Teaching and Learning Styles that Facilitate Online Learning
Documentation and Research and Development Projects

Pedagogical issues emerging from this project

About 80 VET practitioners have had input into this project. Sources of data collection have included an online survey, three Webforums and more detailed interviews with identified leaders in the field.

The following pedagogical issues have emerged from this project.

Technology does not cause learning

As an instructional medium online technologies will not in themselves improve or cause changes in learning. What improves learning is well designed instruction.

Online learning environments have many capabilities and the potential to widen options and opportunities available to teachers and to learners.

However, the key to changing conditions for improving learning is how these options and opportunities are utilised by teachers and learners.

Technology is coming before pedagogy

The value of any technology for education is proportional to the need for that technology to realise educational objectives. We are constantly reminded that learning must be developed around learning needs, meeting educational objectives and producing viable graduates. However, at this stage of development, the effort put into exploring technologies to 'keep at the cutting edge' is at the expense of equal investment in the underpinning educational design.

Primarily a delivery technology

Generally the online technology is being used as a

delivery technology, with learning material which is essentially similar to material used in other teaching methods (e.g. self-paced learning modules or lecture handouts).

The current use of online technology primarily involves 'repackaging' the adaptation of instructional models developed for other media into an online environment. This is in lieu of 'restructuring' the re-development of new teaching and learning models which match the unique capabilities and features of an online environment.

The concept of design

There are so many 'designers' of online learning environments- aspects required include instructional, graphic, interface design. To retain a focus on learning, distinguishing between educational and structural design is useful.

Educational design focuses on the underpinning conceptual framework to achieve the educational intentions. Such frameworks include a metaphoric training environment, collaborative learning or problem-based learning.

Structural design focuses on the interface design and navigation pathways.

Educational design models

Two types of educational design models for online learning environments seem to be emerging:

- the individual learning model
- the network learning model.

Individual learning model

The individual learning model closely mirrors self-paced independent learning where the interaction is primarily with the computer.

Course content can be provided or can come from a

range of Internet sources including the WWW, databases, virtual libraries and tutorials.

Discrete units of study are placed in a sequence that the learner can work through in easy steps. Content is presented, followed by learning activities, self-tests and assessment.

This model provides opportunity for improvements in access to material and to *just-in-time, just-enough* and *where-I-am learning.*

Learning network model

In contrast, the learning network model is an expert and peer coaching model based on the use of several Computer Mediated Communication (CMC) techniques. The emphasis is on learning through human interaction. A carefully designed learning environment is essential to support network learning. The underpinning design models for networked learning include collaborative, problem-based and project-based learning.

These two models are by no means mutually exclusive. While elements of both can be found in the design of many online courses, the former model is perhaps the most frequently used within the VET sector at this time.

However, the network learning model and its variations is receiving more acknowledgement in the research literature as a design model which capitalises more effectively on online capabilities to enhance teaching and learning. The human factor or 'fleshware' is emerging as a key factor in effective utilisation of online technologies for teaching and learning.

Structural design

Structural or interface design focuses on the usability of a Website.

There is a lot of research from a usability perspective that could fruitfully be incorporated into the design of online courses.

The following comments for example, come from Jacob

Nielsen's Website:

- People read 25% less on screen than on paper, so for a positive experience, there should be only 50% of the amount of text usually presented on paper.
- Text should be chunked into small, self-contained units that can be linked together with related topics.
- The chunk and link system should allow users to explore the material at different depths they can choose for themselves.
- The amount of scrolling should be minimised as the majority of users do not scroll down the screen.
- The text should be written in a 'reverse pyramid' as used by journalists. The main argument is presented at the top of the page and the rest of the article serves to explain it further.

The model of teaching and learning adopted is influenced by the teacher's concept of learning

A teacher's mental model of what learning is, influences the approaches taken to the design of the learning environment and the types of strategies used. A well known study by Saljo (1979) which investigated what individuals understood by learning, came up with five categories.

1. Learning is a quantitative increase in knowledge. Learning is acquiring information or 'knowing a lot'.
2. Learning as memorising. Learning is storing information that can be reproduced
3. Learning as acquiring facts, skills and methods that can be retained and used as necessary.
4. Learning as making sense or abstracting meaning. Learning involves relating parts of the subject matter to each other and the real world.
5. Learning as interpreting and understanding reality in a different way. Learning involves comprehending the world by reinterpreting knowledge.

The last two are qualitatively different from the first two. A teacher's mental model of what learning is will

influence the approaches taken to the design of the learning environment and the types of strategies used.

Designers of effective online learning environments have been effective designers in other media

Teachers who are applying good instructional design principles to online learning are likely to have been the ones who have always done so regardless of the medium.

A common characteristic of the 'snapshots of success' collected during this project is that the teachers as designers had all re-thought the educational design of the learning tasks and material for an online context.

Same strategies, same outcomes

The large amount of literature on comparative benefits of media would suggest that the effectiveness of learning online would not be any different from the effectiveness of that same instructional technique delivered using other methods (Clark, 1983, 1994).

While the implementation of online education is still in a forming stage, it is predicted that there will be no difference in learning outcomes when online learning environments provide the same instructional techniques and learning experiences as other teaching methods.

Innovative and unique uses of online capabilities

Computer Mediated Communication (CMC)

Enhancement of communication through CMC is emerging as an effective feature of the online learning environment. This communication may be one-to-one, one-to-many, many-to many, in both real time and asynchronously.

Successful applications of the technology have reported the use of online technologies to communicate with

other people, rather than interacting only with the computer.

Discussion groups, Email, chats, Webforums and tutorials feature prominently in descriptions of effective educational uses of the Internet.

The importance of increasing the social aspect of learning is a recurring theme.

> *Learning activities that lack social interaction usually fail to evoke emotional involvement from learners and thus deny engagement with culture in the 'community of practice' (Lave and Wegner, 1990) - in Pennell*

Asynchronous - time delayed communication - is consistently mentioned as being particularly effective. Email, computer conferencing, Web forums can be set up for more intimate, protected, convenient and reflective opportunities for exchange.

CMC also supports collaborative learning including problem solving, group work, projects, discussion and peer support.

The social as well as the academic functions that CMC perform, have highlighted the benefits of developing 'learning communities' as an integral part of online course design.

CMC focuses both on the content to be learned (the what) and the process of learning (the how).

Online environments may enable increased instructional efficiency

Online technologies often enable traditionally effective instructional techniques to be used more efficiently. For example, online tutorial discussions can be more easily saved to form a knowledge bank or archive for reference in future. (Pitt & Clark, 1997).

Sometimes the increased efficiency can be so marked that the interaction may be classed as unique. For instance, the ability to conduct Email discussions with

large numbers of people around the world, would be so prohibitively expensive that it may not be practicable with other communication methods.

Distribution of learning resources may also be more efficient.

The online environment has potential as a cognitive tool

Cognitive tools refer to technologies that enhance our cognitive powers during thinking, problem-solving and learning.

Where students use the online technologies as a tool for constructing their own learning, there is likely to be evidence of improved wider learning outcomes (e.g. motivation, complexity of understanding, depth of learning), not reflected in traditional academic assessment.

Learners use the technology for representing and expressing what they know. Learners themselves function as designers, using technologies as tools for analysing the world, accessing information, interpreting and organising the personal knowledge and representing what they know to others.

The online environment seems to be conducive to enabling students to build a project or a body of knowledge. Examples of learners as designers are beginning to emerge. One example can be found in Electronics and Information Technology at Torrens Valley Institute. Learners are given a homepage to display final projects.

New assessment requirements

The kinds of learning that are facilitated by technology are not always easily measured by traditional assessment methods. For example, building hypertext projects has been shown to

- improve long term memory for facts
- increase complexity of understanding

- provide greater motivation.

These are all tasks that are not directly measured by traditional outcome measures such as multiple choice tests (Lehrer, 1993).

Movement away from transmission of content

As a second round developer observed:

> *It's no longer sexy to put everything up on the Web.*

Online technologies may not be so suitable for the transmission of vast amounts of content. The following comment is typical of much of the findings:

> *Many Web-based courses essentially consist of a textbook online. What a waste! Harder to read, cannot take to the park, no permanent record. Also, students want a paper copy of everything and perceive they are missing something if they do not have it.*

Usability research would support this position and recommends that if content is to be delivered, special design considerations must be given to its organisation, chunking and sequencing.

Learner skills

> *The learner who does best in an online environment is generally used to working independently, has personal motivation to learn and knows what he/she wants to achieve. In short, it's an adult student who pursues learning regardless of circumstances. (Crouch, M and Montecino V)*

This learner profile may, however, be the exception rather than the norm for VET students. Self-management skills and self responsibility and motivation are key requirements for a successful online learner.

To participate effectively, learners also need a certain level of computer literacy. Even with the best access to the Internet and exceptional course materials, if students have not used computers or are not confident about their ability to use computers, they may not interact with the material in a way teachers may assume.

Generally positive feedback from learners

The feedback from most students seems to be generally positive about online learning (e.g. Goldman, 1997, Jasinski and Mitchell, 1997). The feedback relates mostly to the convenience of the technology to access the learning. Often the technology enables students to learn in a more convenient way, such as being flexible in its delivery time and time of engagement in learning.

Learning support is a key to success

Most respondents have placed a large emphasis on the need for learner support. This is reinforced by the findings of an ANTA project Learner Support for Online Delivery

Induction

The need for adequate induction programs for learners was a consistent theme. This was especially emphasised by teachers who had experience in facilitating online courses.

Where to place the induction program was an issue for many teachers. If induction was included as part of the course, the time taken out of the learning program was often significant.

As one teacher observed:

> *It took about 5 weeks for the students to get used to the technology. That was five weeks out of our course. This meant we had to squash up the learning outcomes to the back end of the semester so the actual learning was not given the attention it needed.*

The focus on technology is a staged process of investigation

The move to online technologies is an evolving process of investigation. The emerging pattern for the development of online courses is that of a staged and incremental process.

In the first round of investigations, the focus for developers is more on understanding the potential of the technology and exploring its features. There is a natural tendency to adapt an existing and familiar methodology to the technology - often the focus is on the content to be learned rather than the process of learning.

Online technologies offer us the opportunity and challenge to do both well. Since VET core business is teaching and learning, the challenge of a balanced investment between the educational design and the technology is one that cannot be ignored.

Online learning - an opportunity to revisit core business

Online technologies have created an opportunity to revisit VET core business - teaching and learning - with a new vigour and rigour. It has fostered debate on a range of issues related to learning, teaching, organisational structures, lifelong learning, the new requirements of the knowledge economy, Key Competencies and professional development.

The nature of the development of courses for online delivery requires a multidisciplinary team approach and this has fostered professional collaboration and provided a platform for sharing of ideas and debating issues of methodology.

The following comments capture the value of the opportunity to refocus on core business:

> *It has provided enormous benefit for teachers working together as a project team. Breaks down barriers across departments.*

Teachers are hungry to talk about core business. They can revisit why they do things, what it means to teach, constantly thinking what it's all about.

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