle was developed. The online unit used learning objects extensively in its instantiation and these appeared as links in the unit presentation. To further demonstrate the utility and advantage of learning objects, in the development of the Moodle setting, several learning objects were created using alternative development tools into an IMS conformant form and imported into Moodle as a resource.

Initially the participants imagined they would need to develop learning objects themselves but the mentor demonstrated several existing objects and the team saw some interesting options. After the mentor's visit, the team searched through the Flexible Learning Toolboxes list of potential learning objects. The team populated the Moodle environment with their own teaching notes and used the mentor to guide the development process. The online unit was supported by a hard copy resource that students used to guide and inform their participation.

The unit activities were planned ahead of delivery and the mentor checked the weekly lessons (at a distance) to discover any possible problems. In its first delivery, the unit ran with 10 students facilitated by one of the team and one other. Since this was the first time the teachers had delivered online, the mentor used Skype to talk to, and help them to organise and run their first chat. Another of the team administered the site and kept a close eye on the Forum to ensure it was being used appropriately. This team member was able to answer all students' technical queries. The mentor clarified the roles for the staff during their implementation so they were able to run their first online unit effectively.

In early November, a second training session was held at the premises of the team in Cairns. This second session was attended by Peter Higgs, Rose Shum, Dominic Lou and Ron Oliver (Project Members), the participants, a local e-learning advisor working with one of team members and office staff. The second session comprised 2 components. The first component on Thursday afternoon explored the conceptual basis of the use of learning objects as design elements. The team demonstrated the online learning environment they had already created for the Workplace Wellbeing Online unit. The team were then led through the process of using The Learning Edge as a development tool, accessing the digital repositories and creating IMS modules that could be delivered using Moodle. The training covered the technical aspects of developing learning settings using embedded and linked learning objects sourced from available repositories and delivering these learning objects through a learning management system.

Since this team already had a successful online learning unit developed for Moodle delivery, they used the second training session to explore the development of some supplementary materials using The Learning Edge and the available objects in the associated repositories.

4.3 Workplace Well-Being

This team developed a unit entitled Workplace Well Being (WWB) as an online version of an existing face to face unit developed by the organisation. The aims of the unit were:

1. To update participants' knowledge and understanding of concepts, values, ideas and responsibilities which underlie wellbeing at work issues and the development of healthy organisational cultures; and
2. To empower individuals to make changes that can lead to improvements in the mental health of their workplaces.

The WWB Online unit was a dynamic evolving unit based on Clinical Psychologist, Robert Scott's book, *Workplace Wellbeing* (2004). Endorsed by the Australian Counselling Association 'Work Wellbeing' was designed for anyone in the workplace; general managers, managers, supervisors, team leaders and general employees. Encouraged by excellent feedback from the Workplace Wellbeing face to face unit, 'Work Wellbeing' was developed online to provide an opportunity for busy people and those who live in remote locations to explore better ways of working and getting control and balance back in their lives.

The emphasis was on self directed learning and the measurement of learning outcomes. Key features included facilitated peer-to-peer communication using online tools, such as real time (synchronous) chats and asynchronous (over time) discussion forums. In this 8 week unit there were five main topics. In each topic students were reminded to go to the main discussion forum and to click on the title to open the discussion thread (e.g. focus question) and to contribute ideas. They encouraged students to keep postings short and to the point and to read and respond to at least two other participants' postings in each thread in each topic. While the facilitator played a significant role in creating a vibrant learning community/group, which provided support and motivation, learners were expected to take responsibility for managing their own learning .

This blended online unit covered a variety of topics to help develop and support mentally healthy workplaces. There were practical tips on managing the very best business asset that any workplace has – its people. There were also suggestions on how to look after mental wellbeing, the key to workplace profitability, personal success and community growth. There was a progression, from considering what a mentally healthy workplace is, to exploring policies and protocols, to enacting the principles when dealing with difficulties. The resources provided were to be used when needing to seek help or find out how to solve a problem or promote a better way of operating. The course was based around the following elements.

a. Course Content

- What is a mentally healthy workplace?
- Working well together, communicating well, giving and receiving feedback and managing confrontation.
- The importance of a work/life balance.
- Personal and organisational stress, stress management.
- Facts and strategies to deal with anxiety, depression, sleep problems workplace bullying, traumatic events at work suicide and alcohol and drugs in the workplace.
- Facts and strategies to deal with other mental health problems - bipolar disorder, psychosis, post-natal disorders.
- How and where to get help towards a mentally healthy workplace.

b. Learning Outcomes

On completion of the blended online unit, participants would be able to:

1. Communicate effectively in an online learning environment;
2. Actively promote values of mentally healthy workplaces;
3. Further develop effective interpersonal communication skills;
4. Build capacity to derive increased satisfaction in balancing work, health and home life;
5. Identify appropriate ways to recognise and help self and others, work through selected mental health difficulties. For example with stress, anxiety, depression, sleep problems, workplace bullying, traumatic events at work, grief, suicide, drugs, gambling, bipolar

- disorder, schizophrenia, obsessive compulsive disorders, psychoses and post-natal disorders;
6. Update knowledge of Employee Assistance Services; and
 7. Plan constructive mentally healthy action for the future.

4.4 The Learning Design

The learning design applied in the unit for Topic 1 could best be described as informed conversation. The unit aimed to promote students' understanding of issues associated with wellbeing in the workplace. In this week students considered their current knowledge and understanding, read informed views and comments and then shared their perceptions with others in an asynchronous communication. The learning occurred through the reflective reading, and the online communication (at least 2 posts were required).

The screenshot shows a web-based learning environment. At the top, it says 'Pelion » M02' and 'Turn editing on'. The main content area is titled 'Weekly outline' and features a 'TherapyWorks' logo. Below the logo is contact information for Whitehouse Specialist Centre: 165 Lake Street, Cairns QLD 4870, Ph. (07) 4041 4933 Fax. (07) 4041 2733, Email. training@therapyworks.org.au, Website. www.therapyworks.org.au. The main heading is 'This week (31st Oct - 6th Nov): Summary and Evaluation'. The text reads: 'We would like to extend a great big THANK YOU to all those participants who have offered and shared their wonderful wisdom and support during the pilot of Work Wellbeing Online. We have enjoyed getting to know you and have appreciated your efforts, which will assist with the success of this program. This week we are summarising the topics covered throughout the course and we also ask for your honest feedback and evaluation of the course. We encourage you to think about the future and work out an action plan to assist with your Work Wellbeing. News forum'. Below this is a section for '1 5 September - 11 September' titled 'Orientation'. The text says: 'Warmest welcome. You made it here. WELL DONE! Firstly I would like to introduce you to your learning facilitators(teachers) for this course, Robyn Crisp & Louise Evans. You can click their names to learn more about them. I am Jennifer Krsticevich, (Training Coordinator and back up facilitator) and will also be popping in from time to time to say hi and to ensure netiquette guidelines are being met. Here's what to do in the first week...so you can feel comfortable learning in this online environment. 1. Explore this course space. a) Click on participants,(located left under People). Update your own profile and learn about your colleagues. b) Scroll down to view the list of learning activities and resources at the bottom of this orientation box. Each activity has an icon beside it. Each activity/resource is also viewable from Activities (top right). • click and view the Work Wellbeing Overview • click Ready Set Go to view the basics of online learning . • click and read the Orientation Booklet (also sent via email). • click and enter the Ongoing Evaluation (Wiki.) This is where you can type your feedback about the course any time. You can also access this evaluation wiki by clicking on the wiki icon located top right, under activities. Use the Help to find out how things work (question mark icon)'. The left sidebar contains 'People' (Participants), 'Administration' (Turn editing on, Settings, Edit profile, Facilitators, Participants, Groups, Backup, Restore, Import course data, Scales, Grades, Logs, Files, Help, Teacher forum), and 'My courses' (TherapyWorks Work Wellbeing M02, Resources, All courses...). The right sidebar contains 'Activities' (Chats, Forums, Quizzes, Resources, Wikis), 'Calendar' (November 2005), 'Search Forums' (Advanced search), 'Messages' (No messages waiting), 'Online Users' (Ron Oliver, last 5 minutes), and 'Latest News' (Add a new topic... No news has been posted yet).

Fig 4.1. The Work Wellbeing Workplace Delivery Format

a. Learning Tasks

In a typical component of this unit the students were given a topic and issue to ponder and were required to do some reading from provided resources to enable them to reflect on their knowledge and to share their viewpoint. Students were required to:

1. Read about giving and receiving feedback in the workplace, write notes on those with which they agreed and disagreed (reflect on own understanding in light of new knowledge);
2. Recall an event at work with some problem characteristics, (reflection), reflect on based on reading, application of knowledge, describe a strategy to improve the situation based on reading(problem-solving);
3. Post into forum and consider other students' responses (multiple perspectives);
4. Read a scenario of conflict in workplace, write a script (considering current practices, how

- they could be solved), focus on being the junior worker in the conflict;
5. Role play with a partner, practice being assertive;
 6. Listen to a tape of a successful assertive junior worker. How did each compare?
 7. Go to the forum and say what happened (verbalise and articulate, reinforcing the positive)
Reading other posts to further understand the process and possible outcomes; and
 8. Complete some extension activities to be done individually requiring reading and reflecting.

The unit was delivered to a cohort of 12 students in an online mode across a 10 week period. Several staff facilitated and encouraged online participation through both synchronous and asynchronous modes, with strong levels of tutor moderation. There were 6 students who formed the core of the online discussion with the remaining 6 students participating with less involvement in the discussions and communications components. The unit represented typically about 12 hours of learning time for the students.

b. Learning resources

The online site prepared for the Workplace Wellbeing unit was populated with a broad variety of resources. The majority of the resources could reasonably be considered to be learning objects. They were resources that were being reused from original contexts and in some cases tailored to fit the learning needs of the target audience.

The site contained a variety of learning resources that students were able to access. The nature of the learning design employed meant that the resources were able to be used in ways that the students chose rather than being delivered in ways that restricted access to particular instructional forms. The resources themselves comprised mainly Word documents, and various Web documents in the form of pdf and HTML pages.

The site included materials sourced from a variety of locations including Web sites, previous units and resource collections owned by the developers. Within the resource set were a small number of resources obtained from the learning object repository provided by the Flexible Learning Toolboxes project.

Figure 4.2 shows a typical lesson/learning sequence from the Workplace Wellbeing unit. The instructional strategies display as activities for the learners in the form of readings, reflections and online discussions. The resources display at the end of the page as accessible links.

c. Learning supports

Learners in the Workplace Wellbeing unit were provided with a number of supports in the online setting. An online tutor moderated and facilitated learner actions and the online unit was designed with class discussions and collaborative activities as principal elements. Students were encouraged and required to complete readings and to then participate in virtual discussions with peers to consolidate their knowledge and understanding.

The role of the tutor and communication with other students was planned to assist in the development of a learning community. The connected nature of the learning was also planned to motivate and encourage learner involvement and participation as well as contributing directly to their development of appropriate knowledge and understanding. The proactive role of the tutor in the design of the learning materials was a deliberate strategy to create a learning setting that was active and dynamic to the learners.

2 12 September - 18 September □

Topic One: Mentally Healthy Workplaces

Well done! 😊 Topic One - Mentally Healthy Workplaces has been extended by a week to end on Monday 26th September to allow for busy participants to contribute.

In this topic we hope to inspire you to actively promote mentally healthy workplaces.

Let's start by discussing what we think of when we hear the term 'mental health'.

To do this:

1. Click to enter the main discussion forum 'Mentally Healthy Workplaces' (brown icon with two heads below). Go to 'First three words' and post your thoughts on mental health.
2. Next read pages 4 through to 8 of the WWB resource booklet. Consider what mentally healthy workplaces are about and also identify some common myths surrounding mental illness. Think about how busting myths associated with mental illness can prevent serious harm.
3. Click to view 'Workplace Features' below. Read the ideas and values that we think underlie mentally healthy workplaces.
4. Revisit the 'Mentally Healthy Workplaces' forum. Click to post your ideas in 'Values and Practices'.
5. Click on the web link 'Myths about Mental Illness' below and complete Parts 1 and 3 of the interactive quiz.
6. Reflect on and track your own progress by going to:
 - a) 'Activity checklist' in RESOURCES under ACTIVITIES top right of this web window.
 - b) Wiki (evaluation), also located top right under ACTIVITIES. 😊 Please remember to post your concerns, suggestions as they arise in this wiki at anytime.

Extension opportunities : Remember these extra activities are optional. For a quick quiz Click What am I ? Click extension link below if you are interested in laws related to mental health rights. To view instructions click and drag top right side scroll bar down.






-  [Mentally Healthy Workplaces](#)
-  [Workplace Features](#)
-  [Myths About Mental Illness](#)
-  [Extension quiz : What am I?](#)
-  [Extension Web link: mental health rights](#)

Fig 4.2. The Workplace Wellbeing topic layout

d. Flexible delivery

The Workplace Wellbeing unit was designed to support independent learners but it was designed with a degree of structure to enable students to communicate and collaborate. The temporal restrictions that are created when students are required to communicate and collaborate are evident in this design but would be seen by many as a positive design aspect even though it can limit the opportunities for flexible delivery.

e. Use of learning objects

The design of the learning environment provided a strong context for the use of learning objects and reusable resources. The instructional designer had developed the unit around tasks and activities that the learners were required to complete. In the main the tasks were very structured requiring the students to complete specified tasks and develop responses to direct questions and statements. The students were supported in their learning by these structured activities and through discussion forums where they were able to share their views with others and reflect meaningfully on outcomes. There were substantial supports provided to ensure students were aware of the schedule and were constantly reminded of the schedule and the various tasks and

responsibilities. Whilst the tasks and activities were designed specifically for this setting and the generic tools from the LMS, the resources were all sourced from elsewhere and were in the form of reusable resources and learning objects. The learning resources were drawn from a variety of sources and their use woven through effective instructional design. There was a chat for learners who could participate online and a forum for those with less flexibility in their study program.

Opportunities for this learning design gained from Learning Objects

- Diversity of content and information from the available learning objects;
- Richness of content and information; and
- Clever instructional design to ensure meaningful use from many learning objects.

Impediments for this learning design presented by learning objects

- The learning design required specific content; and
- The learning objects needed to be totally decontextualised from their original learning setting and to be discrete entities.

4.5 Staff Responses to the Use of Learning Objects

At the end of the unit, the participating staff were asked to give their impressions on the opportunities and limitations provided to quality educational settings by the use of learning objects as a design strategy. Table 4.2 shows the responses of the teachers to the questions posed.

Table 4.2. Staff responses to learning object usage questionnaire

Question	Response
1. What problems did you find using the repository to locate Learning Objects and resources for your course? eg. interface is confusing, too few objects, search strings hard to plan etc.	<ul style="list-style-type: none"> • <i>No problems at all but in the future in the specific area I am involved in - mental health-there may be a lack of objects.</i> • <i>Too few objects for mental health area.</i>
2. What problems did you face designing an online course using Learning Objects? eg. finding the objects, matching the objects to what you wanted to do, time taken to build an online course etc.	<ul style="list-style-type: none"> • <i>Searching for the best object can take a bit of time but no where near as much as if you had to develop your own resources</i> • <i>Finding objects that matched the content and purpose of our online course.</i>
3. What advantages did you derive from the use of Learning Objects in the planning your course? eg. it made me plan ahead, I was able to concentrate on the learning design, , found one or two really good resources etc	<ul style="list-style-type: none"> • <i>They helped with planning as we were able to focus on developing those resources that we had to design for ourselves confident that the objects we had already selected were providing us with quality activities. If we had to develop all our own resources we would have had major issues with time, budget and access to skills and technology.</i> • <i>Found some good resources. Allowed more time to work on other learning activities.</i>
4. How have the Learning Objects you used added to the quality of your online course? Added interest to the course, provided really strong resources etc.	<ul style="list-style-type: none"> • <i>It was great to have quality objects that were designed using sound pedagogical theory. They also used different multimedia which suits a variety of learning styles. Some of the objects provided fun in the course which was needed to lighten up a topic that can be too serious.</i> • <i>Provided participants with comprehensive and interesting information and interactivity on the topic</i>

<p>5. How many learning objects from the repository did you ultimately use in your course? How many resources from elsewhere? From where did you get the other resources you used?</p>	<ul style="list-style-type: none"> • <i>We used four objects and developed our own resources for other activities. We did link to some websites which provided information participants may have used for their own research.</i> • <i>2 objects were used in our online course. There were a number of other resources that were mainly created by us.</i>
<p>6. From your own experiences so far, what problems do you think other teachers will face when planning online courses using learning objects? eg. technical problems, lack of learning objects available, lack of time etc.</p>	<ul style="list-style-type: none"> • <i>Lack of LO's and technical issues where teachers need assistance customising objects that have used flash.</i> • <i>Possibly technical problems, depending on their experience etc. Maybe not being able to find the extra time to look through the repository to find exactly what they are looking for.</i>
<p>7. What were the most useful elements in the training you received from Peter Higgs? eg. booklet, ideas templates etc.</p>	<ul style="list-style-type: none"> • <i>Peter was incredibly inspiring. He was able to sort through lots of half formed ideas and get to the crux of what we needed to do next. Having access to The Learning Edge provides you with such an easy to use tool to develop courses particularly if compared to developing one from scratch with DreamWeaver.</i> • <i>The ideas created by collaborating with them. The information on where best to find resources for the mental health area. Being able to modify the learning objects while Peter could supervise and assist if required. The brief knowledge from Dr Dominic Lou on instructional design was also of great benefit.</i>
<p>8. What impediments do you think still exist that will prevent/impede other interested VTE/TAFE teachers using Learning Objects in their online courses? eg. lack of hardware for students, requires to much bandwidth</p>	<ul style="list-style-type: none"> • <i>VTE/TAFE teachers I am in contact with through the Dip of E-learning seem to have lots of difficulties with lack of support or vision for e-learning both from colleagues and management, lack of funding, time ,resources (depending on which institution they're with) and not enough technological support if many staff are developing courses at once.</i> • <i>There can always be problems with lack of hardware of students. I am not sure what else would prevent interested TAFE teachers from using them.</i>
<p>9. What difficulties do you still expect to face when building your next course using Learning Objects? eg. too few resources, using Learning Edge, not enough time etc.</p>	<ul style="list-style-type: none"> • <i>We have already been searching and there is a lack of LO's related to dealing with stress and related issues. Time and budget will also be problems if we are unsuccessful at marketing our first course.</i> • <i>Possibly not enough time and not being able to find enough resources to suit the mental health field.</i>
<p>10. What strategies will you use when planning your next online course that will enable you to make good use of learning objects? eg. concentrate on the learning design, take more time to find learning objects, get more help etc.</p>	<ul style="list-style-type: none"> • <i>Now we are 'experienced' it will be so much easier as we're familiar with the different sorts of activities LO's can provide and we know about customising them and how to get help if we need it. Our skills in instructional design are also much better so in the future giving instructions and choice of activities will definitely be improved</i> • <i>Take more time to find learning objects and modify if possible. Concentrate on instructional design.</i>

The feedback from the teachers concerning the value and opportunities they derived from the use of learning objects in the design and development of this course revolved around 3 main themes:

- **Access** The teachers reported access to appropriate learning objects to be a significant problem. The teachers reported concerns that learning objects were difficult to find for particular needs and questioned the number of learning objects that actually existed and were able to be used.
- **Richness** The advantages the teachers appeared to derive from the use of learning objects related to the richness and quality of the resources. The teachers claimed that the high quality of the learning objects contributed significantly to the student learning experience.
- **Technical problems** The teachers expressed the view that the use of learning objects requires a degree of technical expertise on the part of the teacher that many VTE teachers might not have. It was felt that whilst a trained teacher could use learning objects reasonably easily and effectively, the majority of VTE teachers would not have the required levels of expertise and would consider learning objects way beyond their capability.

The participating teachers commented that through the Trial they had learned to use learning objects and suggested that there are strategies and processes associated with designing with learning objects that need to be learned. They considered they would be better users next time because of what they had learned through this trial experience. Areas where they had developed expertise included designing settings that could use learning objects and customising learning objects. Still they felt that the barrier to further use revolved around the actual availability of relevant and appropriate learning objects. Interestingly, concerns that were not raised by the teachers included interoperability, sequencing, and tracking. The teachers did not use the learning objects in sophisticated ways and were looking for them to provide a richness and diversity to the learning setting rather than any technical supports.

4.6 Student feedback

Only one student completed the student questionnaire and the results can only be taken as general and not indicative. The student was an older male who had no previous online learning experience. His feedback was very positive and in his responses it was evident that he enjoyed the experience, found the interactions with the tutors and peers very positive and he experienced no problems that could be related to the learning objects or the design based on learning objects (Table 4.3).

It is hard to isolate in the feedback from the student any comments that might be attributable to the use of learning objects. It can be surmised that the use of learning objects added resources to the setting, provided some richer and more interactive media and resources and added to the extent of the available learning materials. The student's preference for freedom and flexibility in the setting was supported by the use of learning objects. His appreciation of the richness of the resources was likely to have been derived in some part from the use of learning objects. Other strong aspects of the unit such as the interactivity and communication appeared very much the result of the informed and clever instructional design of the learning setting.

Table 4.3. Student responses – Workplace Well Being

Question	Response
1. Tell us a bit about yourself. Are you male or female? How old are you? Why did you do this course?	<ul style="list-style-type: none"> • <i>54 year old male with extensive Admin and Financial background. Over 35 years experience in workplaces ranging from 2 people to 100s. I was invited onto the pilot and thought it was a good opportunity to see and experience first hand the type and style of training being developed.</i>

2. Have you done any online learning before? Did you enjoy it last time?	• NO
3. What was your impression of the quality of the online resources you were provided in this course? Were they better in this course than others you have done?	• <i>Pleasantly surprised. No previous experience.</i>
4. What was your impression of the scope of the online resources you were provided in this course? Was there enough? too many/too few?	• <i>I have no previous experience to judge this by however felt that the resources provided were more than adequate.</i>
5. What did you think of the variety of the resources you were provided in this course? Do you think the variety was strong or weak?	• <i>Strong</i>
6. In what ways did learning online in this course contribute to the quality of your learning experience? eg. kept your interest, provided you with plentiful resources etc.	• <i>Plenty to do from week to week. Some modules I found more interesting than others but that is only natural.</i>
7. In what ways did learning online in this course diminish the quality of your learning experience? eg. had trouble getting online, the links didn't work, pages took too long to load, it took too long to do things etc.	• <i>Personally I experienced no difficulties with the course presentation or the technical side of the delivery. One of my chat partners experienced a problem in raising me for a scheduled chat using Skype however we quickly converted to Skype typed chat and continued on.</i>
8. What were the best parts of this online course? eg. the discussions, the freedom to work on your own, the flexibility to learn when you wanted? etc	• <i>Freedom and flexibility without doubt</i>
9. In what ways could the online course have been improved? eg. easier to find resources, fewer readings, more interesting readings etc	• <i>With no previous experience I would find it difficult to make a meaningful comment here. The course as presented I believe taught me as much about the subject as possible and the extensive resources one was referred to I believe provided a much more rounded learning experience than would be possible in the same course delivered face to face.</i>
10. How well does what you learned in this course compared to what you have learned in other similar courses?	• <i>See answer to Question 9.</i>

5.0 Case Study 3

5.1 South Australian Trial

This case study describes the project undertaken in South Australia. The participants owned and ran a small company associated with food processing and the training requirements of food processing personnel.

The team consisted of a husband and wife who had been running their private RTO since 2003, both as lecturers and managers. Previous experiences included being a lecturer in processing at Regency Institute of TAFE (SA) between 1987 and 2003. There had also been involvement in the development of the Meat Industry training packages on behalf of MINTRAC including the development of assessment and training materials.

Both participants had been involved in e-learning over the last couple of years and used Moodle as a flexible delivery tool in their institute. In 2004 they were start-up team members of the Australian Flexible Learning Framework for Learnscope and had continued this association this year managing a Learnscope team project looking at developing partnerships in School-based Apprenticeships in VTE and schools using flexible and e-learning methods for metropolitan and rural communities.

As a husband and wife team, both were heavily involved in the development of the learning object materials, though the wife was primarily the one working with The Learning Edge System to develop the learning object resources.

When asked about their reasons for participating they indicated a desire to provide quality training opportunities for their clients, especially the rural and remote ones. They had a strong focus in flexible learning and believed that anything that would assist them in developing e-Learning alternatives for their clientele was of great interest to them. Table 5.1 shows the entry point survey feedback.

Table 5.1. teacher entry survey responses

Question	Response
1. What has been your previous knowledge and practical experience with design and development of learning objects?	<i>Developing our learning platform, customising learning objects for our students</i>
2. What has been your previous knowledge and practical experience with teaching with learning objects ?	<i>Have been involved in training for many years</i>
3. What has been your previous knowledge and practical experience with customisation experience with Los	<i>Customisation is a constant requirement, each situation, client is different. We are constantly expanding our scope according to demand, and developing new materials to suit these clients</i>
4. What has been your previous knowledge and practical experience with peripheral experience with learning objects? eg. committees, working parties	<i>Involved in LearnScope & Reframing the Future projects, Edayz, On-line communities, eg Learning times Australia, various Edna Groups, on-line conferences</i>
5. What has been your previous knowledge and practical experience with use of repositories of digital resources?	<i>Customising toolboxes, no real 'Meat Retail' or 'Smallgoods' specific material available. Have found lots of useful, relevant material in the Kitchen Operations toolbox, which we have purchased, among other toolboxes..</i>
6. What has been your previous knowledge and practical experience with use of metadata for storing and/or searching?	<i>lit is our major form of research and collection of material. We rely very little on hard copy information, and if, we store it in electronic</i>

	<i>format which we can use.</i>
7. How much do you expect the learning objects to support your teaching needs?	<i>If I could successfully find and download them, I would expect they would be a valuable resource and enhance and support our teaching methods.</i>
8. How much work do you think will be involved to develop course materials using learning objects?	<i>Always plenty work involved, lots of late nights, but we aim to offer our students quality learning materials in flexible formats. We are slowly increasing our clients interest in e-learning options. Some need some educating, but the options are available. The beauty with our Learning Platform is it can be added to when we have the time, and the work is done once.</i>
9. How appropriate is this project to your existing ICT skill set?	<i>Will add to their development</i>
10. How appropriate is this project to your existing pedagogy skill set?	<i>With the development of new technologies, basic principles of training remain similar, however the methods used to carry our message requires advanced interpersonal delivery methods.</i>
11. How efficient will this be? Will there be a good learning return on your investment of time?	<i>Projects of this nature provide a benefit for participants to focus and reflect on current and future skill needs which will provide greater effectiveness and efficiency in future training programs</i>
12. How much do you expect to learn from the project?	<i>Hopefully lots. Am constantly learning, one needs to be able to keep up with the constantly changing technologies.</i>
13. How motivated are you to see this project succeed? Do you have the time you need? Will this project put you under a bit of pressure timewise?	<i>Very motivated. We are always learning and trying to keep up. Finding LearnScope very useful for this. One never has enough time, but we always manage to squeeze it all in. Prioritize, and if there is a benefit for our clients, it will find its way to the top. We are still in developing stage of our RTO, in our 2nd year now, but the rewards and the directions it is taking us are challenging but exciting. So, yes we are under pressure, but we seem to be working well under pressure.....so far a</i>
14. What forms of technical support will you have at your disposal at your institution?	<i>We have a good IT specialist, we have lots of help and support contacts who we can turn to, have had no major problems that we could not deal with ourselves.</i>
15. What are your expectations (how successful do you anticipate your efforts will be)?	<i>We hope to improve what we can offer to our clients, we work in bite sized chunks, and are pleased with every new addition to our platform, Obviously the more the better, but one can only expect to get out what one puts in</i>
16. What problems do you anticipate will hinder or limit your success in the Trials of Learning Objects?	<i>Time to dedicate to project would be the only problem I anticipate.</i>
17. How much is this project being driven by RTO management and how much by your own desire to learn more about Learning Objects?	<i>We are a small RTO, we are the management, so it is driven by both RTO management and our desire to learn more about learning objects</i>

5.2 The Training Program

The training program for the Learning Objects trial took place in the boardroom of Barossa Fine Foods in Elizabeth West, Adelaide, on the afternoon of the 27th of October and the morning of the 28th of October. In attendance were the following team members:

- Peter Higgs – TAFE Tasmania, Learning Objects Trial mentor;
- Dominic Lou – E-Works;
- Trials of Learning Objects teachers – Independent Institute of Food Processing; and
- Mark McMahon – Edith Cowan University, Learning Objects Trial evaluator

The training was therefore split into two sessions, one per day.

Day One focused on providing an introduction to the Learning Object Repository and The Learning Edge system. The first part involved a presentation from Peter Higgs, while the second part provided the teachers with some hands on experience in using the system.

The mentor's presentation provided a broad introduction to the trials including the roles of the project managers, mentor, and research team. He then discussed the range of participants in the project and the purpose of the trials. The discussion then centred on the structure and use of the Learning Edge tool. The mentor explained the workflow in terms of the nature of the resources that make up the repository, and how the repository interacts with content and learning management systems. Peter also made sure that the team were aware of potential intellectual property issues in the reuse of existing materials.

The processes of developing a sample unit were then modelled. In particular, the mentor demonstrated the various methods of searching for objects and showed how these could be brought into The Learning Edge and then embedded or linked within a sequence. The team was shown how to create pages to link objects and edit the content on these pages before exporting to WebCT, Moodle or the Web.

The team then practised these skills. The teachers logged into The Learning Edge, performed a search and assembled some materials, demonstrating competence in using the search facility and the materials assembler. At this stage the focus was on using the tool rather than implementing an instructional approach.

The focus of Day Two was on Instructional Design. The eWorks instructional designer provided an overview of a range of design models such as that of Dick and Carey (2004), while focusing specifically on the ASSURE model as promoted by Smaldino, Russell, Heinich, & Molenda. (2004). The eWorks instructional designer promoted this model for its strong basis generic ADDIE model, and its value for the project in terms of the focus on selecting rather than developing materials from scratch. Each of the components of analysis, stating objectives, selecting method media and materials, utilizing them, and requiring learner participation leading to evaluation and revision were discussed in terms of how the teachers could apply the model to their particular training area. The instructional designer then demonstrated a number of example products, in particular a number of small simulations, which could exist as objects in a unit.

The team then had the opportunity to develop some materials that may come to be included in their final unit. The teachers identified numeracy as a critical skill in food processing, and one that trainees often have difficulty with. It was decided that decimals and fractions are an area for which there are an existing range of materials that could be reused, and one for which there was a tangible need for on-line learning, partly because of an unwillingness on trainees' behalf to admit to deficits in this area and the potential of the on-line courseware to provide a flexible and safe environment for learners to develop skills in this area. As such it would be an important adjunct to the existing learning materials that are currently on the team's Moodle site.

The teachers created some sample materials using learning objects on fractions, demonstrating an ability to search for materials, bring them into The Learning Edge environment, create and

edit pages within the unit and embed the materials. Overall, it appeared that the teachers felt comfortable with The Learning Edge and were able to see a value in it for creating materials to be used as part of the Learning Object Trial project.

5.3 The Online Course

The team constructed their planned online unit in the Learning Edge comprising 4 modules (Figure 5.1). Each of the 4 modules was designed to provide a self-contained online unit for the students.

The screenshot shows the TAFE Tasmania Resource Centre interface. At the top, it says "Logged in as mcmahonm" with options for "log out" and "edit my details". The main header is "Resource Centre". Below this is a search bar and a filter section for "Content Modules that are not published". The search criteria are set to "From 1 January 2000" and "To 12 December 2005". The results section shows four modules:

Module Name	Description	Date	Version	Status	Actions
Communicate in the Workplace	Communicate in the workplace	01-Dec-2005	Version 1	draft	Modify, Delete
Mathematical Concepts	Apply basic maths in the workplace	30-Nov-2005	Version 1	draft	Modify, Delete
Hygiene & Sanitation	Basic hygiene and sanitation practices	30-Nov-2005	Version 1	draft	Modify, Delete
Follow Safe Work Policies	Work safety	30-Nov-2005	Version 1	draft	Modify, Delete

Fig 5.1. The unit modules

The first module was designed to develop students' mathematical skills and capabilities and was derived from learning objects found in the repository. A front page describing the context and purpose was provided with a link to the actual learning activities (Figure 5.2).

The screenshot shows the Learning Edge interface for the "Apply Mathematical Concepts - MTMS2B" module. The left sidebar contains a "Contents" menu with links to Introduction, Addition, Subtraction, Multiplication, and Division. The main content area is titled "Apply Mathematical Concepts - MTMS2B" and "Introduction". It states: "Maths is an important part of most workplaces. Maths will be part of your daily work." and "Maths is an important part of:" followed by a list of activities:

- filling out orders, log books, check lists, stock controls, etc.
- following Work Instructions and SOPs
- taking and recording measurements
- filling out quality or statistical control sheets, charts and graphs

It also lists skills needed: "You need to be able to:"

- recognise the maths that is there
- do the maths
- check your results
- record the results
- report or communicate to someone else about the results

A link is provided: [Click here for some activities](#) on fractions, then try the various exercises...

Fig 5.2. The introduction to the mathematics module

The mathematics module provided a series of descriptions of mathematical processes with images and interactive elements that were intended to provide students with instruction and guidance in a variety of fundamental processes relating to calculations with fractions (Figure 5.3).

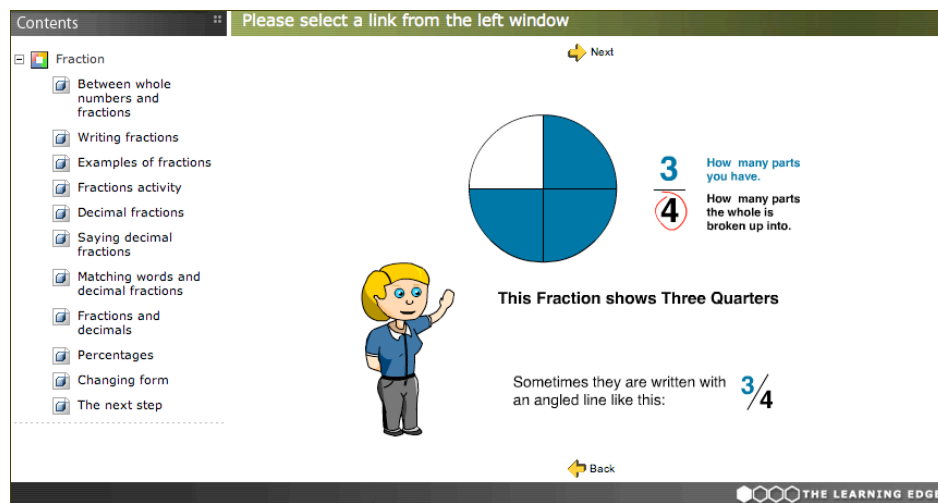


Fig 5.3. A sample screen from the mathematics module

Upon completion of the various pages and tasks, a Quiz module was included that students could undertake to demonstrate their competence with mathematical calculations involving fractions (Figure 5.4).

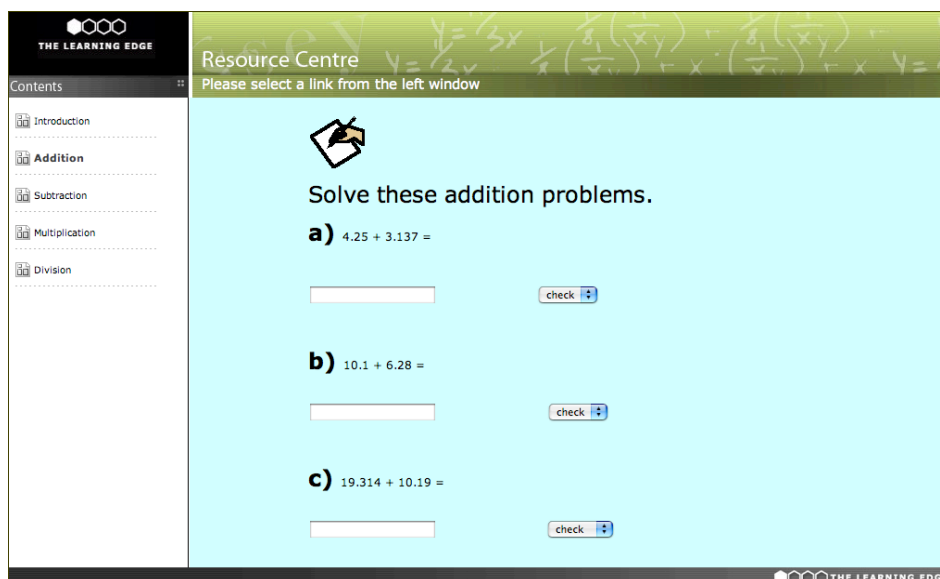


Fig 5.4. The mathematics quiz page

The second module in the unit was entitled Apply Hygiene and Sanitation Practices. This module was also comprised entirely of learning objects drawn from the Repository. Once again The Learning Edge was used to create an introduction that provide a sense of the scope and context to the learning and which provided a means for learners to access the various resources through direct links (Figure 5.5).

The screenshot shows a web interface for 'THE LEARNING EDGE'. On the left is a 'Contents' sidebar with a tree view containing: Introduction, Personal hygiene, Handle Food Hygienically, Keep workplace clean, and References. The main content area has a green header with 'Resource Centre' and 'Please select a link from the left window'. The title is 'Apply Hygiene and Sanitation Practices' with the code 'MTMMP2B'. The section is titled 'Introduction' in red. The text explains that hygiene practices are actions to keep oneself, the plant, and food free from contamination, listing: hand washing, clean uniforms, etc., and following work instructions. It also states that sanitation practices cover cleaning during and after operations in and around the workplace.

Fig 5.5. The introductory page to apply hygiene and sanitation practices.

Each of the elements in this module of the online unit was a discrete object from the Repository and comprised resources from a number of previous Toolboxes. Each was accessible by direct links within the framework developed by the teachers using The Learning Edge environment (Figure 5.6).

The screenshot shows the same 'THE LEARNING EDGE' interface. The 'Contents' sidebar now has 'Personal hygiene' selected. The main content area has a green header with 'Resource Centre' and 'Please select a link from the left window'. The title is 'Maintain personal hygiene'. The text explains that maintaining personal hygiene in the workplace involves personal presentation, cleanliness, clothing, and footwear, and that poor hygiene can affect food safety and staff health. It includes a blue link for a 'Learning Pack' and a 'Self Check' link for a quiz. Below the text is a small image of hands being washed at a sink.

Fig 5.6 The introductory page to apply hygiene and sanitation practices.

The various pages learners would access held a consistent appearance within the modules as a consequence of the Toolbox design but page from the different learning objects were different. Since the environment consisted of a large number of sections and components, there was a

degree of variability in appearance, layout and organization in the way they presented themselves to the learners. Figure 5.7 shows a typical page from within a section of the module.

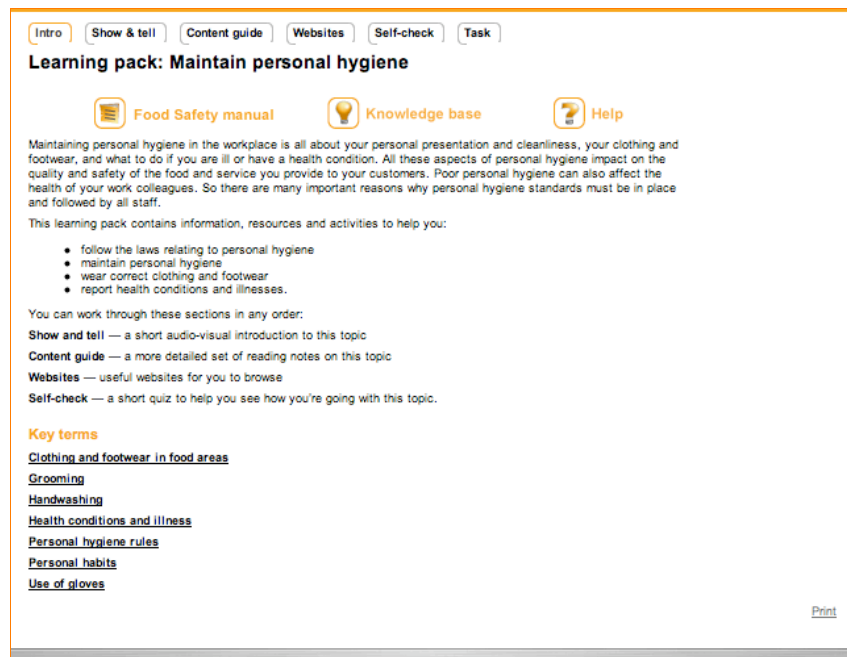


Fig 5.7 Content page from apply hygiene and sanitation practices.

a. Learning tasks

The learning design used in this online unit was driven very much by the forms of learner activity supported by the learning objects taken from the repository. The environment included tasks which typically involved reading descriptions and elaborations and completing small consolidation and rehearsal activities. The majority of the learning outcomes related to acquisition of knowledge and the learning tasks tended to be low order tasks aimed at encouraging reading and some consideration and reflection on the information. The design of the materials tended to involve creating a sequence with the chosen learning objects and using the learning designs they contained as the basis for student activity.

Eight students participated in the trials and completed the unit across a 5 week period. The students worked independently to complete the learning materials under the guidance of their tutor. They completed both modules as described above.

b. Learning resources

The resources contained in the learning setting were a mixture of Web pages from discrete learning objects. Whilst the learning setting was intended for learners in the Meat Processing Industry, it contained resources that had been designed for a variety of different learning settings. The mathematics activities were planned originally for building and construction and contained tasks relating to measurements etc. from this industry. The safety and health resources were drawn from learning settings designed primarily for health workers and related to hospital and medical sites. Whilst the processes and procedures contained in the resources were applicable in generic settings, the learners may have found themselves wondering a little about the choice of context given the differences to their own settings.

In most instances the resources comprised Web pages with graphic and text. Some interactive elements were included but these were quite limited in their scope. Overall the resources were plentiful but limited in their media richness.

c. Learning supports

In its initial form, the learning setting did not contain many learning supports. Since the unit was to be implemented with strong tutor support, many of the conventional forms of support found in online settings were not included in the materials themselves but planned to be included by the tutors in the delivery.

The teachers planned to include their online materials into a Moodle delivery system which would have enabled them to have included the supports from Moodle eg. discussions, chats, online quizzes. In the final outcome, the online unit was implemented in WebCT due to technical difficulties associated with the upload into Moodle and the learning supports were not planned into the software or delivery system.

d. Learning flexibility

The online unit was designed with some flexible elements although it was not intended that students be given too much freedom in their pathways through the unit. Whilst the modules were designed in a fashion that provided learners with access to the various elements, the planned delivery was intended to encourage learners to follow a set path completing the elements and modules in a pre-determined sequence and at a pre-determined pace. The lack of flexibility was needed to enable the tutors to coordinate and manage a cohort of learners rather than supporting a class of independent learners. The supports planned required learners to be following a set schedule and learning sequence.

e. Learning objects

Whilst the online unit ended up being comprised of learning objects, the teachers expressed some concerns with the development process. Problems encountered included bandwidth difficulties associated with a slow dial up and the large file sizes of many of the learning objects. This led on several occasions to learning objects being chosen without being given a full inspection and preview.

The teachers had some difficulty sequencing the learning objects in the desired order and in the initial product the 'Mathematical Concepts' and 'Hygiene & Sanitation' units finished up under the 'Collaborative Content Modules' whilst the 'Communicate in the Workplace' and 'Follow Safe Work Policies' ended up under 'My Content Modules'. The teachers were not sure how this happened and how they might rearrange the modules as learning objects.

The size of some of the learning objects was seen as problematic. In some instances only small parts of learning objects were wanted but there was no mechanism to take parts and the whole learning object had to be included. For example, with the communication learning object, the teacher wanted small sections rather than the entire learning object. The teachers felt that they then had probably too much content on this topic for what the students needed (and hoped students might be sensible enough to know when they had learned what they needed).

The teachers found a raft of useful material but found themselves with insufficient time to spend choosing what could be used and assembling the various resources into their learning setting. Once again, technical issues provided some barriers for them in completing the build of the learning setting with the learning objects.

5.4 Teacher Responses to the Use of Learning Objects

In the South Australian trial, the teacher experienced some difficulties in immediately implementing the online units and they ran some time later with a cohort of ten students. The teacher experienced some difficulty in loading the learning resources and materials into a courseware management system. The intention was to use Moodle within the organisation but technical problems prevented this.

In the end the unit was uploaded in the WebCT environment supported by the mentor. The teacher was reasonably happy with the unit that was developed but expressed concern with the granularity of some of the available resources, the bandwidth required to operate with such large files, and some technical issues associated with sequencing and structuring units once they had been developed.

The teacher felt that the 'Mathematical Concepts' unit was very successful and enjoyed and used constructively by the learners. The students appreciated the graphical nature of the resources, the interactivity and the constructive feedback. They found it easy to use and were successful with it, and indicated it was informative and of benefit. The second setting was considered less successful. The teacher felt that the 'Hygiene and Sanitation' module seemed to be a bit too complex for the students, and a number of the interactive Flash elements did not function as planned.

The students were asked to do an Induction WebCT unit, but only had access to one prepared for staff professional development and a few problems appeared that needed the teacher to settle. The teacher was unfamiliar with WebCT and experienced some difficulty in monitoring student progress and maintaining a close watch on students' activities and performances. Many worked quite independently in the Mathematical Concepts module but needed guidance with the hygiene and sanitation. The difficulties experienced in the delivery of the modules caused the teacher to reflect 'There certainly is a lot involved in putting together something on-line, the content was almost the easy part'.

In the development of the modules using learning objects, the teacher, despite being a novice ICT user, felt very comfortable and successful with the tools. The teacher found some of the learning objects to be too extensive to be useful and would have preferred a smaller grain size for many of them. The chosen learning objects were from a different discipline area, eg. the building trades, but still they seemed to be useful and valuable to the students in the food industry. The mathematics objects in particular were seen to be very suitable where the concepts did not seem to be lost in the building context in which they were to be delivered.

The teacher commented on the value of the training and saw this as essential to her success. She found herself having to spend a good deal of time to locate and choose the learning objects but less time than would have been needed to develop from other sources.

The teacher commented on the need for more learning objects and the value of strong infrastructure eg. bandwidth and technology to facilitate the design and delivery processes. She was also keen to see more opportunity to customise learning objects so that they could be made more relevant to the discipline area.

Table 5.2. Staff responses to learning object usage questionnaire

Question	Response
1. What problems did you find using the repository to locate Learning Objects and resources for your course? eg. interface is confusing, too few objects, search strings hard to plan etc.	<i>I found the repository easy to use, the search function worked well. A general search seemed to work best, refining them too much usually found nothing.</i>
2. What problems did you face designing an online course using Learning Objects? eg. finding the objects, matching the objects to what you wanted to do, time taken to build an online course etc.	<i>In order for some chosen learning objects to 'work' as intended, they needed to be embedded, and often this was a whole section of a toolbox, with far too much information than needed. If these could be 'broken up' further, to be able to pick out what was relevant, would be great.</i>

3. What advantages did you derive from the use of Learning Objects in the planning your course? eg. it made me plan ahead, I was able to concentrate on the learning design, , found one or two really good resources etc	<i>I found lots of good resources, some in completely different industry areas, but still relevant. Obviously if it were possible to customise, this would be preferable.</i>
4. How have the Learning Objects you used added to the quality of your online course? Added interest to the course, provided really strong resources etc.	<i>They will certainly improve our online courses, offering our students a vast array of activities to complete.</i>
5. How many learning objects from the repository did you ultimately use in your course? How many resources from elsewhere? From where did you get the other resources you used?	<i>I only used learning objects from the repository.</i>
6. From your own experiences so far, what problems do you think other teachers will face when planning online courses using learning objects? eg. technical problems, lack of learning objects available, lack of time etc.	<i>Time will certainly always be a factor, my biggest dilemma being the dial up connection, making the process very slow and laborious. With a faster connection, I can see no real problems. An online course is easy to develop, the most time needed to research and peruse what is available</i>
7. What were the most useful elements in the training you received from Peter Higgs? eg. booklet, ideas templates etc.	<i>The face to face session was extremely useful, the booklet only made a lot of sense after that</i>
8. What impediments do you think still exist that will prevent/impede other interested TAFE teachers using Learning Objects in their online courses? eg. lack of hardware for students, requires to much bandwidth	<i>I am unsure of how much bandwidth is required to use the finished resources. Any students participating in an online course would have the needed resources. We are offering online courses as an alternative. Students can choose how they want to study.</i>
9. What difficulties do you still expect to face when building your next course using Learning Objects? eg. too few resources, using Learning Edge, not enough time etc.	<i>As the Learning Edge is developed further, the amount of resources would increase. My dialup connection will still be a problem, but this is something that we need to look into asap, if we wish to continue providing online learning options.</i>
10. What strategies will you use when planning your next online course that will enable you to make good use of learning objects? eg. concentrate on the learning design, take more time to find learning objects, get more help etc.	<i>Certainly need to take more time researching what is available and how it can best be used for our purposes. Customising these further so that the learning objects are relevant to the required industry area.of activities will definitely be improved.</i>

5.5 Student Feedback

Two students provided feedback to the project. Both students had reasonable levels of ICT skills and previous online learning experience. The students found the materials easy to navigate and rated the quality of the resources highly. They found the materials to be quite extensive in scope and considered the resources to have contributed significantly to their learning. There was not much discussion so the students were mixed in their responses to its contribution to their learning. They both felt that the teacher provided strong support and rated their satisfaction as high (not very high) and their overall enjoyment of the unit as moderate and very high. The results of open-ended questions about aspects of the learning experience are shown in Table 5.3.

Table 5.3. Student responses – Apply Mathematical Concepts

Question	Response
1. Tell us a bit about yourself. Are you male or female? How old are you? Why did you do this course?	<ul style="list-style-type: none"> • <i>Male Butcher apprentice, 17 yo, I was asked to do the course because I like learning on the internet</i> • <i>Male, age 19, to further my knowledge</i>
2. Have you done any online learning before? Did you enjoy it last time?	<ul style="list-style-type: none"> • <i>Yes, yes</i> • <i>yes, it went pretty well..</i>
3. What was your impression of the quality of the online resources you were provided in this course? Were they better in this course than others you have done?	<ul style="list-style-type: none"> • <i>It was good. Better than some I have done</i> • <i>yes.</i>
4. What was your impression of the scope of the online resources you were provided in this course? Was there enough? too many/too few?	<ul style="list-style-type: none"> • <i>The maths was good, lots of exercises, enough I think</i>
5. What did you think of the variety of the resources you were provided in this course? Do you think the variety was strong or weak?	<ul style="list-style-type: none"> • <i>Variety was good, got to practice basic maths</i>
6. In what ways did learning online in this course contribute to the quality of your learning experience? eg. kept your interest, provided you with plentiful resources etc.	<ul style="list-style-type: none"> • <i>The pictures were good, the talking about fractions was good, easy to understand</i>
7. In what ways did learning online in this course diminish the quality of your learning experience? eg. had trouble getting online, the links didn't work, pages took too long to load, it took too long to do things etc.	<ul style="list-style-type: none"> • <i>No, worked quite well, mainly the maths</i>
8. What were the best parts of this online course? eg. the discussions, the freedom to work on your own, the flexibility to learn when you wanted? Etc	<ul style="list-style-type: none"> • <i>Yes, the flexibility to learn when I wanted, after work in the evening is good for me</i>
9. In what ways could the online course have been improved? eg. easier to find resources, fewer readings, more interesting readings etc	<ul style="list-style-type: none"> • <i>More quizzes maybe with scores, I did the ones on emergency and stuff, they were good</i> •
10. How well does what you learned in this course compared to what you have learned in other similar courses?	<ul style="list-style-type: none"> • <i>It was different, more interesting, so i think I learned more</i>

6. Discussion & Implications for Practice

The participating teachers completed a survey after they had developed their resources to provide feedback on aspects of developing learning settings using learning objects. Figure 6.1 shows the participants' responses to questions about their levels of satisfaction with the process and difficulties faced. The results reflect the following patterns:

- Most found the repository easy to search and use;
- Most found useful resources in the repository;
- The resources that were found were generally of a high quality;
- Most did not have too much difficulty building their learning environment with the learning objects from the repository;
- Very little customisation was carried out.

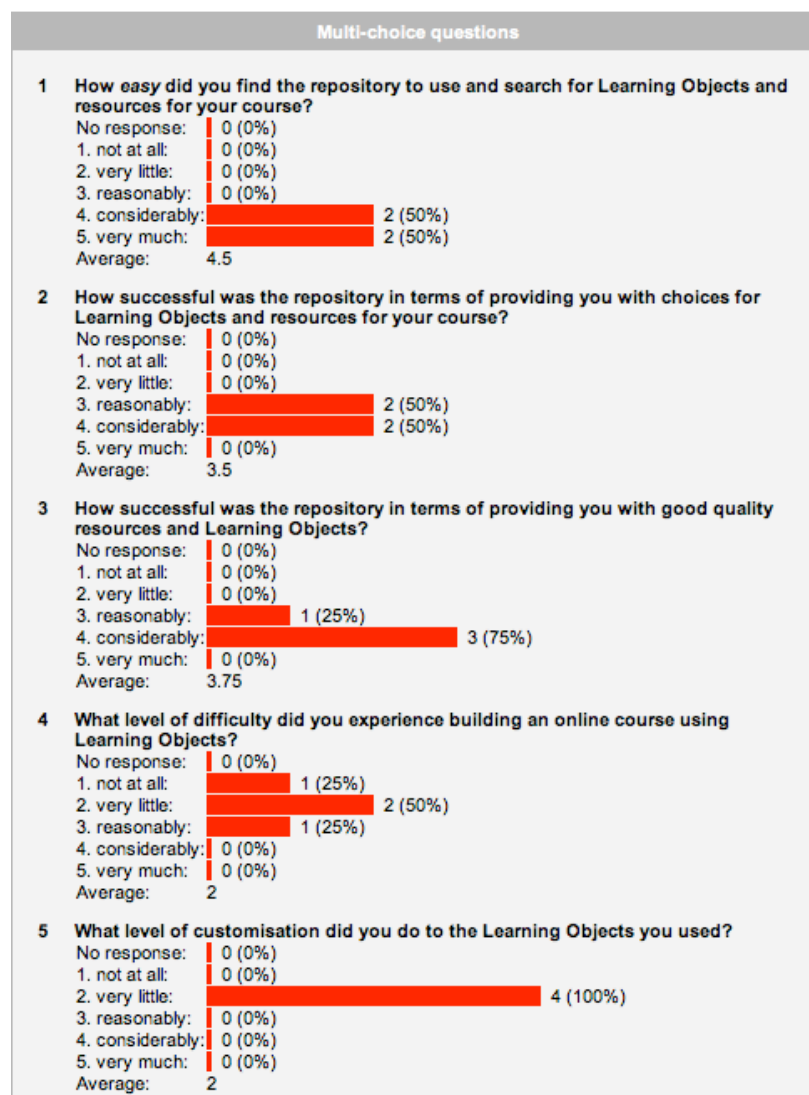


Figure 6.1. Participants' responses to ease of use of the repository

Participants were also asked to provide some judgments about the quality of the resources they found and used and the difficulty which using learning objects held for them and might hold in the future. The responses showed wide ranging impressions:

- The participants were generally positive about the quality of the resources they discovered;
- The level of support required to build the unit differed significantly across all participants;

- Most felt that next time they went to use learning objects from a Repository they would find the task easy;
- Learning Edge was found to be a very accessible and friendly tool for unit building; and
- The general impression was that there are distinct advantages to be derived from development approaches that are based on the use of learning objects.

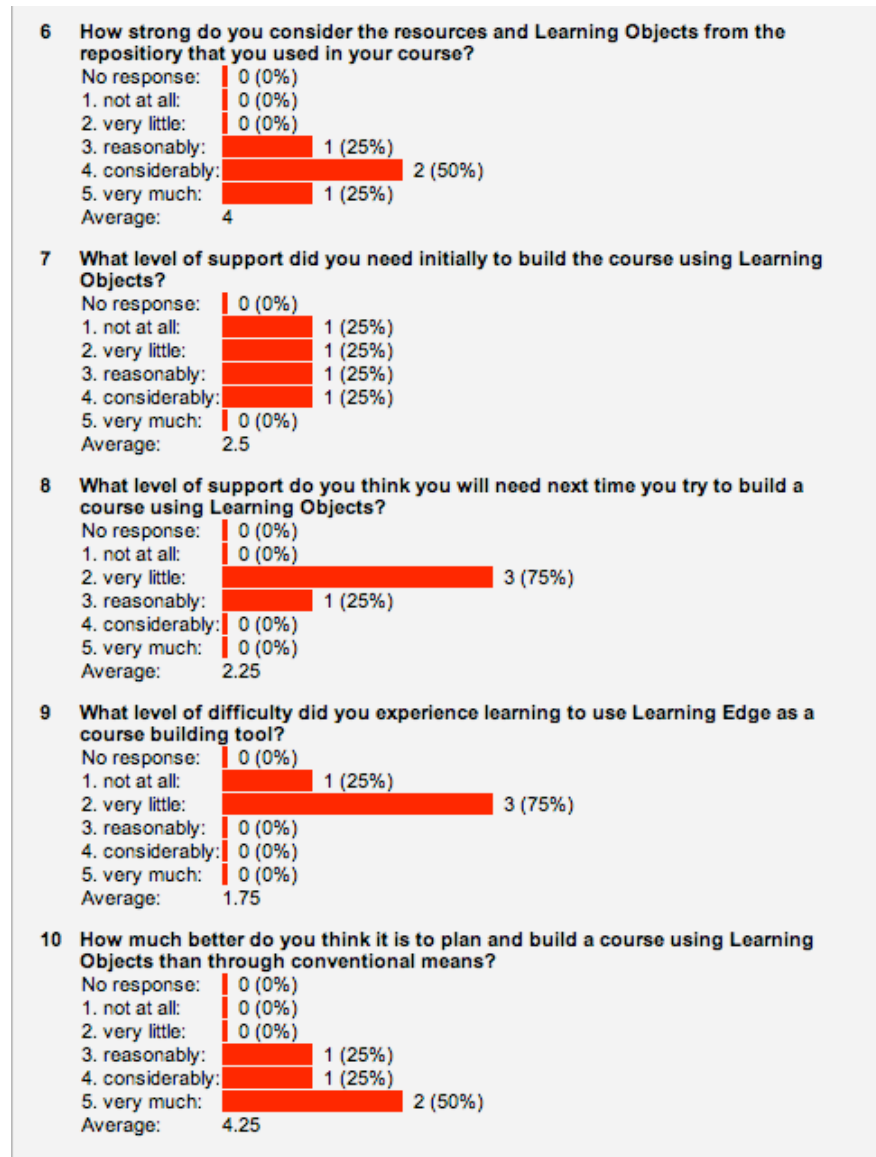


Figure 6.2. Participants' responses to the opportunities gained from the use of the LORN Repository

6.2 Outcomes and Findings

Based on the data gathered from the various trials and the feedback from the teachers, students and project participants, the following statements have been developed to summarise what are considered the major findings from the project. The statements are drawn from the observed practices and from attempts to determine causal relationships between what was observed and the reasons that may have led to the outcomes. The findings are not necessarily proven in the study but emerge as reasonable statements based on the evidence from the trials and the analyses drawn from the evaluation processes employed.

1. The use of a stable and powerful content management system provides strong support for designing online learning units using learning objects.

The participants in the Trial of learning objects used The Learning Edge content management system as the means by which they assembled and structured the learning objects into a SCORM compliant form. This tool is a complex tool with many components and functional elements. With only small amounts of (well delivered) instruction and support, even the least technical teachers in the trials were able to develop sound mental models of the system and its operation. Many of the teachers who will use learning objects may have low levels of technical skills and confidence. The infrastructure and supports for e-learning environments use many acronyms and many technically confusing options. As such the settings are likely to present many barriers to novices. The use of a conceptually sound and well built tool like The Learning Edge, when coupled with sound professional development support, will enable all teachers to make use of Repositories and learning objects in a relatively short period of time. And it is highly likely that teachers will quickly become self-sufficient users as was observed in this study.

2. Repositories need to hold many learning objects to provide teachers with adequate choices to select the resources they require.

The Trials of Learning Objects found that in every instance, the participating teachers would have preferred to have access to more resources than were available to them. This finding was based on the fact that teachers had particular contexts and strategies in mind as they searched for resources and frequently found items that were potentially useful but not exactly what they were seeking. In order to more fully meet the needs of the teachers, it was felt that more variety and choice would have helped them to have more easily developed the environment they were seeking. This study was conducted at an early stage of the development and implementation of the relevant repositories, which accounts for restricted number of learning objects available to the participants.

3. Many learning objects hold strong contextual connections with their original use which can limit their reuse in other settings.

The repositories used in the Trials of Learning Objects contained many resources which were relatively easy to discover and to use in the planned setting. One interesting observation was the strong context that many of the learning objects carried that in some ways limited their opportunities for reuse. The mathematics learning objects for example were designed for use in the building industry. Fractions were taught as measures of building materials etc. In the Trial of Learning Objects, the mathematics was being taught to meat process workers. The sorts of calculations the students needed make in this setting related mainly to weights of food as part of processing. This meant that while the algorithmic processes for working with fractions were dealt with, the context would have appeared a little strange to the learners. The development of learning objects needs to consider reuse, so that wherever possible decisions are taken that can support this aim.

4. The use of learning objects appears to have a strong fit with teachers' existing design and development strategies.

In the Trial of Learning Objects, the instructional design and development processes employed by the various teachers appeared to be well supported by the use of learning objects. In most instances, teachers examined the competencies they were seeking to deliver and went into the repositories to discover what resources might be available. In such instances, the available resources became the basis of the learning settings that were developed. With one team, the design of the learning environment was planned first and then resources were taken from the repositories that could support these outcomes. These different approaches resulted in quite different forms of learning setting but in both cases the use of learning objects was found to be a beneficial and positive addition to the processes of the teachers. It did not appear that to use learning objects teachers needed to adopt alternative or unfamiliar design processes.

5. The use of learning objects can discourage the use of task-oriented learning designs.

Following on from the previous observation, it appeared through the Trials of Learning Objects that when teachers used learning objects in their design and development, they tended to be constrained by what resources they could discover and access. As such, the process tended to result in learning settings which revolved around objects as the principal learning elements. The preferable and more effective forms of learning environments are those where learners undertake tasks and activities with resources as supports and scaffolds (rather than as learning agents). It appeared when the teachers did not have a deliberate learning strategy in mind, the availability of learning objects drew them towards the more directed and structured learning setting characteristic of information and content as an end in themselves rather than as items that learners learn to apply and use.

6. The majority of available learning objects tend to be of a tutorial form. There appear far fewer content and information learning objects from which teachers can choose.

In this project, all teachers came to the repositories to seek learning objects that could support online learning in units with established objectives and learning outcomes. In searching the repositories, it was evident that the vast majority of learning objects were of a tutorial nature, in that they provided information and learning activities to consolidate knowledge and skill acquisition. The teachers were unable to source information and content alone for their units and this influenced the forms of learning design that they ultimately chose to use. It was felt that access to learning objects which could provide information alone about underpinning knowledge and concepts would have been very useful to designing effective learning settings.

7. The granularity of learning objects can influence their capacity for reuse. Larger objects tend to be less useful than smaller objects.

In many instances in the Trials of Learning Objects, resources were discovered that strongly supported the planned learning outcomes. But in many of these instances, the grain size of the learning object meant that there was a high degree of other material in the learning objects that teachers did not necessarily want or need. Teachers remarked on a number of occasions that they would have liked to be able to have chosen parts of the learning objects rather than having to take the complete entity. This comment was also made by several students who recognised that within the learning environment, they were being exposed to and required to use, resources that were unnecessary and in some cases irrelevant. The problem exists in the grain size of the objects and their capacity to be further disaggregated. Often disaggregation is not possible without losing critical elements. The key to success is in the careful and deliberate design to ensure grain size is optimal to support reuse. Had more time been available to the participants in this study, they may have learned to use The Learning Edge to create content modules using learning objects, and in this way, been able to achieve more customisation to meet their students' contexts.

8. Teachers appear not inclined to seek to customise learning objects.

There were few teachers in the trials who customised some of the learning objects they were using. This appeared to stem from a number of reasons. In the first instance few teachers appeared to have the technical capability to use the development tools to effect the changes that might be made. Secondly few teachers had the time needed to make any changes and thirdly the software assembling tools being used did not easily support customisation. If we know that teachers are not likely to want to, or to be able to, make changes, it suggests that in the design of learning objects, developers need to consider ways to maximise the reuse potential in instances when changes and customisation are not likely to be possible.

9. Teachers would be advantaged by better descriptions of learning objects to aid their discovery and selection.

Many of the teachers commented that the time taken to discover and access learning objects was increased significantly by the time it took to run a learning object and to review its contents.

Teachers need to know precisely what is in the resources they choose for their students. They need to walk in the shoes of their students to ensure that the learning experience is what they want it to be. Previewing every learning object can be a time consuming process and one that limits the extent to which teachers will search and look. There exists a need for learning objects to be developed and stored in ways that might reduce the overheads of teachers seeking to use them. Possible solutions include stronger keyword and metadata descriptors, the use of detailed abstracts etc.

10. Repositories can conceal many of the learning objects that they contain.

The project found that teachers took considerable time to discover and select learning objects for use in their learning settings. Whilst the various repositories had quite functional and efficient search functions, the nature of electronic storage meant that the teachers had little sense of the scope and extent of the learning objects in the repositories that may have been useful to them. It would have been helpful to the teachers to have been able to explore some summary data on repository contents to help them to know which repositories held the most prospect for them to use and the scope and extent of learning objects appropriate to their needs.

11. The use of learning objects in designing online settings is a complex task for inexperienced users.

The Trials of Learning Objects revealed that it is possible using available resources and infrastructure to develop online learning units for the VTE sector using learning objects from local repositories across a variety of discipline areas. It was also evident that the process can have many sticking points for teachers tackling the process for the first time. The problems include locating the repositories, discovering appropriate resources, being able to assemble them in a courseware management system for delivery and designing an effective learning setting with appropriate activities and assessments. It was evident that many teachers need access to appropriate training and support and would not be able to complete this process independently.

6.3 Implications for Practice

These findings from the Trials of Learning Objects suggest the need for actions in the following areas if the use of learning objects is to become a component of mainstream use of ICT in the Australian VTE sector. The findings suggest the need for, and value of, appropriate actions across a number of discrete areas.

a. The design and development of learning objects

In designing and developing learning objects, the following strategies can maximise the opportunities for their reuse:

- Smaller rather than larger learning objects provide more opportunity for reuse;
- Learning objects that minimise discipline contexts provide greater opportunities for reuse than learning objects strongly tied to contexts;
- Information and content learning objects without any instructional elements provide strong contexts for reuse; and
- Learning objects need to be designed in ways that encourage and support simple and non-technical forms of customisation, to enhance reusability.

b. Assembling and storing learning objects

In developing repositories and collections of learning objects, the following strategies would appear to promote learning object usage:

- Learning objects need to be described accurately and fully with keywords that provide some sense of the scope of learning and the instructional/learning strategies involved;
- Repositories could aid teachers if they were able to provide some sense of the scope and extent of the resources they contain in relation to specific subject and discipline areas;

- Strategies need to be adopted to source more learning objects for inclusion in repositories. The strategies would need to encourage organizations and individuals to share resources and to see advantage in this;
- Repository projects need to include a contribution process that allows teachers and designers to contribute quality assured learning objects to the repositories; and
- A metadata maintenance program and an automated metadata implementation and validation process should be included to ensure metadata quality and integrity for all stored learning objects.

c. Systems to support teacher use of learning objects

In considering the forms of supports needed by teachers to create online settings using learning objects the following strategies emerged as necessary to support further uptake and use:

- Comprehensive support strategies are needed to enable first time users to employ learning objects in e-learning. Uptake and use of learning objects will likely be very slow if the support is not deliberately designed and provided;
- The training support for users of learning objects needs to include strategies in both linking and/or re-packaging/customising resources. This will allow teachers and designers to take smaller parts of learning objects as required;
- Given the increasing opportunity for using learning objects, teachers would benefit greatly from access to learning design templates that support quality learning designs using learning objects;
- Successful uses of learning objects by teachers in all their forms, eg. blended learning, fully on-line etc. need to be publicised to promote this as a mainstream strategy for unit delivery;
- Targeted professional development focusing on design and customisation strategies for novices and intermediate users would seem to be a particularly useful support strategy.

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